ECRONICON OPEN ACCESS

EC NEUROLOGY
Research Article

The Prevalence of Migraine and its Impact on the Educational Achievement of Medical Students at King Saud University - Riyadh, Saudi Arabia

Sara Rayed Saleh Alsaleh[1]*, Majed Muid Owidh Albogami[2], Ashwag Saud Alharthi[3], Mousa Mohammed Akkour[4], Sahar abdrab alameer alshakhis[5], Nouf Jafar Alzahrani[3], Yasser Abdullah Alhudaithi[6], Turki Faissal Bugshan[7], Faisal Amjad Abdulaziz[8] and Ali Ibrahim H Sabei[9]

[1]*Johns Hopkins Aramco Healthcare, Dammam, Saudi Arabia*
[2]*Princess Basma Teaching Hospital, Taif, Saudi Arabia*
[3]*Taif university, Taif, Saudi Arabia*
[4]*Dar Aluloom university, Riyadh, Saudi Arabia*
[5]*Abqaiq general hospital, Dammam, Saudi Arabia*
[6]*Qassim university, Qassim, Saudi Arabia*
[7]*Ibn Sina National Collage, Jeddah, Saudi Arabia*
[8]*MIQAT general hospital, Madinah, Saudi Arabia*
[9]*Primary health center, Sabya, Jazan, Saudi Arabia*

***Corresponding Author:** Sara Rayed Saleh Alsaleh, Johns Hopkins Aramco Healthcare, Dammam, Saudi Arabia.

Received: December 20, 2019; **Published:** December 31, 2019

Abstract

Background: Migraine is episodic brain disorder characterized by attacks of a pulsating headache that varies in intensity from moderate to severe, lasting from mere hours to 2 - 3 days, usually one-sided and aggravated by physical activity. In the previous studies, the most common migraine triggers were lack of sleep and fatigue.

Objectives: This study aimed to identify the prevalence of migraine and its impact on educational achievement of medical students at King Saud University in Riyadh district, Saudi Arabia.

Methodology: A cross-sectional analytical study was conducted among medical students in Riyadh district during educational year 2018 - 2019. Data was collected by using pre-tested self-administered questionnaire. A two stages random sampling method was used for the selection of participants.

Results: A total of 396 medical students participated in this study. According to international headache society's criteria of diagnosing migraine, we found that the prevalence of migraine among our sample of medical students is 18%. This percentage is similar to other prevalence rates around the world ranging from 11% to 40%. Migraine was more prevalent among females (59.8%) compared to males (40.2%) and the most affected age group was more than 21 years. The most common trigger factors of migraine reported by students were irregular sleep, (worry anger and exams) and exposure to sunlight (90%, 79% and 74% respectively). Migraine was more prevalent among first-level and fourth-level students (31.9% and 25% respectively) compared to other levels. The study also found that the majority of students with migraine had college absence due to migraine and most of them reported a decrease in concentration during the migraine attack which affect their educational achievement (68%).

Conclusion: Migraine prevalence among medical students was among the prevalence rates of the world. Migraine more prevalent among females. It more frequent and severe among students in the first level compared to other levels. which can affect their educational achievement.

Keywords: *Migraine; Prevalence; Medical Students; Riyadh*

Introduction

Migraine is a neurological disorder that represents a significant global health problem due to its frequency and substantial disability. In 2001, World Health Organization (WHO) listed migraine in the top 20 illnesses that causes disability [2]. Migraine is an episodic brain disorder characterized by attacks of a pulsating headache that varies in intensity from moderate to severe, lasting from mere hours to 2 - 3 days, usually one-sided and aggravated by physical activity [3]. Photophobia, nausea, and vomiting all can accompany migraine. A transient neurological symptom that includes visual, sensory and/or aphasic features known as aura can precede migraine attacks and usually last between 5 to 60 minutes. Attacks tend to be of a shorter duration in children and abdominal symptoms are more common [4].

It usually starts during childhood or during puberty and remains with the patient for the rest of their life, its occurrence in the general population is about 12%, affecting females (18%) more than males (6%). In females it occurs during their reproductive time (20 - 50 year old). Migraine not just affects one's life but that person is also a burden on the community [5]. Although numerous studies have assessed the prevalence of migraine within the general population, professional groups, and industrial/work place settings, there were few studies focused on the prevalence of migraine among university students [6,12]. Decreased school performance limits success, this may influence the student's future occupational performance in the society [7]. Life of a medical student is full of stresses related to heavy work load, studies, examination and emotional reactions to interpersonal relationships and socioeconomic conditions [8]. Headache is very common in medical students [9] and it has been shown that 40% of medical students had various types Of headache and 40.2% of those were migraine [10].

In previous published studies, 50% - 72% of students with migraine reported stress and/or lack of sleep as specific triggers [7,14,15]. These studies also concluded that up to 40% of medical students with migraine reported severe or very severe impact on daily activities, and about 25% of them required sick leave and bed rest [11,14]. Around 30% reported missing class or clinical duties because of migraine symptoms [7,12,14]. Previous studies showed that stress, sleeplessness, eating habits, menstrual cycle, changes in weather conditions and temperature, frequent traveling, food items, oral contraceptives and physical activities are the factors that trigger most of the migraine attacks. The most common migraine triggers were lack of sleep and fatigue [15,16,18].

Medical students are exposed to stress with regard to their exams, high-level performance and the increased years of education. Many studies from different countries have identified the prevalence of migraine among medical students, ranging from 11% to 40% worldwide [1,7,13]. However still no published studies have addressed the prevalence and impact of migraine among Saudi medical students, so this study was carried out to determine the prevalence of migraine and its Impact on educational achievement among medical students at King Saud University.

Methodology

Study design

This is a cross sectional descriptive study, conducted by a group of medical interns and general physicians under supervisions of college of medicine at King Saud University to assess the prevalence of migraine among medical students of King Saud University, Riyadh district, Saudi Arabia.

Study area

The study was conducted among medical students at King Saud University in Riyadh district, Saudi Arabia during the educational year 2018 - 2019.

Study population

The study population were all medical students (1st, 2nd, 4th, and 5th) levels, and who were available in the educational year during 2018 - 2019. It was inconvenient to include 3rd and 6th level students in the study as they were on their final exams. The list of all students was obtained from registration department.

Sample size

Calculation of sample size will be based on the following formula:

$$\text{Sample size (N)} = \frac{PQ(Z)^2}{(D)^2}$$

N = Sample size required.

Z = Certainly (for 95% z = 1,96).

P = Proportion of the characteristic in the population = 50%.

Q = 1 - 0.5 = 0.5

D = Error allowable (d = 5%)

$$N = \frac{1.96^2 \times (0.5 \times 0.5)}{0.05^2} = \frac{0.96}{0.0025} = 384 \text{ patients}$$

The sample size required was 384 students.

We added 10% (38) as drop out to the sample size to avoid any missing among students during data collection, so the sample size was increased to 422 students.

Sampling method

Two stages sampling method we used in this study as the following:

First stage:

- There are six levels in King Saud University (1st, 2nd, 3rd, 4th, 5th, 6th)
- We selected (1st, 2nd, 4th and 5th) levels, as the other two levels were having their final exams.
- Percentage of medical students in the selected levels:

$$\frac{\text{Number of medical students in each selected level}}{\text{Number of medical students in all four selected levels (608)}} = \text{x } 100$$

- Sample size required in each selected level:

$$\frac{\text{Percentage of medical students in each selected level}}{100} = \text{x } 100$$

Academic year	Students No.	Percentage %	Sample size
1	189	31%	131
2	142	23%	97
4	144	24%	101
5	133	22%	93
Total	608	100%	422

Table 1: *Distribution of sample size proportion in each level of the all four selected levels.*

Second stage:

- The sample size required distributed proportionally in each level according to sex.
- Each level had two sample size frames (male and female) so, students was selected from each sample frame by simple random sample method (Table 2-5).
- Percentage of both sex in each level:

$$\frac{\text{Number of male or female medical students in each level}}{\text{Number of all students in four selected levels}} = \text{x } 100$$

Academic year	Sex	Students No.	Percentage	Sample size
1	Male	121	64%	84
	Female	68	36%	47
Total		189	100%	131

Table 2: *Distribution of students and required sample size in first level according to sex.*

Academic year	Sex	Students No.	Percentage %	Sample size
2	Male	86	61%	59
	Female	56	39%	38
Total		142	100%	97

Table 3: *Distribution of students and required sample size in second level according to sex.*

Academic year	Sex	Students No.	Percentage %	Sample size
4	Male	88	61 %	62
	Female	56	39%	39
Total		144	100 %	101

Table 4: *Distribution of students and required sample size in fourth level according to sex.*

Academic year	Sex	Students No.	Percentage	Sample size
5	Male	71	53%	49
	Female	62	47%	44
Total		133	100 %	93

Table 5: *Distribution of students and required sample size in fifth level according to sex.*

Data collection and tools

The data was collected by using Self-administered pre tested questionnaire. The questionnaire was divided into two parts as the following:

1. Personal data (Name not included).
2. Migraine questionnaire.

Questionnaire validation and pilot survey (pre-test)

In order to increase the validity of the questionnaire, two steps were carried out.

First: A review of the relevant literatures.

Second: A pilot survey of 20 medical students of King Saud University was conducted before the beginning of data collection.

For securing a good data collection a team of four; two males and two females personnel were selected to do a pre-test. 20 students were selected randomly from King Saud university, college of medicine, in order to check the level, language, response and other characteristics of the questionnaire, and to test the relevancy of the questionnaire in relation to the aim of the study and determine if the questions asked were understood by the respondents.

Some questions were modified according to this pilot survey and quality of questionnaire improved.

Data analysis

The data was checked for completeness, coded then entered into a computer by Statistical Package for Social Sciences (SPSS VI 1.5). Obtained data was analyzed using descriptive statistical tools (frequencies, percentages). The mean and Standard Deviation (SD) were also calculated for continuous variables.

Ethical consideration

An approval of the project was obtained from King Saud University College Of Medicine and Department of Family and Community Medicine. Verbal consents were obtained from all subjects who participated in the interviews. Simple brief explanations about the study aims, why and how subjects has been chosen are explained to participants before starting the interview. Participant's privacy was respected and confidentially was assured, neither subjects' name nor beds' number were included in the questionnaire or any sign that may identify the identity of respondent.

Results

In this study, we distributed (422) questionnaires to medical students, all of them were answered, giving a response rate of (100%). 26 questionnaires were excluded from the study due to incomplete data. The results showed that, out of 396 students participated in our study, 48.7% of them were males and the remaining 51.3% were females. Most of the participant 82.1% were older than 21 years, mean age was 22.27 ± 2.17 and the majority of studennts (92.9%) were single (Table 6).

Variable	Frequency	Percentage
Gender		
Male	193	48.7
Female	203	51.3
Age group		
< 20 years	71	17.9
> 21 years	325	82.1
Mean age ± SD*	22.27 ± 2.17	
Marital status		
Single	368	92.9
Married	28	7.1
Educational level		
First level	124	31.3
Second level	92	23.2
Fourth level	92	23.2
Fifth level	88	22.2

Table 6: *Sociodemographic characteristic of students No. (396).*

**: Standard deviation.*

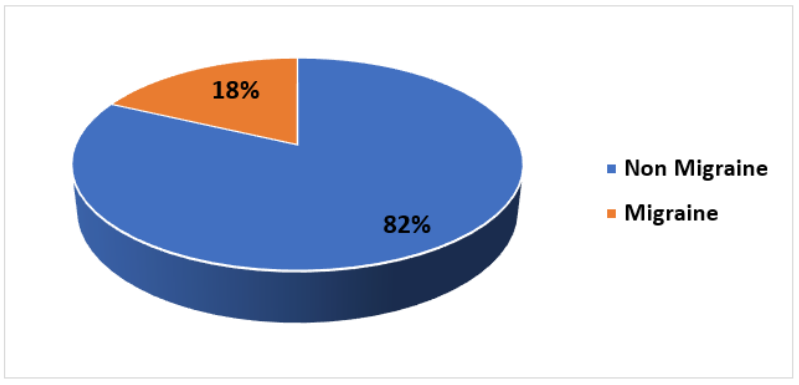

Figure 1: *Prevalence of migraine among medical students according to HIS criteria.*

The study showed that the prevalence of migraine among medical students according to migraine diagnosing criteria by international headache society (IHS) was 72 students (18%).

Variable	Migraine F %	Total
Age group		
Less than 20 years	14 (19.4)	7 2(100%)
More than 21 years	58 (80.6)	
Gender		
Male	29 (40.2)	72(100%)
Female	43 (59.8)	

Table 7: *Prevalence of migraine among Medical students according to their age and sex.*

As shown in table 7 migraine was more prevalent among females 59.8% compared to males 40.2% with female to male ratio of (1.5:1), and the most affected students were older than 21 years, 58 students (80.6%).

Variable	Yes* Freq. (%)	No* Freq. (%)
Worry, anger, exam	57 (79)	15(21)
Irregular sleep	65 (90)	7(10)
Not eating	29 (40)	43 (60)
Noise	48 (67)	24 (33)
Smoker	13 (18)	59 (82)
Physical activity	41 (57)	31 (43)
Exposure to sun	53 (74)	19 (26)
Others	12 (17)	60 (83)

Table 8: *Trigger factors among medical students with migraine No. (72).*

**Most students gave more than one response hence the percentage cannot be summed to 100%. The study showed that irregular sleep (90%), Worry anger and exam (79%), and exposure to sunlight (74%) were the most common migraine triggers reported by the majority of students with migraines.*

Variable	1st level Freq. (%)	2nd level Freq. (%)	4th level Freq. (%)	5th level Freq. (%)	Total Freq. (%)
Migraine Prevalence	23 (31.9)	15 (20.8)	18 (25)	16 (22.3)	72
Frequency of attack in months					
One-two attacks	8 (36.3)	4(18)	4 (18)	6 (35.7)	22
More than two attacks	15 (30)	11(22)	14 (28)	10 (20)	50
Intensity of attack					
Mild	5 (20)	6 (24)	7 (28)	7 (28)	25
Moderate	15 (34.8)	9 (21)	10 (23.2)	9 (21)	43
Sever	3 (75)	0 (0)	1 (25)	0 (0)	4

Table 9: *The prevalence of migraine among medical students at different levels according to frequency and intensity of migraine.*

Table 9 showed that migraine was more prevalent among first and fourth level students (31.9%, 25% respectively) compared to other levels. Out of 72 students with migraine, 23 (31.90%) were a first level students followed by fourth level students 18 (25%), while the least percentage was among the second level students 15 (20.8%). The frequency per month was increased among first level and fourth level students (30%, 8% respectively). Also, the severity of migraine increased in the first and fourth level students (75%, 25% respectively) compared to other levels.

Variable	Frequency	Percentage
Absence from college		
Zero to two days per month	60	83.3
Three to five days per month	8	11
More than five days per month	4	5.7
Absence from daily active of collage		
Yes	25	34.7
No	47	65.3
Lost your concentration or attention during daily activity of collage		
Yes	56	77.7
No	16	22.3
Note any deterioration in your studying habits		
Yes	48	66
No	24	34
Notes any deterioration in your educational achievement		
Yes	49	68
No	23	32

Table 10: *Migraine impact on educational achievemeant of students (No. 72).*

The study showed that a large proportion of students 60 (83.3%) reported missing collage up to two days per month while a small proportion 4 (5.7%) reported missing collage more than five days per month. Majority of students 47 (65.3%) says that they're attending daily activity of collage. Minority of them 16 (22.3%) lost their concentration due to migraine. About 49 (68%) of students noted an impairment in their educational achievement.

Discussion

This study was conducted among the medical students at King Saud University in order to determine the prevalence of migraine and its effect on student achievement. The study results indicated that the prevalence of migraine among medical students in King Saud University was 18% based on international headache society (HIS) criteria [19]. The high prevalence of migraine among medical students in our study can be related to the medical school curriculum at King Saud University which requires constant concentration, continuous effort and hard work, even one day absence from college can affect the student's school performance and success. The prevalence of migraine in our study was similar to other prevalence rates around the world ranging from 11% to 40% [1,7,13]. However, our prevalence rate of migraine is relatively higher than that found in the other studies done among medical students in Oman 12.2% [22], Turkey 12.6% [23] and Iran 16.3% [24]. On the other hand the prevalence rate of migraine in our study is much lower than that reported in other study conducted in different college in Riyadh 33.1% [20] and in Kuwait 27.9% [21]. The difference in migraine prevalence between our study and the those studies could be explained by the methodological differences or different self-reporting questionnaires used and the time of the study which differs with various studies. In our study, migraine prevalence was more prevalent among females than males which are in agreement with the literature and previous studies [20-22]. This likely explained by different hormonal and pubertal changes between males and females whose puberty starts earlier. Similar to other studies [20-22] our data showed that the prevalence of migraine increased with age, with the majority of migraine (80.6%) occurring among those aged more than 20 years, this rate can be explained by starting of puberty for females and the consistent level of hormones up to the menopausal age, a pattern indicating a role for estrogen in headache pathogenesis [25-27]. The increase is more difficult to explain in boys. Regarding trigger factors of migraine, our findings revealed that, the most common trigger factors of migraine reported by our students were irregular sleep, worry, anger, exam and exposure to sunlight. Our findings were in agreement with the findings of previous studies that stress and irregular sleep were the most common triggering factors cited by the students [20-22]. Our study indicated that migraine prevalence, frequency and severity were found more prevalent among students in the first level compared to other levels. In contrast to our findings, the study conducted in Kuwait found that migraine prevalence and severity were found more prevalent among students in the last 2 years compared to first two years [21]. The present study shows that the majority of students (83.3%) with migraine had school absence due to migraine. In agreement to our findings, other study conducted in Riyadh city, Saudi Arabia, observed that more than half of students with migraine (56.8%) had also school absence due to migraine [20]. In contrast to our results, a study conducted in the United States found that only 14.6% of students had college absence due to migraines. This difference in results can be attributed to race, environment, different socio-economic states, climate and nutritional habits [28].

The results of our study showed that the majority (77.7%) of students lost their concentration during the migraine attack, while the study in the United States showed that, (75.9%) Of students did not lose their concentration during the attack. This difference can also be explained by different social and economic states, climate or dietary habits [28].

Conclusion

The prevalence of migraine in our study among medical students was 18%. It was similar to other prevalence rates around the world, ranging from 11% to 40%. It was higher among female compared to male. The most common trigger factors of migraine reported by students were irregular sleep, worry, anger, exam and exposure to sunlight. Migraine prevalence, frequency and severity were found more prevalent among students in the first level compared to other levels. The present study found that the majority of students with migraine had college absence due to migraine. As well as the majority of them lost their concentration during the migraine attack which can affect their educational achievement.

Bibliography

1. Murray CJ., *et al* "Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990-2010: a systematic analysis for the global burden of disease study". *Lancet* 380 (2010): 2197-2223.

2. World Health Organization. The World Health Report. "Mental health: New understanding, new hope" (2001).

3. Organization W. "Atlas of Headache Disorders and Resources in the World 2011". 1st edition. Geneva: World Health Organization (2011).

4. Ferrari M., *et al* "Migraine pathophysiology: lessons from mouse models and human genetics". *The Lancet Neurology* 14.1 (2015): 65-80.

5. Michael BR., *et al* "Prevalence and Sex-Ratio of the Subtypes of Migraine". *International Journal of Epidemiology* 24.3 (1995): 612-618.

6. Bicakci S., *et al* "Prevalence of migraine diagnosis using ID migraine among university students in southern Turkey". *The Journal of Headache and Pain* 9 (2008): 159-163.

7. Bicakci S., *et al* "Headache characteristics in senior medical students in Turkey Tohoku". *Journal of Experimental Medicine* 213 (2007): 277-282.

8. Sherin A. "A survey on non-psychotic psychiatric disorders in medical student community". *Journal of Medical Sciences* 3.5 (1994): 1-4.

9. Tahir MU., *et al* "Headache prevalence, Patterns and Symptoms Amongst Medieval Students at Fatima Memorial College, Lahore". *Pakistan Journal of Medical and Health Sciences* 4.4 (2010): 542-543.

10. Sanvito WL., *et al* "The epidemiology of Migraine in Medical Students". *The Journal of Head and Face Pain* 36 (1996): 316-319.

11. Ojini FI., *et al* "Prevalence and clinical characteristics of headache in medical students of the University of Lagos, Nigeria". *Cephalalgia* 29.4 (2009): 472-477.

12. Deleu D., *et al* "Prevalence and clinical characteristics of headache in medical students in Oman". *Headache* 41.8 (2001): 798-804.

13. Ferri-de-Barros JE., *et al* "Headache among medical and psychology students". *Arquivos de Neuro-Psiquiatria* 69.3 (2011): 502-508.

14. Amayo EO., *et al* "Headache associated disability in medical students at the Kenyatta National Hospital". *East African Medical Journal* 79 (2002): 519-523.

15. Galinovic I., *et al* "Migraine and tension type headache in medical students: a questionnaire study". *College Appoints* 33 (2009): 16973.

16. Zivadinov R., *et al* "Migraine and tension type headache in Croatia: a population-based survey of precipitating factors". *Cephalalgia* 23.5 (2003): 336-343.

17. Vlajinac H., *et al* "Some lifestyle habits of female Belgrade university students with migraine and non-migraine primary headache". *The Journal of Headache and Pain* 4 (2003): 6771.

18. Bessisso MS., *et al* "Pattern of headache in school children in the State of Qatar". *Saudi Medical Journal* 26.4 (2005): 566-570.

19. International Headache Society. international Classification of Headache Disorders, 2nd edition. Cephalalgia 24.1 (2004): 9-160.

20. Al-Tulaihi BA and Al-Jumah MA. "Prevalence of migraine and non-migraine headache among high school students at National Guard Housing in Riyadh, Saudi Arabia". *Saudi Medical Journal* 30.10 (2009): 121.

21. Al-Hashel JY., *et al*. "Migraine among medical students in Kuwait University". *The Journal of Headache and Pain* 15.26 (2014): 3.

22. Deleu D., *et al*. "Prevalence and clinical characteristics of headache in medical students in Oman". *Headache* 41.8 (2001): 798-798.

23. Balaban H., *et al*. "Migraine prevalence, alexithymia and post-traumatic stress disorder among medical students in Turkey". *The Journal of Headache and Pain* (2012).

24. Maryam YazdanparastI., *et al*. "Prevalence of and Factors Associated with Migraine in Medical Students at Bandar Abbas, Southern Iran". *Electronic Physician* 5.3 (2015).

25. Classification and diagnostic criteria for headache disorders "Cranial neuralgias and facial pain. Headache classification committee of the International Headache Society". *Cephalagia* 8.7 (2003): I-96.

26. Winner P., *et al*. "Demographic and migraine characteristics of adolescents with migraine: Glaxo Well come clinical trials database". *Headache* 2003 43 (2003): 451-457.

27. Wong TW., *et al*. "Prevalence of migraine and other headaches in Hong Kong". *Neuroepidemiology* 14 (2003): 82-91.

28. Johnson H and Guhi G. "Migraine in Students of a US Medical School". *Family Medicine Journal* 46.8 (2014): 616-617.

Volume 12 Issue 1 January 2020
©All rights reserved by Sara Rayed Saleh Alsaleh., *et al*.