Original Article :

Assessment of Medical Students' Knowledge of Migraine Headaches in The Western Region of Saudi Arabia: A Cross-Sectional Study

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Abstract

Background and Aims:

Migraine is a common neurological disease with frequent episodes that may impact the social, mental, and physical dimensions. This study aims to determine medical students' knowledge of migraines in the western region of Saudi Arabia, which may help decrease misdiagnosis and referral to secondary healthcare facilities.

Methods:

A descriptive cross-sectional study was conducted using an electronic questionnaire. A total of 628 medical students in Makkah, Jeddah, Al-Taif, and Medina were involved in the investigation in November 2021. The questionnaire addressed their knowledge of diagnosis and treatment options.

Results:

More than half of the participants were men (60.5%). The academic level was approximately equal among the participants (61.5% were in their pre-clinical years). Only 20.4% of the students had a good knowledge of migraine diagnosis and 20.1% had good knowledge of headache treatment. A good knowledge level was detected among 33.8% of the students aged 24 years or more compared with 4.7% of those aged 18–19 years (P-value: .001). In addition, students in their clinical years had better knowledge compared with those in their pre-clinical years (P-value: .001). Students exposed to any patients with migraines at medical school had a good knowledge level compared with those who did not. A good knowledge level was detected among 40.1% of the students who participated in any course on migraine headaches compared with 11.9% of those who had never participated.

Conclusions:

Medical students in the western region of Saudi Arabia have low knowledge of migraines. We recommend students be exposed to high-quality sources of information.

Keywords:

Headache, Migraine, Knowledge, Medical Students, Saudi Arabia.

Introduction

Migraine is a disabling neurological disease with associated symptoms and characteristics that fulfill the migraine diagnostic criteria, including headache, nausea, vomiting, and hypersensitivity to visual, auditory, and olfactory stimuli[1]. Migraine has two main types: chronic migraine (CM) lasts for at least 15 days each month, while individuals experience 0–14 headache days per month when they suffer from episodic migraine (EM)[2]. Migraine is considered to be the second most disabling disorder worldwide, accounting for more than 7% of the global burden of neurological diseases[3,4]. CM is predicted to affect 1–5% of the global population[5], whereas the prevalence rate is 12.1% among Saudi Arabian adults[2].

The frequency of migraine attacks affects health-related quality of life in the social, mental, and physical dimensions. Numerous patients with migraines suffer from decreased productivity and decision-making at work as well as disruptions in their family, social, and leisure activities[6,7]. Migraine also affects society because of the direct and indirect medical costs incurred [1]. However, only 20% of patients who match the criteria for CM are appropriately identified, according to a recent US study[8]. Once a patient has been diagnosed, doctors can focus on removing or reducing aggravating variables and optimizing treatment, thereby lowering the global burden of disease[9]. In most situations, proper CM management necessitates the assistance of a neurologist. The majority of CM patients are referred from primary healthcare facilities to secondary facilities. The latter is vital in locations with insufficient professionals, as is the case in many parts of Saudi Arabia. In other words, good CM management requires a collaborative effort between the PCP and neurologist. During our literature search, we found no research in the western region of Saudi Arabia. Hence, the purpose of this study is to determine the level of knowledge of CM symptoms and characteristics among medical students in the western region of Saudi Arabia (Mecca, Jeddah, Al-Taif, and Medina). It is critical to know the knowledge of medical students to modify medical curricula and raise the knowledge of students/GPs to decrease misdiagnosis and referral to secondary healthcare facilities in the future.

Methods

Research design, population, and samples

This descriptive cross-sectional study was conducted among 628 undergraduate medical students in the western region of Saudi Arabia between 10 November 2021 and

24 November 2021. We included medical students in Makkah (Umm Alqura University), Jeddah (King Abdulaziz University, King Saud bin Abdulaziz University for Health Sciences) , Al-Taif (Taif University), and Medina) Taibah University) studying in their pre-clinical and clinical years (the second year to the sixth year) who were sufficiently competent to answer our questionnaire. We excluded any students who refused to participate. The study protocol was approved by the Research Ethics Committee of the Biomedical Ethics Unit at Umm Al-Qura University, Makkah, Saudi Arabia (Reference No. HAPO-02-K-012-2021-11-815).

The minimum sample size required for this study was calculated by OpenEpi version 3.0 10 based on a population of 4,119 medical students. Keeping the confidence interval at 95% and considering the 50% prevalence rate of knowledge of migraine headaches, the minimum sample size was calculated to be 352 participants. To compensate for any possible data loss, the total sample size required was 400 participants.

Questionnaire structure

The questionnaire was built in Google Forms and distributed electronically through social media platforms (e.g., WhatsApp, Twitter, and Telegram) in English [11]. A semi-structured questionnaire was designed for this study; its face and content validity was checked by two consultants in neurology [12]. Then, a pilot study was performed among 30 students. The questionnaire was divided into three main domains. The first domain collated sociodemographic data, including eight questions on gender, age, university, academic year, GPA, exposure to patients with headaches, participation in migraine headache courses, and study sources. The second domain included a multiple-choice question on the diagnosis of migraine headaches based on criteria by the IHS[13], which included three answers ("Yes", "No", and "Do not know"). The questions on diagnosis were related to duration, frequency, aura, criteria, associated symptoms, and history. The third domain assessed the treatment of migraine headaches, including a multiple-choice question with the same three options as above; treatment-related questions were asked about lifestyle modification, trigger management, acute and preventive treatment, medication overuse, management of other problems, side effects (B blockers, angiotensin blockers, and tricyclics), anticonvulsants as a first-line treatment, supplements used in the treatment (riboflavin (vitamin B2) and magnesium citrate (or laurate)), and use of prophylactics (e.g., topiramate, gabapentin, tizanidine, fluoxetine, amitripty-

line, and valproate). It also examined the efficiency of topiramate in treatment and whether antidepressants and muscle relaxants were used in the treatment plan. However, one item from treatment knowledge subscale was deleted during the validation process, as it was judged to be redundant.

Statistical methods

After the data were extracted, they were revised, coded, and fed into the IBM SPSS version 22 statistical software (SPSS, Inc. Chicago, IL). All the statistical analyses were carried out using two-tailed tests. A P-value less than .05 was considered to be statistically significant. For the knowledge and awareness items, each correct answer scored one point and the sum of the discrete scores of the items in each knowledge domain (diagnosis and treatment domains) was calculated. A patient with a score less than (equal to or more than) 60% of the total score was considered to have poor (good) knowledge. A descriptive analysis based on the frequency and percentage distribution was carried out for all the variables, including students' age, gender, academic year, GPA, history of exposure to headache cases, and attendance at headache and migraine courses. In addition, students' knowledge of CM and migraine diagnosis and treatment were also tabulated, while the source of study was illustrated. Cross-tabulation was used to assess the distribution of students' knowledge and awareness of headache diagnosis and treatment according to their personal data, academic stage, and source of study. Relations were tested using the Pearson chi-square test and the exact probability test for small frequency distributions.

Results

A total of 628 medical students meeting the inclusion criteria completed the questionnaire. Students' ages ranged from 18 to 29 years, with a mean age of 21.3 ± 1.7 years. Altogether, 380 (60.5%) students were men. In total, 386 (61.5%) students were in their pre-clinical years (first to third years); 339 (54.0%) had an excellent GPA, 175 (27.9%) had a very good GPA, and only 18 (2.9%) recorded a pass. A total of 185 (29.5%) reported that they had been exposed to patients with migraines at medical school and 207 (33%) had participated in training courses on migraine headaches. Table 1 demonstrates detailed personal data of the included participants.

Figure 1 reveals the most reported source of study among medical students in the western region of Saudi Arabia. The most reported sources were medical websites (32.6%), courses (28%), references (22.9%), journals (6.8%), conferences and workshops (3.2%), and lectures (2.9%).

Table 1. Personal data of medical students in the western region of Saudi Arabia

| Personal data		No.	%
Age in years	18–19	86	13.7%
	20–21	287	45.7%
	22–23	181	28.8%
	24 and more	74	11.8%
Gender	Male	380	60.5%
	Female	248	39.5%
Academic year	1st year	94	15.0%
	2nd year	154	24.5%
	3rd year	138	22.0%
	4th year	123	19.6%
	5th year	62	9.9%
	6th year	57	9.1%
Academic stage	Pre-clinical	386	61.5%
	Clinical	242	38.5%
GPA	Pass	18	2.9%
	Good	96	15.3%
	Very good	175	27.9%
	Excellent	339	54.0%
Have you been exposed to any patients with migraines at medical school?	Yes	185	29.5%
	No	443	70.5%
Have you participated in any course on migraine headaches?	Yes	207	33.0%
	No	421	67.0%
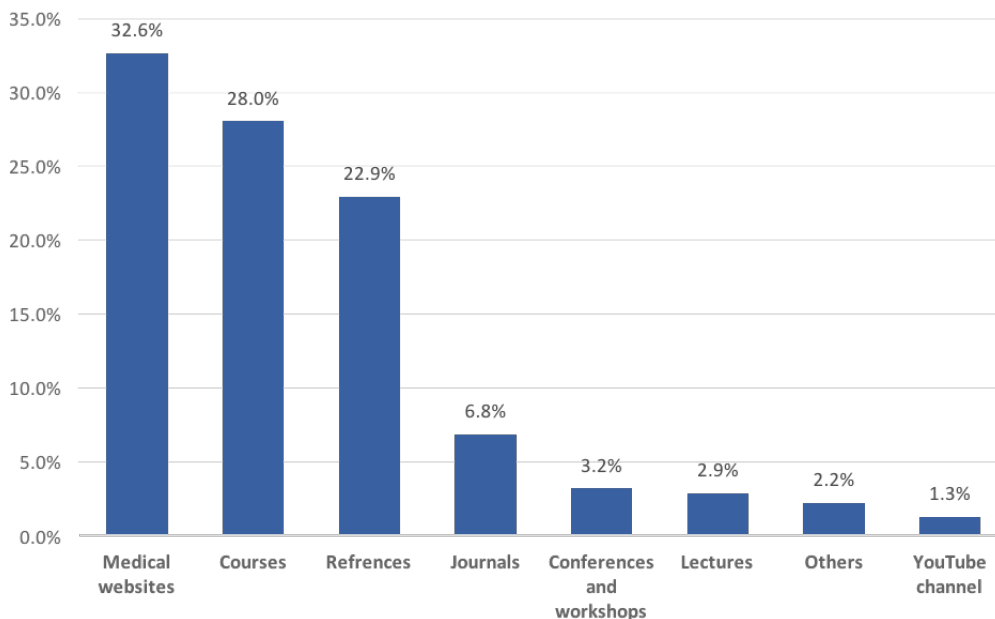
Figure 1. The most reported sources of study among medical students in the western region of Saudi Arabia

As shown in Table 2, for diagnosis, 70.2% knew that an accurate history is crucial for the diagnosis of migraine, 58.3% of the students knew that migraine-associated

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symptoms include nausea and photophobia/phonophobia, 51.1% reported that CM could have a long duration (attacks lasting up to 72 hours), 35% agreed that CM could have a short duration (attacks lasting less than 4 hours on average), and 34.6% knew that CM is defined by 15 or more headache days per month for more than 6 months. As for migraine treatment knowledge, 69.7% of the students reported that lifestyle modification and trigger management are part of the broad approach to treating CM, 57.3% knew that managing other problems that exacerbate their tendency to suffer headaches will aid the treatment of CM, 54.8% reported that acute and preventive treatments are part of the broad approach to treating CM, and 36.5% reported that managing medication overuse aid the treatment of CM. Only 21.3% stated that anticonvulsants are the first-line treatment of CM.

Table 2. Medical students' knowledge of the diagnosis and management of headaches in the western region of Saudi Arabia

Domain	Items	Yes		No		Do not know	
		No	%	No	%	No	%
Diagnosis	Chronic migraine can have a long duration (attacks lasting up to 72 hours).	321	51.1%	78	12.4%	229	36.5%
	Chronic migraine can have a short duration (attacks lasting less than 4 hours on average).	220	35.0%	162	25.8%	246	39.2%
	Chronic migraine is defined by 15 or more headache days per month for more than 6 months.	217	34.6%	69	11.0%	342	54.5%
	Chronic migraine has two types: chronic migraine with an aura and chronic migraine without an aura.	287	45.7%	42	6.7%	299	47.6%
	Do the new appendix criteria recommend that more than three migraine attacks should be diagnosed as chronic migraine?	110	17.5%	82	13.1%	436	69.4%
	Do migraine-associated symptoms include nausea and photophobia/phonophobia?	366	58.3%	50	8.0%	212	33.8%
	Is an accurate history crucial for the diagnosis of migraine?	441	70.2%	39	6.2%	148	23.6%
Treatment	Are lifestyle modification and trigger management part of the broad approach to treating chronic migraine?	438	69.7%	40	6.4%	150	23.9%
	Are acute and preventive treatments part of the broad approach to treating chronic migraine?	344	54.8%	59	9.4%	225	35.8%
	Does manage medication overuse aid the treatment of chronic migraine?	229	36.5%	147	23.4%	252	40.1%
	Does managing other problems that exacerbate the tendency to suffer headaches aid the treatment of chronic migraine?	360	57.3%	35	5.6%	233	37.1%
	Should preventive treatments for chronic migraine be commenced at a low dose to minimize the possibility of developing side effects?	249	39.6%	58	9.2%	321	51.1%
	Are B blockers, angiotensin blockers, and tricyclics used in the treatment of chronic migraine?	194	30.9%	64	10.2%	370	58.9%

Domain	Items	Yes		No		Do not know	
		No	%	No	%	No	%
Treatment	Are anticonvulsants the first-line treatment for chronic migraine?	120	19.1%	134	21.3%	374	59.6%
	Are riboflavin (vitamin B2) and magnesium citrate (or laurate) supplements used in the treatment of chronic migraine?	178	28.3%	48	7.6%	402	64.0%
	Are topiramate, gabapentin, tizanidine, fluoxetine, amitriptyline, and valproate used as prophylactics in the treatment of chronic migraine?	167	26.6%	61	9.7%	400	63.7%
	Is topiramate the most efficacious in patients with chronic migraine?	128	20.4%	55	8.8%	445	70.9%
	Can antidepressants be used in the treatment of chronic migraine?	202	32.2%	57	9.1%	369	58.8%
	Can muscle relaxants be used in the treatment of chronic migraine?	180	28.7%	69	11.0%	379	60.4%

Figure 2 represents the overall knowledge level of migraine treatment and management among medical students in the western region of Saudi Arabia. For headache diagnosis, 20.4% of the students had a good knowledge level, while 20.1% had a good knowledge of headache treatment and only 21.2% had a good overall knowledge level.
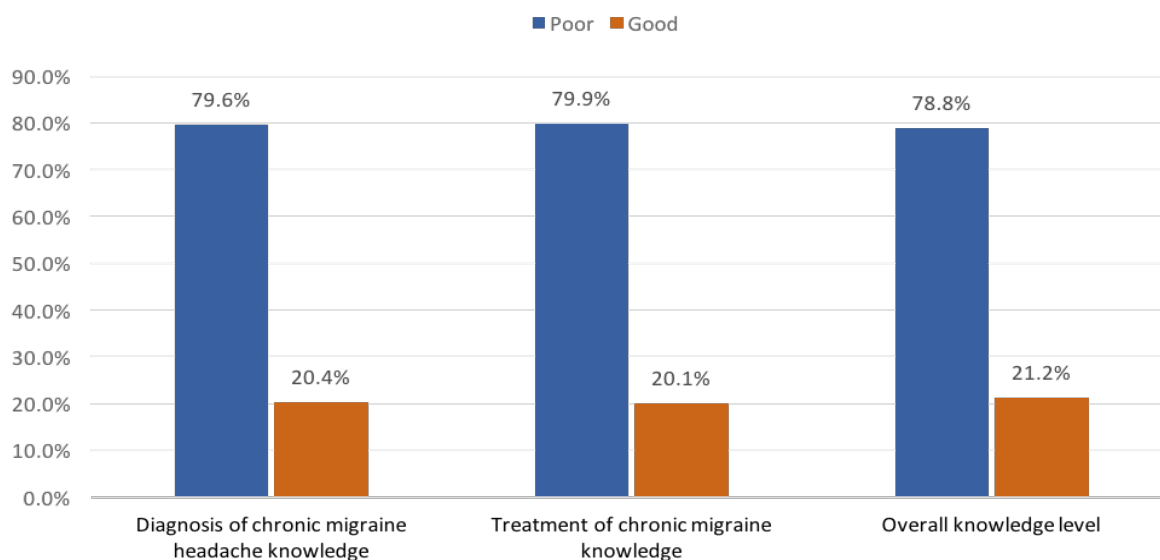
A good knowledge level was detected

Figure 2. Overall knowledge level of migraine treatment and management among medical students in the western region of Saudi Arabia

among 33.8% of the students aged 24 years or more compared with 4.7% of those who aged 18–19 years (P=.001). In addition, 30.6% of the students in their clinical years had a good knowledge level compared with 15.3% of those in their pre-clinical years (P=.001). Additionally, 34.6% of the students exposed to patients with migraines

at medical school had a good knowledge level compared with 15.6% of those who did not (P=.001). A good knowledge level was detected among 40.1% of the students who participated in any course on migraine headaches compared with 11.9% of those who did not (P=.001). The distribution of medical students' knowledge of headache diagnosis and treatment by their personal data is presented in Table 3.

Table 3. Distribution of medical students' knowledge of headache diagnosis and treatment by their personal data

Personal data	Overall knowledge level				P-value
	Poor		Good		
	No.	%	No.	%	
Age in years					
18–19	82	95.3%	4	4.7%	.001*
20–21	228	79.4%	59	20.6%	
22–23	136	75.1%	45	24.9%	
24+	49	66.2%	25	33.8%	
Gender					
Male	298	78.4%	82	21.6%	.761
Female	197	79.4%	51	20.6%	
Academic stage					
Pre-clinical	327	84.7%	59	15.3%	.001*
Clinical	168	69.4%	74	30.6%	
GPA					
Pass	16	88.9%	2	11.1%	.441
Good	78	81.3%	18	18.8%	
Very good	132	75.4%	43	24.6%	
Excellent	269	79.4%	70	20.6%	
Have you been exposed to any patients with migraines at medical school?					
Yes	121	65.4%	64	34.6%	.001*
No	374	84.4%	69	15.6%	
Have you participated in any course on migraine headaches?					
Yes	124	59.9%	83	40.1%	.001*
No	371	88.1%	50	11.9%	
Study source					
Medical websites	149	72.7%	56	27.3%	.197$
References	114	79.2%	30	20.8%	
Courses	145	82.4%	31	17.6%	
Journals	36	83.7%	7	16.3%	
YouTube channel	8	100.0%	0	0.0%	
Lectures	16	88.9%	2	11.1%	
Conferences and workshops	16	80.0%	4	20.0%	
Others	11	78.6%	3	21.4%	

P: Pearson X^2 test

$: Exact probability test.* P .05> (significant)

Discussion

According to the Global Burden of Disease in 2015, migraine is estimated to be the third cause of disability in individuals under the age of 50 and affects 12% of the global population and 25% of the Saudi population[14,15]. Therefore, it is important to assess medical students' knowledge of this disease. As stated previously, our findings revealed that the majority of the students had a poor overall knowledge of migraines and only 21.2% had a good overall knowledge level. For diagnosis, only 20.4% of the students had a good knowledge level, while 20.1% had a good knowledge of headache treatment and management. This result is considered as a poor knowledge and is remarkably lower than that found by most prior studies. For example, one previous study conducted among medical and non-medical students in the western region [16] reported that students' knowledge of migraine was good, as 48.9% of non-medical and 84.6% of medical students had a good background. They also found that the prevalence of migraine among students was 35.4%. Another study conducted in Jeddah among primary healthcare physicians 12 showed a good overall level of knowledge among approximately half of the participants, but the detailed assessment showed inconsistent knowledge in three out of seven diagnosis-related items and eight out of 12 treatment-related items. Our findings revealed that the participants' knowledge of headache diagnosis and treatment differed according to their sociodemographic characteristics, as also reported in previous studies[12,16]. Our results revealed a good knowledge level among 33.8% of the students aged 24 years or more compared with 4.7% of those aged 18–19 years (statistically significant). In addition, 30.6% of the students in their clinical years had a good knowledge level compared with 15.3% of those in their pre-clinical years. Additionally, 34.6% of the students exposed to patients with migraines at medical school had a good knowledge level compared with 15.6% of those who did not. A good knowledge level was detected among 40.1% of the students who participated in any course on migraine headaches compared with 11.9% of those who did not.

According to these results, we provide suggestions and possible solutions to the problem or aim to at least raise the level of migraine knowledge among students. First, our results showed that a good knowledge level was found in 40.1% of the students who took any course on migraine headaches compared with 11.9% of those who did not. Therefore, taking classes on this subject would help enhance knowledge from the lectures and regular studies. Oth-

er factors include exposing students to certain sources to help them in their studies instead of just studying from lecture slides. For example, our results showed that 88% of the students who had good knowledge chose medical websites, references, and courses as study sources (Table 3). In addition, more clinical exposure and increased neuro rotation at medical college are important, as we found that 30.6% of the students in their clinical years had a good knowledge level compared with 15.3% of those in their pre-clinical years and that 34.6% of the students exposed to any patients with migraines at medical school had a good knowledge level compared with 15.6% of those who did not. One of the best methods to increase medical knowledge is to read from reliable sources and add to this foundational knowledge with recent developments and current issues in clinical practice by sourcing medical literature. Seminars and workshops are also great for absorbing focused information dedicated to one aspect of medicine.

To our knowledge, this study is the first conducted among medical students in the western region of Saudi Arabia to assess their knowledge of migraine headaches. However, it has certain limitations. First, because medical students were the only ones who reported on all the research variables, recall bias is a possibility. Second,

as the current study used a cross-sectional model, we could not draw any causal inferences. Finally, our study's limited sample size may raise the risk of errors. Therefore, we recommend conducting similar studies with questions targeted toward medical students with a larger sample size to confirm our results.

Conclusion

A low overall knowledge of migraine treatment and management among medical students in the western region of Saudi Arabia was found. Thus, we recommend that students should be exposed more to high-quality sources of information and keep up-to-date with recent developments and current issues as well as take more migraine and neuro courses. To verify our findings, we recommend performing comparable community-wide research with a larger sample.

Acknowledgment

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