

Levels and determinants of knowledge about chronic migraine diagnosis and management among primary health-care physicians in ministry of health, Jeddah 2019

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ABSTRACT

Background: Chronic migraine (CM) poses a significant burden for patients, and it has multiple diagnostic and managerial challenges, particularly among primary health-care physicians (PCPs). **Objectives:** The objective of this study is to assess the levels of knowledge regarding CM diagnosis and management among PCPs and to explore the factors associated with poor knowledge. **Methods:** A cross-sectional study was conducted among PCPs working at primary health-care centers in Jeddah, Saudi Arabia. A semi-structured questionnaire comprising 20 items related to CM diagnosis and treatment was used. **Results:** A total of 136 PCPs responded (aged 36.4 ± 8.1 , 68.4% were females). The overall median (P75) knowledge score was 13.0 (15.0), and 45.6% of the participants had adequate knowledge (score > median). The majority of respondents (>50%) could not identify the lower limits of CM duration, the necessity of identifying at least eight migraine attacks in a month, the importance of managing medication overuse, and the indication of topiramate as the most efficacious agent in CM. Young physicians (23–35 years), bachelor graduates, general practitioners (GPs), and those having ≤ 5 years of experience scored lower than their peers. Physicians with 6–10 years of clinical experience were independently more knowledgeable than less-experienced PCPs (odds ratio = 5.09, $P = 0.006$). **Conclusion:** Knowledge regarding CM diagnosis and treatment was inadequate among PCPs, which could detrimentally influence the patterns of referral to secondary health-care facilities. Given these observations, it is recommended to amend the academic curricula for medical students/GPs and adopt continuing medical education programs for PHPs to support their levels of knowledge.

Keywords: Chronic, cluster headache, headache disorders, knowledge, migraine, physicians, primary care, Saudi Arabia

Introduction

Chronic migraine (CM) is a clinical entity that categorizes a subgroup of migraineurs who experience a complicated evolution

of their migraine attack's profile. The International Classification of Headache Disorders published by the International Headache Society (IHS) defines a set of criteria for CM: Over a three-month duration, headaches have to last for at least 15 days per month, including at least 8 days a month on which the headache characteristics are consistent with typical migraine attacks.^[1] In essence, the cutoff of 15 days differentiates between the episodic migraines (EMs), which is the commonly known subtype, from CM.

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Migraine, in general, is considered the second most disabling condition worldwide, which contributes to more than 7% of the global burden of the neurological disorders.^[2,3] Focusing on CM, the prevalence of the disease has been estimated as 1–5% of the general population, worldwide.^[4] However, given the heterogeneity across studies and lack of data from certain regions, the epidemiological picture of CM is incomplete. It accounts for about 8% of all migraine cases, and each year, 2.5% of EM transforms to a CM.^[5,6]

Accordingly, the impact of CM is thought to be more important, and several studies evaluate this impact in terms of headache-related disability, worse socioeconomic status, health-related quality of life, higher rates of comorbid medical and psychiatric conditions, and increased health-care resource utilization.^[7] Besides, the mean headache-related total costs among patients with CM are over three times than those of EM.^[8] Furthermore, because of the substantial number of undiagnosed cases (approximately 75% of actual cases), and the associated mismanagement inducing higher health-care costs, the economic burden related to CM is believed to be much higher.^[6]

Therefore, there is a need to properly manage CM patients to reduce such a personal and economic burden. Nonetheless, management of CM might slightly differ from the common form. In addition to the general approach to treat a migraine, which includes pharmacological and nonpharmacological treatment, several points must be taken into consideration.^[9,10] First, CM is an evolving form of migraine, so the treatment could be more complicated, relying often on prophylaxis. Second, the treatment should focus upon seeking the reverse factors for the transformation of an EM to a CM. Third, it is extremely important to avoid the overuse of migraine abortive drugs, which is one of the main red flags to rule out the diagnosis of primary chronic headaches, because it may cause medication overuse headache.^[5,11,12] Nevertheless, in several cases, current therapies are not enough to prevent or reduce the impact that CM has on people's lives. This can lead to sufferers who frequently become depressed and unable to cope with this headache disorder.^[13]

In general cases, the successful management of CM requires the help of a neurologist. Most of CM patients are referred from primary health-care centers to secondary facilities.^[14,15] Although the role of the primary-care physician (PCP) remains debatable, it is important in terms of identifying the nonclassical clinical presentation and the disease unusual history, because this represents the first health-care line. In addition, providing good training to PCPs would support their discriminative capacity to differentiate between EM and CM. Consequently, this would help initiate an optimal therapy and limit unneeded referrals to the neurologists.^[16] The latter would be important in areas with insufficient numbers of specialists, which is the case in multiple regions in Saudi Arabia. In other words, the complementary interaction between the PCP and the neurologist leads to the proper management of CM.

This way, raising the awareness and the knowledge regarding the specific concept of CM using the criteria of IHS is a crucial step in the aforementioned management. In this context, the data available have to do just with the common migraine in general population in Saudi Arabia, and they are inadequate. This is due to the lack of good counseling of patients about the disease, its natural history, and the therapy process,^[17] which are the result of the low level of awareness about migraine as a real public health problem.

This study aims at assessing the level of knowledge of CM diagnosis and management among physicians working in the Ministry of Health Primary Health Care Centers (PHCCs) in Western Saudi Arabia and at identifying determinants affecting this knowledge, in order to be able to manage patients with CM at the PHCCs as well as to reduce the numbers of the referred cases to secondary facilities.

Methods

Design and population

This cross-sectional study involved male and female general practitioners (GPs) and family physicians working in the Ministry of Health PHCCs of Jeddah city, Saudi Arabia, between September 01, 2019 and October 25, 2019. Other specialists such as pediatricians, gynecologists, and so on and other health workers were excluded. The study protocol was reviewed and ethically approved by the Directorate of Health Affairs, MOH, Jeddah.

Sampling

The total number of GPs and family physicians working in the PHCCs of Jeddah, during the period of the study, was estimated as 209 physicians. The sample size ($N = 136$) was calculated to detect an unknown percentage of physicians with adequate knowledge about CM ($P = 0.5$), with 95% confidence interval (95% CI), 80% statistical power, and 5% margin error. A 10% increase in calculated sample size was applied to compensate for eventual incomplete participations, resulting in final sample size = 149.

Given that the total number of PHCCs in Jeddah is 47, and assuming an equal distribution of physicians across centers, the mean number of physicians by center was estimated as 4.44 (total number of physicians [209] divided by the total number of PHCCs [47]). Subsequently, the number of PHCCs to be included ($N = 33$) was estimated by dividing the target sample size (149) by the number of physicians by center (4.44). A simple random sampling technique was used to select 30 PHCC out of the list of 47 PHCCs in Jeddah, by using random number generator (<http://www.random.org>).

Data collection tool

A semi-structured questionnaire was designed for the purpose of this study and undergone face and content validity by two consultant neurologists. It included three parts: Part 1 explored

demographic data such as age and gender, and academic and professional data such as qualification (bachelor, masters, PhD, etc.), grade (GP, resident, specialist, or consultant), years of experience, average number of patient seen per day, and source of CME accredited hours (journals, conferences, etc.), and so on; Part 2 explored knowledge about the diagnosis of CM based on criteria by the IHS,^[1] including migraine attack duration and frequency, besides types, associated symptoms, and necessity of a well-conducted history taking for the diagnosis (seven items); Part 3 assessed knowledge about the treatment and included initially 13 items such as the importance of lifestyle factors in triggering or preventing the CM attack, medication overdose management, indication topiramate, β blockers, vitamin B2, and so on. However, one item from treatment knowledge subscale (Part 3) was deleted during the validation process, as it was judged to be redundant. Items from both diagnosis (Parts 2) and treatment (Part 3) knowledge subscales were formulated as a direct question with three answering options (yes, no, or I do not know).

Data collection technique

Hard copies of the questionnaire were directly submitted to all eligible physicians in the participating centers to be self-administered. A 30-min time was given for each participant to fill the questionnaire, before the latter was recollected.

Statistical methods

Statistical analysis used IBM SPSS Statistics, version 20.0. Reliability analysis was carried out to test the internal consistency of the overall knowledge scale, as well as the diagnosis and treatment knowledge subscales, by calculating Cronbach's alpha coefficient and interitem correlations. Participants' answers to each item were rated 1 for correct answer and 0 for incorrect answer or for "I do not know"; thereby, a knowledge score was calculated as the number of correct answers (range 1–19). The Shapiro–Wilk test was used to test the normality of the distribution for knowledge score in the study population. Factors of knowledge were analyzed using two methods: (1) nonparametric tests (Mann–Whitney *U* test or Kruskal–Wallis test, as applicable) by comparing raw knowledge scores, and (2) cross-tabulations (chi square or Fisher's exact test) by comparing the percentage of participants with adequate knowledge level, which was defined as a knowledge score > median. Results were presented as median (75th centile [P75]) in the first method and percentage of adequate knowledge in the second method. Pearson's correlation was used to measure the strength and direction of association between knowledge subscales including diagnosis (range 0–7) and treatment (range 0–12) knowledge scores. A *P* value < 0.05 was considered for the rejection of the null hypothesis.

Results

Participants' characteristics

One hundred and thirty-six PHC physicians responded, mean (SD) age = 36.37 (8.07) years, 68.4% were females. The

typical respondent profile was bachelor graduate (49.3%), working as GP (47.8%), and having up to 10-year experience (64.0%). Majority declared seeing up to 40 patients daily (67.7%), and spending up to 10 min with each patient (58.8%) at the consultation. However, a minority declared having participated in migraine-related course (9.6%) [Table 1].

Knowledge about CM

Regarding diagnosis, majority respondents did correctly identify the upper limit of migraine headache duration (80.1%), types of migraine (80.1%), migraine-associated symptoms (91.9%), and importance of history taking in diagnosis. For the other items, results showed mixed responses. Regarding treatment, the most frequently acknowledged item was about lifestyle modification and trigger management being part of the broad approaches (96.3%), followed by the use of acute and preventive treatments (86.8%), while use of topiramate (32.4%) and muscle relaxants (32.4%) entailed the lowest percentage of correct answers [Table 2].

Table 1: Participants "characteristics" (n=136)

Parameter	Category	Frequency	Percentage
Gender	Male	43	31.6
	Female	93	68.4
Age (years)	Mean, SD	36.37	8.07
	Min, max	23	84
	23-35	73	53.7
	36-45	45	33.1
	≥45	13	9.6
Nationality	Not answered	5	3.7
	Saudi	121	89.0
Qualification	Non-Saudi	15	11.0
	Graduate	67	49.3
Grade	Master	22	16.2
	MD	21	15.4
	PhD	26	19.1
	GP	65	47.8
Years of experience	Resident	17	12.5
	Specialist	36	26.5
	Consultant	18	13.2
	≤5	39	28.7
	6-10	48	35.3
Average no. of patients seen by day	11-15	26	19.1
	≥16	19	14.0
	Not answered	4	2.9
	≤20 patients	25	18.4
	21-40 patients	67	49.3
Average time spent with each patient (min)	≥41 patients	39	28.7
	Not answered	5	3.7
	≤5 min	17	12.5
	6-10 min	63	46.3
Participation in migraine-related course	11-15 min	45	33.1
	≥16 min	8	5.9
	Not answered	3	2.2
	No	122	89.7
Participation in migraine-related course	Yes	13	9.6
	Not answered	1	0.7

Table 2: Knowledge about chronic migraine

Dimension/Item	Answer, n (%)		
	No	Do not know	Yes
Diagnosis			
Chronic migraine headache can be of long duration (attacks lasting up to 72 h)	17 (12.5)	10 (7.4)	109 (80.1)
Chronic migraine headache can be of short duration (attacks lasting ≥ 4 h on average)	49 (36.0)	23 (16.9)	64 (47.1)
Chronic migraine headache is defined by 15 or more headache days per month for more than 3 months	31 (22.8)	33 (24.3)	72 (52.9)
Chronic migraine headache has two types: (1) chronic migraine with Aura, (2) chronic migraine without Aura	9 (6.6)	18 (13.2)	109 (80.1)
Do the new appendix criteria recommend that more than eight migraine attacks will be diagnosed as chronic migraine?	15 (11.0)	60 (44.1)	61 (44.9)
Do migraine-associated symptoms include nausea or photophobia or phonophobia?	3 (2.2)	8 (5.9)	125 (91.9)
Is accurate history taking vitally important in the diagnosis of migraine?	7 (5.1)	12 (8.8)	117 (86.0)
Treatment			
Are lifestyle modifications and trigger management part of the broad approaches to treating chronic migraine?	1 (0.7)	4 (2.9)	131 (96.3)
Are acute treatments and preventive treatments part of the broad approaches to treating chronic migraine?	8 (5.9)	10 (7.4)	118 (86.8)
Does managing medication overuse aid in the treatment of chronic migraine?	44 (32.4)	30 (22.1)	62 (45.6)
Does managing other problems that exacerbate their tendency to headaches will aid in the treatment of chronic migraine?	14 (10.3)	20 (14.7)	102 (75.0)
Should preventive treatments in the treatment of chronic migraine be commenced at a low dose to minimize the possibility of developing side effects?	20 (14.7)	27 (19.9)	89 (65.4)
Are β blockers, angiotensin blockers, and tricyclics used in the treatment of chronic migraine?	16 (11.8)	26 (19.1)	94 (69.1)
Are anticonvulsants the second line in the treatment of chronic migraine?	12 (8.8)	34 (25.0)	90 (66.2)
Are riboflavin (vitamin B2) and magnesium citrate (or taurate) supplements used in the treatment of chronic migraine?	15 (11.0)	62 (45.6)	59 (43.4)
Are topiramate, gabapentin, tizanidine, fluoxetine, amitriptyline, and valproate used as prophylactic in treatment of chronic migraine headache?	11 (8.1)	32 (23.5)	93 (68.4)
Is topiramate the most efficacious in patients with chronic migraine?	18 (13.2)	74 (54.4)	44 (32.4)
Can antidepressants be used in the treatment plan of chronic migraine?	16 (11.8)	21 (15.4)	99 (72.8)
Can muscle relaxants be used in the treatment plan of chronic migraine?	34 (25.0)	58 (42.6)	44 (32.4)

Cronbach's alpha=0.645 (19 items)

Levels of knowledge and scale reliability

Reliability testing of the study diagnosis, treatment, and overall knowledge scales is presented in Table 3 and showed acceptable reliability (Cronbach's alpha = 0.763) for overall knowledge scale. However, diagnosis scale and treatment scale showed poor and questionable reliability, respectively.

Diagnosis, treatment, and overall knowledge scores were not normally distributed in the study population, as shown by Kolmogorov–Smirnov and Shapiro–Wilk tests. Descriptive statistics showed median (P75) of diagnosis (5.00 [6.00] out of 7), treatment (8.00 [9.00] out of 11), and overall (13.00 [15.00] out of 19). Histograms in Figure 1 depict the distribution of three scores in the study population. By using the median as cutoff, 45.6% of the participants had adequate knowledge (score > median). Further, a weakly positive correlation was found between diagnosis knowledge score and treatment knowledge score, with a Pearson's correlation coefficient ($P = 0.496$) and P value <0.001.

Factors associated with overall knowledge about migraine

Both nonparametric tests and cross-tabulations showed significant association of overall knowledge with participant's age, qualification, grade, and years of experience. That is, young physicians (23–35 years), bachelor graduates, GPs, and those having ≤ 5 years of experience had lower median scores

and lower percentage of adequate knowledge, compared to their counterparts. No statistically significant association was found with other demographic, academic, and professional factors [Table 4].

Independent factors of knowledge

The multivariate analysis showed the years of experience as being the only independent factor of knowledge, as physicians who achieved 6–10 years of experience had greater probability of having adequate knowledge level (OR = 5.09, $P = 0.006$), by reference to those having ≤ 5 years. As to physicians who had longer experience, OR of adequate knowledge level was 4.69 and 6.67 for 11–15 and ≥ 16 years of experience, respectively; however, the results did not reach the statistical significance [Table 5].

Discussion

This cross-sectional study assessed the level and explored the factors of knowledge about the diagnosis and treatment of CM among PCPs in Primary Care Centers of the Ministry of Health in Jeddah. It showed an overall satisfactory level of knowledge among approximately half the participants, by using the knowledge score. On the other hand, detailed assessment showed inconsistent knowledge (<70% of correct answers) in 3 out of 7 diagnosis-related items and 8 out of 12 treatment-related

items. Further, the overall internal consistency of the overall scale was acceptable, while that of diagnosis and treatments subscales were below the acceptability range, which may question the accuracy and reproducibility of the scores. Thus, this study suggests a low recognition and inappropriate attitude toward the general characteristics of CM, despite the high prevalence of migraine in KSA (Kingdom of Saudi Arabia) and its well-known burden.^[18]

There are few studies examining the rate of knowledge and awareness of CM among PCPs. This rate is believed to be low worldwide, since the level of knowledge regarding migraine disorders is below the desirable level.^[19] In a Turkish study aiming at assessing the awareness of migraine among PCPs, only 10.5% of the participants had a satisfactory level of knowledge to make a correct diagnosis of migraine fulfilling the IHS criteria. One-third of them expressed the need for brain

screening to diagnose migraine, which is considered unnecessary for a definitive diagnosis of migraine disorder.^[19] In a study conducted in the USA, the gap of knowledge about migraine was significant even among physicians practicing in a top academic medical center.^[20] Indeed, just one-third of them were familiar with the American Academy of Neurology guidelines.^[20-22] In an educational-based study,^[23] the investigators aimed at assessing the frequency of CM recognition among selected medical trainees in the internal and family medicine program in Kentucky and the surrounding states (Tennessee, Ohio, and West Virginia). The initial hypothesis had been that medicine trainees were more likely to identify CM than PCPs. The authors applied two different methods in reporting the cases vignette. The results were surprising, even when the appropriate method was used; the adequate awareness level did not exceed 24.1%, and that was considered very low.^[23]

This gap of knowledge affects patient management and interferes with reaching a definite diagnosis. In a study conducted in England, it was found that two-thirds of patients did not get the right diagnosis of their trouble from PCPs.^[24] In addition, the Chronic Migraine Epidemiology and Outcomes Study showed that 13.6% of the CM sample consulted a

Table 3: Internal consistency of the study scales

Scale	No. of items	Cronbach's alpha	Conclusion
Diagnosis	7	0.588	Poor
Treatment	12	0.695	Questionable
Overall knowledge	19	0.763	Acceptable

Table 4: Factors associated with overall knowledge about migraine

Parameter	Category	Knowledge level				
		Overall Score			Adequate	
		Median	P75	P ¹	%	P ²
Gender	Male	13.00	15.00	0.409	46.5	0.883
	Female	13.00	15.00			
Age (years)	23-35	12.50	14.25	0.019*	34.2	0.019*
	36-45	14.00	15.25			
	≥45	14.00	15.00			
Nationality	Saudi	13.00	15.00	0.422	43.8	0.235
	Non-Saudi	14.00	15.00			
Qualification	Graduate	11.00	14.00	<0.001*	28.4	0.001*
	Master	14.00	15.00			
	MD	15.00	15.50			
	PHD	14.50	15.00			
Grade	GP	11.50	14.00	<0.001*	27.7	<0.001*
	Resident	13.00	15.00			
	Specialist	14.00	15.25			
	Consultant	15.00	15.00			
Years of experience	≤5	11.00	13.00	<0.001*	17.9	<0.001*
	6-10	14.00	15.00			
	11-15	14.00	15.00			
	≥16	15.00	16.50			
Average no. of patients seen by day	≤20 patients	13.00	15.00	0.134	40.0	0.316
	21-40 patients	14.00	15.00			
	≥41 patients	13.00	14.00			
Average time spent with each patient (min)	≤5 min	13.00	15.00	0.911	35.3	0.562
	6-10 min	13.00	15.00			
	11-15 min	14.00	15.00			
	≥16 min	13.00	14.00			
Participated in migraine-related course	No	13.00	15.00	0.060	43.4	0.087 ^F
	Yes	14.50	15.00			

Test used: ¹Nonparametric tests including Mann-Whitney U test and Kruskal-Wallis test, ²Fisher's exact test (^F), otherwise Chi-square test; *statistically significant test (P<0.05)

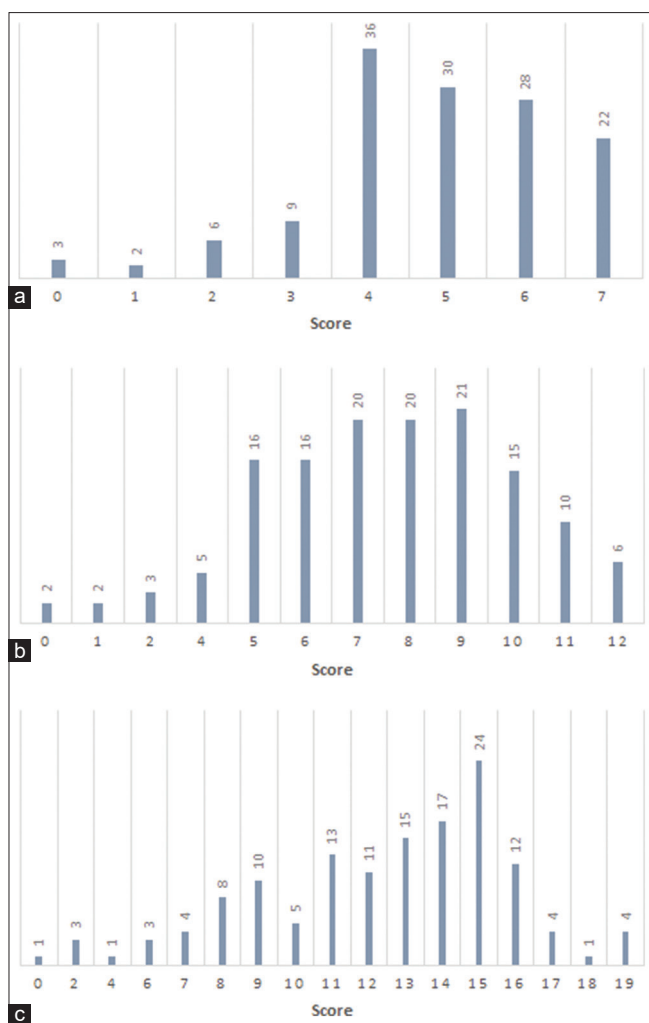


Figure 1: Levels of knowledge about diagnosis and treatment and overall knowledge about migraine. Histogram bars represent the number of participants who had the given score, which correspond to the number of correct answers in (a) diagnosis knowledge subscale, (b) treatment knowledge subscale, and (c) overall knowledge scale

Table 5: Independent factors of knowledge level about migraine

Predictor	Level	OR	95% CI	P
Age (years)	23-35	Ref		0.922
	36-45	0.78	0.20 3.04	0.715
	≥45	0.66	0.07 6.29	0.721
Qualification	Graduate	Ref		0.101
	Master	2.72	0.47 15.91	0.267
	MD	2.34	0.73 7.48	0.151
	PHD	0.42	0.07 2.60	0.348
Grade	GP	Ref		0.235
	Resident	1.83	0.50 6.69	0.363
	Specialist	3.09	0.74 12.93	0.122
	Consultant	7.54	0.90 63.38	0.063
Years of experience	≤5	Ref		0.050
	6-10	5.09	1.61 16.08	0.006*
	11-15	4.69	0.77 28.60	0.094
	≥16	6.67	0.69 64.30	0.101

OR: Odds ratio; 95% CI: 95% confidence interval; Ref: reference category for OR calculation; *statistically significant result (P<0.050)

specialist (i.e., neurologist, headache specialist, pain specialist) for the diagnosis and treatment of migraine, of whom only 36% were correctly diagnosed with CM.^[20] This illuminates that the inadequate recognition of CM creates an obstacle of traversing a series of the three steps judged to be essential to good care: medical consultation, accurate diagnosis, and a minimal pharmacologic strategy that includes acute and preventive treatments.^[13]

According to the US Ambulatory Medical Care Survey, 72.2% of outpatient visits for migraine take place in primary-care settings.^[25] Consequently, PCPs play a central role in the care project of this patient; they could contribute in making the correct diagnosis, coordinating with the specialist to initiate therapy, and monitoring the overall treatment plan and outcome.^[16]

In our study, the participants had difficulties to recognize the clinical features of CM. Actually, they did not realize that the migraine attack is defined by a time-interval that ranges from 4 to 72 h. Therein, more than half (52.9%) of our PCPs failed to recognize that headache attacks of CM last for at least 4 h. Additionally, almost half (47.1%) of them failed to recognize that the recurrence of the attacks in the case of CM could persists over 15 days in a month, which constitutes the main diagnostic criteria of CM according to the IHS.^[6] Further, only 44.9% were aware about the new appendix criteria in the last version of IHS classification, which states that the migraine headache features should be identified on at least 8 days per month to confirm the diagnosis of CM.^[26] This clearly shows the confusion among PCPs concerning the concept of CM and its clinical definition. For this reason, we highlight two important steps when approaching a patient who reports a changed migraine profile by reference to his usual attacks. First, it is important to look for the core features of the migraine attack, especially the upper and the lower limits of the attack duration as defined by the IHS criteria; hence, the disorder could be accurately identified. Second, the ascertainment of how the headache evolves over a period of 1 month to define the pattern of a chronic headache.^[11]

With respect to the treatment, the participants in our study were relatively aware about the general therapeutic approach of CM including the basic treatment, adjuvant therapeutic arsenal, and the necessity to use antidepressants in particular cases. While the previous rules are generally shared with all types of migraine, participant's performance was significantly lower regarding relatively specific recommendations for CM. Notably, two-thirds of PCPs did not recognize topiramate as the most efficacious preventive oral treatment in patients with CM, and only one-third were aware that muscle relaxants could be part of the treatment. This suggests that our PCPs are less familiar with the specific preventive medication of CM and may have confusion with that of EM. The efficacy of topiramate is proven in more than two randomized clinical trials and is considered the only oral drug with high-quality evidence of efficacy.^[21,27,28] Hence, topiramate is the first prophylactic treatment option in CM. The treatment outcome can also be improved by the identification and the

management of comorbidities such as depression, or any factor that may aggravate the pain like muscle tension in the neck and shoulders.^[5]

Another important aspect of the treatment is the screening and management of medication overuse, which is the hallmark of an unplanned management of CM. Indeed, the association between CM and medication overuse headache is well established and documented.^[5] In our study, less than the half (45.6%) of the PCPs recognized that medication overuse is a central part among the population under study. Thus, awareness should be raised among our PHPs about the risk of medication overuse in order to enhance patients' screening and prevent unnecessary treatment escalation such as the use of opioids.

According to the statistical model used in this study, inferential analysis showed that young physician's age and low qualification and grade were associated with lower knowledge about CM, while prolonged physician's experience was highlighted as the sole independent factor for higher knowledge. This suggests that physicians' knowledge about migraine is mostly acquired by experience. By deduction, such observation may point weakness in the medical college curriculum, suggesting insufficient theoretical content and clinical exposure to different types of migraine during the clinical years. In the USA, the medical students have an average of only 3 h of teaching in headaches. Furthermore, once they become PCPs, they do not receive formal continuing academic education on headaches.^[23] This is supported by GPs and younger physicians, in the present study, having the lowest knowledge level despite being recently graduated, and supposedly more recently exposed to neurology rotation than their counterparts.

Despite being a statistically insignificant predictor of poor knowledge in our study, the short time spent with each patient represents an important barrier for a correct diagnosis. This barrier can be addressed by encouraging PCPs to use screening tools for CM, such as ID-Chronic Migraine (ID-CM)^[29] and the AMS/AMPP CM screening algorithm.^[30,31] Although the latter tool has a high negative predictive value, which may help ruling out the diagnosis of CM, the ID-CM tool has a high positive predictive value and is simpler to use.^[32] When combined, both tools would enable health-care professionals with or without training headache to correctly identify the majority of patients with migraine or CM.^[32]

Further, this should not temper the urgent need for educating PCPs to raise the awareness and knowledge about CM and migraine headaches in general. Continuing medical education and migraine educational programs are good alternative to cover the deficit in formal training; however, the motivation of the PCPs to learn and to keep their knowledge up-to-date may be hindered by the academic aspect of the training. Indeed, PCPs need quicker and easily perceived information in order to make evidence-based decisions regarding patient care. In the study of Minen,^[23] PCPs preferred the direct contact with specialists to improve the knowledge about CM.

This study is limited by the reduced sample size that did not reach the target size required for adequate statistical power. Additionally, the reliability of the calculated knowledge score may be questioned, which may moderate the generalizability of the related results. However, by exploring each item, the interpretation of the results was in line with international reports indicating low levels of knowledge about CM among physicians and overall difficulty to discriminate the different types of migraine.

Conclusion

PCPs in Jeddah had low knowledge levels and inappropriate attitudes toward CM as indicated by their inconsistent knowledge responses (<70% of correct answers) for majority of items related to the diagnosis and management of the disease.

Knowledge about CM was significantly lower in young physicians (aged 23–35), fresh graduates, and those with <5 years of experience compared to their counterparts; while having a prolonged experience was the sole independent factor of high knowledge, indicating the prominent role of clinical experience in enriching the knowledge of PHPs regarding the diagnosis and management of CM.

The findings of this study indicate marked deficits in the formal education for medical students and highlight the need to implement effective academic curricula provided as evidence-based, easy-to-perceive material. Besides, it is imperative to adopt continuing medical education programs for PHPs to help relief the pain experienced by migraineurs.

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Conflicts of interest

There are no conflicts of interest.

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