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ORIGINAL ARTICLE

The profile of headaches and migraine amongst medical students and its association to stress level, disability and self-management practices

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Abstract

Introduction: Migraine is the most common headache affecting young people that impairs their functional ability. This study aimed to determine the frequency of migraines among Malaysian medical students, the association between migraines, stress level, and functional disability among these students, and describe their self-management practices.

Methods: A cross-sectional study was conducted among medical students in a private medical school in Penang state. All medical students in the study site were screened for the presence of headache symptoms and the diagnosis of migraine using a self-administered questionnaire comprising International Headache Society (IHS) diagnostic criteria. Other domains that were assessed were perceived stress level and functional disability, which were measured using the Perceived Stress Scale and the Headache Impact Test-6 (HIT-6), respectively. The students' self-management practices for their headaches were determined using a descriptive survey.

Results: A total of 374 medical students participated in this study and 157 (42%) students reported experiencing headaches. More than half (n=97, 61.8%) of those with headaches fulfilled the IHS criteria for migraines. Migraines were significantly associated with functional disability compared with non-migraine headaches (p<0.001); however, no significant difference in stress levels were reported between the two groups. During migraine attacks, sleep (n=73, 60.33%) and self-medication (n=56, 69.14%) were the most common self-management practices. Only 11.46% of the 157 students with headaches consulted a doctor.

Conclusion: A high proportion of medical students suffered from headaches and more than half of them had migraines. Migraine headaches were associated with significant functional disability. Very few students sought medical consultation and most students chose to self-manage their headaches.

Introduction

Headache is the second leading cause of disability globally.[1] The prevalence of headaches among adolescents ranged between 8% and 88% in studies conducted in several countries using different tools.[2] Headaches affect young people academically in terms of performance on examinations and study sessions in addition to having a negative impact on daily and social activities that would aid in relaxation; this in return leads to a vicious cycle of increasing headache incidence.[3]

Headache was the most common cause of disability across all ages and was ranked 14th in the 2019 Global Burden of Disease Study Collaborators; migraine was the top 3rd cause of disability among young people (15–49 years old) according to the 2016 Global Burden of Disease Study Collaborators.[4] Migraine sufferers have impaired academic performance and social life activities, predominantly activities involving family and leisure.[5,6] The impact of migraines can be reduced if they are correctly diagnosed and appropriately managed or prevented.

Migraine headaches are known to be triggered by stress, loud auditory stimuli, fatigue, fasting, and menses; to some migraineurs, the triggers are either excessive or insufficient sleep.[7] Migraine headaches are commonly associated with a lack of sleep and stress.[8] Therefore, taking the appropriate precautions to avoid triggers can prevent migraine headaches and reduce their related impacts.

In general, migraine sufferers experience severe functional disability compared with

non-migraine headache sufferers.[5,9] Migraine sufferers also experience a high amount of work-related disability and absenteeism; however, a majority do not seek help.[10] A study on healthcare workers in 52 primary health care centres in Abha City, Saudi Arabia found that nearly 48% of 102 resident doctors and specialists reported suffering migraine headaches with moderate to severe disability (Migraine Disability Assessment [MIDAS] score 2–4); 94% of the doctors reported having moderate to poor quality of life as compared with nurses, pharmacists, and other allied health workers.[11]

Medical students in Malaysia are aged between 19 to 25 years, representing late adolescence. They are typically viewed as being susceptible to stress due to their learning environment. As part of their training, their hectic schedules may result in a lifestyle that predisposes them to migraine headaches, such as excessive caffeine intake, missing meals, lack of sleep, and high psychological stress.[5] This environment results in significant disability and affects their academic performance and clinical training as future healthcare professionals. Previous studies have shown that migraines are associated with impaired academic performance and social life.[5,6] Medical students with migraines were often found to have other co-morbid conditions, such as depression.[6]

Although the prevalence of migraines in the Malaysian general population was estimated to be 9%,[12] it may be higher among medical students considering that the reported prevalence of migraines among medical students in other countries ranges from 12.2% to 27.9%.[13,14] Unfortunately, migraines may be underdiagnosed, even among medical students. A study conducted on medical students in South India found that, despite nearly 11% experiencing disability due to migraines, only 2.6% were aware that they had migraine headaches.[5] To our knowledge, there are no published studies on the prevalence of migraines among medical students in Malaysia. The association between migraines and psychological stress and functional disability should also be examined. Migraine management can be classified into management for acute migraines and preventive management.[15] Migraine sufferers benefit from structured behaviour modification therapy that incorporates recognition and avoidance of triggers.[16] Pharmacological prophylaxis may be indicated for those with recurrent disabling migraine attacks. However, most sufferers prefer to take a quick reliever medication, such as non-steroidal anti-inflammatory drugs, instead of taking long-term prophylactic medications.[17]

Migraine headaches in medical students and their association with stress, functional disability, and self-management practices have not been explored in the local population. Therefore, this study aimed to determine the frequency of migraines among medical students with headaches and to explore their management practices, including self-management. This study also aimed to determine the association between migraines and stress level, functional disability, and self-management practices.

Methods

A cross-sectional study was conducted from June 2013 to November 2013 in a private medical college in Penang state. The inclusion criteria were medical students aged 18 years or older who had experienced headaches in the preceding 3 months. Students who were absent during the data collection period were excluded from this study. Based on an expected frequency of migraines among medical students of 13.9%,[18] a 95% confidence interval and 20% non-response rate, the minimum sample size required to determine the frequency of migraine headache was 222 students.

Data collection

During the data collection period, 514 medical students were enrolled at the college. After receiving approval from the college administrator, all students registered during the study period were invited to participate using a universal sampling technique. Universal sampling was used to allow all students to be screened for the inclusion and exclusion criteria, and to facilitate data collection as all the students were available at a fixed time. Students were approached during their break time between lectures in their lecture halls. They were briefed about the study and those who agreed were requested to submit their written consent forms.

Study instrument

Students were given a set of screening

questions to identify those who suffered from headaches over the last 3 months. Of the 374 students who agreed to participate, 157 (41.2%) students fulfilled the International Headache Society (IHS) criteria and identified as having headaches. These students completed a checklist of the IHS diagnostic criteria for headaches. The students with headaches were further classified into 'migraine headache' or 'non-migraine headache' using the symptoms checklist. The items for diagnosis were 'duration of the headache', 'headache fulfilling at least two out of four criteria of characteristics of migraine', and 'one of two associated symptoms and headache not caused by other medical conditions'. By identifying students who had headaches and by administering the International Classification of Headache Disorders (ICHD) diagnostic criteria, we were able make a possible diagnosis of migraine, which was subsequently confirmed by clinical assessment of the students. Students with headaches also completed a self-administered questionnaire that collected data on their socio-demographic profiles, self-management practices, functional disability using the 6-Item Headache Impact Test (HIT-6),[19] and stress level using the 10-Item Perceived Stress Scale (PSS).[20] A non-commercial licence (QM017606) for use of the HIT-6 questionnaire was obtained from OptumInsight Life Sciences, Inc.

The HIT-6 assesses the impact of headaches on patients regarding pain, social role limitations, cognitive functioning, psychological distress, and vitality. The internal consistency reliability for HIT-6 was 0.89, alternate forms were 0.9, and the test-retest reliability was at 0.8. Possible scores for HIT-6 ranged from a minimum of 36 to a maximum of 78; higher scores represented higher level of disability.[19] HIT-6 scores ≤49 indicated little to no impact, score of 50–55 indicated moderate impact, scores of 56–59 indicated substantial impact, and scores ≥60 indicated severe impact.

The PSS measures the perception of stress and the degree to which life situations are viewed as stressful. It has good internal consistency reliability, with a Cronbach-α of 0.78. The minimum possible score for PSS is 0 and the maximum possible score is 40. Higher scores reflect higher stress levels.[20] Respondents who scored <13 were categorised as having a low stress level, those who scored 14–26 were categorised as having moderate stress, and those who scored ≥27 were categorised as having severe stress.

Both questionnaires were not translated as medical students were assumed to have sufficient command of English to understand the original English version of the questionnaires.

For self-management, students were requested to respond to a checklist of nine self-management practices that was developed based on local guidelines on headache self-management[21] and expert opinions. Respondents were allowed to choose as many self-management practices as were relevant, including their decision to seek medical consultation.

In addition, the students were requested to provide information on the preferred medical consultation, either private or government doctors and specialist or general practitioners. The full set of questionnaires were pre-tested on 10 students prior to conducting the study. There were no identified issues and the students were able to understand and answer the questions.

Statistical analysis and ethical consideration

Data was analysed using IBM SPSS Version 22.0. Descriptive analyses were reported as frequencies, percentages, and mean or median, where appropriate. Bivariate inferential analysis was performed using the chi-squared test, Fisher's Exact test, and Student's t-test. The level of significance was set at a p-value of 0.05.

All the students received a verbal and written explanation regarding the study and its objectives before enrolment. Only those who provided written informed consent were screened for inclusion in the study. The respondents' information was handled in strict confidentiality.

Students who were identified to have migraines were offered a referral to the nearest health clinic for further assessment and treatment. Students found to have chronic migraines with severe impact were offered a referral to the nearest neurology specialist clinic. Students with non-migraine headaches were offered a formal assessment by the site investigator and were referred to the nearest health clinic or hospital accordingly.

Results

A total of 374 students were screened for headaches, with a response rate of 72.8%. Of these students, 157 (42%) reported experiencing headaches in the preceding 3 months. Students who had headaches were predominantly female (n=113, 71.9%) and Malays (n=109,69.4 %), and their ages ranged from 18 to 26 years old. The frequency of migraines over all medical students who were screened was 25.9%. Among the students with headaches, migraines (61.8%) were more common than non-migraine headaches (38.2%).

Migraines were significantly more common in female students (n=75, 66.4%) compared with male students (n=22, 50%) (X^2=2.82, p=0.06).

Table 1. Sociodemographic distribution of migraine headaches and non-migraine headaches.

Demographic characteristic		Total (N=157)	Migraine (N=97)		Non-migraine (N=60)		X^2 / t-test	p-value
Age (years)	Mean (SD)	21.12 (1.49)	21.15 (1.59)		20.82 (1.24)		1.41	0.16
			N	%	N	%		
Gender	Male	44	22	50.0	22	50.0	2.82	0.06
	Female	113	75	66.4	38	33.6		
Race	Malay	109	72	66.1	37	33.9	1.46	0.7*
	Non-Malay	48	25	52.1	23	47.9		

*Fisher's exact test was performed for race because 6 cells (50%) had an expected count < 5 in the chi-square analysis for race.

There was no significant difference in gender, ethnic distribution, or age between students with migraine and non-migraine headaches.

Perceived stress levels among the migraine and non-migraine respondents

The maximum possible range for the PSS score was from 0 to 40. The mean PSS score for the migraine group was 21.1 (SD=4.9) and the mean PSS score for non-migraine group was 18.9 (SD=5.1). The difference between the groups was not statistically significant (p=0.14).

Functional disability among the students with migraine and non-migraine headaches

In terms of functional disability evaluated using the HIT-6, the possible range of scores was from 36 to 78, with higher scores representing a higher level of disability. Students with migraines had a significantly higher functional disability score (mean score 60.70, SD= 5.8) compared with non-migraine headaches (mean score 56.50, SD=7.5) (t=3.94, p<0.001).

Self-management practices among migraine and non-migraine respondents

In general, most students with headaches tended to self-medicate. In total, only 69 students (66.09%) sought consultation with doctors because of their headaches; they preferred to consult primary care doctors 66 (95.6%) rather than hospital specialists. Self-management practices among the students with headaches are illustrated in **Table 2**.

Sleep and using painkillers were the two most preferred self-management practices among students with either migraine or non-migraine headaches. A higher proportion of students with non-migraine headaches would do nothing (p<0.01), while a higher number of students with migraine headaches would self-medicate using painkillers, turn off loud noises, and turn off electronic devices whenever they had an attack compared with their counterparts (p<0.05). Only a few students would see a doctor (n=18/157, 11.46%) or take traditional medications (n=18/157, 11.46%).

Table 2. Self-management practices among migraine and non-migraine respondents (N=157).

Self-management practice	Migraine (N=97)	Non-migraine (N=60)	Overall (N=157)	X^2	p
	N (%)	N (%)	N (%)		
Sleep	73 (75.26)	48 (80.00)	121 (77.07)	0.47	0.49
Take their own painkillers	56 (57.73)	25 (41.67)	81 (51.59)	4.02	**0.02**
Turn off loud noises	43 (44.33)	17 (28.33)	60 (38.21)	4.20	**0.02**
Rest in a dark room	37 (38.14)	17 (28.33)	54 (34.39)	1.58	0.21
Turn off electronic devices	38 (39.18)	14 (23.33)	52 (33.12)	4.20	**0.01**
Do nothing	9 (9.28)	14 (23.33)	23 (14.65)	5.85	**0.004**
See a doctor	10 (10.31)	8 (13.33)	18 (11.46)	0.33	0.56
Take traditional medicine	12 (12.37)	6 (10.00)	18 (11.46)	0.21	0.65
Others	8 (8.25)	5 (8.33)	13 (8.28)	0.01	0.99

Discussion

Our study revealed a high proportion of medical students who were suffering from migraine headaches (61.8%) as compared with non-migraine headaches (38.2%). The frequency of migraines among all medical students who were screened was 27.5%, which was comparable to prior studies. Previous studies on medical students abroad showed a prevalence of migraine headaches ranging from 27.9% to 42%.[5,14] The difference could be explained by the difference in the exclusion criteria, whereby one study excluded medical students who had mild headaches for the past 1 year,[5] while the other study focused on students having headaches with disability.[14] Therefore, the proportion of migraines in these two studies might have been under-reported. In contrast, our study included all types of headaches experienced in the past 3 months.

The interaction between stress and migraines has been proposed to be bidirectional.[22] Increasing allodynia in migraines causes stress to the sufferers and thus affects disability.[23] Stress is a known triggering factor, causing a vicious cycle for the development of migraines.[13] Stress has been observed as a known trigger for migraine headaches affecting medical students.[5,7] Medical school being a generally stressful environment affects those suffering from migraine headaches more than those with non-migraine headaches. However, the perceived stress levels were equal between both groups in our study, indicating that they were exposed to similar levels of stress.

In terms of functional disability, students with migraines reported significantly higher disability than students with non-migraine headaches. This observation confirms the findings of earlier studies involving medical students where students with migraines were significantly affected in terms of their daily academic performance, working activities and, social lives.[5,18,24]

Self-care management strategies used by medical students with migraine headaches to relieve their headaches in this study were taking painkillers, controlling the noise in the environment, turning off their electronic devices, and sleeping or resting in a dark room. Students with non-migraine headaches mostly chose sleep as their self-management, and significantly fewer took painkillers.

In both groups, students preferred to sleep when experiencing a headache, and only a small proportion of the students would see a doctor for their headache. Lack of sleep was reported as the most common trigger for migraine among medical students[7,14]; therefore, the sufferers would try to make up for lack of sleep. Their headaches were relieved with sleep.[14]

The second most common self-management practice was self-medication using pain killers, especially among the migraine sufferers. Self-medication was seen as a common practice in a previous study, as the suffered perceived that their illnesses were mild and the painkillers could quickly relieve the pain.[3] Medical students preferred to self-medicate to save both time and cost.[25] Their training and medical knowledge could have made the medical students more confident in self-medicating with analgesics for their headaches.[26,27] Medical students who were younger than 20 years of age were significantly more likely to self-medicate as

with to older medical students.[29] However, knowledge of the safety of analgesics was only found to be increased among those who were already in their senior years.[28] Only a small proportion of the students would see a doctor for their headaches and their awareness of the safety of self-medication may be considered insufficient if they wished to self-medicate with analgesics instead of seeking help.

Limitations

Our study had several limitations. This was a cross-sectional study, which is not suited to demonstrate causality. The study population was limited to medical students studying in Penang state and, therefore, the results of this study may not be a representative of the general population of other medical students in this country. While screening the students for headaches, we may have missed some students who had acephalgic migraines; however, this condition is very rare. Furthermore, we aimed to determine the proportion of migraine headaches among those with headaches. Only bivariate analysis was conducted for this study. The number of students with migraines may be under-estimated, as those who did not have migraines in the preceding 3 months were not accounted for. In addition, the diagnosis of migraine was based on a self-reported symptom checklist and the severity of the migraines was not assessed.

This study did not explore the self-management practices that would influence the impact of migraines on the students, such as sleep quality, sleep pattern, types of medications and painkillers, due to limited resources available to collect the data.

Strengths of the study and recommendations

This study provides new data on the prevalence of migraines among medical students in Malaysia and their self-management practices. The study should be replicated in other medical schools in Malaysia to obtain a more accurate representation of all medical students in the country. Assessment of the severity of migraines and confirmation of the diagnosis by a clinician should be performed to obtain more information regarding the magnitude of this problem among medical students. A follow-up study on the prevalence of migraines among medical doctors and their severity may also be beneficial to complement the information obtained from this study.

This study could be expanded to identify the different subgroups of migraines and other common causes of primary headaches, such as tension headaches and cluster headaches. Multivariate analyses to control for possible confounding factors would be invaluable in identifying the independent associations of migraines and the risk factors.

In conclusion, a high proportion of medical students suffered from migraines. Students with migraine headaches had significantly higher functional impact compared with those with non-migraine headaches. The preferred self-management practices among migraineurs were sleeping, taking painkillers, controlling the noise in the environment, and resting in a dark room. Sleeping or self-medicating were the preferred methods of self-management to relieve their headaches.

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Conflicts of interest

The authors report no conflicts of interest.

How does this paper make a diffrence in general practice ?

- It is important to identify and diagnose migraines in medical students with headaches because they may suffer from functional disability due to the migraines.
- Appropriate self-care practices can be taught to migraine sufferers, such as avoiding triggering factors.
- Self-medication practices among medical students were commonly observed in this study. The appropriateness of the self-medication practices should be evaluated.
- Non-migraine headaches should be assessed appropriately using IHS criteria.

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