

Occurrence and Characteristics of Headache in Medical Students at the University of Mostar School of Medicine

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ABSTRACT

Background: Primary headaches are some of the most common neurological problems, with a high prevalence among medical students. We studied the occurrence and characteristics of headaches among first- and sixth-year medical students and the impact on their lives.

Methods: The research was conducted at the School of Medicine, University of Mostar, in May 2022. The anonymous combined survey and Headache Impact Test-6 (HIT-6) questionnaire were conducted via an online link and the Google Forms application.

Main findings: Out of 120 students, 64 of them declared that they had a headache in the past three months. First-year medical students had a significantly higher number of headaches per month than sixth-year students ($p < 0.001$). The most common precipitating factor was psychological fatigue, and it presented at a higher percentage among first-year medical students (88.3%) than among sixth-year ones (66.7%) ($p = 0.009$).

Principal conclusion: Headaches are very common among medical students, especially during the first year of study. Psychological fatigue and stress have led to headaches in the majority of students. So, this problem should be properly perceived and its potential impact on the everyday life and academic success of the students should not be neglected.

Key words: headaches, medical students, University of Mostar.

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INTRODUCTION

Headaches, especially of the primary type, are considered a major global health problem due to their high prevalence, almost lifelong duration and sometimes significant disability for sufferers (1, 2). Moreover, headache is the leading neurological symptom reported by patients to primary care physicians and neurologists (3, 4). It is estimated that 50% of adults experience at least one headache episode per year. Globally, the general prevalence of headache is 46%, tension headache 42%, migraine 11% and chronic daily headache 3% (5). Headache or “cephalalgia” is one of the most frequent medical conditions that negatively affect the quality of life, making a person unable to perform routine daily activities (6).

Headache severity is directly proportional to the negative impact of headaches, which includes reduced academic performance, quality of life and impaired functioning, and it is often associated with different psychiatric comorbidities (7). On the other hand, since the mechanisms of migraine and tension-type headaches are still insufficiently elucidated, epidemiological studies in specific populations are needed to help clinicians and researchers to find out the origin of pain and the factors that influence the frequency of headaches (8-10).

According to the International Classification of Headaches (ICHD-III β), headaches are divided into primary and secondary types (11). Primary headaches are those without an identifiable underlying cause. Secondary headaches are the result of another underlying pathology (12). Primary headaches include migraine, trigeminal autonomic cephalalgia and tension-type headaches, as well as other primary headaches. Secondary headaches include those secondary to intracranial space-occupying lesions, central nervous system infections, subarachnoid hemorrhages and giant cell arteritis, as well as cerebral venous thrombosis and idiopathic intracranial hypertension (13). Although headache is a common problem, especially among adolescents and young

adults, it is also considered the most common complaint of medical students, which is predictable due to the high levels of physical and psychological stress that medical students face, that is often greater compared to the general population (14). The epidemiology of migraine among medical students is particularly important because this is the most common type of headache in young adults (15). The prevalence of migraine among medical students ranges from 11% to 40% worldwide (16-18). The lifestyle of students puts them at high risk of fatigue, stress and anxiety, which are the most common causes of tension headaches and migraines (19). A wide range of factors including stress, fatigue, starvation, sleep disturbance, alcohol consumption, noise and sounds, etc., have been associated with the occurrence of migraine (20). These triggering factors, especially educational stress and irregular sleep, are more common among young adults compared to other age groups, especially university students, making them vulnerable to headaches (20).

Almost 10%-18% of university students worldwide have been reported to suffer from migraines (21). Anaya et al. determined that lack of sleep is the main trigger for migraines and tension-type headaches. Additional critical factors include physical activity, stress and long hours of study (22). Headaches, especially in the student population, are usually underdiagnosed and undertreated, and therefore headache attacks may lead to poorer academic performance (10).

Researchers have developed the Headache Impact Test-6 (HIT-6 score) as a useful tool for assessing the impact of headaches on various aspects of daily life, such as social and cognitive functioning. The HIT-6 also measures the severity of headache and psychological distress. Considering the previous findings regarding the strong influence of headaches on students' daily lives, the aim was also to estimate the impact of headache on academic performance. Souza-e-Silva revealed that a high headache impact on a student's life was associated with worse academic performance (19).

Self-medication has been reported to be on the rise internationally (23). In most countries, the majority of students (88.2%) take over-the-counter medications without consulting a doctor (24). In addition, among headache patients, especially the younger generation, several studies have found a high level of self-treatment with a small percentage of patients visiting consultants, with the overall prevalence of self-medication among undergraduate medical students as high as 97.8% (25-27). Primary headaches such as migraine with and without aura and episodic tension-type headaches can be treated by the patients themselves. However, the first diagnosis and treatment should be made by a doctor (28).

Considering the fact that medical students are exposed to a high level of stress, longer duration of study and a stronger responsibility toward their education, we performed this research to investigate the occurrence and characteristics of this morbidity in medical students at the University of Mostar School of Medicine.

The main aim of our study was also to recognize the precipitating factors for headache and its impact on daily living in first- and sixth-year students, as a potential factor that could influence their academic success.

PARTICIPANTS AND METHODS

Participants

This cross-sectional study was conducted in the academic year 2021/2022 among first- and sixth-year medical students at the University of Mostar School of Medicine. Second-, third-, fourth- and fifth-year medical students were excluded from the research. Only headaches that did not appear as part of another illness, including a febrile condition, were analyzed in this investigation.

Methods

After receiving approval from the Ethics Committee University of Mostar School of Medicine, students in the first and sixth years of study were asked to fill out the research

questionnaire. Incomplete questionnaires were excluded. The questionnaires were prepared by the investigators themselves based on other similar works and consisted of two parts. The first part referred to the number and gender of the respondents, and the number of headache attacks per month, and the second part contained questions related to the characteristics and precipitating factors of headaches. The combined survey questionnaire was distributed to respondents via an online link and the Google Forms application. The survey was anonymous, and the notification of anonymity was presented at the beginning of the survey questionnaire. The list of medical students and their e-mail addresses and contact numbers were obtained from the academic record section, and an e-mail containing a link to Google Forms was randomly sent to the selected students. All the data were collected during May 2022.

The HIT-6 questionnaire was utilized to assess the impact of headache on daily functioning. A development and validation study showed that the HIT-6 has good psychometric properties among headache sufferers. The HIT-6 consists of six questions related to the severity of pain, work and family functioning, vitality and cognitive functioning. The examinees give answers to six linked questions using one of the following five responses: "never," "rarely," "sometimes," "very often" or "always." These responses are summarized to obtain a total HIT-6 score that ranges from 36 to 78, where there is the possibility of little or no (49 or less), some (50-55), substantial (56-59) and severe (60-78) impact of headache on daily living (29).

Statistical analysis

The chi-square test and Fisher's exact test were used to test differences between nominal variables. Student's t-test for independent samples was utilized to analyze differences among continuous variables. Variances in the scores of the HIT-6 questionnaire between the groups were analyzed by the t-test for independent samples. Statistical significance was set at $p < 0.05$. All statistical analyses were

performed with SPSS for Windows (version 23.0, SPSS Inc, Chicago, Illinois, USA).

RESULTS

A total of 120 students participated in this research, i.e., 60 first-year medical students and 60 sixth-year medical students. The average age of the students was 22 years.

The total number of female students was 81 (67.5%), which was significantly greater compared to the number of male students at 39 (32.5%) ($p < 0.05$). The first-year group included 48 female students and 12 male students ($p < 0.05$). The sixth-year group consisted of 33 female students and 27 male students ($p > 0.05$). First-year medical students had a significantly higher number of headaches per month than students in their sixth year. First-year students had an average of six headaches per month, while sixth-year students had an average of two headaches in one month. The results were statistically different ($p < 0.001$) (Figure 1).

Among the precipitating factors, psychological fatigue was the most prevalent among students in the first and sixth years of medicine, with a statistically significant difference between the two groups ($p = 0.009$).

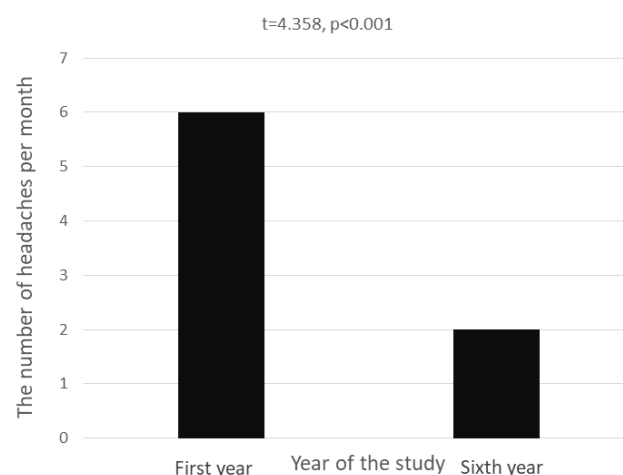


Figure 1. Average number of headaches per month in students in the first and sixth years of study

This is followed by stress, sleep disturbance, being overloaded with college duties, physical fatigue and taking and preparing for exams. Statistically significant differences were observed in physical fatigue ($p = 0.044$), taking and preparing for exams ($p = 0.001$) and being overloaded with university duties ($p = 0.002$). Alcohol and smoking were the less common precipitating factors (Table 1).

Table 1. Differences in precipitating factors between first- and sixth-year medical students

	Year of study				χ^2	p
	First		Sixth			
	n	%	n	%		
Stress	49	81.7	41	68.3	2.178	0.140
Psychological fatigue	53	88.3	40	66.7	6.882	0.009
Physical fatigue	35	58.3	23	38.3	4.038	0.044
Sleep disorders	47	78.3	41	68.3	1.065	0.302
Passing and preparing for exams	37	61.7	17	28.3	12.155	<0.001
Overloaded with faculty obligations	41	68.3	23	38.3	9.676	0.002
Alcohol	6	10.0	13	21.7	2.251	0.134
Smoking	6	10.0	4	6.7	0.109	0.741

*Fisher's exact test

Table 2. Characteristics of headaches among medical students

	Year of study				χ^2	p
	First		Sixth			
	n	%	n	%		
Character of pain					1.053	0.591
Pulsating	15	25.0	14	23.3		
Pressure	38	63.3	42	7.0		
Shock	7	11.7	4	6.7		
Intensity					9.752	0.014*
Weak	8	13.3	19	31.7		
Moderate	41	68.3	35	58.3		
Strong	11	18.3	4	6.7		
Very strong	0	0.0	2	3.3		

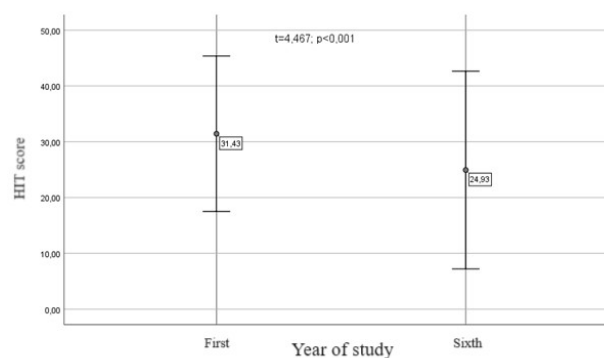
In terms of the nature of the pain, the pressing/band-squeezing type of headache was the most common type of pain in both first-year (n=38, 63.3%) and sixth-year students (n=42, 70%), but without statistically significant differences. Regarding the intensity, most students in their first year (n=41, 68.3%) and in their sixth year (n=35, 58.3%) stated that they had a moderate-intensity headache, also without statistical significance between groups (Table 2).

The average sum of HIT-6 score points in students in their first year of study was 31.43. In the sixth-year students, the average sum of HIT-6 score points was 24.93. Students in their first year had significantly higher HIT-6 scores than sixth-year students ($p<0.001$) (Figure 2). Despite these differences, the analysis of the HIT-6 questionnaire and the sum of the points revealed that headaches have no or a very small impact on the daily life of first- and sixth-year medical students (HIT-6 score less or equal to 49).

DISCUSSION

Primary headaches affect individuals of all age groups and are one of the main causes of impaired daily functioning. Since the great prevalence of different types of headaches was established in the student population, it was

important to determine their occurrence among medical students (19).

**Figure 2.** HIT-6 score in students in the first and sixth years of study

This investigation was conducted on first- and sixth-year students at the School of Medicine, University of Mostar, to examine the occurrence of headache, with the symptoms determined by using a self-reported questionnaire without clinical examination. The majority of students were female with an average age of 22. Our research suggests that students in their first year of study have on average a statistically significant higher number of headaches per month (6), in contrast to students in their sixth year (2). This can be explained by the fact that first-year students are exposed to greater mental fatigue, stress due to their learning environment and sleep disorders due to

adaptation to the larger amount of material they have to master.

Psychological fatigue, stress and sleep disorders are the most common precipitating factors found in this research, and this is noticeable in a significantly higher percentage of first-year medical students. This result is comparable with those revealed in other international evaluations, where stress and lack of sleep, often associated with a long time studying for exams, were the most common trigger factors for different types of headache (31). Accordingly, a cross-sectional study Anaya et al. conducted among medical students in Palestine obtained results suggesting that lack of sleep is the primary trigger for headaches (22).

It has been shown that headaches are often related to various types of psychological difficulties and the same was confirmed by Alkarrash et al. in their research on undergraduate students of medicine, dental medicine and pharmacy at the University of Aleppo (30, 31). Among those, the most common factors related to headaches were depressed mood, anxiety, dissatisfaction with educational success and stress (31). The most common characteristics of headaches between our students were the pressing/band-squeezing type of headache. Although neurological examination and diagnostic procedures were not performed and an accurate diagnosis was not established, the pressing/band-squeezing type of headache is usually referred to as a tension type of headache. This finding is in accordance with other similar studies, such as the one performed on medical students in Riyadh by Almesned et al., where the tension one was the most common type of headache among medical students (32).

HIT-6 scores were low (below 49) in both groups of students, showing that headaches have no or little impact on the daily life of students in the first and sixth years of medical studies at the School of Medicine, University of Mostar. This finding is not supportive of some previous works that showed the serious impact

of headaches on different aspects of daily functioning and its associations with poor academic performance (19). Due to this discrepancy, further investigations should be conducted with a larger number of subjects, and medical students of all years should be included in the research.

One of the limitations of our study is the small number of participants, as this sample cannot give us conclusions for the whole student population. Another limitation is the fact that the symptoms of headache were self-estimated and our participants were not examined by a neurologist. Further investigations with a larger sample and more specific headache characteristics should be performed.

CONCLUSION

Headache is a very common complaint among medical students. First-year students have a significantly higher number of headaches per month than sixth-year ones. The most common precipitating factor was psychological fatigue. This investigation leads us to the conclusion that it is very important to ensure a less stressful environment to obtain better productivity. For students in both the first and sixth years, headaches did not have a major impact on daily life. This study was performed on a small sample, and in order to obtain more precise data, studies on larger ones are required.

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CONFLICT OF INTEREST

None to declare.

AUTHORS' CONTRIBUTIONS

NP and MM: contribution to study conception and design, literature review, supervision, writing of the paper, interpretation of data, critical revision of the paper; MB: acquisition of data, contribution to study conception and design, literature review, critical revision of the paper, assistance in writing the paper; AM and NPS: acquisition of data, contribution to study conception and design, literature review, assistance in writing the paper.

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Data availability statement: We deny any restrictions on the availability of data, materials and associated protocols. Derived data supporting the findings of this study are available from the corresponding author on request.

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