

IMPACT OF HEADACHES ON LEARNING AMONG MEDICAL COLLEGE STUDENTS

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Abstract

Headaches as one of the most common neurological disorders can distress people regardless of sex, age, education, occupation and socioeconomic status. The research aims to determine the impact of headaches on learning among medical college students. A quantitative cross-sectional survey was conducted among 229 students from the P. Stradins Medical College of the University of Latvia. The study was conducted from February 20 till March 20 in 2024. Results of the study revealed that headaches affect both ability to focus and daily learning performance. Although 72.1% of respondents indicated that their grades remained unchanged, 24% reported that their learning performance worsened and 3.06% reported significant difficulties in learning performance. Students reported that headaches mainly affect all daily activities (36.7%) and learning process (27.5%). The correlation analysis showed moderate correlation between frequency of headaches and used medications ($r_s=0.47$; $p<0.001$), and between headaches and difficulties during learning process ($r_s=0.53$; $p<0.05$). Likewise there was a strong correlation between headaches in last three months and pain intensity ($r_s=0.60$; $p<0.05$). Results showed that headaches affect students' learning process and daily activities, despite the fact that majority of them do not have a diagnosis for headaches. The study highlights the necessity of early identification and prevention strategies to reduce the burden of headaches in academic settings.

Keywords: headaches, learning performance, medical college students

Introduction

Relevance of the topic. Neurological diseases are the leading cause of global disability, and headaches are among the most prevalent conditions, especially affecting students. Headaches can significantly impact academic performance, daily functioning, and quality of life (Bhattarai et al., 2022; WHO, 2024). According to the International Classification of Headache Disorders (ICHD-III), headaches are classified into primary and secondary types (Wang et al., 2023).

Primary headaches include migraine, tension-type headaches, and cluster headaches, while secondary ones are due to underlying conditions such as infections or vascular disorders (Liu et al., 2023). Recent studies have emphasized that frequent headaches disrupt the learning process, affecting students' ability to attend classes, concentrate, and achieve high academic performance (Basdav et al., 2016).

Headaches, especially among students, represent a growing concern within both academic and clinical environments. According to the Global Burden of Disease Study (GBD, 2024), headache disorders, including migraine and tension-type headaches, rank among the top causes of years lived with disability. Medical students, due to their intense academic

demands and stress levels, are particularly susceptible to frequent and severe headaches (Al-Hashel et al., 2022).

Research problem. In a systematic review by Smitherman et al. (2015) was found that students with persistent headaches reported decreased academic productivity, reduced concentration, and had poor sleep hygiene. Factors such as irregular eating habits, screen time, and poor posture are significant contributors to headache onset (Cohen, 2013). Furthermore, findings by Tavi (2022) and the National Headache Foundation (2020) underline the importance of early recognition and management strategies, noting that untreated headaches may evolve into chronic forms, leading to medication overuse headaches (MOH).

Furthermore, Maizels and Burchette (2004) emphasize that comorbid somatic symptoms such as fatigue and sleep disturbances can exacerbate the experience of headaches, making it harder for students to cope with academic responsibilities. This aligns with Dyrbye et al. (2006), who identified psychological distress, including anxiety and depression, as contributing factors among medical students. Recent study in Turkey showed high prevalence of tension-type headaches among medical students, what could be affected by sleep patterns, exercise frequency, academic stress, and electronic device usage (Abu Saadeh et al., 2024).

Subject matter of the research – the impact of headaches on the learning performance and daily activities of students in medical college. By identifying patterns and correlations, the study aims to raise awareness and support the implementation of preventive strategies in academic institutions.

Research aim – to determine how headaches influence learning performance and results.

Research objectives:

1. To assess the prevalence on headache among medical college students.
2. To evaluate the impact of headache on students' learning process.
3. To find out the diagnosis for headaches in medical college students.
4. To assess the frequency of used analgetic medications during headache.
5. To determine the relation between headaches and effects on learning, pain intensity and daily activities.

Research methods: A quantitative cross-sectional survey using a questionnaire of 25 questions was conducted among 229 students of P. Stradins Medical College. Data were processed using SPSS 29.0. Correlations were measured using Spearman's rho test with significance at $p < 0.05$.

1. The Study

Notwithstanding that headache disorders are a global burden there are few studies in Latvia exploring the prevalence of headaches. One research in general adult population showed that one third of respondents experienced headache once a week, besides majority of them did not have any diagnosis for headaches (Łacka, 2022). In turn, Tavi (2022) showed that majority of medical students experienced recurrent headaches. Besides, main risk factors for headaches were family history of headache, absence of regular physical activity and comorbidities such as gastrointestinal disorders, asthma and musculoskeletal diseases. And leading triggering factors for headache were lack of sleep, working/studying too much and stress (Tavi, 2022). Therefore, this study adds more information about the emerging distribution of headache among students in Latvia.

2. Methods

2.1. Design and participants

The quantitative method, using cross-sectional survey was applied to detect the impact of headaches on learning among students of P.Stradins medical college of the University of Latvia. The survey consisted of 25 questions about socio-demographic questions, questions about the impact of headaches on learning, factors that influence the occurrence of headaches, warning symptoms, nature and intensity of headaches, use of methods to reduce headaches, ability to attend classes during headaches, impact of headaches on student's everyday life. The questions were uploaded in the format of a commercial Internet survey provider (google forms).

In order to gather a wider understanding of the impact of headaches on student learning, all students from the P.Stradins medical college of the University of Latvia from the 1st to 3rd year of the study programs: "Medicine", "Aesthetic Cosmetology", "Social Rehabilitation", "Social Care", "Podiatry", "Radiology Assistant", "Biomedical Laboratory Assistant", "Medical Massage" were asked to fill the questionnaire. The study was conducted from February 20 till March 20 in 2024. In P.Stradins medical college of the University of Latvia at that time totalled about 305 students. From those 229 (75%) students, age of 19 till 62, responded to the survey.

2.2. Ethical Considerations

The research was approved by Ethics Committee of the P. Stradins medical college of the University of Latvia, Nr.56. All participants received information about the purpose of the study and affirmation that all data would remain anonymous. They were informed that participation in the study was voluntary, they had the right to refuse to fill out the questionnaire, and their refusal would not cause any unwanted consequences.

2.3. Statistical analysis

The data were analysed using SPSS v.29 (IBM Corp., Armonk, NY, USA). The internal consistency of the scales was assessed using Cronbach's alpha. The alpha values for all scales were acceptable, ranging from 0.75. Categorical variables were expressed as numbers (n) and percentages (%), respondents' age and pain scale data were expressed as mean (M) and standard deviation (SD). Spearman's rho (rs) was calculated to measure the correlation between the variables. The following classification was used to evaluate the correlation: < 0.39 – weak; from 0.39 – 0.60 – moderate; > 0.6 – strong. A 95% confidence interval (95%CI) was calculated to evaluate the accuracy of statistical parameters. In all statistical analyses, p-value < 0.05 was considered as statistically significant.

3. Results

Study results showed that majority of students were female (95.2%, n=218), only 11 respondents (4.8%) were male. Mean age of respondents was 30.8 ± 10.6 years. All respondents rated their headaches in pain scale as 5.62 (SD 2.12), stating that in average students have distracting or even distressing headache.

Students reported that they experience headaches very rarely (21.4%, n=49) or rarely (31.4%, n=72), however 27.5% (n=63) and 19.7% (n=45) said that they have headaches often

and very often, respectively. Besides, in past three months 39.3% (n=90) students had unbearable headaches and 47.2% (n=108) had severe, but bearable headaches (Table 1).

More than half of respondents (51.1%, n=117) admitted that headaches interfere with daily activities, and 41.5% (n=95) said that headaches partially interfere with daily activities (Table 1).

Majority of students (78.2%, n=179) revealed that they do not have a diagnose for headaches. Among other respondents the most common diagnosis was migraine (7.86%, n=18) and cervical osteochondrosis or spinal deformation (6.55%, n=15). Respondents said that headaches are disturbing (44.5%, n=102) or partially disturbing (39.3%, n=90) during study process (Table 1).

Majority of students (48.9%, n=112) said that headaches disturbs them to focus and do everything on time during study process, also 17.5% (n=40) respondents indicated that headaches during study process affect their reading and information understanding. However, when asked about the study results, 72.1% (n=165) students pointed out that results did not change. Respondents noted that when they have headaches they use pain reducing medicine rarely (32.8%, n=75), sometimes (24.5%, n=56), often (14.4%, n=33), every time having headache (22.3%, n=51), yet only 6.11% (n=14) said that they do not use medications (Table 1).

During or just before menstruation female respondents said that they had headaches (12.2%, n=28), and 30.6% (n=70) said that they headaches sometimes, however 52.4% (n=120) did not have headache at all. Respondents revealed that due to headache it is hard for them to do all daily activities (36.7%, n=84), to study (27.5%, n=63), to work (8.3%, n=19), to do household duties (6.99%, n=16) or to communicate (5.68%, n=13, Table 1).

Table 1. *Impact of headache on learning among medical college students*

Question	Occasion	%	N
<i>How often do you experience headache?</i>	Very rarely (once in 3-6 months)	21.4	49
	Rarely (1-2 times in month)	31.4	72
	Often (once in week)	27.5	63
	Very often (3-7 times in week)	19.7	45
<i>Did you experience unbearable headache in past three months?</i>	No	13.5	31
	Yes, but bearable	47.2	108
	Yes	39.3	90
<i>Do headaches interfere with your daily activities?</i>	No	7.42	17
	Partially	41.5	95
	Yes	51.1	117
<i>Do you have a diagnose for headaches?</i>	No	78.2	179
	Migraine	7.86	18
	Cervical	6.55	15
	osteocondrosis/ spinal deformation		
	Head trauma	2.18	5
	Cardiovascular disease	3.49	8
<i>Do headaches disturb your study process?</i>	Other	1.74	4
	No	16.2	37
	Partially	39.3	90
	Yes	44.5	102
<i>What difficulties do headaches cause during study process?</i>	No	12.7	29
	Reading and understanding	17.5	40
	Focusing	48.9	112
	Memory	6.11	14
	Everything that concerns	14.8	34
<i>Do headaches affect your study results?</i>	No	0.44	1
	Results do not change	72.1	165
	Results got worse	24.0	55
	Have some debts	3.06	7
	Have many debts	0.44	1
<i>How often do you take medications for headache?</i>	Never	6.11	14
	Rarely	32.8	75
	Sometimes	24.5	56
	Often	14.4	33
	Very often	22.3	51
<i>Do you have headache during or just before menstruation (for female respondents?)</i>	No	52.4	120
	Sometimes	30.6	70
	Yes	12.2	28
<i>Which of your daily activities are disturbed due to headache?</i>	No	14.0	32
	Communication	5.68	13
	Car driving	0.87	2
	Work duties	8.30	19
	Home duties	6.99	16
	Studies	27.5	63
	All activities	36.7	84

Spearman test did not show significant correlation between age and headache frequency, however, it was found that the frequency of headache and the use of pain-

relieving medications has positive and direct moderate correlation ($r_s=0.47$; $p<0.001$). The correlation between the frequency of headaches and daily activities was positive and weak ($r_s=0.23$; $p<0.001$). There was a positive and direct strong correlation between headache in last three months and pain scale data ($r_s=0.60$; $p<0.05$). Positive and direct moderate correlation was observed between the questions: if the headache is disturbing during studies and which kind of difficulties cause headaches during study process ($r_s=0.53$, $p<0.05$, Table 2).

Table 2. *Correlation Analysis Summary*

Correlation between:	Spearman's rho correlation (r_s)	Significance (p value)
Frequency of headache and use of analgetic medications	0.47	0.001
Frequency of headaches and daily activities	0.23	0.001
Headache in last three months and pain scale data	0.60	0.05
Headache is disturbing during studies and what difficulties headache causes during study process	0.53	0.05

4. Discussion

This study appears to mirror the findings of similar studies conducted in other countries. The results reveal that almost half of students (47.2%) often and very often suffer from headache, besides in past three months 39.3% of them have had unbearable headache. Therefore, more than a half of students (51.1%) responded that headaches seriously interferes with their daily activities, including studies. Despite the intensity of the headache and difficulty performing daily activities due to the headache the majority of students (78.2%) revealed that they do not have any definite diagnosis. This study results showed that students due to headache had difficulties to focus on studies, however it did not have impact on learning results. Students used medications mainly rarely and sometimes. Majority of female students said that they do not have headaches during or just before menstruation. Correlation analysis showed that headache frequency affected daily activities and caused difficulties during study process. Correlation analysis also showed that students used more medications if they had more frequent headache, besides headaches in last three months strongly correlated with the pain scale assessments.

The study contributes to the growing body of literature on headache prevalence among students, especially in medical education. Our findings are consistent with Smitherman et al. (2015), who highlighted the adverse effects of episodic migraines on academic productivity. The significant correlations in this study reinforce the idea that headaches, often considered as minor inconvenience, can profoundly impact students' academic engagement and overall well-being.

The high frequency of analgetic medication use observed among students raises important clinical concerns. Radojičić et al. (2024) noted that repeated use of analgesics may result in MOH, making diagnosis and headache management more complicated. Institutions should consider including education in responsible medication use in wellness programs.

The gender distribution in this research, with 95.2% female respondents, mirrors gender trends in medical and caregiving programs, but may also signal greater headache

burden among female students. Al-Hashel et al. (2022) suggested that hormonal factors may increase susceptibility to migraines and tension-type headaches in women, however this study showed that female students do not have headache during or just before menstruation.

Although only a small percentage of students had a formal diagnosis, a large proportion reported frequent or unbearable headaches, pointing to a potential gap in clinical assessment and treatment. Maizels and Burchette (2004) argued that co-occurring somatic symptoms, such as fatigue and sleep disorders, can amplify headache effects and academic impairment.

Finally, even though 72.1% of students indicated that their grades were unaffected, nearly half experienced difficulties to focus and comprehend the study material. This suggests that traditional academic metrics may not capture the full academic burden of headaches. Further qualitative inquiry could explore how students can adapt and cope, as recommended by Souza-e-Silva & Rocha-Filho (2011).

Conclusions

1. The results show that almost half of medical college students (47.2%) often and very often suffer from headache, and in past three months 39.3% of them have had unbearable headache. Besides, students have graded their headaches according to pain scale as distracting or even distressing.

2. Medical college students revealed that headaches seriously interfere with their daily activities, including studies, they have difficulties to focus on studies, however it does not have impact on learning results.

3. The majority of students (78.2%) revealed that they do not have any definite diagnosis for headache, and female students said that menstruations are not the cause of headaches.

4. Medical college students revealed that they used analgetic medications for headache rarely (32.8%) and sometimes (24.5%), however 22.3% used them very often.

5. There was a significant relation between the frequency of headaches and doing daily activities, learning or taking analgetic medicine. Besides, headaches in last three months strongly correlated with the pain scale assessments.

6. Further research should focus on a detailed analysis of contributing factors that cause headache, in the same time emphasizing the diagnosis for headaches, which could also improve pain management reducing the risk of MOH.

7. Addressing student headaches may not only improve academic performance but also increase retention and reduce dropout rates among vulnerable students.

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Summary

Headache is one of the greatest common neurological disorders, it can distress people regardless of sex, age, education, occupation and socioeconomic status. This article examines the impact of headaches on the academic performance and daily activities of medical college students. The research problem centres around the high prevalence and underdiagnosis of headaches, which can affect concentration, productivity, and overall well-being. The aim of the study was to investigate how headache frequency, intensity, and medication use correlate with academic challenges.

A quantitative cross-sectional survey, consisting of 25 questions and uploaded in the commercial internet survey provider was performed. The study was conducted from February 20 till March 20 in 2024, 229 students from P.Stradins Medical College of the University of Latvia took part. The research was approved by Ethics Committee of the P.Stradins medical college of the University of Latvia, Nr.56. Data were analysed using SPSS v.29 (IBM Corp., Armonk, NY, USA). The internal consistency of the scales was assessed using Cronbach's alpha. The alpha values for all scales were acceptable, ranging from 0.75. Categorical variables were expressed as numbers (n) and percentages (%), respondents' age and pain scale data were expressed as mean (M) and standard deviation (SD). Spearman's rho (rs) was calculated to measure the correlation between the variables. The following classification was used to evaluate the correlation: < 0.39 – weak; from 0.39 – 0.60 – moderate; > 0.6 – strong. A 95% confidence interval (95%CI) was calculated to evaluate the accuracy of statistical parameters. In all statistical analyses, p-value < 0.05 was considered as statistically significant.

The results showed that almost half of medical college students (47.2%) often and very often suffered from headache and in past three months 39.3% of them have had unbearable headache. Besides, students have graded their headaches according to pain scale as distracting or even distressing. Medical college students revealed that headaches seriously interfere with their daily activities, including studies, they have difficulties to focus on studies, however it does not have impact on learning results. The majority of students (78.2%) revealed that they do not have any definite diagnosis for headache, and female students said that menstruations are not the cause of headaches. Medical college students revealed that they used analgetic medications for headache rarely (32.8%) and sometimes (24.5%), however 22.3% used them very often. There was a significant relation between the frequency of headaches and doing daily activities, learning or taking analgetic medicine. Besides, headaches in last three months strongly correlated with the pain scale assessments. Further research should focus on a detailed analysis of contributing the factors that cause headache, in the same time emphasizing the diagnosis for headaches, which could also improve pain management, thus reducing the risk of medication overuse headaches. Addressing student headaches may not only improve academic performance but also increase retention and reduce dropout rates among vulnerable students.

The conclusions emphasize the need for educational institutions to implement preventative strategies, early diagnosis, and stress management programs. The research highlights the broader implications for public health and the necessity of holistic support systems in educational environments.

Keywords: headaches, learning performance, medical college students