

Prevalence, phenotype, and academic impact of headache among undergraduate health sciences students: a cross-sectional study

Prevalência, fenótipo e impacto da cefaleia na performance acadêmica de universitários da área de ciências da saúde: um estudo transversal

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ABSTRACT

Background: Headache is a common neurological condition among university students, and it can impact their academic performance.

Objectives: to investigate the prevalence, clinical characteristics, and impact of headache on academic performance among undergraduate students of health sciences.

Methods: The study was undertaken during February-June 2021 among a convenience sample of undergraduate students of Campus Lagarto of Federal University of Sergipe (UFS). Data were collected using an online self-administered questionnaire, which comprised a form with sociodemographic and clinical characteristics data and the Migraine Disability Assessment (MIDAS).

Results: A total of 154 students participated in the study, with a mean of age of 23.35 ± 5.02 years and 75.9% were females. The overall headache prevalence was 93.5% in the past three months. Of those, 94.4% reported experiencing frequent headaches (≥ 2 episodes/month), 68.1% described the headache duration between 1-4 hours, with frontal predominance (38.9%), bilateral (50.7%), pulsating/throbbing quality (66.7%), moderate intensity (56.2%). Headache was associated with photophobia (53.9%), phonophobia (32.7%) and nausea (30.5%). Stress or anxiety (80.5%), excessive electronic devices use (68.8%), and sleep disturbance (61.7%) were considered as common triggering factors for headache among the participants. The MIDAS score showed that 73.5% of the students had some disability, and 77.1% stated that headache negatively affect their academic achievements.

Conclusion: The prevalence of headache among the students of health sciences courses was high and negatively impacted their academic performance. Thus, further studies are recommended to design strategies to reduce the headache prevalence and to increase the academic performance of these students.

Keywords: headache, health occupations student, academic performance

RESUMO

Introdução: Cefaleia é uma condição neurológica comum entre estudantes universitários e pode impactar sua performance acadêmica.

Objetivos: Investigar a prevalência, características clínicas e o impacto da cefaleia no desempenho acadêmico de estudantes da área da saúde.

Métodos: Um total de 154 estudantes participou do estudo, com idade média de $23,35 \pm 5,02$ anos, sendo 75,9% mulheres. A prevalência de cefaleia foi 93,5% (144/154) nos últimos três meses. Dos estudantes com cefaleia, 94,4% relataram cefaleia frequente (≥ 2 episódios/mês), 68,1% descreveram duração das crises entre 1 e 4 horas, com predominância frontal (38,9%), bilateral (50,7%), caráter pulsátil (66,7%), e intensidade moderada (56,25%). Cefaleia foi associada com fotofobia, fonofobia e náusea em 53,9%, 32,7% e 30,5% dos estudantes, respectivamente. Estresse e ansiedade (80,5%), uso excessivo de aparelhos eletrônicos (68,8%) e distúrbios do sono (61,7%) foram considerados os principais fatores desencadeantes de cefaleia entre os participantes. O score do MIDAS mostrou que 73,5% dos estudantes tinham algum grau de incapacidade e 77,1% dos estudantes relataram impacto negativo da cefaleia em sua performance acadêmica.

Conclusão: A prevalência de cefaleia entre os estudantes da área da saúde foi alta e reduziu a performance acadêmica deles. Assim, mais estudos são recomendados para melhorar o conhecimento sobre a epidemiologia da cefaleia entre estes estudantes e aumentar seu desempenho acadêmico.

Palavras-chave: cefaleia, estudantes de ciências da saúde, desempenho acadêmico.

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INTRODUCTION

Headache is the perception of pain at the level of the cephalic segment. It is one of the most common neurological conditions in all age groups, with an increasing trend in the younger people¹. The Global Burden Disease (GBD) 2019 estimated that headache disorders was the fifth cause of disability in people aged 10-24².

Headache can be triggered and/or aggravated by several factors like emotional stress, sleep problems, coffee consumption, missing a meal, prolonged electronics uses. Many of these factors are present in the university students' lifestyle behaviors, which could increase the risk of headache in these individuals³⁻⁶.

In fact, headache is a common symptom among university students, showing a great variability prevalence in this population, with a range of 46%-96%, significantly higher in women^{7,8}. It is one of the main causes of morbidity that lead to college absenteeism and poor academic performance of undergraduate students⁴.

Epidemiology of headache in young populations in Brazil, especially in undergraduate population, as well as its impact on academic performance, have been explored in some studies. Epidemiological data are essential for monitoring trends and outbreaks of health-related conditions in this population.⁹⁻¹¹. However, little is known about the epidemiology of headache among our students. As such, the aim of this study was to explore the epidemiology of headache among our undergraduate students of health sciences courses by investigating the prevalence, clinical characteristics, and impact on academic performance in students with headache.

METHODS

This is an observational analytic study with a cross-sectional design. The study was done in accordance with Resolution 466/12 of the National Health Council and approved by institutional Ethics Committee of Research (CAAE 33523120.6.0000.5546).

The research was carried out among healthcare students of campus Professor Antônio Garcia Filho of Federal University of Sergipe, Brazil, between February and June 2021. The students were contacted by email and informed about the purpose of the research. A convenience sample of students signed the consent term and received an online self-administered questionnaire, generate by using google forms, which comprised a form with sociodemographic and clinical characteristics data and the Migraine Disability Assessment (MIDAS).

The form was built to characterize the study sample and it included the following information: age, gender, ethnicity, marital status, with who do they live, ways of transportation used, work activities, presence of kids, presence of headache and its features in the past three months, including the impact the impact of headache on academic performance. The following headache

characteristics were investigated: duration, frequency and intensity of headache, location of headache, description and intensity of pain, its triggering factors and associated signs and symptoms.

The MIDAS is a simple and useful instrument to evaluate the headache-related disability. It was developed to measure functional consequences of migraine but can be used to evaluate the disability-related to other types of headaches. It consists of five questions, scoring the number of days in the past three months of activity limitations due to headache¹². Its scores defines patients into four categories of headache disability: 0-5 no disability, 6 to 10 indicates mild disability, 11 to 20 indicates moderate disability, and higher than 20 suggest severe disability¹³.

Data were analyzed using Graph Pad Prism, version 8.0. Descriptive data were presented as frequency, percentages, mean and standard deviation (SD). Fisher's exact test and odds ratio (OR) were uses to evaluate association between variables. For statistical significance, p-value <0.05 and a 95% confidence interval (CI) were considered.

RESULTS

A total of 154 questionnaires were filled completely and considered for analysis. Mean of age of participants was 23.35 ± 5.02 years and majority of them were females 117 (75.9%). Of all participants, 123(79.9%) were first-course university students and 121(78.6%) were studying full-time. Sociodemographic characteristics of the study participants are shown in table 1.

The study participants were asked about the presence of headache episodes in the past three months, we found that 144/154 participants suffered from headache, with an overall prevalence of headache of 93.5% (95% CI 0.88-0.97), and a higher prevalence among female than male students (94.9% vs. 88.9%, respectively). In addition, the likelihood of headache was 2.31 higher among female students compared to their male counterparts (OR= 2.31; 95% CI 0.62- 8.69).

About the clinical characteristics of headache, our results showed that a total of 118/144 (81.9%) participants reported experiencing frequent headaches (≥ 2 episodes/month), while 26/144(18.1%) reported infrequent episodes of headache (≤ 1 episode/month). Most of the students, 98/144 (68.1%), reported episodes of headache lasting from 1 to 4 hours. Most participants described a headache with frontal predominance (38.9%), bilateral (50.7%), pulsating/throbbing quality (66.7%), moderate intensity (56.2%). Headache was associated with photophobia in 53.9%, phonophobia in 32.7% and nausea in 30.5% of the students. Stress or anxiety (80.5%), excessive electronic devices use (68.8%), and sleep disturbance (61.7%) were considered as common triggering factors for headache among the participants. The headache characteristics among the study participants are

summarized in table 2. Most of them, 111(72.1%), reported have experienced headache prior to entering the university, of which, 67 (60.4%) informed that they had experienced worse headaches after they started university.

The MIDAS total score showed that 73.5% of the students had some disability, which 59 (40.9%) students had severe disability (MIDAS score of ≥ 21), 31 (21.5%) had moderate disability (MIDAS score 11-20), 16(11.1%) had mild disability (MIDAS score of 6-10), and finally, 38 (26.4%) had no disability (MIDAS score 0-5). The students were divided into two groups: with headache disability (MIDAS total score >5) and no headache disability (MIDAS total score ≤ 5). The association between headache disability and different variables was investigated. Sleep problems were more prevalent among students who were scored into headache disability group ($p=0.008$, Odds Ratio=2.79, 95% CI 1.25- 6.14). The same was found for difficulty concentrating ($p<0.0001$, Odds Ratio=12.26, 95% CI 3.13-42.81) and memory impairment ($p=0.0008$, Odds Ratio=4.01, 95% CI 1.80- 8.44).

When the study participants were asked about the impact of headache on their academic life, most of them stated that headache affect their academic achievements, since 111/144(77.1%) reported that they stopped studying due to the headache, 108/144 (75%) indicated that the headache was more frequent than usual in tests/exams time, 76/144 (52.7%) believed that headache prejudice their academic grade and 113/144 (78.5%) reported difficulties to accomplish activities on time.

DISCUSSION

Headache is a common health problem that affects people of all ages, but studies have shown that headache prevalence has increased considerably among adolescents and young adults in the last years. It is a frequent health complaint among university students, and it can interfere on their academic performance. In this study, we investigated the prevalence and clinical characteristics of headache among health science students in a Public Brazilian University.

Our results showed a high overall prevalence of headache of 93.51% (95% CI 0.88-0.97) among the students, with at least one episode in the last three months. Previous studies have also shown high prevalence of headache among students of health science courses. A Brazilian study conducted among medical students of a public university from North Brazil (Amazonas) showed a similar prevalence rate of 93.5% in the last 3 months⁹. Another study performed with medical and psychology students from southeast of Brazil (Taubaté, São Paulo) showed a lifetime prevalence of headaches of 98% and a last-year prevalence of headaches of 91%¹⁰. Falavigna et al. conducted a study with undergraduate students from a private university in Southern Brazil and showed a headache prevalence of 74.5%, however, when analyzed by course, the health and

biological sciences students showed a prevalence of 37.1%¹¹. Panigrahi et al. revealed high prevalence of headache among students of health profession in India, with an overall last year prevalence of 73.1%⁴. Ojini et al, showed a headache prevalence of 46% among medical students of the University of Lagos, Nigeria⁷. The discrepancy of prevalence rate might be attributed to methodological, sociocultural and geographic differences.

The mean age of the study participants was 23.35 years (SD 5.02) and majority of them were female (75.9%), like findings of previous studies with health science students^{4,9,14}. The likelihood of headache was 2.31 times higher among females compared to the male counterparts. Other studies have also shown that headache was more frequent among female students^{4,7,10,15}. It has been suggested that a higher headache prevalence on females might be due hormonal factors. Pavlović et al.¹⁶ showed that 60% of women with migraine reported an association between the pain episode and menstruation, however, caution should be exercised when generalizing this data, especially in a population predominantly composed of women.

We observed that most of our students reported experiencing frequent headaches (≥ 2 episodes/month), with episodes lasting from 1 to 4 hours, predominance frontal, bilateral, pulsating/throbbing quality and moderate intensity. Previous studies have shown similar clinical headache characteristics among health courses students. An Indian study conducted among dental students at a tertiary care dental teaching hospital showed that majority of its sample also experienced frequent headaches, with attacks lasting less than 4 hours, which were characterized by bilateral location and moderate intensity.¹⁷ A study carried out with medical students in Saudi Arabia showed that most students characterized their headache as frontal, bilateral and pulsating/throbbing quality, like our results¹⁸. Another study conducted among undergraduate students of health course showed that 58.9 % of the cases also reported their headache with pulsating/throbbing character⁴.

Most study participants, 72.08%, reported have experienced headache before entering the university, of which 60.36% informed that they had experienced worsening headaches since university admission. Carneiro et al reported in their study that 54.8% of medical students had worsening of headaches after entering university¹⁹. Ferri-de-Barros et al, showed that 35.2% of the medical and 36.9% of psychology students also reported worsening of headache since they were admitted to the university¹⁰.

Headache was frequently accompanied by other symptoms such as photophobia and nausea in our students. A previous study with medical students of the university of Lagos, Nigeria, showed that subjects also reported that headache was also associated with nausea and photophobia, especially among students with migraine⁷. Stress or anxiety, excessive electronic devices

use, and sleep disturbance were considered as possible triggering factors for headache among our participants. These factors are common among university students once they face many challenges in their formation process, which make certain unhealthy lifestyle behaviors prevalent during this stage of their life³. Stress and sleep deprivation were also showed as triggering factors for headache in other studies with university students^{4,20}. The electronic devices use, especially computers and smartphones, has been recently become necessary to online learning at universities because of the COVID-19 pandemic. The excessive screen time has been identified as a possible leading cause of headache in this population. Evidence has suggested that headache and associated symptoms (nausea, photophobia), as well as factors like stress and sleep deprivation can led to poor educational performance^{21,22}.

Headache can directly interfere with students' quality of life, interfering with income, productivity, ability to concentrate and absenteeism, contributing to a reduction in an academic performance²³. Our results revealed that 40.97% of our students had severe disability according to MIDAS total score. Sleep problems, difficulty concentrating, and memory impairment were more prevalent among students who scored into headache disability group. Health sciences students usually are under significant pressure, especially when they begin to care for patients, they can experience elevated levels of external stress and anxiety symptoms, which can increase the risk of headache and thereby negatively affecting their academic performance²⁴.

Regarding the impacts on academic life, our study showed that most students (77.08%) were unable to continue studying due to headache and 75% of them indicated that the headache was more frequent than usual in tests/exams time. In a Brazilian study conducted with medical students, 76.9% of students with migraine and 55.6% of those with tension-type headache reported an increase in headache attacks before exams, which could be associated with higher intake of psychostimulant substances, stress, and fewer hours of sleep during this period¹⁹.

In addition, in the present study, most of our students with headache reported difficulties in carrying out activities on time and believed that headache prejudice their academic grade. Similarly, Bigal et al. showed that students with migraine reported that headache interfered with their final performance academic, considering the impact on study and on final grades obtained²⁵. Souza-e-Silva et al. evaluated the repercussion of headache on academic performance of university students using the following variables: student's self-reporting of absenteeism, need for re-taking exams, and the number of failures in disciplines. They observed that students who displayed a greater headache intensity headaches had a worse academic performance (greater number of failures and absenteeism)²⁶, suggesting their headache can cause a prejudice to academic performance.

Thus, our study is accordance with previous studies suggesting that headache is a common and debilitating neurological condition among undergraduate students. Despite the overwhelming epidemiological evidence, our study had some limitations. First, the sample size was a small percentage of the total university student population, once this study enrolled a convenience sample of health students and some of questionnaires were not filled completely and were not considered for analysis. Another issue was that the data were collected by using a self-administered questionnaire, relied exclusively on information provided by respondents which itself is subjective and prone to recall bias. Also, being a cross sectional study in nature, it not possible to establish a cause-effect relationship between variables.

CONCLUSION

In conclusion, we observed a high prevalence of headache among health sciences university students and a possible association between headache and poorer academic performance. Stress, excessive use of electronic devices and sleep disturbance were reported as headache triggering factors. Thus, future studies should be developed to improve the knowledge about epidemiology of headache in university students and to contribute to prophylaxis of this condition what can be helpful to improve the academic performance of the students.

Table 1. Socio-demographic characteristics among undergraduate health sciences students (N=154)

Variables	Number (%) or Mean \pm SD
Age in years	23.35 \pm 5.02
Gender	
Female	117 (75.9)
Male	36 (23.4)
Not informed	1 (0.6)
Race or Color	
Mixed	93 (60.4)
White	36 (23.4)
Black	21 (13.6)
Yellow/East Asian	3 (1.9)
Indigenous	1 (0.6)
Civil Status	
Single	147 (95.5)
Married	7 (4.5)
Have children or dependents	
No	146 (94.8)
Yes	8 (5.2)
Residential area	
Urban zone	132 (85.7)
Rural zone	22 (14.3)
Living situation	
With family	112 (72.7)
With friends	20 (12.9)
Alone	15 (9.7)
Others	7 (4.5)
Employment status	
Full-time student	121 (78.6)
Employed	33 (21.4)

Table 2. Clinical characteristics of headache in undergraduate health sciences students (N=144)

Headache Characteristics	Number of students (%)
Headache duration (hours)	
0-4	98 (68.1)
5-12	36 (25.0)
≥12h	10 (6.9)
Frequency of headaches (monthly)	
≤1	26 (18.1)
≥ 2 a < 15	92 (63.8)
≥ 15	26 (18.1%)
Headache location	
Frontal	56 (38.9)
Temporal	30 (20.8)
Fronto-temporal	24(16.7)
Parietal	11(7.6)
Ocular	9 (6.2)
Occipital	6 (4.2)
Temporo-occipital	5 (3.5)
Cervical	3 (2.1)
Headache side	
Unilateral	48 (33.4)
Bilateral	73 (50.7)
Holocranial	23(15.9)
Headache Intensity	
Mild	18 (12.5)
Moderate	81 (56.25)
Severe	45 (31.25)
Type of pain	
Pulsating/ Throbbing	96 (66.7)
Thinness/Pressure	27 (18.7)
Sharp/ Stabbing	21 (14.6)
Associated symptoms (Multiple responses)	
Photophobia	83 (53.9)
Phonophobia	50 (32.7)
Nausea	47 (30.5)
Vomiting	14 (9.1)
Others	9 (5.8)
No associated symptoms	54 (35.1)
Triggering factors (Multiple responses)	
Stress or anxiety	124 (80.5)
Excessive electronic device use	106 (68.8)
Sleep disturbance	95 (61.7)
Bright light	93 (60.3)
Reading	48 (31.2)
Physical activity	30 (19.5)
Drinks with caffeine	14 (9.1)
Others	16 (10.4)

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