

Prevalence and impact of headache in undergraduate students in Southern Brazil

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ABSTRACT

Objective: To determine the prevalence, characteristics and impact of headache among university students. **Method:** The criteria established by the International Headache Society were used to define the primary headache subtypes and the Migraine Disability Assessment Questionnaire (MIDAS), to assess the disability. The students were then grouped into six categories: [1] migraine; [2] probable migraine; [3] tension-type headache; [4] probable tension-type headache; [5] non-classifiable headache; [6] no headache. **Results:** Of all undergraduate students interviewed, 74.5% had at least one headache episode in the last three months. Regarding disability, there was a significant difference between the headache types ($p < 0.0001$). In the post-hoc analysis, migraine was the headache type with most reported disability. **Conclusion:** Headache is a highly prevalent condition among the students at the University of Caxias do Sul. This disease may have a major impact on the students' lives and in some cases, ultimately lead to educational failure.

Key words: disability, headache, prevalence, young population.

Prevalência e impacto da cefaléia em estudantes do sul do Brasil

RESUMO

Objetivo: Determinar a prevalência, características e impacto da cefaléia entre estudantes universitários. **Método:** Foram utilizados os critérios estabelecidos pela Sociedade Internacional de Cefaléia para definir os subtipos de cefaléia e o *Migraine Disability Assessment Questionnaire* (MIDAS), para avaliar a incapacidade associada. Os estudantes foram classificados em seis categorias: [1] migrânea; [2] provável migrânea; [4] cefaléia do tipo tensional; [4] provável cefaléia do tipo tensional; [5] cefaléia não classificável; [6] sem cefaléia. **Resultados:** De todos os estudantes entrevistados, 74,5% tiveram pelo menos um episódio de cefaléia nos últimos três meses. Em relação à incapacidade, foi encontrada uma diferença significativa entre os tipos de cefaléia ($p < 0,0001$). Na análise post-hoc, a migrânea foi o tipo de cefaléia mais relacionada à incapacidade. **Conclusão:** A cefaléia é uma condição de grande prevalência entre estudantes da Universidade de Caxias do Sul. Esta doença pode ter um grande impacto na vida dos estudantes e, em alguns casos, levar a um pior desempenho acadêmico.

Palavras-chave: cefaléia, incapacidade, população jovem, prevalência.

Overall, 47% of the adult population presents an active headache disorder, tension-type headache and migraine being the most frequent disorders, with a prevalence of 38% and 10%, respectively¹. These

painful conditions are related to a major lack of productivity at work or at school limitation of social activities and impairment of quality of life^{2,3}. Also, the primary headaches have a significant economic

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impact, implying direct costs, such as medical care (diagnosis, treatment, medication) and on the state (public health care), and indirect costs, which involve the loss of production attributable to the illness⁴.

Headache disorders are under-diagnosed and under-treated conditions in certain populations, such as undergraduate students. In this specific population, the headaches lead to lost days of study and worse academic performance. Few studies were performed on undergraduate students. In Greece, the prevalence of migraine is 2.4%⁵ and in Turkey, 12.4%⁶. In Brazil, Bigal et al.⁷ found a prevalence of 25% of migraine and 32.9% of the students reported episodic tension-type headache. The authors also observed that students with migraine showed a 62.7% decrease in productivity while studying, compared with a 24.4% decrease in those with episodic tension-type headache.

There are few studies about the impact of primary headaches in these students, specially using standardized tools, such as the Migraine Disability Assessment Questionnaire (MIDAS). Thus, this study aims to determine the prevalence and characteristics of headache and its impact among undergraduate students at a private university in Southern Brazil, using the MIDAS questionnaire.

METHOD

Design and sample

This cross-sectional study was carried out at the University of Caxias do Sul, a private university in Southern Brazil. After mapping of all university campus buildings, the researchers were trained to approach all of the university buildings in class periods during the morning, afternoon and evening shifts. The classrooms approached were randomly chosen by the researchers during the data collection. The undergraduate students were invited to participate in the study and signed a letter of consent. A structured, closed-ended questionnaire was completed during the classes. The inclusion criteria were to be under 30 years of age and to accept to participate in the study by signing the letter of consent. The study was submitted to the Ethics and Research Committee of UCS and the study began after approval (Project number 49/07).

Instrument

The following variables were collected using the structured questionnaire: gender, age, course, socioeconomic level, presence of headache and its features in the past three months, and the headache-related disability. The socioeconomic level was measured by the Brazilian Association of Research Companies (*Associação Brasileira de Empresas de Pesquisa - ABEP*) and divided into five categories, where the highest socioeconomic level was "A".

The students were asked about the presence of head-

ache in the past three months. The criteria established by the International Headache Society⁸ were used to classify the types of primary headaches. The following were investigated: the presence of any type of headache, frequency, duration, intensity, headache quality and associated symptoms (nausea and/or vomiting, photophobia, phonophobia). All different types of aura symptoms were aggregated in one item. The students were then grouped into six categories: [1] migraine; [2] probable migraine; [3] tension-type headache (TTH); [4] probable tension-type headache; [5] other headache; [6] no headache. The numerical rating scale ranging from zero, no pain, to ten, worst pain, assessed pain intensity.

We analyzed the headache-related disability with the Migraine Disability Assessment Questionnaire. MIDAS is a 5-question, open-response questionnaire that evaluates the headache-related functional impairment experienced by the patient. It is expressed by loss of days at work or at school, household chores, and social activity, during a 3-month period. It has already been translated and validated for the Brazilian-Portuguese language⁹. Even being a questionnaire that analyses the migraine disability specifically, the MIDAS score were previously tested in populations of nonmigraine headache sufferers. This scale has an acceptable test-retest reliability (Spearman's correlation: 0.84) and a good internal consistency (Cronbach's alpha: 0.83)¹⁰, supporting the reliability of the measure in patients with nonmigraine headaches. Also, the MIDAS score was already used across a spectrum of others headache types in previous studies^{11,12}.

Statistical analysis

All statistical analyses were conducted with SPSS 16.0 (SPSS, Chicago, IL). The categorical variables were presented as proportions. The continuous variables were submitted to the Kolmogorov-Smirnov test to verify normal distribution and were presented as mean plus standard deviation or median plus interquartile interval, depending on distribution. The Chi-square test was used to compare the nominal variables and ANOVA to compare the continuous variables. Post-hoc analysis (Bonferroni test) was performed to assess multiple comparisons between the different types of headaches considering the MIDAS value.

Reliability

To assess the reliability of the instrument 53 students were randomly selected to complete the questionnaire for a second time, approximately 7 days after the first completion. The correlation between test-retest was measured by kappa index (κ).

RESULTS

A total of 1273 students answered the questionnaire, where 1,092 met the inclusion criteria. Of the 1,092 sur-

Table 1. General sample characteristics (n=1,092).

Female gender	63.6%
Median age (P25-P75)*	21.0 (19.0-24.0)
Ethnicity	
Caucasian	93.9%
Mulatto	4.8%
Black	1.1%
Asian	0.2%
Socioeconomic status	
A	10.4%
B	43.8%
C	37.7%
D	8.9%
E	0.2%
Courses	
Health and biological sciences	37.1%
Exact sciences and engineering	48.2%
Humanities and art	14.7%

*Percentile 25- Percentile 75.

vey respondents, 63.6% were women and the median age was 21 years. The most prevalent socioeconomic status in the population studied, according to the Brazilian Association of Research Companies (*Associação Brasileira de Empresas de Pesquisa - ABEP*), was "B" and "C", with frequencies of 43.8% and 37.7%, respectively. The prevalence of the types of courses was: health and biological sciences, 37.1%; exact sciences and engineering, 48.2%; and humanities and art, 14.7%. The general characteristics of the sample are presented in Table 1. Of the total students, 813 presented headache (74.5%). The headache features such as duration and frequency of headache attacks, site of pain and nausea/vomiting are described in Table 2.

The most common primary headache was non-classifiable headache (29.7%). Regarding headache disability, there was a significant difference between the headache

Table 2. Headache characteristics in university students (n=813).

Duration of the attacks - hours (P25-P75)*	2.0 (1.0-5.0)
Frequency of headache attacks	
Once a week or more	40.9%
Once a month	39.3%
One time or less in three months	19.8%
Site of pain	
Unilateral	44.3%
Bilateral	40.0%
Other	15.8%
Quality of pain	
Pulsating	55.1%
Pressing / tightening	29.7%
Stabbing	13.2%
Others	2.0%
Nausea / vomiting	35.5%
Photophobia	57.3%
Phonophobia	76.8%
Aura symptoms	25.0%
Pain worsens with daily activities	40.8%

*Percentile 25- Percentile 75.

types, shown in Table 3 ($p < 0.0001$). The students with migraine were the group in which more individuals reported incapacity due to pain (46.7%). Table 4 describes the post-hoc analysis, where there is a significant loss of days in the last three months, measured with the Migraine Disability Assessment questionnaire, in the individuals who met the criteria for migraine in our study, compared with the other types of headaches. Graph 1 shows the MIDAS score in the primary headache types, described as median and interquartile interval.

The test-retest analysis showed a median kappa of 0.75; in 3 questions, 0.4-0.6; in 4 questions; 0.6-0.8; and in 5 questions, >0.8. Thus, the questionnaire demonstrated good reliability.

Table 3. Prevalence of headache types and their associated disability and its associated disability y (n=813).

Headache type	Prevalence (n=1092), N (%)	Prevalence of moderate or severe disability (n=813), N (%)*	
		No	Yes
No headache	279 (25.5)	–	–
Migraine	75 (6.9)	40 (53.3)	35 (46.7)
Tension-type headache	140 (12.8)	122 (87.1)	18 (12.9)
Probable migraine	87 (8.0)	64 (73.6)	23 (26.4)
Probable tension-type headache	187 (17.1)	175 (93.6)	12 (6.4)
Non-classifiable headache	324 (29.7)	259 (79.9)	65 (20.1)
Total of headache types	813 (74.5)	660 (81.2)	153 (18.8)

* $p < 0.0001$ in the Chi-Square test.

Table 4. Post-hoc analysis of MIDAS mean of headache types.

Headache type (A)	Headache type (B)	Mean Difference (A-B)	P value	95% CI
Migraine	Tension-type headache	8.17292*	<0.0001	3.6009-12.7449
	Probable migraine	4.22978	0.181	-0.7993-9.2588
	Probable tension-type headache	9.02193*	<0.0001	4.6711-13.3727
	Non-classifiable headache	6.27236*	<0.0001	2.1679-10.3768
Tension-type headache	Migraine	-8.17292*	<0.0001	-12.7449-(-3.6009)
	Probable migraine	-3.94314	0.113	-8.3171-0.4308
	Probable tension-type headache	0.84901	1.000	-2.7244-4.4225
	Non-classifiable headache	-1.90056	1.000	-5.1696-1.3685
Probable migraine	Migraine	-4.22978	0.181	-9.2588-0.7993
	Tension-type headache	3.94314	0.113	-0.4308-8.3171
	Probable tension-type headache	4.79215*	0.012	0.6500-8.9343
	Non-classifiable headache	2.04259	1.000	-1.8400-5.9252
Probable tension-type headache	Migraine	-9.02193*	<0.0001	-13.3727-(-4.6711)
	Tension-type headache	-0.84901	1.000	-4.4225-2.7244
	Probable migraine	-4.79215*	0.012	-8.9343-(-0.6500)
	Non-classifiable headache	-2.74957	0.089	-5.7013-0.2022
Non-classifiable headache	Migraine	-6.27236*	<0.0001	-10.3768-(-2.1679)
	Tension-type headache	1.90056	1.000	-1.3685-5.1696
	Probable migraine	-2.04259	1.000	-5.9252-1.8400
	Probable tension-type headache	2.74957	0.089	-0.2022-5.7013

*The mean difference is significant at the .05 level; MIDAS: migraine disability assessment questionnaire.

DISCUSSION

Headaches are the most common neurological symptom, affecting almost everyone at least once in their lives. According to Stovner et al., the overall prevalence of headache in general is 47%¹³. Primary headaches affect individuals of all ages, being a major cause of impairment and lower quality of life. In undergraduate student populations, the disability provoked by headache has a negative influence on academic productivity^{6,7,14,15}.

Of all undergraduate students interviewed, 74.5% had at least one headache episode in the last three months, a high prevalence that is in accordance with other studies^{1,13,16,17}. In the Brazilian undergraduate populations, the lifetime prevalence was 98,5%¹⁴ and the one-year prevalence was 57.9%⁷. In Spanish undergraduate students, 91.9% of persons said that they had suffered from headaches during the last year¹⁸.

Migraine prevalence in this study was 6.9%, which is a lower prevalence, when compared to other studies conducted in a university population. Demirkirkan et al.⁶ conducted a study with university students in Turkey, and demonstrated a migraine prevalence of 12.4%. In Greek undergraduate students, only 2.4% presented migraine⁵. In Brazil, the migraine prevalence was 25%⁷. Compared

with a general population, the prevalence also varies. In Brazil, a general population study showed a prevalence of 10.7%¹⁹, and another, of 16.3%²⁰.

Regarding tension-type headache, the frequency found in this study was 12.8%. The tension-type headache frequency varies more than migraine across the studies. The lifetime prevalence can be as high as 86%²¹, described in a study conducted in a general population in Denmark, or as low as 22.9% in Brazil¹⁷. Among undergraduate students at a Brazilian university, the one-year prevalence of episodic tension-type headache (ETTH) was 32.9%⁷. In a Turkish population, the prevalence of TTH was 20.35%²². The disparity between the overall headache prevalence and its types can be explained by the different methodologies adopted in each study. Most of the studies show a lifetime or one-year prevalence. The spectrum of number of tension-type headache episodes varies, and an explanation for the lower prevalence found in our study is the fact that we describe a three-month prevalence. Also, the disparity across cultures and different populations investigated in the studies should be taken into account.

In surveys conducted in undergraduate students, a negative influence of headaches on school performance is shown^{6,7,14,15}. According to Catharino et al.¹⁴, headache

is associated with learning difficulty complaints. In another Brazilian population, 62.7% of migraineurs and 24.4% of tension-type headache sufferers, when in pain, present decreased productivity while studying. Also, fifty percent of migraineurs tried to study despite the pain, compared with 53.2% of those with ETTH⁷. According to Curry and Green¹⁵, sixty percent of students interviewed indicated that headaches interfered with their usual activities.

The impact of migraine on an individual's life and in society is more discussed in literature than the tension-type headache, even with a larger prevalence. However, owing to this high prevalence of tension-type headache, the disability caused by this type of headache is greater than for migraine¹. Also, Rasmussen et al.²³ showed greater absence from work owing to tension-type headache than migraine. This greater concern with migraine is probably due to factors such as the underdiagnosis of tension-type headache, the less disabling symptoms associated, and pain intensity is mild to moderate in the majority of cases.

The MIDAS questionnaire is a valuable instrument to research and quantify the extent of headache impact. To our best knowledge, there is only one study that uses this instrument in undergraduate students. All the same, this study, conducted with undergraduate students with migraine at a university in Turkey, shows that most migraine sufferers have a major disability. Twenty-six percent have moderate disability (grade III) and 41.4% have severe disability (grade IV), according to this study⁶. In our sample, we found that 46.7% have moderate or severe incapacity.

Twenty-five percent of the students present aura symptoms. However, only 6.9% and 8% has migraine and probable migraine, respectively. This is due by the fact that a relevant number of students have non-classifiable headaches, and in this percentage are included students with aura, but do not have all symptoms of probable migraine or migraine. Also, this elevated portion of sample that present non-classified headache can be explained by how the data were collected. The face-to-face interview is more capable to diagnose this students having headache without classification than the evaluation of a questionnaire.

This study has some limitations. First, it was conducted at a private university, where most of the students are from the higher socioeconomic levels, making it difficult to investigate headaches in undergraduate students from lower socioeconomic levels. Also, we did not evaluate the students' academic performance.

In conclusion, this study presents the prevalence, general characteristics and impact of headache in undergraduate students at a private university in southern Brazil. Our findings shows relevant disability associated with mi-

graine, compared with the others types of headache researched in this study, which is consistent with the data found in the literature. It is necessary to identify and treat these students with headache, to improve the scholar performance that is often compromised in this condition.

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