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Original

# Headache in Vale do Taquari: a retrospective study

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**Introduction**
Primary headaches are highly prevalent neurological disorders and represent a global public health issue, with a significant impact on functionality and quality of life. Despite this, studies indicate that a considerable portion of sufferers, especially those with migraine, remain without a formal diagnosis, which hinders adequate clinical management. In this context, understanding the epidemiological profile at regional levels is essential.

**Objective**
Therefore, the aim of this study is to describe the profile of patients presenting with headache complaints at a specialized neurology center in Vale do Taquari (Lajeado/RS), to support healthcare strategies for this population.

**Methods**
Observational, descriptive, and retrospective study based on the review of medical records from a specialized clinical center in Vale do Taquari, Rio Grande do Sul. Patients aged 18 years or older, attended for primary headache complaints between August 2017 and February 2024 were included. Sociodemographic, clinical (ICHD-3 diagnosis), and treatment variables were collected and analyzed using descriptive statistics. The project was approved by the Research Ethics Committee.

**Results**
The sample consisted of 111 patients, with a mean age of 48 years and a predominance of females (n=91, 82%). Most self-identified as white (n=96, 87%), and (n=18, 35%) had a low level of education (5 to 8 years). The most prevalent diagnosis was migraine without aura (n=54, 48.6%), followed by cervicogenic headache (n=22, 19.8%) and tension-type headache (n=17, 15.3%). Neurological examination abnormalities were detected in some patients, mainly in cranial nerves and sensory function. Magnetic resonance imaging was the most requested imaging exam (n=51, 45.9%). Acute treatment was predominantly monotherapy, with common analgesics being the most prescribed. Prophylaxis was instituted in 74 (66.4%) of cases, mainly with tricyclic antidepressants and beta-blockers.

**Conclusion**
This study allowed the characterization of the clinical and sociodemographic profiles of patients presenting with headache complaints at a specialized center in Vale do Taquari, highlighting a predominance of females, a mean age of 48 years, and a higher prevalence of migraine without aura. A high rate of imaging requests was observed, not always aligned with guidelines, as well as predominant use of common analgesics for acute treatment and tricyclic antidepressants and beta-blockers for prophylaxis.

**Keywords:**
Headache
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## Introduction

Headaches constitute a global health problem of considerable magnitude. Data indicate that 46% of the world's adult population suffers from some form of active headache. Among specific types, tension-type headache is the most frequent, affecting 42% of adults, whereas migraine affects 11% and chronic daily headache 3% (1). Primary headaches, such as migraine and tension-type headache, directly impact quality of life and productivity (2). Migraine, for example, is a neurovascular condition that affects more than 1 billion people worldwide and ranks among the leading causes of years lived with disability (1,3). It is characterized by recurrent episodes of pulsating pain, often accompanied by nausea, vomiting, and sensitivity to light and sound, symptoms associated with cortical hyperexcitability (4,5).

Tension-type headache, in turn, is the most common form of primary headache, presenting as pressure-like pain, generally bilateral, with radiation to the neck (1). Although less disabling than migraine, its high prevalence and chronic nature—especially when it occurs on 15 or more days per month—result in a substantial socioeconomic impact. Cluster headache, while less prevalent, stands out for the extreme intensity of pain and is described as one of the most disabling among painful syndromes (4,6,7). The concomitant presence of other headache types can hinder diagnosis and delay the initiation of effective treatment (8).

A population-based study in Canada revealed that only 46% of individuals who met clinical criteria for migraine reported having received a physician's diagnosis, meaning that more than half remained undiagnosed (9). Similarly, a U.S. study concluded that most people with migraine do not report a medical diagnosis, with only 41% of women and 29% of men affected having been diagnosed (10). In this context, the roles of primary and secondary care services are fundamental in the initial management of headache cases, ensuring appropriate referral to specialized levels when necessary.

Primary care, as demonstrated in international models such as general practice, is the most appropriate level for the initial management of headache, performing early diagnosis, initiating treatment, and triaging for specialty referral. Its strategic position in the care network enables it to absorb most of the demand, reduce overload at secondary and tertiary levels, and promote longitudinal care (11). This integration between primary and secondary care is essential to prevent patients from being lost within the health system, avoid unnecessary tertiary consultations, and ensure continuity of care. When well-structured, such coordination optimizes resources, improves access, and contributes to better clinical outcomes (12).

Against this backdrop, understanding the epidemiological profile of patients with headache complaints in the Vale do Taquari is essential to identify associated factors, guide more assertive interventions, and support regional strategies for prevention and health care, as well as to understand the demands of smaller, less populous, and lower-complexity centers. The objective of this study is to describe the profile of patients seeking care for headache complaints at a specialized neurology center in the city of Lajeado, Rio Grande do Sul, Brazil.

## Methods

This is an observational, descriptive, and retrospective study with a quantitative approach, based on the review of clinical records. The structure followed the guidelines of the STROBE statement (Strengthening the Reporting of Observational Studies in Epidemiology) (13).

The research was conducted using data from the Clinical Specialty Center of the University of Vale do Taquari (UNIVATES), located in the municipality of Lajeado, Rio Grande do Sul, Brazil. The UNIVATES Clinical Center offers outpatient care in 20 medical specialties, in addition to multiprofessional follow-up with Nursing, Pharmacy, Physiotherapy, Social Services, and Biomedicine. The Center has easy access for cities in the region: Estrela is the closest, only 7 km away, while Capitão, Roca Sales, Encantado, and Venâncio Aires are within a radius of 25 to 33 km. Poço das Antas and Doutor Ricardo are located 39 km and 53 km away, respectively.

The Vale do Taquari region comprises 36 municipalities and has a Socioeconomic Development Index (IDESE) of 0.79. It is characterized by a transition from a historically rural profile to an urban one, with a notable aging of the population—20.4% being over 60 years of age (Departamento de Economia e Estatística – DEE).

Data were collected retrospectively from medical records registered in the Tasy® system. The collection period included consultations conducted between August 2017 and February 2024. All patients aged 18 years or older who attended outpatient consultations with a main complaint of headache were included.

The variables analyzed included sociodemographic (sex, age, ethnicity, municipality of residence, education level, marital status), clinical (specific diagnosis according to ICHD-3, International Classification of Diseases code, imaging tests), and pharmacological treatment data. Data analysis was performed using descriptive statistics. Categorical variables were expressed as absolute and relative frequencies (%), while numerical variables were presented as measures of central tendency (mean) and dispersion (standard deviation). The analyses were carried out using R software version 4.4.1.

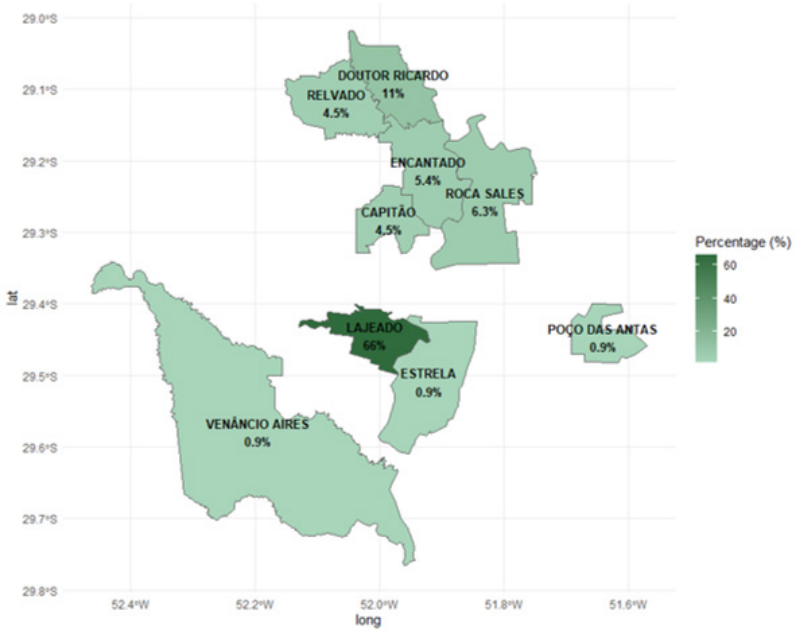


Figure 1. Geographical origin of patients with headache attending a specialized center in Vale do Taquari.

This study was approved by the Research Ethics Committee of Univates (15931719.4.0000.5310), in accordance with current regulations of the Brazilian National Health Council (CNS).

## Results

The sample of the present study consisted of 111 patients seen at a specialized outpatient clinic, with a mean age of 48 years (±18). A predominance of the female sex was observed, in 91 patients representing 82% of the studied population, while 20 (18%) were male. Regarding race/skin color, most participants self-identified as white (n=96, 87%). In terms of educational attainment, the most prevalent level was 12 or more years of schooling (n=59, 53.2%), followed by 9 to 11 years (n=18, 16.2%). Most patients (n=45, 41%) reported being single, while 42 (38%) were married (Table 1). Many participants resided in the municipality of Lajeado (73, 66%) (Figure 1).

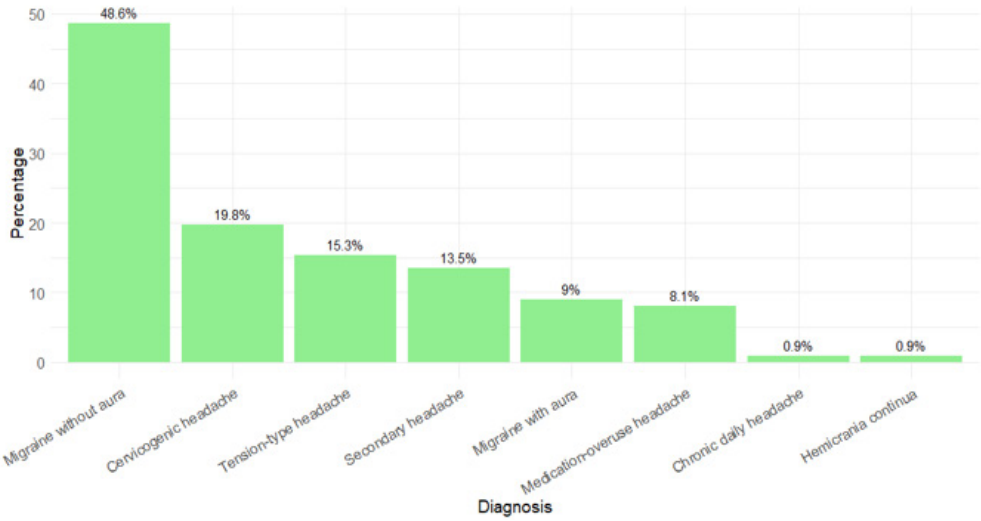


Figure 2. Distribution of Headache Based on the ICHD-3 Classification.

Table 1. Characteristics of the sample of patients presenting with headache as the main complaint in a specialized center

| Characteristics | Patients, n |
|---|---|
| Age, mean (SD) | 48 (18) |
| Sex, n (%) | |
| Female | 91 (82%) |
| Male | 20 (18%) |
| Race/Color, n (%) | |
| Yellow (Asian) | 1 (0.9%) |
| White | 96 (87%) |
| Brown | 9 (8.2%) |
| Black | 4 (3.6%) |
| Not reported | 1 (0.9%) |
| Education level, n (%) | |
| 1 to 4 years | 2 (1.8%) |
| 5 to 8 years | 9 (8.1%) |
| 9 to 11 years | 18 (16.2%) |
| 12 or more | 59 (53.2%) |
| Illiterate | 11 (9.9%) |
| Unknown/Other | 12 (10.8%) |
| Marital status, n (%) | |
| Married/Cohabiting | 42 (38%) |
| Separated | 15 (14%) |
| Single | 45 (41%) |
| Widowed | 8 (7.3%) |
| Not reported | 1 (0.9%) |

SD- standard deviation.

Based on the International Classification of Headache Disorders – 3rd edition (ICHD-3), 90 patients (81%) presented a single diagnosis, whereas 18 individuals (16.2%) had two or more concomitant diagnoses (4). The most frequently identified headache types were migraine without aura (n=54, 48.6%), cervicogenic headache (n=22, 19.8%), and tension-type headache (n=17, 15.3%) (Figure 2). According to the International Classification of Diseases – 10th Revision (ICD-10), the code G43.0 (migraine without aura) was the most prevalent, 45 patients representing 40.5% of cases (14). Following this, code G44.8 (other specified headache syndromes) was recorded in 32 patients (28.8%), while codes G43.1 (migraine with aura) and G44.2 (tension-type headache) were observed in 9 patients each (8.1%).

Neurological evaluation revealed abnormalities in different systems. The most common alterations were observed in the cranial nerves and cephalic region, identified in 28 patients (25.2%). Sensory (n=25, 22.5%) and motor (n=19, 17.1%) changes were also frequently reported (Figure 3). Among imaging tests, magnetic resonance imaging was the most commonly performed, used in 51 patients (45.9%), while computed tomography was performed in 31 patients (27.9%).

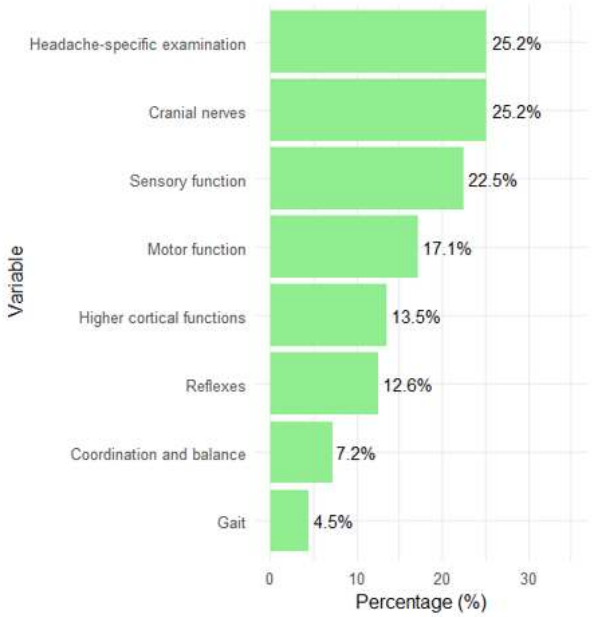


Figure 3. Percentage of abnormalities in the neurological examination.

With regard to therapeutic approaches, prescriptions were made for both acute treatment and crisis prophylaxis. For acute treatment, monotherapy was the predominant strategy, employed in 77 patients (69.4%), while 34 patients (30.6%) received combination therapy. Among the most frequently prescribed abortive medications, common analgesics (n=40, 35.8%), NSAIDs (n=33, 30%), and antiemetics (n=19, 16.7%) stood out. Triptans, recommended for the specific treatment of migraine, were prescribed to 16 patients (14.2%) (Figure 4).

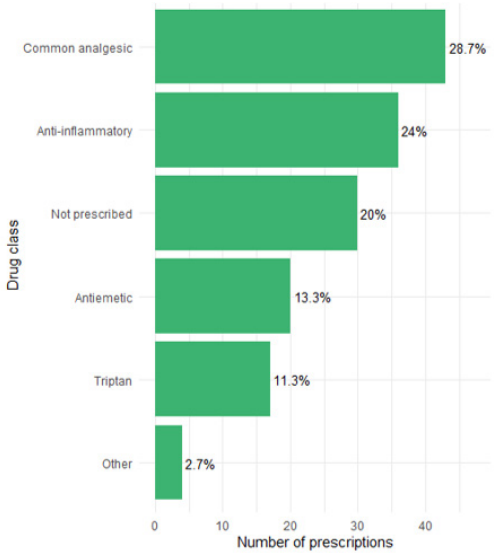


Figure 4. Frequency of medications prescribed for acute migraine attacks.

The use of prophylactic therapies was identified in 74 patients (66.4% of the sample). Among these, most (n=71, 95.5%) received prescriptions in a monotherapy regimen, while 3 patients (4.5%) used drug combinations. The drug classes most frequently used for prophylaxis were tricyclic antidepressants, such as amitriptyline and nortriptyline (n=41, 37.1%), followed by beta-blockers, such as metoprolol and propranolol (n=16, 14.7%) (Figure 5).

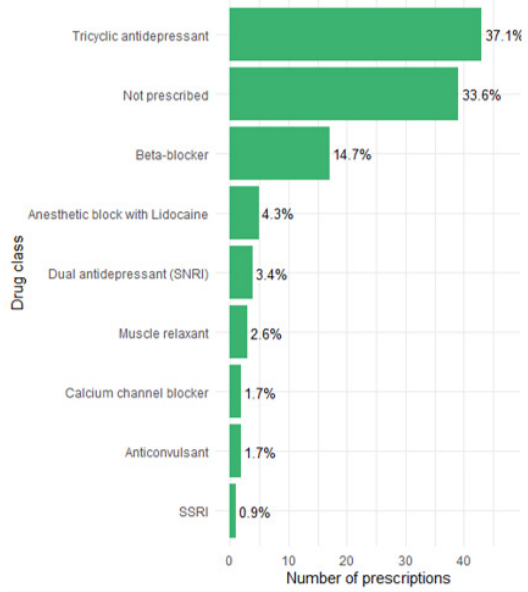


Figure 5. Frequency of prophylactic medications prescribed.

## Discussion

This study describes the profile of patients seen at a specialized headache outpatient clinic in the interior of Rio Grande do Sul, specifically in the Vale do Taquari region, revealing their clinical and demographic characteristics. The mean age of 48 years and the marked predominance of females (82%) are consistent with the epidemiological pattern widely documented in the literature for headache disorders, particularly migraine (15). Previous studies have demonstrated that migraine is more prevalent in women, especially during reproductive age, possibly due to hormonal influence and psychosocial factors associated with the female sex (16).

Regarding ethnicity, most participants self-identified as white (87%). Educational attainment demonstrated a predominance of individuals with 12 or more years of schooling (53.2%). These findings must be interpreted in light of the sociocultural context of the region, which is characterized by lower ethnic-racial diversity and an educational profile compatible with small- and medium-sized municipalities in southern Brazil (17). Furthermore, a study by Queiroz et al. (18) showed a 1.5 times higher prevalence of migraine among patients with more than 11 years of schooling.

Most patients presented a single type of headache (81%), with migraine without aura being the most prevalent diagnosis (48.6%), followed by cervicogenic headache (19.8%) and tension-type headache (15.3%). Although studies point to tension-type headache (TTH) as the most prevalent in the general population, affecting 26% to 40%, specialized services tend to receive patients with more disabling conditions, a characteristic often present in migraine (19,20).

Physical examination revealed neurological abnormalities in a significant portion of patients, particularly involving cranial nerves (25.2%) and sensory changes (22.5%). A detailed neurological evaluation is important for screening associated symptoms, even in primary headaches. The study by Fernández-de-Las-Peñas et al. (21) demonstrated increased mechanical sensitivity along the supraorbital nerve in patients with chronic tension-type headache. These findings are consistent with the literature regarding the relevance of neurological examination.

Magnetic resonance imaging was the most frequently used diagnostic imaging test (45.9%). These data align with the findings of Zhong et al. (22), who demonstrated that in a specialized outpatient clinic, 51.1% of patients underwent MRI and 10.9% underwent both CT and MRI. However, another study showed that more than 35% of imaging tests were requested in disagreement with current guidelines. The rate of relevant findings was extremely low: only 3.1% presented significant abnormalities, such as carotid dissections or reversible cerebral vasoconstriction syndrome (23). This raises the possibility that in some cases, imaging tests may be unnecessary, contributing to the overuse of healthcare resources.

With regard to therapeutic approaches, in acute management, monotherapy was the most common strategy (69.4%), with predominance of common analgesics (35.8%) and non-steroidal anti-inflammatory drugs (NSAIDs) (30%). Triptans were prescribed in 14.2% of cases. Studies indicate that such limitations—restricted use of triptans and underprescription of prophylactic therapies—occur mainly in primary care. Strengthening professional training, adopting clinical protocols, and ensuring effective integration between healthcare levels are fundamental measures to optimize the quality of care and clinical outcomes in headache management (24). These findings are consistent with national clinical guidelines, which recommend both specific (such as triptans) and non-specific (such as simple analgesics and NSAIDs) medications, depending on the severity of the crisis and individual patient characteristics. Nevertheless, there is still room for improvement in clinical practice, particularly through greater prescription of the association between analgesics and antiemetics, a strategy that can increase treatment efficacy and improve symptom control. The use of prophylactic therapies was identified in 66.4% of the sample, with monotherapy being the predominant

regimen (95.5%). Tricyclic antidepressants, such as amitriptyline and nortriptyline, were the most frequently used medications (37.1%), followed by beta-blockers (14.7%), especially metoprolol and propranolol. These practices are aligned with the recommendations of the European Federation of Neurological Societies (EFNS) and the guidelines of the Brazilian Headache Society, which consider beta-blockers (propranolol and metoprolol) and topiramate as first-line options for migraine prophylaxis (25).

However, although topiramate is included in the National List of Essential Medicines (RENAME), its use is restricted to specific indications, such as epilepsy and Lennox-Gastaut syndrome, according to Clinical Protocols and Therapeutic Guidelines (PCDTs). Migraine prophylaxis is not contemplated among these indications, limiting access to the medication through the Brazilian Unified Health System (SUS). In contrast, propranolol, metoprolol, and amitriptyline are available in the SUS Basic Pharmaceutical Care Component, without the need for specific reports or protocols (26).

The results of this study contribute to understanding the clinical and sociodemographic profile of patients with headache treated at a specialized service in the interior of Brazil, providing support for improving clinical management and the quality of care in these healthcare settings. Despite the relevance and originality of the topic, the study has several important limitations, including its observational design and the retrospective nature of data collection, which may limit the generalizability of the findings. Nevertheless, the results obtained provide valuable information for clinical practice and the formulation of public policy, particularly regarding access to medications through the SUS.

## Conclusion

The present study enabled the characterization of the clinical and sociodemographic profile of patients presenting with headache complaints at a specialized center in the Vale do Taquari, highlighting a predominance of females, a mean age of 48 years, and a higher prevalence of migraine without aura. A high rate of imaging requests was observed, not always aligned with guidelines, as well as predominant use of common analgesics for acute treatment and tricyclic antidepressants and beta-blockers for prophylaxis. These findings reinforce the need for greater rationalization in the use of diagnostic resources, as well as the strengthening of healthcare practices in primary and secondary care, to ensure early diagnosis, adequate treatment, and equitable access to therapeutic options.

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