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Headache-related hospitalizations among adolescents in the Brazilian public health system: sex differences across pubertal age groups

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Introduction
Headache is a leading cause of disability during adolescence. While prepubertal prevalence is comparable between sexes, a marked female predominance in primary headaches emerges after menarche. Fluctuations in ovarian steroids—particularly estrogen—are thought to modulate trigeminovascular system activation. In Brazil, epidemiological data on headache presentations requiring hospitalization among adolescents remain scarce.

Objective
To analyze the epidemiological profile of hospitalizations due to migraine and other headache syndromes among adolescents in the Brazilian Unified Health System (SUS) from 2015 to 2025, with emphasis on sex-related differences across pubertal age groups.

Methods
A descriptive ecological study was conducted using secondary data from the Hospital Information System (SIH/SUS) via DATASUS/TabNet. Hospitalizations coded under the ICD-10 category "Migraine and Other Headache Syndromes" were analyzed for adolescents aged 10–14 and 15–19 years across all Brazilian regions from 2015 to 2025. Variables included sex, age group, geographic distribution, length of hospital stay, hospitalization costs, and in-hospital mortality. A chi-square test was used to compare sex distribution between age groups, with a significance level of 5%.

Results
A total of 469 hospitalizations were recorded: 314 (66.9%) in females and 155 (33.1%) in males (female-to-male ratio: 2.02:1). In the 10–14 age group, the female-to-male ratio was 1.63:1 (130 vs. 80), rising to 2.45:1 in the 15–19 age group (184 vs. 75). Female hospitalizations increased by 41.5% between age groups, whereas male admissions decreased by 6.3%. The difference in the female-to-male ratio between age groups was statistically significant (^{2} = 4.38, df = 1, p = 0.036). The Southeast region accounted for 41.4% of female hospitalizations, followed by the Northeast (30.6%). The mean length of hospital stay among females was 3.9 days, with no in-hospital deaths recorded.

Conclusion
The progressive increase in the female-to-male hospitalization ratio across adolescent age groups was statistically significant and demonstrates an epidemiological pattern consistent with the sex differences observed in primary headache disorders after puberty. Although hormonal levels were not directly measured, these findings align with current pathophysiological models that implicate estrogen-related modulation of trigeminovascular susceptibility. As limitations, this study relies on administrative data, which are subject to underreporting and lack clinical diagnostic confirmation. These findings underscore the need for sex- and age-sensitive strategies in the prevention and management of headache disorders among Brazilian adolescents.

Keywords:
Migraine disorders
Headache
Hospitalization
Adolescent
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