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Impact of prolonged digital screen exposure on headache occurrence in children and adolescents: a systematic review

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Introduction
Increasing exposure to digital devices among children and adolescents, whether for educational or recreational purposes, has been linked to a higher prevalence of headaches, mainly due to visual strain, poor posture, and sleep disturbances. This systematic review aims to synthesize current evidence on this association, contributing to clinical management and a better understanding of the impact of prolonged screen use on pediatric neurological health.

Objective
To evaluate the prevalence of headaches in children and adolescents exposed to varying durations of daily screen time and electronic device use.

Methods
This systematic review followed the PRISMA protocol. The search was conducted in scientific databases (such as PubMed, Scielo, and Web of Science) using the MeSH/DeCS descriptors "headache," "children," "adolescents," and "screen time", combined with Boolean operators. Studies published in recent years (2022–2026), written in Portuguese and English, were included. The eligibility criteria encompassed observational studies (cross-sectional, cohort, and case-control studies) and literature reviews involving participants aged 0 to 19 years, excluding studies without quantitative or qualitative data regarding the frequency or intensity of symptoms. The selection process occurred in two stages: screening of titles/abstracts and full-text reading of eligible articles. Data extraction was standardized and included authorship, year, study design, sample, age group, screen time measurement, and clinical outcomes.

Results
Prolonged screen use is a multifactorial risk factor for headaches in children and adolescents, worsened by visual fatigue, poor posture, sleep deprivation, and sedentary behavior. Excessive use, especially during nighttime, is correlated with migraine exacerbation and increased analgesic consumption. From a pathophysiological perspective, blue light alters circadian rhythm and sensory sensitivity, while cognitive stress promotes central fatigue and neuroendocrine dysregulation, sensitizing the trigeminovascular system. This scenario negatively impacts school performance and the social quality of life of these patients.

Conclusion
The findings highlight digital hygiene as a key component in the management of pediatric headaches, emphasizing the importance of pediatricians and neurologists assessing screen time during clinical evaluation. Although the association between excessive screen exposure and headaches is well established, further standardized longitudinal studies are needed to support more precise clinical guidelines. Preventive strategies focused on educating families about responsible technology use represent cost-effective and essential measures for protecting the neurological health of younger generations.

Keywords:
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