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Association between sleep deprivation and headache disorders: a systematic review of clinical and observational studies

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Introduction
Sleep deprivation has been increasingly associated with the onset and worsening of headache disorders, especially migraine. Changes in sleep quality and duration may contribute to cortical hyperexcitability, sensory disturbances, and increased headache-related disability, negatively affecting patients' quality of life. Given the high prevalence of both sleep disturbances and headache disorders, understanding this relationship is clinically relevant for improving prevention and therapeutic strategies.

Objective
To analyze the association between sleep deprivation and headache disorders, emphasizing the impact of insufficient sleep on migraine symptoms, headache-related disability, and quality of life.

Methods
A systematic review was conducted using the PubMed database. The search strategy included the descriptors "Sleep Deprivation," "Sleep Disorders," "Insomnia," "Headache," and "Migraine," combined with the Boolean operators AND and OR. Clinical trials and observational studies published in English between 2023 and 2026 were included. Narrative reviews, editorials, duplicated publications, and studies unrelated to headache disorders were excluded. The selection process involved title and abstract screening followed by full-text analysis according to predefined eligibility criteria.

Results
The included studies demonstrated a significant association between sleep deprivation and worsening headache outcomes, particularly migraine. Insufficient sleep was associated with increased cortical excitability, impaired sensorimotor processing, photophobia, greater headache-related disability, and reduced quality of life. Observational studies also identified poorer sleep quality among patients with chronic headache conditions and migraine. Furthermore, sleep disturbances were linked to psychological impairment and functional limitations, especially in adolescents and individuals with persistent headache disorders. Overall, the findings suggest that inadequate sleep may act as both a trigger and an aggravating factor for headache episodes.

Conclusion
Sleep deprivation is strongly associated with the development and exacerbation of headache disorders, particularly migraine, contributing to increased disability and poorer quality of life. These findings reinforce the importance of sleep assessment and sleep-focused interventions in headache management. However, limitations such as heterogeneity among studies and restricted sample sizes highlight the need for further large-scale prospective studies to better clarify the underlying mechanisms of this association.

Keywords:
Headache
Quality of life
Migraine
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