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Melatonin as a prophylactic treatment for migraine - A systematic review of literature

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ABSTRACT

Migraine is one of the most common widespread neurological conditions. Even though we have access to a variety of treatment options, such as beta-blockers, anticonvulsants, and antidepressants, their tolerability is often limited because of their side effects. Recently a well known neurohormone - melatonin, which is responsible for regulating the sleep-wake cycle, became the subject of research as a potential alternative to standard therapeutic options. In this systematic review we have concluded the results of the studies published between 2015 and 2024. We focused on the efficacy, safety, and tolerability of melatonin in comparison to valproic acid and amitriptyline. The results consistently demonstrate that melatonin decreases migraine frequency and severity. Furthermore, it lowers the reliance on pain medication. Its efficacy is generally comparable to valproic acid and slightly lower than amitriptyline but melatonin presents fewer and milder side effects making it more tolerable. The fact that melatonin alleviates both headache symptoms and sleep disturbances may play a key role in its selection as a treatment for a particular group of patients. Studies involving pediatric populations suggest that melatonin may be a safe and beneficial option also for children, although further evidence is required. The findings of this review support the thesis that melatonin might be a promising, safe, well-tolerated, and accessible option in migraine management. However, more clinical trials are needed to establish treatment guidelines and determine the most effective dosage and duration of melatonin treatment.

Keywords: Migraine, Melatonin, Migraine prophylaxis, Valproic acid, Amitriptyline

1. INTRODUCTION

According to WHO in 2019, headache disorders were the third leading cause of neurological disease burden, following stroke and dementia, as measured by age-standardized disability-adjusted life years (DALYs). Unfortunately, only a minority of patients achieve satisfactory treatment outcomes. Migraines manifest as recurrent

episodes of headaches that can vary in intensity and may be accompanied by other symptoms, such as nausea, vomiting, or hypersensitivity to light or sound. These symptoms can significantly affect daily functioning and quality of life. Therapies we are familiar with, including triptans, beta-blockers, and anticonvulsants, offer varying degrees of efficacy and are often associated with side effects that can limit patient adherence.

Melatonin is a neurohormone produced by the pineal gland. The blood levels of melatonin fluctuate throughout the day. During the daytime, they typically range between 0-20 pg/ml. At night, the melatonin blood concentration increases significantly, reaching 40-100 pg/ml. Melatonin secretion occurs at night, with peak plasma levels occurring between 2 am and 4 am (Zduńska et al., 2021). The production and secretion of melatonin is genetically determined, and it decreases with age (Zduńska et al., 2022; Kamfar et al., 2024). Melatonin affects sleep regulation, it demonstrates antioxidative properties, and it has an ability to modulate vascular tone and neurotransmitter release. These factors may play a crucial role in migraine pathophysiology (Long et al., 2019).

The main center that controls the activity of the pineal gland and melatonin synthesis is the suprachiasmatic nucleus of the hypothalamus, which is part of a complex neural pathway that transmits information about changes in light conditions to the pineal gland (Lu & Kim, 2022). The hypothalamus also connects with the nuclei of the trigeminal nerve, particularly the caudal nucleus. The structure is involved in migraine pathophysiology. It processes pain signals from the head and face. It contributes to central sensitization, which intensifies pain during migraine attacks (Salinas-Abarca et al., 2025).

Aim

We conducted this systematic review to determine whether melatonin may be a potential prophylactic treatment for migraine. An expanding number of studies provide evidence of its beneficial effects. Some studies report decreases in attack frequency, duration, and severity. However, other studies have shown varied results. Multiple randomized controlled trials and observational studies have been analyzed to accumulate the most reliable data. The top priority was also to determine its safety profile and to compare it to traditional treatments. Knowing the complexity of migraine pathophysiology, its multiple clinical manifestations and various patient responses to treatment, it is critical to evaluate the impact of melatonin on multiple aspects and on a variety of different patients.

2. REVIEW METHOD

The article was created based on the randomised controlled trials, clinical trials, and observational studies published in the period 2015 - 2024 to provide the most recent data. The key outcomes in the reviewed studies were the effectiveness and safety of melatonin in the treatment of migraine. Both adult and pediatric populations were considered. The selection criteria have been pointed out below:

Inclusion criteria:

1. Studies evaluating the use of melatonin for migraine prevention or treatment.
2. Both adult and pediatric populations.
3. Clinical trials, cohort studies and randomized controlled trials.
4. Studies comparing melatonin with placebo, standard migraine medications, or other prophylactic treatments.
5. Studies published in peer-reviewed journals.

Exclusion Criteria:

1. Conference abstracts, metaanalysis, other reviews, and non-peer-reviewed publications.
2. Studies focus on migraine conditions other than primary migraine, such as those secondary to other neurological disorders.
3. Non-English language studies.
4. Studies conducted before 2015.

The data for the review were collected from available sources, including PubMed, Scopus, and Google Scholar (Figure 1). Keywords such as 'melatonin', 'migraine', 'headache prevention', 'migraine prevention', and 'headache and migraine prophylaxis' were used in research. Evelven independent reviewers conducted the search, analysis, and editing to ensure comprehensiveness and minimize selection bias. The selection focused exclusively on English-language publications. After insightful evaluation we included the studies in the review to analyze in terms: the effect of melatonin on the frequency of migraine attacks, the influence of melatonin on the severity and duration of migraine attacks as well, as the quality of life, as measured by standardized scales [e.g., MIDAS (The Migraine Disability Assessment Score), PSQI (The Pittsburgh Sleep Quality Index)]. Secondary outcomes included adverse effects or side effects associated with melatonin use, including drowsiness, dizziness, or gastrointestinal disturbances.

The quality appraisals were performed individually by each reviewer, and necessary modifications have been implemented. Each reviewer had continuous access to the data collected throughout the entire process. We stored the data in a standardized electronic format, available to all researchers.

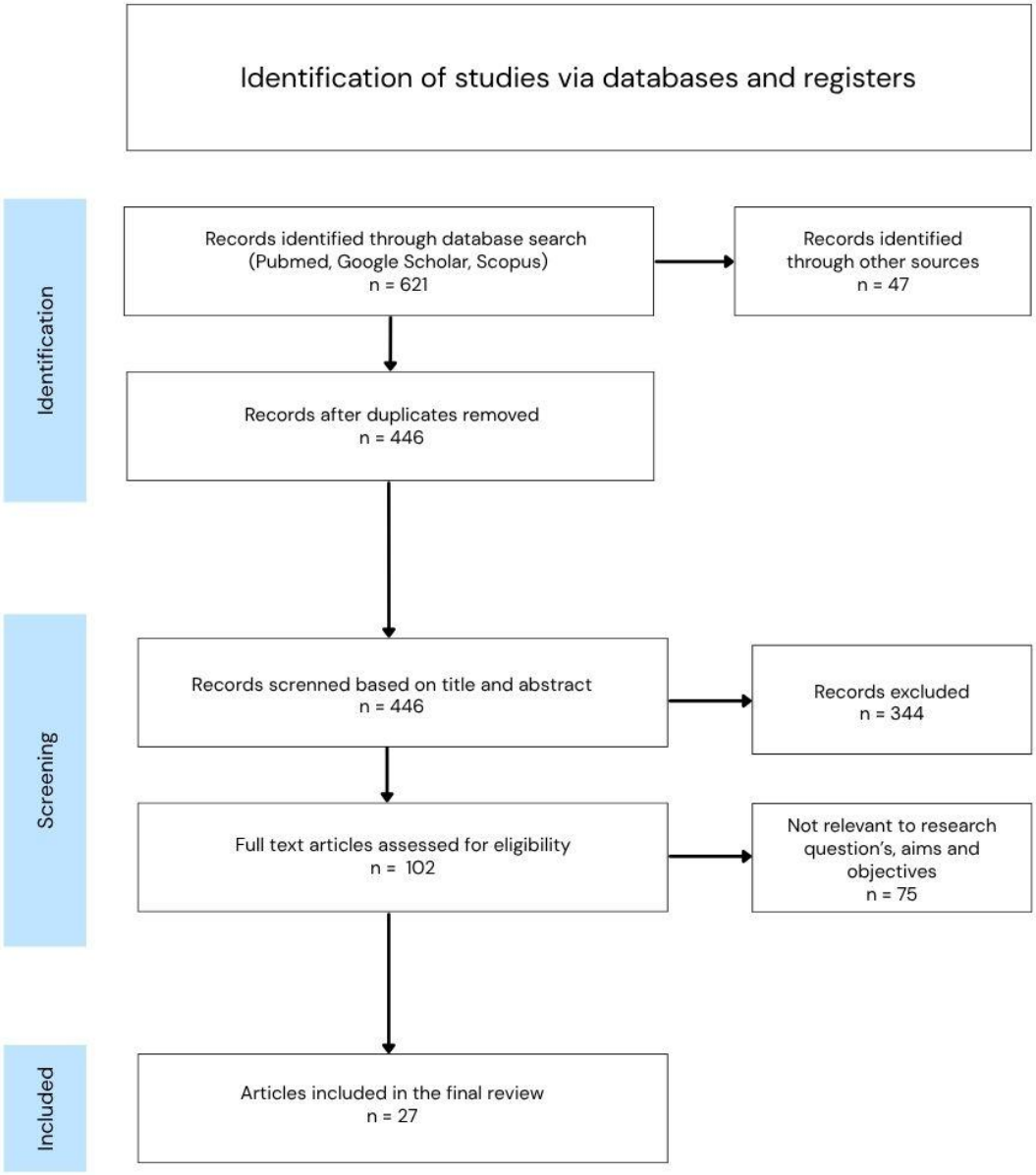

Figure 1 Consort Chart

3. RESULTS AND DISCUSSION

Within the analyzed studies, we investigated several aspects of melatonin use in migraine prophylaxis and treatment. Some studies included in this review primarily focused on comparing the melatonin treatment group with a placebo group. At the same time, others also included comparisons with standard treatment options such as valproic acid and amitriptyline. One of the variables addressed in the studies was the occurrence of side effects and patient tolerance. These were especially important for further discussion whether melatonin could be considered as a potential pharmacological option for migraine management. Our analysis highlights the key aspects of melatonin's impact on headaches: its efficacy and side effects in comparison to other therapeutic options.

Frequency, duration and severity of migraine attacks

One of the most important factors studied in the reviewed articles was the reduction of the number of headache episodes in groups treated with melatonin. Multiple high-quality studies provided proof that melatonin is effective in reducing the frequency of migraine attacks measured as the number of monthly migraine days (MMD). A notable observation that repeated itself across the analyzed studies was that the reduction in MMD was particularly pronounced after a prolonged treatment period, ranging from 2 to 4 months. For the duration of a single migraine episode, a similar trend was observed. Melatonin showed a promising result, with a reduction in attack duration across the majority of studies.

The Visual Analog Scale (VAS) and the Migraine Disability Assessment Scale (MIDAS) were used by the researchers to assess headache intensity. Participants in the melatonin groups reported a notably lower score. These findings underscore the potential of melatonin as an effective therapeutic intervention for alleviating migraine-related disability.

Comparison of Melatonin and Valproic Acid and Amitriptyline

One of the main points of the studies was to establish the efficiency of melatonin in comparison to other, commonly used, standard therapeutic options. The authors of the analyzed studies made an effort to carefully and meticulously select study groups in a way that ensured comparability. They chose participants with similar MMD, duration of single attack, VAS, MIDAS scores, and the need for analgesics use. This way, they enhanced the reliability of the results.

In comparative studies, melatonin demonstrated similar clinical efficacy to sodium valproate and amitriptyline – two common medications used for migraine prevention. Most studies reported comparable headache frequency, duration, severity, and MIDAS scores in the treatment groups. However, the placebo group did not show meaningful improvements.

Melatonin demonstrated effects comparable to those of valproic acid, whereas some studies suggested that amitriptyline may be slightly more effective than melatonin. Most studies focused on evaluating the efficacy of the drugs depending on the duration of their administration. Findings indicated that while the initial efficacy of melatonin was comparable to that of valproic acid and amitriptyline, it demonstrated greater effectiveness after several months of continued use. The most significant change was visible in attack severity and MIDAS score (Ebrahimi-Monfared et al., 2017; Gonçalves et al., 2016). Melatonin and valproic acid significantly reduced disability that was associated with migraine, improving overall quality of life (Ebrahimi-Monfared et al., 2017; Wang et al., 2024; Bougea et al., 2016). Migraines affect up to 11% of the population (Feigin et al., 2017). The ability to alleviate migraine-related disability directly influences daily functioning. According to researchers, more than 50% of migraine patients experience substantial limitations in their daily activities because of the severity of their condition. It leads to lost productivity and increased healthcare costs (Wolfe et al., 2016). The fact that both melatonin and valproic acid significantly reduced disability in the studies aligns with the need for research on effective treatments that not only decrease the frequency and severity of migraine attacks but also improve the overall quality of life without causing additional side effects.

Placebo groups didn't report any significant changes in disability scores. Furthermore, it is noticeable that patients with migraine often experience significant issues with sleep quality (Hammond et al., 2019).

Since the fundamental role of melatonin is its effect on sleep regulation, it is plausible that its positive impact on sleep quality may also contribute to alleviating the disability associated with migraines. Sleep disruptions are common among migraine sufferers, and improving sleep quality could potentially reduce the frequency and severity of migraine attacks, enhancing overall patient outcomes. Studies have shown that individuals with migraine often experience disturbed sleep patterns, including poor sleep quality, reduced sleep duration, and increased sleep fragmentation, which in turn may exacerbate the severity of migraine attacks.

Poor sleep may be both a trigger and a consequence of migraine attacks. Inadequate sleep, its amount or quality, often triggers migraines. It also works the other way around - migraine may be the reason for sleep disturbances. A study proved that the risk of more frequent and more severe migraine attacks was way higher for individuals who experienced poor sleep quality. The beneficial effects of melatonin in migraine prevention and sleep enhancement may explain its efficacy in reducing migraine-related disability (Song et al., 2018; Cho et al., 2020; Andrijauskis et al., 2020; Ziv & Gross, 2020; Duan et al., 2022).

Analgesic usage in addition to treatment

The frequency and amount of analgesic use are essential secondary outcomes in migraine prophylaxis studies, as they reflect both the severity of individual attacks and the overall burden of the disease on patients. Patients who received melatonin required fewer

analgesics throughout the follow-up period. They noted both reduced attack severity and frequency. Valproic acid had a comparable effect, achieving similar reductions in need for analgesics.

Similar results were observed for the amitriptyline group, although the reduction was slightly less consistent across studies compared to melatonin and valproate. There were no meaningful changes in analgesic dependence reported in placebo groups. In some cases, analgesic dependence remained unchanged or there was only a minor decrease. The result underscores the effect of treatment. These findings support the utility of melatonin as a well-tolerated and effective option. Melatonin may be a highly competitive alternative to standard methods for reducing acute migraine (Gelfand & Goadsby, 2016; Gonçalves et al., 2016; Ebrahimi-Monfared et al., 2017).

Melatonin may not only alleviate the burden of migraine attacks but also lower the risk of potential long-term consequences of chronic analgesic consumption. This observation may lead to the development of more sustainable migraine management strategies. Treatment that will not only focus on the main symptom but also take into consideration the patient's profile, their co-occurring conditions, needs, expectations, and possible future outcomes.

Safety and Tolerability of Melatonin

When a new treatment is introduced, safety and tolerability are crucial factors that are always considered in long-term therapies for chronic conditions, such as migraines. Melatonin introduced a more favorable safety and tolerability profile. Significantly fewer patients experienced side effects, such as dry mouth, fatigue, somnolence, weight changes, and dizziness, compared to those receiving valproic acid or amitriptyline. The melatonin groups mainly experienced mild side effects. Amitriptyline was associated with significant weight gain, whereas patients receiving melatonin experienced a noticeable weight reduction—an effect that may be important in guiding treatment decisions. This topic needs further discussion and research. The melatonin groups generally showed a higher responder rate, outperforming amitriptyline, valproic acid, and placebo. All of the above evidence suggests that melatonin is a promising alternative for long-term migraine prevention, particularly for patients who cannot tolerate the side effects of traditional treatments (Fallah et al., 2018; Gonçalves et al., 2016; Mehramiri et al., 2024).

Potential for Use in Adolescents and Children

Some of the reviewed studies included pediatric populations, where melatonin has also shown promise. A survey by Gelfand et al., (2016) evaluated its effectiveness in adolescent migraine patients. Melatonin significantly lowered both the frequency and severity of migraine attacks compared to the placebo group. That finding emphasizes the potential of melatonin as a safe and practical choice for younger patients, who may be more sensitive to the side effects of other preventive medications. Nevertheless, the quantity of studies conducted in pediatric populations is currently minimal, which makes it difficult to establish firm evidence-based conclusions. Therefore, there is a need for further well-designed studies in this age group. To facilitate the interpretation and comparison of the cross-study findings, the results have been organized into a summary table (Table 1).

Table 1 Cross-study summary and comparison

	Melatonin	**Valproic Acid**	**Amitriptyline**	**Placebo**
Efficacy	Effective in reducing frequency, duration, severity, analgesic use, and disability scores.	Similar efficacy to melatonin across most clinical outcomes.	Effective, though with a slightly lower responder rate compared to melatonin.	Generally ineffective; minor improvements only in some cases (e.g. severity).
Responder Rate	The highest proportion of patients with significant reduction in migraine frequency.	Moderate responder rate; similar to melatonin.	Lower responder rate than melatonin, but still better than placebo.	Lowest responder rate; many patients showed no significant improvement.
Tolerability	Well-tolerated, mild side effects; similar to placebo.	Less well tolerated; side effects are more frequent and	Poorer tolerability; significantly more adverse events	Well tolerated; side effects are minimal and similar to melatonin.

		noticeable.	reported.	
Common Side Effects	Fatigue, drowsiness (mild, infrequent).	Nausea, tremor, dizziness.	Dry mouth, constipation, weight gain, sedation.	Dry mouth syndrome; very few reported effects overall.
Weight Impact	Slight weight loss or neutral.	Not highlighted as significant.	Weight gain was observed and statistically significant.	Slight weight gain; less than with amitriptyline.
Disability Reduction	Significant improvement in MIDAS and headache-related quality of life.	Similar improvement to melatonin.	Improvement noted but less emphasized.	No significant improvement in disability scores.
Analgesic Use	Noticeable reduction in painkiller use.	Comparable reduction.	Reduced use, but less consistently than melatonin.	No significant reduction.
Overall Clinical Value	Safe, cost-effective, and promising as a first-line or adjunct treatment.	Effective but with more side effects; may suit specific patient profiles.	Effective but less favorable due to tolerability issues.	Largely ineffective as a standalone migraine prophylaxis.

4. CONCLUSION

Melatonin preserved a profitable balance between efficacy and safety. It is a promising candidate for both first-line and adjunctive migraine prophylaxis. In multiple studies, melatonin has been proved to be more tolerable by patients, as it was associated with fewer side effects in comparison to amitriptyline and valproic acid.

The collected data indicate that melatonin is effective in reducing the frequency and duration of migraine attacks. It is also beneficial due to its improved tolerability compared to traditional treatments, with fewer side effects. Further large-scale, high-quality clinical trials are necessary to confirm these findings and to better define the optimal dosing, duration, and patient populations that may benefit most from melatonin therapy.

Author's Contributions

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Informed consent

Not applicable.

Ethical approval

Not applicable.

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Conflict of interest
The authors declare that there is no conflict of interest.

Data and materials availability
All data sets collected during this study are available upon reasonable request from the corresponding author.

REFERENCES

1. Andrijauskis D, Ciauskaite J, Vaitkus A, Jatužis D, Jurkevičienė N. Primary headaches and sleep disturbances: A cause or a consequence? J Oral Facial Pain Headache 2020; 34(1):61–66. doi:10.11607/ofph.2405
2. Bougea A, Spantideas N, Lyras V, Avramidis TG, Thomaidis T, Chrousos GP. Melatonin 4 mg as prophylactic therapy for primary headaches: a pilot study. Funct Neurol 2016;31(1):33–37. doi:10.11138/fneur/2016.31.1.033
3. Cho S, Lee MJ, Park HR, Kim BK, Chung PW, Sohn JH, Chu MK. Effect of sleep quality on headache-related impact in primary headache disorders. J Clin Neurol 2020;16(2):237–244. doi:10.3988/jcn.2020.16.2.237
4. Duan S, Ren Z, Xia H, Zhang Y, Wang Z, Zhao L, Ma Y, Cheng Z. Association between sleep quality, migraine and migraine burden. Front Neurol 2022;13:955298. doi:10.3389/fneur.2022.955298
5. Ebrahimi-Monfared M, Sharafkhah M, Abdolrazaghnejad A, Mahmoodzadeh S, Salehi M, Masoumi M. Use of melatonin versus valproic acid in prophylaxis of migraine patients: A double-blind randomized clinical trial. Restor Neurol Neurosci 2017;35(4):385–393. doi:10.3233/RNN-160704
6. Fallah R, Fazelishoroki F, Sekhavat L. A randomized clinical trial comparing the efficacy of melatonin and amitriptyline in migraine prophylaxis of children. Iran J Child Neurol 2018;12(1):47–54.
7. Feigin VL, Abajobir AA, Abate KH, Abd-Allah F, Abdulle AM, Abera SF, Abyu GY, Ahmed MB, Aichour AN, Aichour MT, Akinyemi RO, Ali R, Alla F, Almaskari F, Alvis-Guzman N, Anwari P, Ärnlöv J, Asayesh H, Atey TM, Avokpaho EFGA, Awasthi A, Bacha U, Barac A, Barboza MA, Barker-Collo SL, Bärnighausen TW, Bedi N, Bennett DA, Berhane A, Bernabé E, Betsu BD, Beyene AS, Bhutta ZA, Biadgilign S, Brainin M, Brazinova A, Breitborde NJK, Brugha TS, Campos-Nonato IR, Carapetis JR, Carrero JJ, Catalá-López F, Choi JJ, Christensen H, Ciobanu LG, Crump JA, Damasceno A, Dandona L, Dandona R, Deribe K, Deribew A, Dewan SMR, Doku DT, Driscoll TR, Dubey M, El-Khatib Z, Endres M, Faraon EJA, Farvid MS, Farzadfar F, Fereshtehnejad SM, Fernandes JC, Feyissa TR, Fischer F, Fitchett JRA, Gebrehiwot TT, Gebremedhin AT, Gebremichael DY, Geleijnse JM, Gillum RF, Gold AL, Gona PN, Gopalani SV, Guillemin F, Hailu GB, Hamidi S, Hankey GJ, Hareri HA, Hassen HY, Hay SI, Hegazy MI, Hilawe EH, Horita N, Hotez PJ, Jacobsen KH, James SL, Javanbakht M, Jeemon P, John D, Jonas JB, Kasaeian A, Kassa NA, Kengne AP, Kereselidze M, Khubchandani J, Kissoon N, Kivipelto M, Knibbs LD, Krohn KJ, Bicer BK, Kulkarni C, Kumar GA, Kumar H, Larson HJ, Linn S, Lopez AD, Lotufo PA, Magdy Abd El Razek H, Majdan M, Majeed A, Malekzadeh R, Malhotra R, Malta DC, Mazidi M, Mehari A, Melaku YA, Memiah PTN, Mendoza W, Mengiste DT, Mengistu DT, Mensah GA, Meretoja A, Mohammed S, Mokdad AH, Monasta L, Mondello S, Montico M, Mooney MD, Moradi-Lakeh M, Nagel G, Nguyen TH, Nguyen QL, Nieuwenhuijsen MJ, Ogbo FA, Osman M, Pakhale S, Patten SB, Patton GC, Pereira DM, Plass D, Qorbani M, Radfar A, Rafay A, Rahimi-Movaghar V, Rahman M, Rai RK, Ranabhat CL, Rao PC, Razo-García C, Reiner RC Jr, Reitsma MB, Roba KT, Roshandel G, Safiri S, Samy AM, Sanabria JR, Santos IS, Sartorius B, Satpathy M, Schlaich MP, Schmidt MI, Sepanlou SG, Shamsipour M, Sheikhbahaei S, Shibuya K, Shiferaw MS, Shigematsu M, Shiri R, Shiue I, Sliwa K, Smith M, Sobaih BH, Sreeramareddy CT, Stein DJ, Strub B, Sufiyan MB, Sykes BL, Tabarés-Seisdedos R, Tessema GA, Thakur JS, Topor-Madry R, Tran BX, Tsilimparis N, Ukwaja KN, Uthman OA, Vasankari TJ, Violante FS, Vollset SE, Wakayo T, Werdecker A, Westerman R, Wijeratne T, Winkler AS, Yano Y, Yaseri M, Yip P, Yonemoto N, Younis MZ, Younker TP, Zaidi Z, Zenebe ZM, Zipkin B, Vos T, Murray CJL. Global, regional, and national burden of neurological disorders during 1990–2015: a systematic analysis. Lancet Neurol 2017;16(11):877–897. doi:10.1016/s1474-4422(17)30299-5
8. Gelfand AA, Goadsby PJ. The role of melatonin in the treatment of primary headache disorders. Headache 2016;56(8):1257–1266. doi:10.1111/head.12862
9. Gonçalves AL, Martini Ferreira A, Ribeiro RT, Zukerman E, Cipolla-Neto J, Peres MF. Randomised clinical trial comparing

melatonin 3 mg, amitriptyline 25 mg and placebo for migraine prevention. J Neurol Neurosurg Psychiatry 2016;87(10):1127–1132. doi:10.1136/jnnp-2016-313458

10. Hammond NG, Stinchcombe A. Health behaviors and social determinants of migraine in a Canadian population-based sample. Headache 2019;59(9):1547–1564. doi:10.1111/head.13610
11. Kamfar WW, Khraiwesh HM, Ibrahim MO, Altamimi AA, Alzarea AI, Abduljabbar M, Althunayyan SM, Mahzari M. Comprehensive review of melatonin as a promising nutritional and nutraceutical supplement. Heliyon 2024;10(2):e24266. doi:10.1016/j.heliyon.2024.e24266
12. Long R, Zhu Y, Zhou S. Therapeutic role of melatonin in migraine prophylaxis: A systematic review. Medicine (Baltimore) 2019;98(3):e14099. doi:10.1097/MD.0000000000014099
13. Lu Q, Kim JY. Mammalian circadian networks mediated by the suprachiasmatic nucleus. FEBS J 2022;289(21):6589–6604. doi:10.1111/febs.16233
14. Mehramiri A, Shalilahmadi D, Mohamadianinejad SE, Yazdani S, Adeli M, Anvari E. The effect of melatonin on reducing the frequency and severity of migraine attacks: A double-blind, randomized clinical trial. Iran J Med Sci 2024;49(5):313–321. doi:10.30476/ijms.2023.97782.2965
15. Salinas-Abarca AB, Gamal-Eltrabily M, Romero-Reyes M, Anaya-González L, Torres-López JE, Granados-Soto V. The role and interaction of hypothalamic-related neurotransmitters in migraine. J Headache Pain 2025;26(1):110. doi:10.1186/s10194-025-02044-w
16. Song TJ, Yun CH, Cho SJ, Kim WJ, Yang KI, Chu MK. Short sleep duration and poor sleep quality among migraineurs: A population-based study. Cephalalgia 2018;38(5):855–864. doi:10.1177/0333102417716936
17. Wang HF, Liu WC, Zailani H, Hassan STS, Koay SY, Huang CC, Li CW, Yang YC, Yeh MH. A 12-week randomized double-blind clinical trial of eicosapentaenoic acid intervention in episodic migraine. Brain Behav Immun 2024;118:459–467. doi:10.1016/j.bbi.2024.03.019
18. Wolfe LE, Goadsby PJ, Ashina M. Migraine and its effect on sleep: Implications for treatment. Curr Pain Headache Rep 2016;20. doi:10.1007/s11916-016-0619-0
19. Zduńska A, Cegielska J, Domitrz I. The pathogenetic role of melatonin in migraine and its theoretic implications for pharmacotherapy: A brief overview. Nutrients 2022;14(16):3335. doi:10.3390/nu14163335
20. Zduńska A, Cegielska J, Zduński S, Zduńska K, Domitrz I. Variability in melatonin concentration in blood serum of patients with episodic migraine: a pilot study. Neurol Neurochir Pol 2021;55(1):81–90. doi:10.5603/PJNNS.a2020.0095
21. Ziv M, Gross M. The relationship between sleep disturbances and migraine: A review of the literature. J Headache Pain 2020.