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Psychiatric comorbidity may affect the quality of life in pediatric migraine patients, independently of pain frequency and PedMIDAS score

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Abstract

Background: Migraine is a prevalent neurological disorder in children, often accompanied by psychiatric comorbidities (PC) such as depression, anxiety, and attention deficit hyperactivity disorder (ADHD). These conditions significantly affect children's lives, particularly their self-esteem, social relationships, and overall quality of life (QOL). However, research on the combined impact of migraine and PC on pediatric QOL remains limited. *Methods:* This study included 175 children aged 8–17 years from the Pediatric Neurology Outpatient Clinic of a tertiary hospital. Among them, 75 were diagnosed with migraine and 100 served as controls. Data on sociodemographic factors, migraine-related disability (PedMIDAS), PC, and QOL (KINDLR questionnaire) were collected. *Results:* Major depression, ADHD, and oppositional defiant disorder were significantly more prevalent in the migraine group compared to controls. Children with episodic migraine and PC had markedly lower self-esteem, poorer social relationships, and overall QOL than those without comorbidities. Conversely, no significant QOL differences were observed between children with and without PC in the chronic migraine group. Furthermore, no correlation was found between PedMIDAS scores and QOL in migraine patients. Psychiatric comorbidities were associated with lower QOL in children with migraine, particularly in those with episodic migraine, with notable reductions in self-esteem and social relationships. PedMIDAS, while useful for assessing migraine-related disability, may not fully reflect the QOL differences associated with PC.
Conclusion: Comprehensive evaluation of both QOL and PC is essential for effective management and follow-up of pediatric migraine patients.

Keywords: Migraine, psychiatric comorbidity, PedMIDAS, quality of life

INTRODUCTION

Migraine is one of the most common causes of primary headache in childhood and is associated with several psychiatric disorders such as major depression, anxiety disorder, obsessive-compulsive disorder, and attention deficit hyperactivity disorder (ADHD).[1-7] Children and adolescents with migraine are at increased risk of psychological disorders, and recent narrative reviews have highlighted consistent associations between pediatric migraine and elevated anxiety and depressive symptoms, even though the prevalence of full-threshold anxiety and mood disorders remains less clearly established because of methodological limitations in many studies.[8] Psychiatric comorbidities (PC) may affect migraine outcome, response to treatment and clinical course. Even if the headache is controlled with treatment, the presence of comorbid psychiatric disease can lead to loss of function in migraine patients.

Recurring headaches can affect the lives of children in several ways. These can take the form of school absenteeism, poor performance, changes in family relationships, and difficulties in social relationships with peers. Headache is a serious complaint that significantly reduces

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school attendance and school success in school-age children.[1,9,10] The impact of migraine can be assessed using the Pediatric Migraine Disability Assessment Scale (PedMIDAS) and/or health-related quality of life measures in children. The PedMIDAS scale measures migraine-related disability, including restriction of school, home, play and social activities. Quality of life (QOL) is the patient's subjective perception of well-being. QOL measurement provides insight into the effect of disease on physical and emotional well-being, family life, disease course, and response to treatment. Migraine has a negative impact on the QOL of children. Children with migraine have been found to have lower QOL than controls and similar or even lower QOL than children with other chronic illnesses.[7,11,12]

Therefore, in the evaluation of migraine, assessing the impact of headaches on QOL and functional loss, in addition to attack frequency, severity, and duration, may provide important complementary information for patient care.[13,14]

This study aimed to investigate the possible effects of psychiatric comorbidities on the QOL in children with migraine.

METHODS

Between September 2013 and April 2014, researchers at the Gazi University Faculty of Medicine, Pediatric Neurology Outpatient Clinic conducted this study. A total of 175 children aged 8-17 years were included in the study, including 75 patients with migraine and a control group of 100 children.

Patients were included in the migraine group if they (i) fulfilled the diagnostic criteria for migraine according to the International Classification of Headache Disorders, and (ii) had no history of chronic systemic, metabolic, or neurological disease other than migraine. Children in the control group were recruited from those presenting with minor, self-limited complaints (e.g. mild infections, routine check-ups) and were included if they had no history of recurrent headache or chronic medical illness.

Patients were excluded from the migraine group if they had tension-type headache, secondary headache, or an unclear headache diagnosis. Children were excluded from the control group if they had any chronic disease, a history of recurrent or chronic headache, or a known neurological disorder.

The study was conducted in accordance with the principles of the Declaration of Helsinki and was approved by the local ethics committee of Gazi University Faculty of Medicine (09.09.2013, decision number 92). Informed consent was obtained from the parents/legal guardians of all participating children.

1. Sociodemographic Questionnaire: The age, gender, comorbid disease status, regular drug use, presence of headache and epilepsy in the family were obtained with the sociodemographic questionnaire.

2. The Pediatric Migraine Disability Assessment Scale: PedMIDAS was used to evaluate the effect of headache on daily life and loss of function.[15] With this scale, the PedMIDAS score was obtained by calculating the total number of days in which the patients experienced limitations related to school, home, and social activities due to headache in the last 3 months. A high score was associated with increased disability. If the PedMIDAS score was between 0-10, disability was considered 'none - very mild', 'mild' if the score was between 11-30 , 'moderate' if the score was between 31-50 and 'severe' if the score was 51 and above.

3. Psychiatric Comorbidity Questionnaire: The 'Psychiatric Comorbidities Inquiry Form', designed by a Child Development Specialist to accurately assess the developmental needs of children and based on the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) diagnostic criteria, was used to evaluate patients in the areas of ADHD, depression, oppositional defiant disorder (ODD), anxiety disorder, and speech disorder. This was a brief, study-specific screening form derived from DSM-IV symptom criteria and reviewed for content validity by a pediatric neurologist and a child psychiatrist prior to use; it is not a diagnostic tool and was used to identify probable comorbidities for analysis.

4. KINDL General Health-Related QOL Questionnaires: The KINDLR QOL scales, which can be applied to children older than 3 years, were used to evaluate the QOL. In these scales, there are a total of seven sections consisting of 'Physical Well-Being', 'Emotional Well-Being', 'Self-Esteem', 'Family', 'Social Relationships', 'School', and 'Illness'. The 'Illness' field was not included when calculating the total score. A high total score was associated with a higher QOL. The appropriate KINDLR scales were selected according to the child's age. (Table 1).[16] The KINDL is a generic, psychometrically

Table 1: KINDL^R questionnaires by age groups

Age	The appropriate KINDL^R Questionnaire
8-11 years	Questionnaire of children → Kid-KINDL^R
12-17 years	Questionnaire of adolescents → Kiddo-KINDL^R

validated instrument for assessing health-related quality of life in children and adolescents with chronic conditions, and it has been previously used in adolescents with primary headache and migraine.[16,17]

The data obtained in this study were evaluated with the SPSS 20.0 package program. No formal a priori sample size calculation was performed; the sample size was determined by including all consecutive eligible patients who presented during the study period. When examining the difference between two groups, the Mann - Whitney U test was used for variables that were not normally distributed within the matched groups. When more than two groups were compared, the Bonferroni-corrected Kruskal - Wallis H Test was used for non-normally distributed variables. The chi-square test was used when examining the association between variables. The relationship between the variables was analyzed with the Spearman correlation coefficient, and the significance level was set at 0.05. All analyses were conducted at the univariable level; multivariable models were not fitted because of the modest sample size relative to the number of outcomes and potential covariates.

RESULTS

Demographic data of patients

Of the 75 patients, 52 (69.3%) were girls and 23 (30.6%) were boys. More female patients (69.3%) suffered from migraines than males (30.6%) ($p<0.05$).

When the patients were compared in two age groups (8-11 years old and 12-17 years old), no significant gender difference was found in the 8-11 age group. However, female patients were seen more frequently than male patients in the 12-17 age group ($p<0.05$).

When the migraine patients were evaluated for frequency of headache, episodic migraine was diagnosed in 48 patients (64%), and chronic migraine in 27 patients (36%). There was no significant difference between male and female patients with respect to headache frequency.

PedMIDAS scores

Patients were classified according to their PedMIDAS disability score. The mean PedMIDAS score in our study was 20.8 ± 30.29 days (daily interval: 1 - 202 days). There were no significant differences between age and sex groups in terms of PedMIDAS score. There was no statistically significant correlation between the PedMIDAS score and the presence of PC or the number of DSM-IV diagnoses.

Psychiatric comorbidity findings

Migraine patients were found to have higher rates of major depression (20%), attention deficit (14.7%), hyperactivity (8%), and oppositional defiant disorder (25.3%) than controls ($p<0.05$). There was no significant difference between the patient and control groups in terms of anxiety and speech disorders.

No significant differences in PC were found between genders in migraine patients and between episodic migraine and chronic migraine.

Quality of life outcomes

In the migraine patients' QOL questionnaires, the scores for the subdimensions and overall QOL were found to be lower than in the control group ($p<0.05$).

In the 8–11 years age group, the perception of family relationships was significantly lower in patients with high headache frequency (≥15 headache days per month) compared to those with low headache frequency. In the 12–17 years age group, the physical well-being score was significantly lower in patients with high headache frequency than in those with low headache frequency. In addition, the physical well-being perception score was significantly lower in patients with chronic migraine (≥15 headache days per month for at least 3 months) than in patients with episodic migraine. ($p<0.05$).

When patients were compared by age group, physical well-being scores were found to be significantly higher in patients aged 8-11 years than in patients aged 12-18 years ($p<0.05$). In all age groups, no significant difference in QOL was

Table 2: The effect of psychiatric comorbidity on quality of life in patients with migraine

		Psychiatric Comorbidity	n	Mean	SD	P values
Episodic Migraine	**Physical well-being**	Absent	28	37.85	16.35	0.85
		Present	20	38.75	17.08	
	Emotional well-being	Absent	28	52.67	12.80	0.49
		Present	20	50.00	13.27	
	Self-esteem	Absent	28	49.46	12.42	**0.02**
		Present	20	34.75	18.09	
	Family	Absent	28	58.21	12.63	0.17
		Present	20	53.00	13.11	
	Social relations	Absent	28	63.00	12.57	**0.016**
		Present	20	53.75	12.55	
	School	Absent	28	43.03	11.33	0.12
		Present	20	37.00	14.17	
	Total quality of life	Absent	28	67.38	8.42	**0.007**
		Present	20	61.20	6.63	
Chronic Migraine	**Physical well-being**	Absent	10	24.50	14.80	0.74
		Present	17	26.47	15.18	
	Emotional well-being	Absent	10	46.50	10.01	0.09
		Present	17	54.11	12.14	
	Self-esteem	Absent	10	46.50	14.72	0.17
		Present	17	37.64	17.59	
	Family	Absent	10	48.00	8.89	0.2
		Present	17	54.11	15.73	
	Social relations	Absent	10	57.50	11.36	0.77
		Present	17	56.17	11.25	
	School	Absent	10	41.00	15.23	0.98
		Present	17	40.88	13.01	
	Total quality of life	Absent	10	60.66	6.45	0.77
		Present	17	61.56	9.74	

found between genders.

The relationship between QOL and the presence of PC in migraine patients was compared. In patients with PC, scores for perception of self-esteem, perception of social relationships, and total QOL were significantly lower than in patients without PC ($p<0.05$) (Table 2).

The correlation between the PedMIDAS score and the QOL score of the patients was evaluated. There was no correlation between the PedMIDAS score and sub-dimensions and the total QOL scores of patients in all age groups.

The QOL was compared among the PC presence groups in patients with 'none - very mild' PedMIDAS disability. Perception of Self-Esteem, perception of social relations, and total QOL scores were significantly lower in headache patients with PC than in patients without PC ($p<0.05$).

The QOL was compared among the PC presence groups in patients with 'mild' PedMIDAS disability. The Self-Esteem perception score was significantly lower in headache patients with PC than in those without ($p<0.05$).

DISCUSSION

This study examined psychiatric comorbidities of childhood migraine and the impact of these conditions on QOL. Headache, especially migraine, is one of the most common neurological disorders worldwide. They profoundly affect the daily lives of individuals, affecting their ability to perform routines and reducing their overall QOL. The burden of headaches goes beyond just physical pain; emotional and psychosocial factors are also involved.[18] In this context, evaluating both headache-related disability and associated psychiatric comorbidities may provide a more comprehensive picture of the burden of migraine on children's well-being. We found that all QOL subdimension scores and the total QOL score were significantly lower in children with migraine than in the control group. In a study assessing the QOL in adolescents with primary headaches using the KINDLR scale, it was found that all QOL scores were statistically significantly lower in the headache group compared to the control group.[17] Our study also found that the physical well-being perception score was statistically significantly lower in patients with chronic migraine than in patients with episodic migraine. In accordance with this, the QOL of patients with a high frequency of headache was found lower than that of patients with a low frequency of pain.[19] A systematic review revealed a decrease in many areas of QOL in children with migraine, regardless of the questionnaire used to evaluate it.[20] These results are consistent with a broad negative association between headache and QOL across domains.The pervasive impact of headaches underscores the necessity for healthcare providers to adopt a holistic approach when treating patients with migraine.

Migraine is not only a debilitating neurological condition but is also frequently associated with psychiatric comorbidities. Previous studies have shown that individuals with migraines are more likely to experience psychiatric disorders such as major depression, anxiety, somatization disorder, obsessive-compulsive disorder, and attention deficit hyperactivity and that the frequency of these conditions is increased in patients with primary headache.[2,11,18,21] In line with this, a recent systematic review and meta-analysis of 80 studies reported moderate to large effect sizes for the association between pediatric migraine and both anxiety and depressive symptoms, and approximately twofold higher odds of anxiety and depressive disorders in children and adolescents with migraine compared with healthy controls.[11] In a Turkish clinical sample, Oztop *et al.* found that 40% of children and adolescents with migraine met criteria for at least one psychiatric disorder based on structured DSM-IV interviews, further underscoring the high burden of psychopathology in pediatric migraine.[7] We also found higher rates of major depression, attention deficit, hyperactivity, and oppositional defiant disorder in the patients than in the control group. The increased prevalence of these comorbidities in migraine patients highlights the complex interplay between neurological and psychological health. Beyond formal psychiatric diagnoses, maladaptive pain-related cognitions also appear to contribute to the burden of pediatric migraine. Orr *et al*. reported that children and adolescents with migraine used fewer adaptive pain coping strategies and endorsed substantially higher levels of pain catastrophizing than healthy peers.[12] Such findings support a multidimensional assessment of both psychiatric comorbidities and pain-related coping in pediatric migraine.

While the impact of PC on the QOL in migraine patients is a critical issue, there are limited primary studies specifically addressing this question in pediatric migraine, although recent narrative reviews clearly show that psychiatric comorbidities are associated with greater headache-related disability and poorer QOL across multiple domains in children and adolescents with headache disorders.[22] In a study involving adolescents with episodic and chronic migraine, as well as a control group, high levels of self-reported depressive symptoms and anxiety were associated with a lower QOL.[19] Similarly, other studies assessing the QOL in children with primary headaches have found that those with psychiatric comorbidities have a lower QOL compared to those without.[2,23] Moreover, treating psychiatric comorbidities may lead to significant improvement in migraine attacks.[24] On the contrary, no significant difference was found in QOL scores between those with and without PC.[7] In our study, the perception of self-esteem, perception of social relations, and total QOL scores of episodic migraine patients found lower in patients with PC compared to those without. However, in chronic migraine patients, we found no significant difference in the sub-scores of QOL or the total QOL between patients with and without PC. These findings suggest that psychiatric comorbidities are more strongly associated with lower QOL in episodic migraine

patients, whereas in chronic migraine patients, other factors may contribute more prominently to reduced QOL beyond PC. Additionally, it should be emphasized that in children with chronic migraine, factors other than PC may contribute to the chronicity of the condition. Therefore, it is crucial to thoroughly evaluate migraine patients for the presence of accompanying PC.

The impact of PC on PedMIDAS is another controversial issue. We found no significant difference between the mean PedMIDAS scores of patients with psychiatric comorbidities and those without. In addition, there was no significant association between PedMIDAS scores and the number of DSM-IV diagnoses. In our sample, PedMIDAS scores did not differ meaningfully according to the presence of psychiatric comorbidities. However, although the presence of PC did not lead to a significant change in PedMIDAS scores, it caused a significant decrease in QOL compared to those without PC. In a study, a correlation was found between the PedMIDAS score, attention deficit, and somatic symptoms.[25] The mean PedMIDAS score of pediatric chronic daily headache patients was found higher in patients with comorbidity than those without, and a positive correlation was shown between the presence of comorbidity and the PedMIDAS score.[2] The discrepancy in findings between our findings and others might be due to the presence of different headache types, the smaller sample size, differences in the criteria used to diagnose psychiatric comorbidities, or variations in the severity and type of psychiatric conditions among different study populations.

There are limited data in the literature comparing PedMIDAS and QOL. QOL was reported to be decreased as the PedMIDAS score increased in several studies.[7,12,26] For example, Oztop *et al*. reported that children and adolescents with migraine had significantly lower PedsQL total and physical health scores than controls, and that these scores were inversely correlated with both PedMIDAS scores and pain severity.[19] In contrast, we did not detect a significant association between PedMIDAS scores and QOL in our cohort, despite clear QOL impairments in migraine patients.[7] Similarly, Orr *et al*. found that pediatric migraine patients had markedly lower PedsQL scores than both healthy controls and children with other chronic illnesses, and that higher PedMIDAS scores were moderately associated with poorer HrQoL, with HrQoL remaining an independent predictor of moderate–severe disability after adjustment for age and sex.[12] However, we found no significant correlation between the PedMIDAS score and the QOL in our study. Consistent with the limited data on disability and QOL, the evidence regarding the impact of internalizing symptoms on migraine-related outcomes in youth is also heterogeneous. In their systematic review, Falla *et al*. found that only a small number of longitudinal studies suggested that higher depressive or mixed internalizing symptoms were associated with greater headache frequency at follow-up, and overall conclusions about the effect of internalizing symptoms on migraine outcomes remained uncertain.[11] Our findings extend this literature by showing that psychiatric comorbidities are associated with poorer QOL even when migraine-related disability, as measured by PedMIDAS, is none–mild, suggesting that the burden of psychiatric symptoms may not be fully captured by disability scales alone. Similarly, in another study, no association was found between the PedMIDAS score and the total QOL scores.[27] These results indicate that although patients' school life and daily activities are not severely affected by headache, their QOL may be impaired. This implies that the impact of headaches on QOL is complex and cannot inferred from the PedMIDAS score alone.

Furthermore, in our study, in the patient group with 'none - very mild' PedMIDAS disability, scores for perception of self-esteem, perception of social relations, and total QOL were significantly lower in patients with psychiatric comorbidities than in patients without psychiatric comorbidities. Similarly, in the patient group with 'mild' PedMIDAS disability, perception of self-esteem scores were significantly lower in patients with psychiatric comorbidities than in those without. Similarly, Lateef *et al*. found that pediatric patients with migraine and comorbid mental disorders had significantly lower Children's Global Assessment of Functioning (CGAS) scores than those with migraine alone, indicating greater overall functional impairment in the presence of psychiatric comorbidity.[18] These results indicate that the presence of PC in patients with headache is associated with lower scores for family relations, social relations and overall QOL, particularly self-esteem, independent of pain frequency and PedMIDAS score. Moreover, in children with chronic migraine, QOL scores were low even in the absence of PC.Therefore, it is crucial to consider additional factors and employ comprehensive evaluation methods

when assessing the overall burden of headaches on patients' lives. By adopting this approach, healthcare providers can develop more effective and holistic treatment strategies, ultimately improving the well-being of individuals suffering from migraines.

This study has several limitations. First, its cross-sectional, single-center design and relatively modest sample size limit the generalizability of the findings and preclude causal inferences. Accordingly, we cannot determine whether psychiatric comorbidities precede migraine, develop as a consequence of migraine, or directly worsen QOL; our findings are limited to observed associations between these variables. Second, psychiatric comorbidities were assessed using a questionnaire based on DSM-IV criteria rather than a structured clinical interview. As highlighted in recent reviews, questionnaire-based screening tools in pediatric migraine may overestimate the prevalence of anxiety and mood disorders because of symptom overlap between migraine (e.g. sleep disturbance, fatigue, poor appetite, concentration difficulties) and items included in commonly used inventories.[8] Third, although we compared some outcomes by age group and sex, we did not perform multivariable analyses. Therefore, residual confounding by age, sex, headache frequency or chronicity, and other clinical factors cannot be excluded.Fourth, socioeconomic status and detailed data on other medical comorbidities were not systematically assessed, and family history was limited to the presence of headache and epilepsy; therefore, we could not explore the potential impact of socioeconomic background or a broader family history of pain disorders on QOL. These limitations should be taken into account when interpreting our results and highlight the need for larger, prospective studies using more detailed clinical and psychosocial characterization.

In conclusion, PedMIDAS alone may not be sufficient in the evaluation of especially mildly affected pediatric migraine patients. Simultaneous evaluation of QOL and accompanying psychiatric comorbidities may help to guide the follow-up and treatment of pediatric patients with migraine.

DISCLOSURE

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REFERENCES

1. Orr SL. Headache in children and adolescents. *Continuum* (Minneap Minn). 2024;30(2):438-72. doi: 10.1212/CON.0000000000001414.
2. Slater SK, Kashikar-Zuck SM, Allen JR, *et al.* Psychiatric comorbidity in pediatric chronic daily headache. *Cephalalgia* 2012;32(15):1116-22. doi: 10.1177/0333102412460776.
3. Lipton RB, Seng EK, Chu MK, *et al.* The effect of psychiatric comorbidities on headache-related disability in migraine: Results from the Chronic Migraine Epidemiology and Outcomes (CaMEO) study. *Headache* 2020;60(8):1683-96. doi: 10.1111/head.13914.
4. Androulakis XM, Yu X, Zhu X, Thiam MA, Cai G. Migraine and major depression: localizing shared genetic susceptibility in different cell types of the nervous systems. *Front Neurol* 2023;14:1254290. doi: 10.3389/fneur.2023.1254290.
5. Hommer R, Lateef T, He JP, Merikangas K. Headache and mental disorders in a nationally representative sample of American youth. *Eur Child Adolesc Psychiatry* 2022;31(1):39-49. doi: 10.1007/s00787-020-01599-0.
6. Gazerani P. Migraine and mood in children. *Behav Sci* (Basel) 2021;11(4). doi: 10.3390/bs11040052.
7. Oztop DB, Tasdelen BI, PoyrazogLu HG, *et al*. Assessment of psychopathology and quality of life in children and adolescents with migraine. *J Child Neurol* 2016;31(7):837-42. doi: 10.1177/0883073815623635.
8. Ziplow J. The psychiatric comorbidities of migraine in children and adolescents. *Curr Pain Headache Rep* 2021;25(11):69. doi: 10.1007/s11916-021-00983-y.
9. Abu-Arafeh I. Headache and psychological comorbidities: An appraisal of the evidence. *J Clin Med* 2023;12(7). doi: 10.3390/jcm12072683.
10. Powers SW, Coffey CS, Chamberlin LA, *et al.* Prevalence of headache days and disability 3 years after participation in the childhood and adolescent migraine prevention medication trial. *JAMA Netw Open* 2021;4(7):e2114712. doi: 10.1001/jamanetworkopen.2021.14712.
11. Falla K, Kuziek J, Mahnaz SR, Noel M, Ronksley PE, Orr SL. Anxiety and depressive symptoms and disorders in children and adolescents with migraine: A systematic review and meta-analysis. *JAMA Pediatr* 2022;176(12):1176-87. doi: 10.1001/jamapediatrics.2022.3940.
12. Orr SL, Christie SN, Akiki S, McMillan HJ. Disability, quality of life, and pain coping in pediatric migraine: An observational study. *J Child Neurol* 2017;32(8):717-24. doi: 10.1177/0883073817702025.
13. Szperka CL, Witzman S, Ostapenko S, *et al*. Patient headache questionnaires can improve headache diagnosis and treatment in children. *Headache* 2023;63(10):1359-71. doi: 10.1111/head.14643.
14. Abu-Arafeh I, Morozova M. Migraine in children and adolescents: Assessment and diagnosis. *Handb Clin Neurol* 2024;199:475-85. doi: 10.1016/B978-0-12-823357-3.00029-X.

15. Hershey AD, Powers SW, Vockell AL, LeCates S, Kabbouche MA, Maynard MK. PedMIDAS: development of a questionnaire to assess disability of migraines in children. *Neurology* 2001;57(11):2034-9. doi: 10.1212/wnl.57.11.2034.
16. Ravens-Sieberer U, Bullinger M. Assessing health-related quality of life in chronically ill children with the German KINDL: first psychometric and content analytical results. *Qual Life Res* 1998;7(5):399-407. doi: 10.1023/a:1008853819715.
17. Milde-Busch A, Heinrich S, Thomas S, *et al.* Quality of life in adolescents with headache: results from a population-based survey. *Cephalalgia* 2010;30(6):713-21. doi: 10.1177/0333102409354389.
18. Lateef T, He JP, Nelson K, *et al.* Physical-mental comorbidity of pediatric migraine in the Philadelphia Neurodevelopmental Cohort. *J Pediatr* 2019;205:210-7. doi: 10.1016/j.jpeds.2018.09.033.
19. Paschoal JK, Lin J, Pinho RS, *et al.* Psychiatric symptoms may contribute to poor quality of life in adolescents with migraine. *Pediatr Int* 2013;55(6):741-7. doi: 10.1111/ped.12178.
20. Ombashi S, Tsangaris E, Heeres AG, *et al*. Quality of life in children suffering from headaches: a systematic literature review. *J Headache Pain* 2023;24(1):127. doi: 10.1186/s10194-023-01595-0.
21. Kafle M, Mirea L, Gage S. Association of psychiatric comorbidities with treatment and outcomes in pediatric migraines. *Hosp Pediatr* 2022;12(3):e101-e5. doi: 10.1542/hpeds.2021-006085.
22. Arruda MA, Arruda R, da Silva JA. Impact of psychiatric comorbidity, resilience and executive function on childhood and adolescent headaches: A narrative review. *Cephalalgia* 2025;45(9):3331024251364204. doi: 10.1177/03331024251364204.
23. Dyb G, Stensland S, Zwart JA. Psychiatric comorbidity in childhood and adolescence headache. *Curr Pain Headache Rep* 2015;19(3):5. doi: 10.1007/s11916-015-0479-y.
24. Smitherman TA, McDermott MJ, Buchanan EM. Negative impact of episodic migraine on a university population: quality of life, functional impairment, and comorbid psychiatric symptoms. *Headache* 2011;51(4):581-9. doi: 10.1111/j.1526-4610.2011.01857.x.
25. Uyar Cankay T, Besenek M. Negative effects of accompanying psychiatric disturbances on functionality among adolescents with chronic migraine. *BMC Neurol* 2021;21(1):97. doi: 10.1186/s12883-021-02119-6.
26. Kernick D, Reinhold D, Campbell JL. Impact of headache on young people in a school population. *Br J Gen Pract* 2009;59(566):678-81. doi: 10.3399/bjgp09X454142.
27. Ferracini GN, Dach F, Speciali JG. Quality of life and health-related disability in children with migraine. *Headache* 2014;54(2):325-34. doi: 10.1111/head.12251.