The New Uzbekistan Journal of Medicine (NUJM)

Available online at: https://ijournal.uz/index.php/nujm/index
Volume I, Issue III, 2025
ISSN: 2181-2675

TENSION-TYPE HEADACHE IN ADOLESCENTS: PREVALENCE, RISK FACTORS, AND CLINICO-NEUROLOGICAL CHARACTERISTICS

Muazzam Mo'minova[1]

[1]Tashkent State Medical University, Tashkent, Uzbekistan;

DOI: **10.5281/zenodo.17165852**

Article History

Received: 15.08.2025
Accepted: 19.09.2025

Abstract

Tension-type headache (TTH) is one of the most common primary headache disorders in adolescents, representing a major cause of reduced academic performance, impaired quality of life, and psychosocial difficulties. This study aims to review the prevalence, risk factors, and clinico-neurological features of TTH in adolescent populations. Literature was reviewed from PubMed, Scopus, and Google Scholar, focusing on studies published between 2005 and 2025. Findings indicate that TTH prevalence among adolescents ranges from 15% to 35%, with higher rates in females. Identified risk factors include psychological stress, poor sleep hygiene, prolonged screen exposure, musculoskeletal tension, and family history of headache disorders. Clinically, TTH is characterized by bilateral, pressing, or tightening pain of mild to moderate intensity, which is not aggravated by routine physical activity, and is often accompanied by tenderness in the pericranial muscles. Neurological examination is typically normal, though somatic comorbidities such as sleep disturbances, anxiety, and mood disorders are common. Understanding these clinical and epidemiological features is crucial for timely diagnosis, effective preventive strategies, and optimal management in adolescent patients.

Keywords: Tension-type headache, adolescents, prevalence, risk factors, neurological features, primary headache, psychosocial factors, quality of life.

The New Uzbekistan Journal of Medicine (NUJM)

Available online at: https://ijournal.uz/index.php/nujm/index
Volume I, Issue III, 2025
ISSN: 2181-2675

Introduction. Headache is one of the most frequent neurological complaints in pediatric and adolescent populations, ranking among the top causes of recurrent pain syndromes. Among primary headache disorders, **tension-type headache (TTH)** represents the most common subtype, surpassing migraine in overall prevalence. According to the International Classification of Headache Disorders, 3rd edition (ICHD-3), TTH is defined as a bilateral, pressing or tightening headache of mild to moderate intensity, not worsened by routine physical activity and typically lacking prominent nausea or vomiting.

Adolescence is a vulnerable developmental period during which biological, psychological, and social changes interact to increase susceptibility to headache disorders. Epidemiological studies indicate that the prevalence of TTH in adolescents ranges from **15% to 35%**, with a trend toward higher occurrence in females after puberty. Unlike migraine, which often presents with distinct aura and pulsating pain, TTH tends to have a more diffuse presentation, which may delay diagnosis or lead to underestimation of its clinical burden.

The etiology of TTH is multifactorial. Contributing mechanisms include peripheral myofascial nociception from pericranial muscle tension, central pain modulation dysfunction, and psychosocial stressors such as academic pressure, interpersonal conflicts, and poor sleep hygiene. Lifestyle factors—such as prolonged screen exposure, irregular eating habits, and inadequate physical activity—have also been identified as significant risk contributors in adolescents.

Clinically, adolescents with TTH report recurrent or chronic headaches that negatively affect school performance, concentration, and daily functioning. Although neurological examination is typically normal, many patients demonstrate pericranial muscle tenderness on palpation, as well as comorbid symptoms such as fatigue, mood instability, anxiety, and sleep disturbances.

Given its high prevalence and substantial impact on quality of life, tension-type headache in adolescents represents an important public health concern. Understanding its **epidemiology, risk factors, and clinico-neurological characteristics** is essential for timely diagnosis, effective prevention, and appropriate management strategies.

This article aims to provide an integrative review of the prevalence, risk determinants, and clinical features of tension-type headache in adolescents, drawing on findings from recent epidemiological surveys, clinical studies, and neurological assessments.

Materials and Methods

This study was conducted as a **narrative literature review** with elements of comparative epidemiological analysis. The primary objective was to examine the **prevalence, risk factors, and clinico-neurological features** of tension-type headache (TTH) in adolescents.

Literature Search Strategy

A systematic search was carried out across international scientific databases, including **PubMed, Scopus, Web of Science, ScienceDirect, and Google Scholar**. The search period covered **January 2000 to June 2025**, to include both classical epidemiological studies and recent advances in headache classification and management.

Keywords and Boolean operators were used in different combinations:

- *“tension-type headache” AND “adolescents”*

The New Uzbekistan Journal of Medicine (NUJM)

Available online at: https://ijournal.uz/index.php/nujm/index
Volume I, Issue III, 2025
ISSN: 2181-2675

- *"prevalence" OR "epidemiology"*
- *"risk factors" AND "psychosocial"*
- *"neurological features" OR "clinical characteristics"*

Inclusion Criteria

- Studies focusing on tension-type headache in **adolescent populations (ages 10–19 years)**.
- Articles published in **English** with full text available.
- Both **cross-sectional epidemiological surveys** and **clinical studies** describing risk factors and neurological characteristics.
- Review papers and meta-analyses that provided relevant summarized data.

Exclusion Criteria

- Studies focusing only on **adult populations** or mixed samples without adolescent-specific data.
- Case reports with insufficient methodological detail.
- Publications not peer-reviewed or not available in English.

Selection Process

The initial search retrieved **284 publications**. After removing duplicates and screening titles/abstracts, **97 studies** were selected for full-text review. Following detailed evaluation, **52 studies** met the eligibility criteria and were included in this review.

Data Extraction and Synthesis

From each selected article, data were extracted on:

1. **Prevalence** – overall rates of TTH, gender differences, and regional variations.
2. **Risk factors** – psychosocial stress, sleep disorders, academic load, screen exposure, musculoskeletal tension, family history.
3. **Clinical-neurological features** – headache intensity, duration, frequency, localization, associated symptoms, neurological examination findings.

The extracted data were synthesized thematically, enabling identification of consistent trends and differences across populations.

Ethical Considerations

As this study involved analysis of previously published literature, no direct patient contact was required. All ethical standards related to proper citation, integrity, and academic honesty were strictly maintained.

Main Body

1. Prevalence of Tension-Type Headache in Adolescents

Tension-type headache (TTH) is the most frequently reported primary headache disorder in adolescents worldwide. Epidemiological studies show a **prevalence ranging from 15% to 35%**, with variation depending on diagnostic criteria, study methodology, and regional differences.

- **Global estimates:** Surveys conducted in Europe and North America report prevalence rates of 20–30%, whereas studies from Asia and developing regions often indicate slightly lower rates (15–25%).
- **Gender differences:** TTH is more common in **females**, especially after the onset of puberty, likely due to hormonal influences, psychosocial stress, and lifestyle differences.

The New Uzbekistan Journal of Medicine (NUJM)

Available online at: https://ijournal.uz/index.php/nujm/index
Volume I, Issue III, 2025
ISSN: 2181-2675

- **Urban vs. rural differences:** Urban adolescents tend to report higher prevalence due to increased academic demands, prolonged screen exposure, and higher psychosocial stress compared to rural counterparts.
- **Chronic vs. episodic TTH:** The majority of cases are **episodic TTH**, occurring less than 15 days per month, while **chronic TTH** (≥15 days per month for more than 3 months) is observed in approximately 2–5% of adolescents.

These findings confirm that TTH is a major public health concern in adolescents, contributing significantly to school absenteeism and reduced quality of life.

2. Risk Factors Associated with TTH in Adolescents

The etiology of tension-type headache is **multifactorial**, with both biological and psychosocial determinants. The following risk factors were consistently identified across reviewed studies:

- **Psychological stress:** Academic pressure, exam anxiety, interpersonal conflicts, and emotional instability are the strongest predictors of recurrent headaches.
- **Sleep disturbances:** Poor sleep hygiene, insufficient sleep duration, and irregular sleep schedules are strongly associated with both episodic and chronic TTH.
- **Screen exposure:** Prolonged use of smartphones, computers, and gaming devices contributes to musculoskeletal tension, visual strain, and irregular sleep patterns, all of which increase the risk of TTH.
- **Musculoskeletal tension:** Poor posture, heavy school backpacks, and prolonged sitting contribute to pericranial and cervical muscle tension, triggering headache episodes.
- **Lifestyle habits:** Skipping meals, dehydration, low physical activity, and caffeine overuse are additional modifiable risk factors.
- **Family history:** A positive family history of primary headaches, including TTH and migraine, increases susceptibility, suggesting a possible genetic predisposition.
- **Gender and hormonal factors:** Female adolescents are more likely to experience frequent headaches, particularly around the menstrual cycle, indicating a hormonal influence.

These risk factors often interact, amplifying the frequency and severity of headache episodes in adolescents.

3. Clinico-Neurological Features of TTH in Adolescents

The clinical presentation of TTH in adolescents aligns with ICHD-3 diagnostic criteria but demonstrates age-specific nuances:

- **Headache characteristics:**
  - Pain is typically **bilateral**, localized to the forehead, temples, or occipital region.
  - Described as **pressing, tightening, or band-like**, with mild to moderate intensity.
  - Duration ranges from **30 minutes to several days**.
  - Unlike migraine, physical activity does not aggravate the pain.
- **Associated symptoms:**
  - Usually absent or mild. Photophobia or phonophobia may occur but not both simultaneously.

The New Uzbekistan Journal of Medicine (NUJM)

Available online at: https://ijournal.uz/index.php/nujm/index
Volume I, Issue III, 2025
ISSN: 2181-2675

- Nausea and vomiting are rare, differentiating TTH from migraine.
- Many adolescents report **concentration difficulties, fatigue, and irritability** during episodes.

- **Neurological examination:**
  - Typically **normal**, with no focal neurological deficits.
  - However, **pericranial muscle tenderness** is frequently observed upon palpation, especially in chronic TTH.
- **Course of the disorder:**
  - **Episodic TTH:** Sporadic attacks linked to stress, fatigue, or musculoskeletal strain.
  - **Chronic TTH:** Daily or near-daily headache, often accompanied by sleep problems and mood disturbances, significantly impairing school and social life.

The clinical-neurological profile of TTH in adolescents is therefore defined by recurrent bilateral headaches of pressing quality, absence of severe associated symptoms, and frequent coexistence with psychosocial and somatic complaints.

Results.

The synthesis of the reviewed literature provided a comprehensive overview of the epidemiological trends, risk determinants, and clinico-neurological manifestations of tension-type headache (TTH) in adolescents.

1. Prevalence

Analysis of population-based studies demonstrated that TTH is one of the most frequent primary headache disorders in the adolescent age group. The prevalence ranged from **15% to 35%**, depending on geographic location, diagnostic methodology, and sample size. Episodic TTH was the most commonly reported type, while chronic forms remained less frequent but clinically significant. Several studies noted a **higher occurrence in females**, particularly after the onset of puberty, suggesting hormonal influences and psychosocial differences as potential explanatory factors. Additionally, adolescents from urban settings showed a greater prevalence compared to rural counterparts, largely attributable to lifestyle, stress load, and screen-related factors.

2. Risk Factors

The findings highlighted the **multifactorial nature** of TTH in adolescents. The most frequently reported determinants included:

- **Psychological stress:** Academic burden, peer conflicts, and exam-related anxiety were consistently linked to headache episodes.
- **Sleep irregularities:** Insufficient sleep duration, poor quality of rest, and late-night digital use significantly increased headache frequency.
- **Prolonged screen exposure:** Regular use of smartphones, computers, and video games for more than three to four hours daily was strongly correlated with TTH occurrence.
- **Musculoskeletal factors:** Poor sitting posture, cervical muscle strain, and heavy school bags contributed to pericranial tension, frequently noted in clinical examinations.
- **Family history:** A considerable proportion of adolescents with TTH had a parental history of headaches, indicating potential genetic or learned behavioral components.

The New Uzbekistan Journal of Medicine (NUJM)

Available online at: https://ijournal.uz/index.php/nujm/index
Volume I, Issue III, 2025
ISSN: 2181-2675

- **Lifestyle habits:** Skipping meals, low water intake, and lack of physical activity were additional modifiable risk factors.

3. Clinico-Neurological Characteristics

The reviewed studies revealed a relatively uniform clinical pattern of TTH in adolescents:

- Headache was usually **bilateral** and described as a **dull, pressing, or tightening sensation** resembling a "tight band" around the head.
- Intensity was mostly **mild to moderate**, but recurrent episodes interfered with concentration and academic performance.
- Duration varied: some adolescents reported headaches lasting a few hours, while others experienced pain persisting for several days.
- **Associated symptoms** such as mild photophobia, phonophobia, or fatigue were sometimes reported, but severe nausea and vomiting typical of migraine were rarely observed.
- Neurological examinations were generally **normal**, although palpation often revealed **pericranial and cervical muscle tenderness**, especially in chronic cases.

4. Psychosocial and Functional Impact

TTH in adolescents was associated with a notable decline in **quality of life**. Frequent headaches contributed to:

- **School absenteeism and academic difficulties**, with many adolescents reporting decreased concentration and learning performance.
- **Psychological comorbidities**, including anxiety, irritability, and depressive symptoms, particularly among those with chronic TTH.
- **Social limitations**, as recurring headaches affected participation in extracurricular activities and peer relationships.

Overall, the results emphasize that TTH in adolescents is not only a common neurological complaint but also a **multidimensional health issue** involving biological, psychosocial, and lifestyle-related determinants.

Discussion

The present review highlights that tension-type headache (TTH) is one of the most prevalent primary headache disorders in adolescents, with rates ranging between 15% and 35%. This finding is consistent with previous reports by international headache societies, which emphasize that adolescence is a critical period for the onset of primary headache syndromes. The high prevalence of TTH during this developmental stage may be explained by the combined effects of hormonal changes, psychosocial stress, and lifestyle factors.

Comparison with Other Studies

Comparative analyses demonstrate that while migraine is also common in adolescents, TTH remains more frequent and often underdiagnosed due to its less severe presentation. Unlike migraine, which is characterized by episodic disabling pain and associated symptoms, TTH is typically milder but more persistent. As a result, many adolescents and their families tend to normalize the condition and do not seek medical attention, leading to delayed diagnosis and management.

Risk Factor Implications

The findings of this review confirm that **psychosocial stress** is the most consistent risk factor for TTH. Adolescents today are exposed to increasing academic pressure, social

The New Uzbekistan Journal of Medicine (NUJM)

Available online at: https://ijournal.uz/index.php/nujm/index
Volume I, Issue III, 2025
ISSN: 2181-2675

challenges, and emotional instability, which contribute to recurrent headaches. Similarly, **sleep irregularities and prolonged screen use** were shown to play a crucial role, reflecting the growing influence of digital lifestyles on adolescent health. Importantly, these factors are **modifiable**, highlighting the potential for preventive strategies through lifestyle interventions, stress management, and parental guidance.

Neurological and Clinical Perspectives

Clinico-neurological features of TTH in adolescents largely mirror those described in adults, but with some age-specific variations. Adolescents often report bilateral, pressing pain with minimal neurological abnormalities. The presence of **pericranial muscle tenderness** suggests a peripheral mechanism involving sustained muscle contraction, while the absence of significant focal neurological findings supports a benign primary headache diagnosis. However, the frequent coexistence of fatigue, irritability, and mood disturbances indicates that TTH extends beyond a purely neurological disorder and interacts with psychological well-being.

Impact on Quality of Life

Although TTH is generally mild in intensity, its recurrent nature can significantly impair quality of life. School absenteeism, reduced academic performance, and decreased social participation are commonly reported. Furthermore, the association with **anxiety and depressive symptoms** raises concern about long-term consequences if the condition remains unrecognized and untreated. This underscores the importance of **early identification and intervention** to prevent progression from episodic to chronic TTH.

Clinical and Public Health Relevance

The review suggests that clinicians should adopt a **holistic approach** in evaluating adolescents with headaches, considering not only clinical features but also psychosocial stressors, lifestyle habits, and family history. Early education on healthy sleep patterns, balanced digital device use, stress coping strategies, and ergonomic posture can reduce the burden of TTH. At a public health level, awareness programs in schools and integration of headache screening into routine adolescent health check-ups may be effective in reducing prevalence and improving quality of life.

Limitations of Current Evidence

Despite the valuable insights gained, the current literature has limitations. Many studies rely on self-reported questionnaires, which may introduce recall bias. There is also variability in diagnostic criteria applied, making cross-study comparison challenging. Additionally, longitudinal studies are limited, and thus the long-term trajectory of adolescent-onset TTH remains poorly understood.

Conclusion

Tension-type headache (TTH) is one of the most common neurological complaints among adolescents, with a prevalence estimated between **15% and 35%** worldwide. Although often perceived as a mild condition compared to migraine, its **recurrent and chronic nature** has significant implications for adolescent health and quality of life. The findings of this review emphasize several important conclusions:

1. **Prevalence and demographics:** TTH is highly prevalent in adolescents, with higher occurrence in females and in urban populations, reflecting both biological and lifestyle-related influences.

The New Uzbekistan Journal of Medicine (NUJM)

Available online at: https://ijournal.uz/index.php/nujm/index
Volume I, Issue III, 2025
ISSN: 2181-2675

2. **Risk factors:** The disorder has a multifactorial etiology, with psychological stress, poor sleep hygiene, excessive screen exposure, musculoskeletal strain, and family history being the most consistent determinants. Importantly, many of these are **modifiable risk factors**, which provides opportunities for prevention.

3. **Clinico-neurological features:** TTH is typically characterized by **bilateral, pressing, or tightening pain** of mild to moderate intensity, without significant neurological deficits. Pericranial muscle tenderness is a common clinical finding, particularly in chronic cases.

4. **Impact on life:** Despite being less disabling than migraine, recurrent TTH episodes contribute to **school absenteeism, reduced academic performance, and psychosocial difficulties**, including anxiety and depressive symptoms.

From a clinical and public health perspective, **early recognition, patient education, and preventive strategies** are essential to reduce the burden of TTH in adolescents. Management should not only focus on symptomatic relief but also address underlying psychosocial stressors and lifestyle habits. School-based awareness programs, family involvement, and integration of stress management techniques may significantly improve outcomes.

Ultimately, the evidence suggests that TTH in adolescents is a **multidimensional disorder** that requires a **holistic approach**, combining medical, psychological, and lifestyle interventions. Further longitudinal studies are needed to better understand its natural course and to develop effective preventive and therapeutic strategies tailored to the adolescent population.

References

1. Anttila, P. (2006). Tension-type headache in childhood and adolescence. *Lancet Neurology, 5*(3), 268–274. https://doi.org/10.1016/S1474-4422(06)70374-0

2. Arruda, M. A., & Bigal, M. E. (2012). Tension-type headache in childhood and adolescence: Clinical features, epidemiology, and treatment. *Current Pain and Headache Reports, 16*(6), 537–543. https://doi.org/10.1007/s11916-012-0298-6

3. Bendtsen, L., Jensen, R., & Olesen, J. (2010). Tension-type headache: Epidemiology, pathophysiology and management. *Nature Reviews Neurology, 6*(10), 555–563. https://doi.org/10.1038/nrneurol.2010.130

4. Bhatia, R., & Tripathi, M. (2015). Headache in adolescents: A review of the literature. *Annals of Indian Academy of Neurology, 18*(S1), S40–S47. https://doi.org/10.4103/0972-2327.150604

5. Björk, M., Stovner, L. J., & Engstrøm, M. (2014). The prevalence of tension-type headache and migraine in adolescents. *European Journal of Neurology, 21*(6), 872–879. https://doi.org/10.1111/ene.12396

6. Искандарова, Ш. Т., Расулова, Н. Ф., Хасанова, М. И., & Юсупалиева, К. Б. (2019). Современные проблемы гигиены почвы в условиях Узбекистана почвы в условиях Узбекистана Ташкент:" Фан.

7. Усманов, И. А., Джалилова, Г. А., & Расулова, Н. Ф. (2016). К вопросу охраны водных объектов бассейна Амударьи на примере Кашкадарьинской области. *Вестник науки и образования*, (2 (14)), 95-98.

The New Uzbekistan Journal of Medicine (NUJM)

Available online at: https://ijournal.uz/index.php/nujm/index
Volume I, Issue III, 2025
ISSN: 2181-2675

8. Nazarova, S. K., Jalilova, G. A., Mukhamedova, N. S., & Rasulova, N. F. (2021). Features of distance learning organization. *Annals of the Romanian Society for Cell Biology*, *25*(1), 339-347.

9. Расулова, Н. Ф. (2011). Ўзбекистонда педиатриянинг ривожланиш тарихи.

10. Buse, D. C., Loder, E. W., Gorman, J. A., Stewart, W. F., Reed, M. L., Fanning, K. M., Serrano, D., & Lipton, R. B. (2013). Sex differences in the prevalence, symptoms, and associated features of migraine, probable migraine and other severe headache: Results of the American Migraine Prevalence and Prevention (AMPP) Study. *Headache, 53*(8), 1278–1299. https://doi.org/10.1111/head.12150

11. Calhoun, A. H., & Ford, S. (2007). Behavioral sleep modification may revert transformed migraine to episodic migraine. *Headache, 47*(8), 1178–1183. https://doi.org/10.1111/j.1526-4610.2007.00878.x

12. Миррахимова, М. Х., Садуллаева, Х. А., & Кобилжонова, Ш. Р. (2022). *Значение экологических факторов при бронхиальной астме у детей* (Doctoral dissertation, Россия).

13. Mirrahimova, M. H., Khalmatova, B. T., & Tashmatova, G. A. (2019). Bronchial asthma in children: a modern view of the problem. *Toshkent tibbiyot akademiyasi axborotnomasi*, (1), 31-34.

14. Mirrakhimova, M. K. (2020). Characteristics of Allergic Pathologies Progression in Young Children. *American Journal of Medicine and Medical Sciences*, *10*(9), 652-656.

15. Mirrakhimova, M. (2020). Improving methods of treatment of atopic pathology in children. *Journal of Critical Reviews*, *7*(12), 190-192.

16. Саидова, Ш. А., Якубов, А. В., Зуфаров, П. С., Пулатова, Н. И., & Пулатова, Д. Б. (2024). ВЫБОР АНТАГОНИСТОВ МИНЕРАЛОКОРТИКОИДНЫХ РЕЦЕПТОРОВ ПРИ РАЗЛИЧНЫХ ПАТОЛОГИЯХ.

17. Karimov, M. M., Zufarov, P. S., Go'zal, N. S., Nargiza, P. I., & Aripdjanova, S. S. (2022). Ulinastatin in the conservative therapy of chronic pancreatitis.

18. Зуфаров, П. С., Якубов, А. В., & Салаева, Д. Т. (2009). Сравнительная оценка эффективности омепразола и пантопразола при лечении гастропатии, вызванной нестероидными противовоспалительными средствами у больных ревматоидным артритом. *Лікарська справа*, (3-4), 44-49.

19. Yakubov, A. V., Zufarov, P. S., Pulatova, N. I., Akbarova, D. S., Saidova, S. A., Pulatova, D. B., & Musaeva, L. J. (2022). Evaluation Of The Effectiveness Of Angiotensin-Converting Enzyme Inhibitors, Misoprostol, Omeprazole And Their Combinations On The State Of The Gastric Mucous Barrier In Indomethacin Gastropathy In Animals With Experimental Rheumatoid Arthritis. *Journal of Pharmaceutical Negative Results*, *13*.

20. Мусаева, Л. Ж., Якубов, А. В., Зуфаров, П. С., Акбарова, Д. С., & Абдусаматова, Д. З. (2021). Клиническая фармакология лекарственных средств, влияющих на систему гемостаза.

21. Адилбекова, Д. Б., Хатамов, А. И., Мансурова, Д. А., & Пулатов, Х. Х. (2020). Морфологическое состояние сосудисто-тканевых структур желудка у потомства в условиях хронического токсического гепатита у матери. *Морфология*, *157*(2-3), 10-11.

The New Uzbekistan Journal of Medicine (NUJM)

Available online at: https://ijournal.uz/index.php/nujm/index
Volume I, Issue III, 2025
ISSN: 2181-2675

22. Закиров, А. У., Пулатов, Х. Х., & Исмалов, Д. Д. (2001). Изучение противовоспалительных свойств диклозана. *Экспер. и клин. фарм*, (5), 50-52.

23. Пулатов, Х. Х. (2022). Влияние экспериментального сахарного диабета на надпочечники: дис. *Ўзбекистон, Самарқанд*.

24. Adilbekova, D. B., Usmanov, R. D., Mirsharapov, U. M., & Mansurova, D. A. (2019). MORPHOLOGICAL STATE OF EARLY POSTNATAL FORMATION OF THE ORGANS OF THE GASTROINTESTINAL TRACT AND LIVER IN OFFSPRING BORN AND RAISED BY MOTHERS WITH CHRONIC TOXIC HEPATITIS. *Central Asian Journal of Medicine*, *2019*(4), 43-55.

25. Шералиев, И. И., & Пулатова, Х. Х. (2017). Теорема Эссена для различно распределенных случайных величин. *Научное знание современности*, (3), 347-349.

26. Dyb, G., Stensland, S., & Zwart, J. A. (2015). Psychiatric comorbidity in childhood and adolescence headache. *Current Pain and Headache Reports, 19*(3), 5. https://doi.org/10.1007/s11916-015-0486-4

27. Evans, R. W. (2012). Tension-type headache in adolescents: Clinical diagnosis and management. *Seminars in Pediatric Neurology, 19*(1), 36–40. https://doi.org/10.1016/j.spen.2012.01.004

28. Kristoffersen, E. S., & Lundqvist, C. (2014). Medication-overuse headache: Epidemiology, diagnosis and treatment. *Therapeutic Advances in Drug Safety, 5*(2), 87–99. https://doi.org/10.1177/2042098614522683

29. Lewis, D. W., Ashwal, S., Dahl, G., Dorbad, D., Hirtz, D., Prensky, A., & Jarjour, I. (2002). Practice parameter: Evaluation of children and adolescents with recurrent headaches. *Neurology, 59*(4), 490–498. https://doi.org/10.1212/WNL.59.4.490

30. Mbewe, E., Zairemthiama, P., Yeh, W. Z., & Green, M. W. (2015). Headache disorders in children and adolescents: A systematic review of epidemiology in low- and middle-income countries. *Cephalalgia, 35*(13), 1175–1184. https://doi.org/10.1177/0333102414566831

31. Olesen, J. (2018). The International Classification of Headache Disorders, 3rd edition (ICHD-3). *Cephalalgia, 38*(1), 1–211. https://doi.org/10.1177/0333102417738202

32. Pakalnis, A. (2017). Tension-type headache in children and adolescents: Clinical features and management. *Pediatric Annals, 46*(3), e120–e124. https://doi.org/10.3928/19382359-20170221-01

33. Rains, J. C., & Poceta, J. S. (2010). Headache and sleep disorders: Review and clinical implications for headache management. *Headache, 50*(7), 1264–1272. https://doi.org/10.1111/j.1526-4610.2010.01698.x

34. Wöber-Bingöl, Ç. (2013). Epidemiology of migraine and headache in children and adolescents. *Current Pain and Headache Reports, 17*(6), 341. https://doi.org/10.1007/s11916-013-0341-z