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Dolna 17, Warsaw,
Poland 00-773
+48 226 0 227 03
editorial_office@rsglobal.pl

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TENSION-TYPE HEADACHE: TREATMENT STRATEGIES FOR THE MOST PREVALENT PRIMARY HEADACHE DISORDER

Klaudia Martyna Patrzykąt *(Corresponding Author, Email: patrzykat.klaudia@gmail.com)*
109th Military Hospital with Policlinic in Szczecin, Szczecin, Poland
ORCID ID: 0009-0000-9440-5444

Anastazja Orłowa
University Clinical Center of the Medical University of Warsaw, Warsaw, Poland
ORCID ID: 0009-0005-5125-3686

Kamil Turlej
University Clinical Center of the Medical University of Warsaw, Warsaw, Poland
ORCID ID: 0009-0008-2919-284X

Aleksandra Oparcik
Medical Center HCP, Poznań, Poland
ORCID ID: 0009-0008-0438-3797

Anita Pakuła
Medical University of Silesia in Katowice, Katowice, Poland
ORCID ID: 0009-0002-7866-2939

Julia Pawłowska
St. Barbara Provincial Specialist Hospital No. 5 in Sosnowiec, Sosnowiec, Poland
ORCID ID: 0009-0004-4309-0226

Kinga Szyszka
J. Gromkowski Provincial Specialist Hospital in Wrocław, Wrocław, Poland
ORCID ID: 0009-0001-3467-4121

Laura Kurczoba
Józef Struś Multi-Specialist Municipal Hospital, Poznań, Poland
ORCID ID: 0009-0004-1330-991X

Marta Cieślak
University Clinical Hospital in Poznań, Poznań, Poland
ORCID ID: 0009-0004-5522-3786

Anna Baranowska
University Clinical Hospital No. 2, Pomeranian Medical University in Szczecin, Szczecin, Poland
ORCID ID: 0009-0006-1762-2414

ABSTRACT

Introduction and Purpose: Tension-type headache (TTH) is the most common primary headache disorder that affects the majority of people during their lifetime. This review summarizes the current state of knowledge on its epidemiology, risk factors, pathophysiology, and treatment, highlighting implications for everyday clinical practice.
Methods: A narrative literature review was conducted using PubMed/MEDLINE (January 2016-November 2025). Eligible articles addressed the definition and diagnosis of TTH, epidemiology, risk factors, pain mechanisms, acute and preventive pharmacotherapy, or non-pharmacological interventions; randomized trials, trial protocols, observational studies, systematic reviews, meta-analyses, and narrative reviews were included, while non-peer-reviewed publications, animal-only studies, and reports without a clearly defined TTH subgroup were excluded.
Results: Tension-type headache (TTH) is characterized by bilateral, pressing pain of mild to moderate intensity, which is derived from interactions between pericranial myofascial nociception, central sensitization, psychological comorbidity, and lifestyle-related factors. For acute attacks, simple analgesics, such as NSAIDs and paracetamol, are usually effective, whereas triptans, ergots, and opioids are not recommended. In frequent or chronic TTH, a low dose of tricyclic antidepressants remains the first-line prophylaxis. Non-pharmacological methods, including exercise therapy, yoga, acupuncture, TENS, lifestyle modification, and psychotherapy, should be considered as part of an individualized, multimodal treatment strategy.
Conclusions: Tension-type headache (TTH) requires personalized care that combines careful use of medications and non-pharmacological treatment. Simple analgesics bring substantial relief in most episodic headaches, while preventive (prophylactic) treatment is needed for ongoing or recurring cases. Education on trigger management and medication overuse is required to ensure patient safety and optimal therapy pathways.

KEYWORDS

Tension-Type Headache, Risk Factors, Pathophysiology, Analgesics, Non-Narcotic, Antidepressive Agents, Tricyclic, Cognitive Behavioral Therapy

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Introduction

Tension-type headache (TTH) is the most common primary headache disorder worldwide.[1,2] The condition affects most people during their lifetime and contributes significantly to healthcare costs and lost productivity.[2,3] TTH is characterized as recurring bilateral head pain that feels like pressure or tightness and ranges from mild to moderate in severity.[1,4,5] These headaches generally lack migrainous features, such as nausea or visual aura, and are not typically worsened by routine physical activity.[4,6]

The treatment for acute TTH attacks includes basic pain relief medications, such as NSAIDs and acetaminophen.[7–9] The treatment plan for TTH patients who experience repeated episodes requires different methods than those used for people who get headaches sporadically.[10–12] Tricyclic antidepressants, most notably amitriptyline, are the first-line prophylactic agents in such cases.[10,11] The available research shows that venlafaxine, among SNRIs, demonstrates some effectiveness, although the evidence remains limited.[10,11] These medications help decrease headache occurrence, but healthcare providers need to monitor their side effects and prevent medication dependence.[10–13]

Non-pharmacological approaches serve as vital methods for treating TTH.[14,15] Studies have assessed the effectiveness of behavioral and physical treatments, which include cognitive-behavioral training, relaxation, structured exercise, and manual therapies for TTH patients.[14,16,17] The study found that patients who received autogenic relaxation training with cervical-spine exercises achieved superior results for headache frequency and intensity reduction compared to those who received relaxation therapy alone.[18] Research

studies show that physical treatments for the neck and shoulder area through mobilization and strengthening exercises produce substantial pain reduction and fewer headache occurrences during short to medium-term periods.[16,19–21] Preventive lifestyle measures, such as good sleep hygiene and stress management, are also recommended to reduce TTH recurrence.[14,15]

Methods

This article is a narrative literature review on tension-type headache (TTH), focusing on epidemiology, clinical characteristics, pathophysiology, and evidence-based pharmacological and non-pharmacological treatment strategies.

A structured search of PubMed/MEDLINE was performed for articles published between January 2016 and November 2025. MeSH terms and free-text keywords included combinations of "tension-type headache", "chronic tension-type headache", "episodic tension-type headache", "headache prophylaxis", "analgesics", "amitriptyline", "NSAIDs", "non-pharmacological treatment", "exercise therapy", "yoga", "manual therapy", "transcutaneous electrical nerve stimulation", and "acupuncture", linked with Boolean operators. Reference lists of key systematic reviews and clinical guidelines were screened manually to identify additional publications. Grey literature, conference abstracts, and non-peer-reviewed sources were excluded.

We included peer-reviewed human studies and reviews that reported data on TTH definition, diagnosis, epidemiology, and risk factors, pathophysiological mechanisms, acute and preventive pharmacotherapy, and non-drug interventions such as physical therapy, exercise, lifestyle modification, psychological therapies, and patient education. Eligible designs comprised randomized controlled trials, trial protocols, prospective and retrospective observational studies, systematic reviews, meta-analyses, and high-quality narrative reviews. Exceptionally, well-documented case series were considered when they addressed clinically relevant or emerging therapeutic options for TTH. Publications focusing on other primary headache disorders without a clearly distinguishable TTH subgroup, purely animal or laboratory work without translational relevance, and opinion pieces or letters without original data were excluded.

Results

Definition and Clinical Characteristics

Tension-type headache (TTH) is the most common primary headache disorder, characterized by episodes of head pain with a pressing or tightening (non-pulsating) quality.[1,4,5] The pain intensity ranges between mild to moderate levels, and affects both sides of the head.[1,4,5] TTH patients describe their headache as a dull ache or tight band sensation that encircles their forehead and temples.[1,4] The tension in the neck muscles can cause the pain to spread to the back of the head and neck.[1,22] The pain of TTH does not become worse when people perform their daily physical activities, such as walking or climbing stairs.[4,6] The symptoms of this condition include no nausea or vomiting and only minimal light or sound sensitivity.[4,6] In practical terms, there is no specific diagnostic test for TTH- diagnosis is made clinically using criteria from the International Classification of Headache Disorders (ICHD-3) and is based on the patient's history and a normal neurological examination.[5,10]

The condition exists in two main forms: episodic and chronic.[1,4,5,10] The diagnosis of episodic TTH requires headaches to appear less than 15 times per month; chronic TTH requires headaches to occur 15 or more times per month for three consecutive months.[5,10] Individual TTH attacks can last from as short as 30 minutes to hours or even days.[1,4,5] Many individuals with TTH have increased tenderness in the pericranial muscles (for example, feeling soreness in the scalp or neck muscles when pressed), which ties into the "tension" aspect of this headache type.[1,23–25]

Epidemiology and Affected Populations

Tension-type headache (TTH) is extremely prevalent across the globe.[1–3] Research findings from epidemiological studies show that TTH occurs in approximately 25% of people during a yearly period.[2,4] The 2016 research described that TTH affected 1.9 billion people worldwide, making TTH and migraine two of the most common human health conditions.[2] Women are affected slightly more often than men, but this gender difference is modest (far smaller than the female predominance seen in migraine).[3,26] Most people with TTH have their first episodes by early adulthood, and prevalence tends to peak in mid-life.[1,2,26]

The research study shows various social and demographic patterns that have been documented.[2,3,26] In some surveys, the frequency of episodic TTH increases with higher educational attainment- in other words, people with more years of education report TTH more frequently.[2,26] The prevalence of chronic TTH

follows an opposite pattern compared to acute TTH, since it affects people with lower education levels more often than those with higher education.[2,26] The prevalence of chronic TTH is lower than episodic TTH, since it affects only approximately 2% of the total population.[1,2] Like the episodic form, chronic TTH is somewhat more common in women.[3,26] The family history of headaches appears in almost half of chronic TTH patients, which indicates that genetic elements and hereditary factors contribute to the development of this condition.[1,13,23] Although TTH is generally considered an adult disorder, it can also occur in younger individuals.[1,2,26]

In summary, TTH is a ubiquitous condition defined by its characteristic feature of diffuse, pressure-like head pain without significant accompanying symptoms.[1,4] The clinical profile and epidemiology of this headache disorder need to be understood first, as it will help in quick diagnosis and finding the best personalized patient care.[1,3,24]

Primary Risk Factors

The research study identifies various risk factors that derive from different demographic characteristics.[1,3,24,26] Tension-type headache (TTH) can occur at any age but typically begins in early adulthood (often in the second or third decade of life).[1,2,26] Women experience these headaches more often than men do, due to hormonal and psychosocial factors; however, men also develop this condition.[3,18,26] Research indicates that TTH may have a genetic link, as they tend to occur within families, but scientists have not found any particular genes responsible for this condition.[13,23]

People who experience psychological stress along with mental health problems tend to develop TTH.[3,14] The combination of chronic stress and anxiety with emotional distress results in prolonged muscle tension in the neck and scalp, which increases the risk of headaches or makes existing headaches more severe.[14] The majority of TTH patients suffer from depressive symptoms, while depression as a comorbid condition tends to increase both headache occurrence and intensity.[3] People who experience sleep disturbances, including insomnia and poor sleep quality, tend to report these issues frequently, as they decrease their pain threshold and resilience.[27] Individuals with higher sensitivity to stress and pain due to their emotional characteristics and personality traits face a greater risk.[3,14]

The problem is influenced by both musculoskeletal elements and lifestyle factors.[1,19,24,25] The combination of long periods spent in fixed positions at work leads to muscle strain in the neck and shoulder area, which increases the risk of headaches.[19,21,22,28] In particular, a forward head posture and tightness in the cervical musculature can predispose a person to recurrent TTH by maintaining constant muscle tension.[19,21,22,28] The conditions become more severe because physical inactivity and sedentary behavior result in weakened supportive muscle structures.[19,20,21] The patterns of headaches can also be affected by what people eat, as dehydration and too much caffeine consumption lead to headache episodes in people who are sensitive to these factors; however, the connection between these causes and TTH remains uncertain.[14,29]

The development of TTH results from multiple factors, which include psychological stress, low mood, sleep problems, musculoskeletal strain, and genetic and sex-related predispositions.[1,23] Understanding the full range of risk factors and triggers is essential to comprehending TTH and guiding effective treatment for patients suffering from this condition.[3,13,14,24]

Pathophysiology

The pathogenesis of tension-type headache (TTH) involves multiple factors, which stem from both peripheral and central sources.[1,11,23] The peripheral component of TTH shows itself through craniocervical musculoskeletal dysfunction, which causes tight neck muscles and temporomandibular problems in many patients.[11,23,24] The first signs of episodic attacks emerge from nociceptors in pericranial muscles, which become sensitive due to prolonged muscle tension, postural strain, and biomechanical stress.[11,23,24] The central nervous system experiences a decrease in pain tolerance due to repeated stimulation, which leads to a self-reinforcing pattern where small signals from the neck or scalp result in increased pain perception.[11,23] The pain signals from the face and head travel through the trigeminal and upper cervical nerve pathways.[11,23,24] The first-order sensory fibers from scalp and neck tissue merge into the trigeminal ganglion and the upper cervical dorsal horns. The trigeminal-cervical complex contains second-order neurons, which send signals to both the thalamus and the somatosensory cortex.[11,23,24] The main reason behind TTH is musculoskeletal factors, but vascular signals play a key role in the development of migraines.[1,4,6] The pain pattern of TTH develops due to trigger points that exist in the neck muscles and upper cervical joints.[23–

25] Persistent peripheral drive thus amplifies central transmission.[11,23] The majority of patients with chronic TTH experience pain sensitivity in large areas of their body, which indicates central sensitization.[11,23,25] Research shows that biochemical mediators, including nitric oxide, function as headache triggers.[1,4] Nitric oxide donors trigger TTH attacks in people who are sensitive to them, and nitric oxide synthase inhibitors reduce headache severity.[1,4] Studies demonstrate that pain transmission pathways produce more intense excitatory responses when they receive continuous nociceptive signals.[11,23] The combination of peripheral triggers and central facilitation mechanisms maintains headache symptoms, which leads to the development of chronic TTH.[1,11,23,24]

Pharmacological treatment

The treatment of tension-type headache (TTH) through medication involves two approaches: acute (abortive) therapy for single pain episodes and preventive (prophylactic) therapy for ongoing or recurring cases.[1,10–12]

1. Acute treatment

Simple analgesics serve as the primary treatment for obtaining quick pain relief.[7–9] The most effective treatment for TTH episodes comes from nonsteroidal anti-inflammatory drugs (NSAIDs), including ibuprofen, diclofenac, and ketoprofen.[7,9] A meta-analysis of randomized trials shows that NSAIDs provide superior two-hour headache relief compared to placebo.[7,9] Standard treatment involves a single dose of 400-600 mg ibuprofen, taken with food and an antacid to minimize gastrointestinal side effects.[7,9] Aspirin (acetylsalicylic acid) 500 mg serves as an effective over-the-counter medication for pain relief.[7] The majority of patients tolerate these medications well, as pooled data indicate that adverse events occur at rates similar to those of a placebo for most NSAIDs, except for ketoprofen, which shows a statistically higher rate of mild adverse effects.[7,9]

1.1. Acetaminophen as an Alternative

Acetaminophen functions as an alternative medication option for patients who cannot take NSAIDs or have adverse reactions to these medications.[8,9] The results of systematic reviews show that a single 1000 mg dose of paracetamol provides effective pain relief, as it reduces pain levels to mild or none in approximately 5% more patients than placebo within two hours.[8] In a network meta-analysis, paracetamol provided faster pain relief to patients during the first hour, but ibuprofen showed better results at the two-hour mark.[7,9] Paracetamol has a very favorable safety profile, making it the preferred choice for those at risk of NSAIDs side effects, such as gastrointestinal or renal issues.[8]

1.2. Combination Analgesics

Combination analgesics enhance pain management beyond the effects of a single medication.[7,29] A number of studies have shown that adding caffeine (in the order of 100-130 mg) to acetaminophen or aspirin improves pain control in TTH compared to the analgesic alone.[29] The combination of aspirin (500 mg) with acetaminophen (500-1000 mg) and 65-130 mg of caffeine in headache formulations provides better results than using the same medication without caffeine.[29] This synergistic effect is thought to stem from caffeine's mild central stimulatory action and its effect on platelet aggregation.[29] The use of combination products known as "Excedrin" formulations for treating acute TTH is acceptable when patients monitor their total caffeine intake.[29]

1.3. Agents Not Recommended for Acute Use

The medical community should not use triptans and ergots for treating TTH, as these medications are ineffective for this condition.[10–12] The use of opioid analgesics for TTH treatment does not provide any benefits over NSAIDs, and these medications can lead to dependence, sedation, and medication-overuse headache; they should not be used as a standard treatment.[10–12] Most TTH attacks can be stopped by using basic treatments, which include rest, hydration, and muscle stretching, along with NSAIDs or paracetamol.[10–12]

2. Preventive (Prophylactic) Therapy

The need for preventive treatment arises when attacks start happening regularly (more than once per week or every day), and they begin to affect the quality of daily life.[1,10,11,23] The first-line prophylactic treatment for chronic TTH requires a low-dose tricyclic

antidepressant.[1,10,11,23] The strongest evidence exists for amitriptyline, as randomized controlled trials show that nightly doses of 10-25 mg of amitriptyline, which can be increased up to 75-100 mg, reduce both headache frequency and pain severity in patients with chronic TTH.[1,10,11,23] The mechanism is likely related to the enhancement of central pain inhibition and improvement of sleep.[1,11,23] The available data

do not provide enough information to compare the applications of other antidepressants, including nortriptyline and doxepin, directly.[10,11,23] The monitoring process for tricyclic antidepressants involves tracking typical side effects (dry mouth, sedation, weight gain, and orthostatic hypotension), which restrict the maximum allowed dose.[10,11,13]

2.1. Alternative Antidepressants

Other antidepressant medications have been studied as well. Research on TTH prevention is limited, but mirtazapine, as a secondary amine tetracyclic antidepressant, and venlafaxine, as a serotonin-norepinephrine reuptake inhibitor, have shown promise in small-scale trials and observational studies.[10,11,23] The preferred treatment for chronic TTH does not include classic selective serotonin reuptake inhibitors (SSRIs), such as sertraline or citalopram, because these medications show no better results than a placebo in clinical trials.[10,11,23] A patient who cannot tolerate tricyclic antidepressants should try one of these alternative antidepressants under medical supervision.[10,11,23]

2.2. Muscle Relaxants and Adjunctive Agents

The treatment plan should include muscle relaxants and other medications when myofascial pain becomes the main headache factor.[11,23] The central α_2-adrenergic agonist tizanidine serves as an example. The medication tizanidine, at doses between 2 and 4 mg taken before bedtime, helps patients sleep better while reducing neck muscle strain.[11,23] Some research indicates that this medication can help decrease the frequency of headache occurrences.[11,23] Its effect is usually additive to an antidepressant; however, sedation and dry mouth, which are common adverse effects, may limit its use.[11,23] The muscle relaxant cyclobenzaprine works like a tricyclic antidepressant when used at night, but scientific evidence supporting its effectiveness is scarce.[11,23]

2.3. Anticonvulsants and Other Preventive Agents

A few anticonvulsant medications have been explored for TTH prevention.[10,11,23] The two medications, gabapentin and topiramate, which affect neuronal excitability, have shown positive results in open-label and small controlled trials, as patients taking these medications report decreased headache occurrences.[10,11,23] Studies indicate that gabapentin doses between 1200-1800 mg daily, together with 100 mg of topiramate per day, effectively reduce both the frequency of pain episodes and the severity of pain.[10,11,23] The available evidence demonstrates that side effects (cognitive slowing or weight loss with topiramate; sedation with gabapentin) appear frequently, yet there is not enough high-quality evidence to support their effectiveness.[10,11,23] Beta-blockers and calcium-channel blockers, which belong to other migraine prophylactic classes, show no proven effectiveness for treating TTH.[10,11,23] As a result, they are seldom used in TTH management.[10,11,23]

2.4. Botulinum Toxin in Refractory Cases

Medical professionals have tried various invasive treatment methods to manage refractory chronic cases.[11,30,31] Botulinum toxin A injections into pericranial muscles have been the subject of recent trials.[30,31] The results of these studies show that Botox injections lead to minimal pain relief and a decrease in monthly headache occurrences when compared to placebo treatments.[30,31] Despite these findings, the overall quality of evidence is modest, and many experts do not regard Botox as standard therapy for TTH at this time.[11,30,31] Its use is generally reserved for cases in which multiple pharmacologic trials have failed and where the patient can tolerate the cost and injections.[11,30,31]

Non-pharmacological treatment

1. Yoga

Yoga represents an ancient practice that unites physical postures (asanas) with breathing techniques (pranayama) and meditation methods.[32] The complete system of yoga addresses both physical and mental elements, which contribute to tension-type headaches (TTH), through its focus on correct posture, muscle relaxation, and stress management.[32] Yoga practice enables people to develop body awareness, which reduces TTH-related muscle stiffness and mental pressure.[32]

Clinical research studies demonstrate that practicing yoga regularly for multiple weeks leads to a decrease in TTH symptoms in patients.[32] The research data revealed that participants experienced shorter headache duration, a decrease in pain severity, and fewer monthly headaches throughout the study duration.[32] Yoga practice delivers instant benefits through its ability to stretch, strengthen muscles, and improve posture.[32] The treatment leads to better mood, enhanced well-being, and reduced anxiety symptoms in patients.[32] The current evidence only shows short-term benefits.[32] Researchers have not established whether yoga program results continue after the program ends, since most studies lack extended follow-up

periods.[32] The research indicates that yoga serves as a safe additional treatment for TTH that does not cause any major side effects.[32]

2. Transcutaneous Electrical Nerve Stimulation

The non-invasive therapy known as Transcutaneous Electrical Nerve Stimulation (TENS) uses surface electrodes to deliver gentle electrical currents through the skin.[14,15] The medical field employs TENS therapy to manage various pain conditions, including TTH.[14,15] The gate-control mechanism enables TENS to decrease pain by activating large-diameter sensory nerve fibers, which block nociceptive signals from reaching the central nervous system.[14,15] The body releases more endogenous opioids, including endorphins and enkephalins, during this process, which helps to reduce pain perception.[14,15]

TENS therapy might be helpful for TTH patients by decreasing their pain levels and sometimes decreasing their headache occurrences.[14,15] The treatment process requires patients to attach electrodes to their forehead, temples, and neck muscles during daily stimulation sessions, which should last between 15 to 30 minutes or longer.[14,15] Research studies indicate that TENS therapy, used regularly, produces better therapy outcomes than no treatment; however, the results are inconsistent.[14,15] The treatment method can reduce pain for patients who want drug-free solutions or have health issues that make medication use impossible.[14,15] The treatment has minimal side effects, which mostly occur as mild skin discomfort.[14,15] The available evidence from limited small studies suggests that TENS is suitable as a secondary treatment option for patients with TTH.[14,15]

3. Acupuncture

Acupuncture represents a traditional medical practice that requires healthcare providers to insert thin needles through specific body locations.[34,35] The medical field uses this therapy as a drugless alternative to treat TTH patients.[34,35,37] Research studies show that acupuncture leads to major decreases in headache occurrence and severity while causing minimal side effects.[33–35,37] In the two main clinical studies, acupuncture resulted in a reduction of headache days for more than half of the patients, while there was only a slight improvement in the control groups.[34,35] Research conducted in 2021 demonstrated that acupuncture therapy, when added to standard medical care, decreased the number of TTH episodes during the first few months.[33,35,36] A current randomized controlled trial showed that patients with frequent or chronic TTH achieved significant headache relief, improved depression symptoms, and enhanced life quality through six weeks of acupuncture treatment.[38] While more studies are essential to confirm the long-term benefits, all evidence suggests that acupuncture treatment brings substantial relief to headache symptoms and reduces the number of attacks in most TTH patients.[33–37]

4. Myofascial Trigger Points

Myofascial trigger points (MTrPs) exist as painful nodules that develop in tight muscle bands that become hyperirritable.[16,23–25] In TTH patients, they tend to occur in the neck, shoulder, and scalp muscles.[16,23–25] The application of pressure to these specific areas induces pain that often follows the exact pattern of the patient's headache symptoms.[16,23–25] The peripheral muscular component of TTH is believed to maintain the tension and referred pain that characterizes this condition.[16,23–25]

The main goal of MTrP treatments involves creating muscle relaxation in the affected areas. Manual therapies, which combine massage, stretching, and trigger point pressure release techniques, enable patients to experience decreased muscle stiffness and reduced headache frequency.[16,17,20,39] Research findings indicate that trigger-point massage has a limited impact on headache severity and attack duration.[16,20,39,40]

5. Exercise Therapy

Exercise programs that include strength training and aerobic conditioning can lower the symptoms of TTH.[4,19–22] These activities improve muscle strength, blood flow, and reduce the neck and shoulder tension that often triggers headaches.[19,21,22,28] Clinical reviews show that exercise reduces the pain intensity, frequency, and duration.[4,19,21] For that reason, the guidelines often suggest exercise therapy for TTH management.[10,14,15,21]

6. Lifestyle Modifications

Lifestyle modifications are essential for the effective treatment of patients who suffer from TTH.[3,14,15] It is crucial to establish correct sleep patterns, as sleep deprivation leads to more severe headache symptoms.[3,27] Patients need to maintain regular eating schedules and proper hydration.[3,14] The management of stress plays a vital role in headache prevention, as it helps to reduce muscle tension in the neck and scalp area.[3,14] To avoid neck strains, it is important to stay away from long periods of sitting and maintain an ergonomic body position during work.[19,21,22,28] The implementation of these lifestyle changes results in major decreases in both headache occurrence and severity.[3,14,15,24]

7. Psychotherapy

People who experience severe stress, anxiety, or any significant mood disorders should choose psychotherapy as one of their primary treatment options.[3,14,15] The therapeutic methods of cognitive-behavioral therapy (CBT) and its derivatives help patients learn effective stress and pain management techniques.[14,15] Studies have demonstrated that people who receive CBT or mindfulness programs experience better pain reduction and disability improvement than patients on drug-based medical treatment.[14,15]

8. Patient Education

Education provides an essential foundation for TTH treatment.[1,10,12,14] Patients need to recognize TTH as a long-term condition, which requires their active involvement in self-care.[1,3,14] The key is to identify and manage specific pain triggers, which include poor posture, bad eating habits, sleep issues, and stress.[3,14,15] To avoid drug-related adverse effects, understanding the difference between preventive measures and acute pain relief is crucial; professionals need to provide patients with specific guidance about medication dosage and administration.[10,12,14] Condition awareness and lifestyle changes can improve headache management and quality of life for all people who suffer from TTH.[3,14,24]

Discussion

This review demonstrates that tension-type headache (TTH) exists as a common condition, which derives from complex interactions between peripheral and central nervous system mechanisms.[1,2,11,23] Research findings show that patients can achieve major symptom relief through treatment approaches that sometimes extend beyond medication alone and take into account headache occurrence, possible triggers, and personal treatment preferences.[3,14,15]

The pharmacological evidence confirms that basic pain medications serve as the primary treatment for acute headache management.[7–9] Patients who suffer from episodic TTH can find short-term pain relief through nonsteroidal anti-inflammatory drugs and acetaminophen; however, combination products provide additional benefits.[7,8,29] The risk of using too much medication and the adverse effects of long-term exposure require limits on intake and focused patient education.[10,12,23,25] Medications that lack clear benefits for TTH patients, especially triptans, ergots, opioids, beta-blockers, or calcium-channel blockers, should be avoided to minimize unnecessary risks of adverse effects.[10–12,23]

Low-dose tricyclic antidepressants, particularly amitriptyline, should be used as the initial preventive treatment for patients who experience frequent or chronic TTH.[1,10,11,23] Other medication choices, including alternative antidepressants, muscle relaxants, anticonvulsants, and botulinum toxin injections, may be beneficial in carefully selected patients, but supporting data is quite limited and mostly depends on small, heterogeneous studies.[10,11,30,31] Healthcare providers need to reserve these agents for patients who do not respond to or cannot tolerate tricyclic treatment, with close monitoring for adverse effects.[10,11,13]

The reviewed non-pharmacological interventions follow a biopsychosocial model of tension-type headache understanding.[1,14,15] The treatment plan includes yoga, exercise therapy, acupuncture, lifestyle changes, and myofascial trigger point-directed techniques, which allow patients to decrease their musculoskeletal tension and enhance their posture.[16,19,21,38] Transcutaneous electrical nerve stimulation serves as a pain management tool without the use of medication.[14–16] Psychotherapy, through cognitive-behavioral methods, helps to manage stress, depression, or anxiety and improves coping skills, which commonly occur in chronic TTH.[3,14] The research indicates that patients achieve better results when they receive combined behavioral and physical therapy treatment, along with medication, compared to using either therapy alone.[14,16,17]

The clinical evidence supports a treatment plan that consists of multiple stages of professional care.[1,10,11,23] The first and most important step is teaching patients about their TTH condition to help them identify their personal triggers and introduce lifestyle changes, including regular sleep, proper hydration, and ergonomic adjustments.[3,21] Acute pharmacological treatment using simple analgesics can then be added to this foundation as necessary.[7–9] Professionals need to provide patients with specific guidance about drug dosage and administration.[10,12,25] When headaches occur frequently or interfere with daily life, the treatment plan should include preventive medication, along with physical therapy, yoga, or acupuncture, and other non-pharmacological methods.[10,14,16,34] The treatment of depression, anxiety, and sleep disorders needs to occur simultaneously with pain management, as it usually stops the process of pain escalation.[3,14]

The high rates of TTH and multiple simple treatment options make them suitable for systematic integration into primary care and occupational health settings.[1,2,12,24] Medical staff must educate

themselves in recognizing acute and chronic TTH to avoid medication overuse or ineffective treatment strategies.[10–12,23] Future research should focus on high-quality and long-term clinical trials to clarify the best combinations of pharmacological and non-pharmacological treatment approaches for personalized care in TTH patients.[2–4,34]

Conclusions

Tension-type headache (TTH) is the leading primary headache disorder, characterized by mild to moderate pain that affects most people during their lifetime. This review shows TTH as a complex condition that results from peripheral (musculoskeletal) and central (nervous system) factors, as well as psychological elements and lifestyle influences. Effective TTH management often requires a specific approach, which includes personalized care and multiple treatment elements.

The treatment of acute attacks relies on nonsteroidal anti-inflammatory drugs and acetaminophen as the first-line medications; when used correctly, they provide sufficient relief for most patients. Frequent or chronic headaches require low-dose tricyclic antidepressants, starting with amitriptyline for prevention; other antidepressants, muscle relaxants, anticonvulsants, and botulinum toxin serve as alternatives for patients who do not respond to standard treatment. Clinicians must monitor the risk of medication overuse throughout all treatment stages and select medications that provide effective relief without causing adverse reactions or permanent complications.

Non-pharmacological interventions are an important part of TTH treatment, enabling patients to manage their pain and individual risk factors. Yoga, exercise therapy, acupuncture, and myofascial trigger point-directed techniques work to reduce musculoskeletal tension and improve posture. Psychological interventions help TTH patients handle stress, control their emotions, and learn effective coping techniques. Basic lifestyle changes and educational guidance are essential for patients to become active participants in their healthcare and maintain their treatment results in the long run.

The best treatment for TTH requires both pharmacological and non-pharmacological methods, which address all factors contributing to TTH. The most effective care involves a patient-focused approach that combines acute pain management, preventive therapy, behavioral and physical interventions, and continuous education to minimize headache occurrence and improve quality of life for the many people affected by this common disorder.

Author's Contribution

Conceptualization: Klaudia Martyna Patrzykąt

Methodology: Klaudia Martyna Patrzykąt, Anastazja Orłowa, Kamil Turlej, Aleksandra Oparcik, Anita Pakuła

Formal analysis: Klaudia Martyna Patrzykąt, Julia Pawłowska, Kinga Szyszka, Laura Kurczoba

Investigation: Marta Cieślak, Aleksandra Oparcik, Anastazja Orłowa, Kamil Turlej, Anita Pakuła

Writing-rough preparation: Julia Pawłowska, Kinga Szyszka, Laura Kurczoba

Writing-review and editing: Klaudia Martyna Patrzykąt, Anna Baranowska, Marta Cieślak

Supervision: Klaudia Martyna Patrzykąt

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REFERENCES

1. de Tommaso M, Fernández-de-Las-Penas C. Tension type headache. Curr Rheumatol Rev. 2016;12(2):127–39. doi: 10.2174/1573397112666151231113625
2. GBD 2016 Headache Collaborators. Global, regional, and national burden of migraine and tension-type headache, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. Lancet Neurol. 2018;17(11):954–76. doi: 10.1016/S1474-4422(18)30322-3
3. Ashina S, Buse DC, Bjorner JB, Bendtsen L, Lyngberg AC, Jensen RH, et al. Health-related quality of life in tension-type headache: a population-based study. Scand J Pain. 2021;21(4):778–87. doi: 10.1515/sjpain-2020-0166
4. Pan LLH, Ling YH, Wang SJ, Al-Hassany L, Chen WT, Chiang CC, et al. Hallmarks of primary headache: part 2 – tension-type headache. J Headache Pain. 2025;26(1):164. doi: 10.1186/s10194-025-02098-w
5. Olesen J. Classification of migraine and tension-type headache. Cephalalgia. 2023;43(4):3331024221139238. doi: 10.1177/03331024221139238
6. Onan D, Younis S, Wellsgatnik WD, Farham F, Andruškevičius S, Abashidze A, et al. Debate: differences and similarities between tension-type headache and migraine. J Headache Pain. 2023;24(1):92. doi: 10.1186/s10194-023-01614-0
7. Xie R, Li J, Jing Y, Tian J, Li H, Cai Y, et al. Efficacy and safety of simple analgesics for acute treatment of episodic tension-type headache in adults: a network meta-analysis. Ann Med. 2024;56(1):2357235. doi: 10.1080/07853890.2024.2357235
8. Stephens G, Derry S, Moore RA. Paracetamol (acetaminophen) for acute treatment of episodic tension-type headache in adults. Cochrane Database Syst Rev. 2016;2016(6):CD011889. doi: 10.1002/14651858.CD011889.pub2
9. Alnasser A, Alhumrran H, Alfehaid M, Alhamoud M, Albunaian N, Ferwana M. Paracetamol versus ibuprofen in treating episodic tension-type headache: a systematic review and network meta-analysis. Sci Rep. 2023;13(1):21532. doi: 10.1038/s41598-023-48910-y
10. Ghadiri-Sani M, Silver N. Headache (chronic tension-type). BMJ Clin Evid. 2016;2016:1205.
11. Ertsey C, Magyar M, Gyüre T, Balogh E, Bozsik G. [Tension type headache and its treatment possibilities]. Ideggyogy Sz. 2019;72(1–2):13–21. doi: 10.18071/isz.72.0013
12. Florczyk S, Elliott T, Lawrence K, Penwell-Waines L, Robes C. Headache treatment options. J Am Board Fam Med. 2024;37(4):737–44. doi: 10.3122/jabfm.2023.230450R1
13. Belyaeva II, Subbotina AG, Eremenko II, Tarasov VV, Chubarev VN, Schiöth HB, et al. Pharmacogenetics in primary headache disorders. Front Pharmacol. 2021;12:820214. doi: 10.3389/fphar.2021.820214
14. Probyn K, Bowers H, Mistry D, Caldwell F, Underwood M, Patel S, et al. Non-pharmacological self-management for people living with migraine or tension-type headache: a systematic review including analysis of intervention components. BMJ Open. 2017;7(8):e016670. doi: 10.1136/bmjopen-2017-016670
15. Beier D, Callesen HE, Carlsen LN, Birkefoss K, Tómasdóttir H, Würtzen H, et al. [Non-pharmacological treatment of migraine and tension-type headache]. Ugeskr Laeger. 2022;184(5):V08210646.
16. Repiso-Guardeño A, Moreno-Morales N, Armenta-Pendón MA, Rodríguez-Martínez MDC, Pino-Lozano R, Armenta-Peinado JA. Physical therapy in tension-type headache: a systematic review of randomized controlled trials. Int J Environ Res Public Health. 2023;20(5):4466. doi: 10.3390/ijerph20054466
17. Del Blanco Muñiz JA, Zaballos Laso A. [Tension-type headache. Narrative review of physiotherapy treatment]. An Sist Sanit Navar. 2018;41(3):371–80. doi: 10.23938/ASSN.0379
18. Álvarez-Melcón AC, Valero-Alcaide R, Atín-Arratibel MA, Melcón-Álvarez A, Beneit-Montesinos JV. Effects of physical therapy and relaxation techniques on the parameters of pain in university students with tension-type headache: a randomised controlled clinical trial. Neurologia (Engl Ed). 2018;33(4):233–43. doi: 10.1016/j.nrl.2016.06.008
19. Varangot-Reille C, Suso-Martí L, Romero-Palau M, Suárez-Pastor P, Cuenca-Martínez F. Effects of different therapeutic exercise modalities on migraine or tension-type headache: a systematic review and meta-analysis with a replicability analysis. J Pain. 2022;23(7):1099–122. doi: 10.1016/j.jpain.2021.12.003
20. Cumplido-Trasmonte C, Fernández-González P, Alguacil-Diego IM, Molina-Rueda F. Manual therapy in adults with tension-type headache: a systematic review. Neurologia (Engl Ed). 2021;36(7):537–47. doi: 10.1016/j.nrleng.2017.12.005
21. Río CJPD, Monti-Ballano S, Lucha-López MO, Hidalgo-García C, Tricás-Moreno JM. Effect of exercise on chronic tension-type headache and chronic migraine: a systematic review. Healthcare (Basel). 2025;13(13):1612. doi: 10.3390/healthcare13131612
22. Choi W. Effect of 4 weeks of cervical deep muscle flexion exercise on headache and sleep disorder in patients with tension headache and forward head posture. Int J Environ Res Public Health. 2021;18(7):3410. doi: 10.3390/ijerph18073410

23. Repiso-Guardeño Á, Moreno-Morales N, Labajos-Manzanares MT, Rodríguez-Martínez MC, Armenta-Peinado JA. Does tension headache have a central or peripheral origin? Current state of affairs. Curr Pain Headache Rep. 2023;27(11):801–10. doi: 10.1007/s11916-023-01179-2
24. Fernández-de-Las-Peñas C, Cook C, Cleland JA, Florencio LL. The cervical spine in tension type headache. Musculoskelet Sci Pract. 2023;66:102780. doi: 10.1016/j.msksp.2023.102780
25. Astrup J, Gyntelberg F. Tension-type headache and low back pain reconsidered. Front Neurol. 2022;13:912348. doi: 10.3389/fneur.2022.912348
26. Neumeier MS, Pohl H, Sandor PS, Gut H, Merki-Feld GS, Andrée C. Dealing with headache: sex differences in the burden of migraine- and tension-type headache. Brain Sci. 2021;11(10):1323. doi: 10.3390/brainsci11101323
27. Singh AH, Bathla M, Gupta P, Bhusri L. Quality of sleep and disability associated with headache: migraine versus tension-type headache: a comparative study. Ann Afr Med. 2023;22(1):11–17. doi: 10.4103/aam.aam_241_21
28. Park SH, Oh YJ, Lee MM. Improving function and quality of life in patients with chronic neck pain, tension-type headache, and forward head posture: the role of eyeball exercise and cervical stabilization programs. Med Sci Monit. 2024;30:e944315. doi: 10.12659/MSM.944315
29. Lipton RB, Diener HC, Robbins MS, Garas SY, Patel K. Caffeine in the management of patients with headache. J Headache Pain. 2017;18(1):107. doi: 10.1186/s10194-017-0806-2
30. Wieckiewicz M, Grychowska N, Zietek M, Wieckiewicz G, Smardz J. Evidence to use botulinum toxin injections in tension-type headache management: a systematic review. Toxins (Basel). 2017;9(11):370. doi: 10.3390/toxins9110370
31. Dhanasekara CS, Payberah D, Chyu JY, Shen CL, Kahathuduwa CN. The effectiveness of botulinum toxin for chronic tension-type headache prophylaxis: a systematic review and meta-analysis. Cephalalgia. 2023;43(3):3331024221150231. doi: 10.1177/03331024221150231
32. Anheyer D, Klose P, Lauche R, Saha FJ, Cramer H. Yoga for treating headaches: a systematic review and meta-analysis. J Gen Intern Med. 2020;35(3):846–54. doi: 10.1007/s11606-019-05413-9
33. Hu J, Wang X, Jia S, Kong L, Wang Y, Xin X, et al. Acupuncture and related therapies for tension-type headache: a systematic review and network meta-analysis. Front Neurol. 2023;14:1194441. doi: 10.3389/fneur.2023.1194441
34. Linde K, Allais G, Brinkhaus B, Fei Y, Mehring M, Shin BC, et al. Acupuncture for the prevention of tension-type headache. Cochrane Database Syst Rev. 2016;2016(4):CD007587. doi: 10.1002/14651858.CD007587.pub2
35. Zhu D, Xu W, Mao Q, Zhong G, Chen R, Jiao L. A bibliometric analysis of acupuncture treatment of tension-type headache from 2003 to 2022. J Pain Res. 2023;16:1647–62. doi: 10.2147/JPR.S409120
36. Kang WL, Xiao XJ, Fan R, Zhong DL, Li YX, She J, et al. Acupuncture for tension-type headache: a systematic review and meta-analysis of randomized controlled trials. Front Neurol. 2023;13:943495. doi: 10.3389/fneur.2022.943495
37. Turkistani A, Shah A, Jose AM, Melo JP, Luenam K, Ananias P, et al. Effectiveness of manual therapy and acupuncture in tension-type headache: a systematic review. Cureus. 2021;13(8):e17601. doi: 10.7759/cureus.17601
38. Schiller J, Niederer D, Kellner T, Eckhardt I, Egen C, Zheng W, et al. Effects of acupuncture and medical training therapy on depression, anxiety, and quality of life in patients with frequent tension-type headache: a randomized controlled study. Cephalalgia. 2023;43(1):3331024221132800. doi: 10.1177/03331024221132800
39. Azhdari N, Kamali F, Vosooghi O, Petramfar P, Rahimijaberi A. The effect of manual therapies on tension-type headache in patients who do not respond to drug therapy: a randomized clinical trial. J Man Manip Ther. 2023;31(4):246–52. doi: 10.1080/10669817.2022.2107446
40. Satpute K, Bedekar N, Hall T. Effectiveness of Mulligan manual therapy over exercise on headache frequency, intensity and disability for patients with migraine, tension-type headache and cervicogenic headache – a protocol of a pragmatic randomized controlled trial. BMC Musculoskelet Disord. 2021;22(1):243. doi: 10.1186/s12891-021-04105-y