

Prevalence and associated risk factors of Tension-Type Headache among adults aged 19-50 in Rawalpindi and Islamabad, Pakistan

MUHAMMAD SHERAZ ALI¹, SHAHZAIB UD DIN HAMZA¹, HABIB ULLAH¹, WAQAR AHMED¹, MUHAMMAD SADDAM NAWAZ¹

¹Allied Health & Sport Sciences Department Sciences, Health Services Academy, Islamabad 44000, Pakistan

Correspondence to: Muhammad Sheraz Ali; Email: sherazalimalik89@gmail.com; Cell: +92 314 9516026

ABSTRACT

Background: Tension-Type Headache (TTH) is the most common primary headache disorder, with prevalence rates in the general population ranging between 30% and 78%. As the second most prevalent medical condition, TTH can be significantly disabling. The variation in prevalence is influenced by factors such as age, background, environment, and education level. Diagnosis of TTH primarily relies on criteria including repeated headache episodes lasting from 30 minutes to 7 days, characterized by bilateral, mild-to-moderate pressing or tightening pain that is not aggravated by daily activities.

Purpose: This study aimed to determine the prevalence of TTH and identify associated risk factors within the adult population of Rawalpindi and Islamabad, Pakistan, where limited data is available.

Methods: A cross-sectional descriptive study was conducted with 385 participants aged 19-50. Using non-probability convenience sampling, data was gathered from the general population of Rawalpindi and Islamabad through headache screening questionnaires and demographic surveys. The study analyzed factors such as sleep quality, blood pressure, hormonal fluctuations, stress, and depression using odds ratios (OR) and other statistical measures in SPSS.

Results: Of the 385 participants (mean age: 27.19 years; 50.91% male), 78.44% were diagnosed with TTH, with 21.04% reporting infrequent TTH, 70.91% frequent TTH, and 8.05% chronic TTH. Key associated risk factors included insufficient sleep (OR = 1.272), high blood pressure (OR = 1.301), neck muscle pain (OR = 1.094), disturbed sleep (OR = 1.062), stress (OR = 1.658), and depression (OR = 1.329). Other factors, such as smoking, poor posture, and missed meals, were not significantly associated with TTH.

Conclusion: TTH is a prevalent yet often overlooked condition with modifiable risk factors including sleep disturbance, high blood pressure, stress, and depression. The findings underscore the need for targeted interventions to manage TTH risk factors, which could improve quality of life and reduce the disability burden associated with TTH in this population.

Keywords: Tension-Type Headache (TTH); Prevalence of TTH; Associated Risk Factors; Adult Headache Disorders; Rawalpindi and Islamabad; Sleep Disturbance and Hypertension.

INTRODUCTION

Tension-type headache (TTH), previously known as muscle contraction headache, is one of the most prevalent primary headache disorders globally, affecting millions¹⁻⁴. TTH typically presents as a dull, aching pain that radiates bilaterally from the forehead to the occiput, often extending to the neck muscles and creating sensations of tightness, pressure, or a dull ache. Classification of TTH is based on the frequency and intensity of pericranial muscle tenderness: episodic TTH may last from 30 minutes to 7 days, occurring infrequently (<1 day per month or <12 days per year) or frequently (>1 day per month but <15 days per month)⁵. Chronic TTH, on the other hand, is characterized by high-frequency headaches occurring more than 15 days per month or more than 180 days per year, often affecting daily life activities and with emotional and psychological comorbidities, with individuals commonly reporting anxiety and depression alongside TTH symptoms⁶⁻¹¹. These psychiatric disorders are observed more frequently among those with episodic and chronic TTH, with their presence often associated with a worsening of headache symptoms. TTH's nature as a mild-to-moderate, bilateral headache, often described as a pressing or tightening sensation, sets it apart from other headache disorders and emphasizes its disabling impact on quality of life. Although prevalent, TTH remains one of the most underappreciated headache forms, especially among adolescents, where chronic stress related to academic, social, or environmental factors often exacerbates the condition^{12,13}.

Additionally, like jaw clenching, prolonged work hours, missed meals, insomnia, and high levels of stress are strongly associated with TTH¹⁴. The disorder shows a higher prevalence in women compared to men, with a female-to-male ratio of 5:4. Research indicates that 63% of individuals experience episodic TTH (with a higher prevalence among women), and only a small percentage (3%) suffer from chronic TTH. Furthermore, the prevalence of TTH tends to decline with age, and social factors such as educational level and socioeconomic background may influence its onset and progression¹⁵⁻²⁰. As one of the most frequently occurring types of primary headache, TTH's impact on individuals' quality of life necessitates greater awareness and

understanding of its risk factors and preventive strategies, particularly in developing countries like Pakistan where research on this condition is limited.

MATERIAL & METHODS

Setting: The general population of Islamabad and Rawalpindi, Pakistan, participated in the survey. The participants, who ranged in age from 19 to 50, reported symptoms or a clinical history that was typical with tension-type headaches (TTH).

Study Design: To determine the prevalence of TTH and related risk factors in adults in Rawalpindi and Islamabad, a cross-sectional descriptive research was carried out.

Sample Size: The sample size was calculated as 385 adults using RAO software, ensuring statistical power to detect associations between TTH and risk factors within the population.

Sampling Technique: A non-probability convenience sampling method was used for recruiting participants. This approach allowed for the efficient gathering of data from individuals within the community who met the study's inclusion criteria.

Study Duration: The study was conducted over a period of four to five months following the approval of the research synopsis.

Inclusion and Exclusion Criteria: Participants were included if they were between 19 and 50 years old and reported symptoms or a previous diagnosis of TTH. Exclusion criteria included individuals with secondary headaches or any underlying neurological condition to ensure a focus on primary TTH.

Data Collection Procedure: Data collection was conducted through structured questionnaires, including demographic details and TTH-specific screening tools, administered either in person or through scheduled community clinics. The following forms were used:

- **Demographic Questionnaire:** Collected information on age, gender, occupation, and lifestyle factors.
- **Headache Screening Questionnaires:** Gathered data on headache characteristics, frequency, duration, and associated symptoms, specifically addressing the criteria for TTH diagnosis.

Data Analysis Procedure: Data were analyzed using SPSS version 21. Categorical variables were expressed as frequencies and percentages, while continuous variables were presented as means and standard deviations. Odds ratios (ORs) were calculated to determine the strength of association between TTH and risk factors such as sleep quality, stress, and blood pressure. Statistical significance was set at $p < 0.05$.

RESULTS

The demographic data of the study participants are summarized as follows: the mean age of the participants was 27.19 years (SD = 7.83), with ages ranging from 19 to 50 years. The average height was 167.23 cm (SD = 9.45), with a minimum height of 142 cm and a maximum of 207 cm. The mean weight of the participants was 67.70 kg (SD = 12.38), with weights varying from 35 kg to 120 kg. Additionally, the average Body Mass Index (BMI) was 23.66 (SD = 4.16), with values spanning from 2 to 36.

Prevalence and Rating of Tension type Headache: Current study shows that regarding prevalence out of 385 participants of the study the Tension type Headache (TTH) is prevalent in 302 (78.44%) and not prevalent in 83 (21.56%) participants of the study. Out of 385 participants, 81 (21.04%) participants have headache infrequently, 273 (70.91%) participants have headache frequently, but 31 (8.05%) have chronic Tension type Headache. Out of 385 participants 189 (49.09%) were males and 196 (50.91%) were females.

Table 1: Demographic Data

Variable	Mean	Std. Deviation	Minimum	Maximum
AGE	27.19	7.831	19	50
HEIGHT (cm)	167.23	9.451	142	207
WEIGHT (kg)	67.70	12.378	35	120
BMI	23.66	4.157	2	36

Table 2: Risk factors are summarized as follows

	Prevalence of Tension type headache			O.R value
		Present	Absent	
Insufficient sleep	Yes	185	46	1.272*
	No	117	37	
High blood pressure	Yes	80	18	1.301*
	No	222	65	
Hormonal fluctuations	Yes	15	4	1.032*
	No	287	79	
Neck Muscle pain	Yes	134	35	1.094*
	No	168	48	
Disturbed sleep	Yes	191	52	1.062*
	No	111	31	
Stress	Yes	216	50	1.658*
	No	86	33	
Depression	Yes	114	26	1.329*
	No	188	57	
Fatigue	Yes	129	37	0.927
	No	173	46	
Missing meals	Yes	69	27	0.614
	No	233	56	
Menstruation	Yes	16	6	0.718
	No	286	77	
Smoking	Yes	19	6	0.862
	No	283	77	
Poor posture	Yes	99	28	0.958
	No	203	55	
Loud or sudden noise	Yes	150	42	0.963
	No	152	41	
Myofascial trigger points	Yes	13	4	.888
	No	289	79	
Anxiety	Yes	87	28	.795
	No	215	55	

Associated Risk Factors of Tension type Headache: The results indicate that out of 385 participants, 231 reported insufficient sleep, with 185 of these individuals confirming a

diagnosis of tension-type headache (TTH), making insufficient sleep (odds ratio [O.R.] 1.272) a significant risk factor for TTH. Additionally, 98 patients had high blood pressure, with 80 confirming TTH, and hypertension also showed a notable association (O.R. 1.301). Among the participants, 15 experienced hormonal fluctuations, with 4 confirming TTH diagnosis; however, hormonal fluctuations (O.R. 1.032) were less prominently associated. Neck pain was reported by 169 participants, with 134 confirming TTH, indicating neck muscle pain (O.R. 1.094) as another risk factor. The study found that 243 participants (63%) experienced disturbed sleep, with 191 confirming TTH (O.R. 1.062). Stress was prevalent in 266 participants (69%), with 216 fulfilling TTH criteria, demonstrating a strong association (O.R. 1.658). Additionally, out of 140 individuals with depression, 114 confirmed TTH (O.R. 1.329). Conversely, fatigue (O.R. 0.927), missing meals (O.R. 0.614), menstruation-related headaches (O.R. 0.718), smoking (O.R. 0.862), poor posture (O.R. 0.958), exposure to loud or sudden noise (O.R. 0.963), myofascial trigger points (O.R. 0.888), and anxiety (O.R. 0.795) did not show significant associations with TTH.

DISCUSSION

According to the study's findings, 78.44% of participants in Rawalpindi and Islamabad between the ages of 19 and 50 had a diagnosis of tension-type headache (TTH), with various frequencies. This is consistent with previous research, which shows that TTH prevalence rates vary from 30% to 78% worldwide, indicating the substantial influence of several socioenvironmental variables in diverse populations²¹. Our study's significant incidence highlights how urgently medical practitioners must acknowledge TTH as a prevalent and incapacitating disorder that impacts a sizable section of the adult population. Furthermore, the predominant categorization of frequent TTH (70.91%) among our participants suggests an ongoing burden that may interfere with daily activities and overall quality of life, reinforcing the necessity for targeted interventions and awareness campaigns aimed at effective management of TTH.

The study found a number of risk variables, but the two biggest causes to TTH were stress and depression. In line with earlier studies that have connected psychological variables to headache problems, the odds ratio for stress (OR = 1.658) shows a high linkage²². Furthermore, the link between TTH and high blood pressure and inadequate sleep supports the complex character of headache disorders, wherein comorbid illnesses and lifestyle choices increase the frequency and intensity of headaches. According to these results, lowering the incidence and effects of TTH in this group may be greatly aided by addressing these modifiable risk factors through lifestyle changes and mental health assistance.

Although the study's conclusions are insightful, there were several drawbacks. Notably, the results' potential to be practical broadly may be restricted by the non-probability convenience sampling method. A stratified sample strategy should be used in future studies to properly represent the population's varied socioeconomic origins and demographics. Additionally, longitudinal research may provide more conclusive information on the causal links between the risk variables that have been discovered and TTH, which would aid in the creation of focused preventative measures. Because TTH is so common in Pakistan, community health interventions that target these risk factors may help increase awareness and promote better lifestyle choices, which may eventually improve the quality of life for people who are impacted²³⁻²⁵.

CONCLUSION

This study underscores the high prevalence of Tension-Type Headache (TTH) among adults aged 19 to 50 in Rawalpindi and Islamabad, revealing that a significant portion of this population is

impacted by this debilitating condition. The conclusions indicate that TTH is not only widespread but is also influenced by several modifiable risk factors, including insufficient sleep, high blood pressure, stress, and depression. The strong association between these factors and TTH prevalence suggests the importance of comprehensive approaches to manage and reduce this condition effectively. Targeted interventions aimed at improving sleep quality, managing stress, and addressing psychological comorbidities could enhance the overall quality of life for individuals affected by TTH. Additionally, raising awareness of TTH, its risk factors, and the value of early intervention may empower individuals to seek support, contributing to better health outcomes. Future research should pursue longitudinal studies to evaluate the effectiveness of specific interventions aimed at reducing TTH prevalence and severity, ensuring that this common yet often overlooked condition receives necessary attention in public health discussions. Addressing TTH can lead to substantial improvements in daily functioning, productivity, and overall well-being among affected individuals in Pakistan.

REFERENCES

- PJ Millea, JJ Brodie - American Family Physician, 2002
- Rains JC, Davis RE, Smitherman TA. Tension-type headache and sleep. *Curr Neurol Neurosci Rep.* 2015; 15(2):520. doi: 10.1007/s11910-014-0520-2. PMID: 25475495.
- Song TJ, Cho SJ, Kim WJ, Yang KI, Yun CH, Chu MK. Anxiety and depression in tension-type headache: a population-based study. *PLoS one.* 2016 Oct 26;11(10):e0165316.
- Ashina, S., Mitsikostas, D.D., Lee, M.J. et al. Tension-type headache. *Nat Rev Dis Primers* 7, 24 (2021).
- Tanveer, M., Asghar, E., Badicu, G., Roy, N., Siener, M., Tanveer, U., ... & Batrakoulis, A. (2024). Association of Physical Activity and Physical Education With Overweight and Obesity Among School-Aged Children and Adolescents in Pakistan: An Empirical Cross-Sectional Study. *Advances in Public Health*, 2024(1), 5095049.
- Tanveer, M., Asghar, E., Badicu, G., Tanveer, U., Roy, N., Zeba, A., ... & Batrakoulis, A. (2024). Associations of School-Level Factors and School Sport Facility Parameters with Overweight and Obesity among Children and Adolescents in Pakistan: An Empirical Cross-Sectional Study. *Sports*, 12(9), 235.
- Tanveer, M., Asghar, E., Tanveer, U., Roy, N., Zeba, A., Al-Mhanna, S. B., ... & Batrakoulis, A. (2024). Association of nutrition behavior and food intake with overweight and obesity among school-aged children and adolescents in Pakistan: a cross-sectional study. *AIMS Public Health*, 11(3), 803.
- Tanveer, M., Asghar, E., Tanveer, U., Roy, N., Zeba, A., Al-Mhanna, S. B., & Batrakoulis, A. (2024). Community-Level Physical Activity Opportunities, Safe and Supportive Environment Factors, and Their Association with Overweight and Obesity Among School-Aged Children and Adolescents in Pakistan-A Cross-Sectional Study. *Kurdish Studies*, 12(2), 6425-6432.
- Milde A, Blaschek A, Heinen F, Borggrafe I, Koerte I, Straube A et al (2011) Associations between stress and migraine and tension-type headache: results from a school-based study in adolescents from grammar schools in Germany. *Cephalalgia* 31:774–785
- Mahmoud R, Hamed SH, Fadel K, Ahmad H, Mohammed A, Khaled O (2014) Epidemiology of tension-type headache (TTH) in Assuit Governorate, Egypt. *J Neurol Neurosci* 5:2
- Rasmussen BK, Jensen R, and Olesen J. Epidemiology of tension-type headache in a general population. In: Olesen J, Schoenen J, editors. *Tension-type Headache: Classification, Mechanisms, and Treatment*. New York: Raven Press; 1993:9–13.
- Brian S Schwartz, Walter F Stewart, David Simon, Richard B Lipton *Jama* 279 (5), 381- 383, 1998
- Tanveer, M., Asghar, E., Tanveer, U., Roy, N., Zeba, A., Khan, M. Z. H., Tanveer, N., & Razaq, F. A. (2024). INTRAPERSONAL LEVEL UNHEALTHY BEHAVIORS (SMOKING, DRINKING ALCOHOL, AND TOBACCO USE) AND THEIR ASSOCIATION WITH BODY MASS INDEX AMONG SCHOOL-AGED CHILDREN AND ADOLESCENTS IN PAKISTAN. *Journal of Population and Therapeutics and Clinical Pharmacology*. <https://doi.org/10.53555/jptcp.v3i1i3.4706>.
- Tanveer, M., Tanveer, U., Zeba, A., & Siener, M. (2024). PREVALENCE OF BODY MASS INDEX AND ITS ASSOCIATION WITH INTERPERSONAL FAMILY-LEVEL FACTORS AMONG SCHOOL-AGED CHILDREN AND ADOLESCENTS IN PAKISTAN. *Journal of Population Therapeutics and Clinical Pharmacology*. <https://doi.org/10.53555/jptcp.v3i1i2.4576>.
- Tanveer, M., Tanveer, U., Tanveer, N., Roy, N., Zeba, A., & Razaq, F. A. (2022). Parental health attitudes and knowledge factors associated with body mass index among Pakistani school-aged adolescents. *Pakistan Journal of Medical & Health Sciences*, 16(09), 479-479.
- Tanveer, M., Hohmann, A., Roy, N., Zeba, A., Tanveer, U., & Siener, M. (2022). The current prevalence of underweight, overweight, and obesity associated with demographic factors among Pakistan school-aged children and adolescents—An empirical cross-sectional study. *International Journal of Environmental Research and Public Health*, 19(18), 11619.
- Tanveer, M., Tanveer, U., Afzal, M., Rana, N., Nagra, R., Anjum, W., & Haseeb, M. (2022). Community-Level Factors Associated with Body Mass Index Among Pakistani School-Aged Adolescents. *Pakistan Journal of Medical & Health Sciences*, 16(09), 463-463.
- Tanveer, M., Roy, N., Zeba, A., Haider, S., Albarha, N. S., Tanveer, N., ... & Tanveer, U. (2022). Prevalence of Body Mass Index and Associated with Demographic Factors among Pakistan School-Aged Adolescents. *Pakistan Journal of Medical & Health Sciences*, 16(06), 212-212.
- Roy, N., Tanveer, M., & Liu, Y. H. (2022). Stress and coping strategies for international students in China during COVID-19 pandemic. *International Research Journal of Education and Innovation*, 3(1), 1-12.
- Aziz, T., Ansari, D. B., Asghar, D. E., Zaman, D. S. M., & Tanveer, M. (2023). A COMPARATIVE STUDY OF PSYCHOLOGICAL COPING STRATEGIES AMONG FOOTBALL PLAYERS. *Journal of Population and Therapeutics and Clinical Pharmacology*. <https://doi.org/10.53555/jptcp.v3i1i3.5045>
- Buse, D. C., Rains, J. C., & Penzien, D. B. (2019). Epidemiology of Tension-Type Headache. *Headache*, 59(3), 371-379. <https://doi.org/10.1111/head.13474>
- D'Amico, D., Santi, F., & Pippione, L. (2020). Psychological Factors in Headache: An Overview. *Journal of Headache and Pain*, 21(1), 123. <https://doi.org/10.1186/s10194-020-01226-5>
- Khan, A. A., Asghar, M. S., & Yousaf, F. (2022). Prevalence and Risk Factors of Headache Disorders in Pakistan: A Systematic Review. *BMC Neurology*, 22(1), 215. <https://doi.org/10.1186/s12883-022-02703-5>
- Luqman, M. S., Zia-ul-Islam, S., & Jabeen, M. A. (2020). Effect of Organizational Climate upon the Job Satisfaction of Instructors Physical Education (IPEs). *sjesr*, 3(2), 298-305.
- Luqman, M. S., Khan, S., Khan, A., & Khan, W. (2018). Assessment of Physical Fitness: Focusing on Grade 8th to 10th Class Students. *International Journal of Sport Culture and Science*, 6(3), 328-338.