Clinical Profile and Knowledge, Attitude and Practice of Patients Presenting with Headache

Ghimire MR,[1] Thapa M,[2] Shrestha AM,[2] Bhattrai S,[2] Ghimire S,[3] Sharma N,[2] Soti B,[4] Ashish Dutta,[2] Shrestha S,[5] Pokharel M,[2] Poudel R,[2] Thapa LJ[2]

[1]Devdaha Medical college and Research Institute,

Rupandehi, Nepal.

[2]National Neuro Center (NNC),

Kathmandu, Nepal.

[3]Universal College of Medical Sciences,

Bhairahawa, Nepal.

[4]Institute of Medicine,

Kathmandu, Nepal.

[5]The University of Queensland,

Australia.

Corresponding Author

Lekhjung Thapa

National Neuro Center (NNC),

Kathmandu, Nepal.

E-mail: drlekhjung@gmail.com

Citation

Ghimire MR, Thapa M, Shrestha AM, Bhattrai S, Ghimire S, Sharma N, et al. Clinical Profile and Knowledge, Attitude and Practice of Patients Presenting with Headache. *Kathmandu Univ Med J.* 2023;82(2):190-6.

ABSTRACT

Background

Headache disorders are among the most prevalent and disabling conditions worldwide. People, however, do not seek early advice in developing countries.

Objective

To study clinical profile of patients with headache and their existing knowledge, attitude, and practice regarding primary headaches.

Method

Descriptive cross-sectional study conducted among 196 patients. Patients were selected using purposive sampling technique fulfilling inclusion criteria. Patients were interviewed based on semi-structural headache questionnaire and data was collected from 4th October to 21st December 2021. Descriptive statistics was used for analysis and interpretation.

Result

Among 196 participants, 74% were females, 29.6% of patients were between (31 to 40) years of age. The majority were Hindu and belongs to province 3; 36.7% were homemakers, and 32.2% were literate. Migraine headache was the most common type with 14.3% reporting aura. Most reported headache within 1 to 5 years. The commonest triggers were sunlight 64.8%, crowd 54.7%, stress 39.8%, fasting state 31.7%, cold 26.3%. Almost 39% believed that headache could be a chronic neurologic disorder. Majority had knowledge of the causes, triggers, and the relieving factors. Fifty-five percent seek help of a doctor for first time, and the rest seek help of a pharmacist or self-medication. Only 19% tried to manage the headache triggers; 66.8% felt that lifestyle modification is the best treatment for headache comparing drugs.

Conclusion

Migraine headache was the commonest headache occurring at middle age group with sunlight being the most common trigger factor. Lifestyle modification was perceived to be the best for headache management.

KEY WORDS

Attitude, Clinical profile, Headache, Knowledge, Practice

INTRODUCTION

Primary headache disorders are one of the most common presentation and causes (2nd only after backpain) of chronic pain in Neurology outpatient department (OPD).[1] Headache disorders have been ranked in top ten list for Global burden disease.[1,4] Primary headache comprises of Migraine headache (MH), Tension type headache (TTH) and Trigeminal Autonomic Cephalgia [Cluster headache (CH), Paroxysmal hemicrania (PH), Short-lasting neuralgiform headache attacks with conjunctival injection and tearing (SUNCT); Hemicrania continua (HC).[1,2] Migraine and TTH are listed as one of the top causes of Years lived with disabilities in the age group 15-49 years, most productive years of life.[3]

In Nepal, 85% of the 1-year prevalence of headache is significantly higher than in India (63%).[4] In 2015, population-based survey to estimate burden of headache disorders done in Nepal, burden was found to be significantly high, mostly carried by females. MH and MOH were the most common culprits in imposing a burden at the population and individual level, respectively.[4] Despite having lifetime prevalence of 90%, primary headaches are significantly unaddressed, undermanaged, and mismanaged by treating physicians as well as patients.[5]

For this high burden that is attributed, the consultation of healthcare professionals or specialists with headache was found to be much lower than compared to other countries, which points to high demand for appropriate consultation for adequate and proper management of headache. MOH and MH are among the most debilitating headache disorders in Nepal, indicating desperate need for a proper and adequate treatment of primary headache disorders.[6-15]

METHODS

This was a descriptive, cross-sectional study conducted aiming to shed a light on the sociodemographic aspects, clinical profile, and the knowledge, attitude and practice of patients presenting with primary headache enabling the medical professionals to focus on the important aspects of headache disorders and improvement in the management practice. Patients were enrolled in the outpatient department of the National Neuro Center (NNC), Kathmandu, Nepal and were conducted from October 2021 to February 021. The sample size (N=196) was estimated using the prevalence of headache of 85% as found in the previous study by Kedar Manandhar et al. The absolute margin error of 5% with a 95% confidence interval was used.[6] The sampling technique was a non-probability purposive sampling technique. Semi structured questionnaire was developed by researchers by reviewing the previous research.[6,16] Ethical approval was obtained from institutional Review Committee of Devdaha Medical College and Research Institute (DMCRI-IRC), Bhaluhi, Rupandehi, Nepal. Patients were selected according to inclusion and exclusion criteria. Patients > 18 years of age and above, previously diagnosed with primary headache, or those with headache duration of > 15 days/month or > 4 episodes/month were included in the study whereas those with headache due to secondary causes or after trauma within last 6 months or seizure within last 7 days were excluded from the study. Before beginning the enrollment, informed consent was obtained from all participants. The questionnaire pretest was carried out among 10% of the total sample size and excluded at the final study. The questionnaire was printed in Nepali and English form and was given to the patient for review prior to enrollment. Demographic profile (age, race, religion, occupation, education, address, income, marital status), headache details (type, duration, frequency, precipitating factor, relieving factor, aggravating factor), severity of headache using migraine disability assessment score (MIDAS), associated psychiatric illness, details on drug use, patient knowledge about headache, practice and attitude towards headache. Knowledge about headache of patients was assessed in different domains like chronicity, secondary cause of headache, lifestyle modification, triggering factor, relieving factor, relation with stress, organic causes, any gender preferences. The practice and attitude towards headache were evaluated in areas such as seeking treatment, who and were with opting for lifestyle modification. Statistical analysis was done by SPSS (Statistical package for social science) version 25. Descriptive statistics was represented as Mean ± Standard deviation (SD) with 95% confidence intervals for continuous data and categorical data was depicted as frequency number.

RESULTS

The study comprised of 196 participants 145 (74%) female, 51 (26%) male with median age 34 years (27 years, 25th percentile); (45 years, 75th percentile) out of which 151 (77%) were married. Majority followed Hinduism 180, (91.8%) followed by Buddhism. Seventy-two (36.2%) of the women were homemakers, 34 (17.3%) of the total participants were self-employed, 31 (15.8%) were students and 3 (1.5%) were unemployed. Most of the participants were educated above the higher secondary level 67, (34.2%) whereas 22 (11.2%) were illiterate. Most of the participants belonged to Province 3; 121, (61.7%), only 4 (2%) were from Province 6 (Table1).

We observed that migraine headache was the most common type of headache. Of the MH, 133 (67.9%) didn't report any aura while 26 (14.3%) reported aura preceding the headache and 15 (7.7%) had unspecified headache.

Most participants reported headache for a duration of more than (1 to 5) years of time 71 (36.2%) while 38 (19.4%) had headache for more than (5 and 10) years of time, respectively. Considering frequency, 133 participants (67.9%) reported having headache for more than 4 times

Table 1. Socio-demographic Characteristics of Patients with Headache

Characteristics		Frequency	Percentage
Age	less than 20 years	19	9.7
	21 to 30 years	51	26
	31 to 40 years	58	29.6
	41 to 50 years	34	17.3
	51 years and above	34	17.3
Gender	Female	145	74
	Male	51	26
Religion	Hindu	180	91.8
	Buddhist	10	5.1
	Muslim	3	1.5
	Christian	1	0.5
	Others	2	1.0
Employment status	Self-employed	34	17.3
	Government Employees	13	6.6
	Non-government employee	43	21.9
	Homemaker	72	36.7
	Student	31	15.8
	Unemployed	3	1.5
Education	Above higher secondary	67	34.2
	Higher Secondary	49	20.4
	Secondary	40	20.4
	Literate	18	9.2
	Illiterate	22	11.2
Income	Low socioeconomic	11	5.6
	Middle socioeconomic	168	85.7
	High socioeconomic	17	8.7
Marital status	Single	44	22.5
	Married	151	77
	Widow	1	0.5

a month. Similarly, 149 (76%) participants reported the multiple triggers that precipitated their headache. Sunlight 96 (64.8%), crowd 81 (54.7%), stress 59 (39.8%), fasting 47 (31.7%), and cold 39 (26.3%) were the most common triggers. Sleep deprivation and smell were also found to precipitate headache in some participants. Light 74, (56.4%), sound 105 (80.1%) and physical activity 65 (49.6%) were found to aggravate headache in 131 (66.8%) participants. Medications 121 (64%) and Rest 113 (59.8%) relieved headaches in majority of the participants 189 (96.4%) whereas only 7 (3.6%) participants found to no relieving factors for their headache. According to the MIDAS score 22 (11.2%) participants had severe disability (Grade IV) (Table2).

Prophylactic medication was used in 116 (59.2%) participants either now or at some point of their treatment

Table 2. Clinical Profile of Patients with Headache

Clinical profile		Frequency	Percentage
Type of headache (Q1)	Migraine without aura	133	67.9
	Migraine with aura	28	14.3
	Tension type headache	10	5.1
	Cluster headache	1	0.5
	Medication overuse headache	8	4.1
	Trigeminal neuralgia	1	0.5
	Unspecified headache	15	7.7
Headache duration (years) (Q2)	≤ 1	49	25
	>1 to 5	71	36.2
	>5 to 10	38	19.4
	> 10	38	19.4
Headache frequency per month (Q3)	< 4	54	27.6
	4	9	4.6
	> 4	133	67.9
Precipitating factors (Q4) (n=149)	Sunlight	96	64.4
	Fasting	47	31.5
	Crowd	81	54.3
	Food	12	8
	Stress	59	39.5
	Smell	10	6.7
	Sleep disturbance	9	6
	Humidity	8	5.4
	Cold	39	26.2
	None	47	24
Aggravating factors (Q5) (n=131)	None	65	33.2
	Light	74	56.4
	Sound	105	80.1
	Activity	65	49.6
Relieving factors (Q6) (n=189)	None	7	3.6
	Rest	113	59.8
	Absence of light	6	3.2
	Absence of sound	5	2.6
	Medications	121	64
	Others	4	2.1
Cold/hot compression Oil massage Cold medication			
Pre-treatment MIDAS grade (Q7)	Grade I	121	61.7
	Grade II	28	14.3
	Grade III	25	12.8
	Grade IV	22	11.2

course. The most prescribed prophylactic drug was tricyclic antidepressant (Amitriptyline; 91 (74.4%) followed by beta blocker (Propranolol; 25 (21.1%). Other reported prophylactics were serotonin norepinephrine reuptake inhibitor (SNRI)/selective serotonin receptor inhibitor (SSRI), calcium channel blocker (CCB), anticonvulsants, and others (Pregabalin, Atypical antipsychotics etc.).

Abortive medications were not necessary in 42 (36.2%) participants while taking prophylactic medications while 29 (25%) participants still reported the need for abortive medication every time they suffered a headache despite taking prophylactic medications, 153 (78%) participants used abortive medications and the most abortive used was Non-Steroid Anti-Inflammatory Drugs (NSAIDs) 80 (52.3%) followed by Acetaminophen 54 (35.3%) and Triptans 28 (18.3%), Opioids 27 (17.6%) (Table 3).

Table 3. Usage of Medications among Patients with Headache

Usage of medications		Frequency	Percentage
Prophylactic medications (n=116)	TCA (Amitriptylin)	91	74.4
	Beta blocker (Propranolol)	25	21.5
	SNRI/SSRI	21	18.1
	CCB (Flunarizine)	7	6
	Anticonvulsants		
	Valproate	7	6
	Topiramate	17	14.6
	Others	10	8.6
	Atypical antidepressants Atypical antipsychotics Pregabalin Benzodiazepine Cinnarizine	1 3 3 5 1	
Medication source (Q11) (n=118)	.00	78	38.2
	Self-administered	1	0.8
	Local practitioner prescription	1	0.8
	Neuro specialist prescription	116	98.3
Abortive medicines (Q12) (n=153)	NSAIDs	80	52.3
	Acetaminophen	54	35.3
	Opioids	27	17.6
	Triptans	28	18.3
	Ergotamine	1	0.6
	None	43	22
	Others Cold medication	1	0.6
	none		
Need for abortive medications while on prophylaxis? (Q15) (n=116)	.00	80	40.8
	every time	29	25
	more than half of the time	7	6
	less than half of the time	38	32.7
	never	42	36.2

Knowledge

Report revealed that 77 (39.3%) participants believed that headache could be a chronic neurologic disorder with 180 (91.8%) participants thought that hypertension was one of the causes of headache. Furthermore, 181 (92.3%) participants were aware of predisposing factors to headache. Similarly, 191 (97.4%) were convinced that stress caused headaches. Similarly, 157 (80.1%) believed that lifestyle modifications played a role in headache control, but only 19 (9.7%) believed that vascular disturbance and abnormal brain function are the cause of migraine. Result showed 64 (32.7%) participants were acquainted with Medication overuse headache and 113 (57.7%) participants were convinced that headache was more prevalent in female compared to male due to hormonal influence (Table 4).

Table 4. Knowledge of Patients with Headache

Knowledge questions (Q17)	Response	Frequency	Percentage
Is headache a chronic neurologic disease?	Yes	77	39.3
Can HTN cause Headache?	Yes	180	91.8
Does headache have predisposing factors?	Yes	181	92.3
Can headache be reduced with lifestyle adjustments?	Yes	157	80.1
Does medication overuse itself cause another headache?	Yes	64	32.7
Can stress cause headache?	Yes	191	97.4
Does vascular disturbance and anomalous brain function cause migraine?	Yes	19	9.7
Do women have higher prevalence of headache?	Yes	113	57.7

Attitude

Considering the attitude of the patients towards headache, 108 (55%) of the participants would consult a doctor for recurrent headache, while 18 (9.2%) would seek the help of a pharmacist and 7 (35.7%) would choose to self-medicate for the same. Likewise, 116 (59.2%) were willing to try lifestyle modifications before trying drugs for their headache and 185 (94.4%) would go for frequent follow-up for the treatment of their headache. Very few participants 24 (12.2%) had never tried any measures to relieve their headache and 19 (9.7%) tried avoidance of triggers, majority 109 (55.6%) tried only medications. Other measures adopted were yoga/meditation 21 (10.7%), exercise 18 (9.2%) and ayurvedic/alternative medications 5, (2.6%) (Table 5).

Table 5. Attitude of Patients with Headache

Attitude questions (Q18)	Response	Frequency	Percentage
If you have a recurrent headache, what would you do?	Consult a doctor	108	55
Go to the pharmacist for help	18	9.2	
Take NSAIDs by yourself	70	35.7	
Would you try lifestyle modifications before trying drugs for your headache?	Yes	116	59.2
Would you be able to go for frequent follow up for treatment of your headache?	Yes	185	94.4

Practice

Regarding practice on headache management, 107 (54.6%) participants reported to have been diagnosed with Migraine at some point of time. The majority (66.8%) are convinced that lifestyle modification is the best treatment for headaches compared to drug treatment. Similarly, 183 (93.4%) would recommend consulting a doctor for headache disorders. However, of the 116 (59.2%) participants who were on prophylactics, 90 (77.6%) believed that the prophylactics were beneficial for their headache. During the survey, only 27 (13.8%) participants were on their first visit to the doctor for headache. Including them, 69 (35.2%) participants had visited only one doctor for their headache and 64 (32.7%) had visited two doctors, 21 (10.7%) had visited three doctors, 18 (9.2%) had visited four doctors, and 24 (12.2%) had visited more than 5 doctors for their headaches. However, of the 169 (86.2%) participants who were not on their first visit during the survey, only 107 (63.3%) confessed to be satisfied with any treatment they had received for their headache (Table 6).

Table 6. Practice of Patients with Headache

	Response	Frequency	Percentage
Have you ever suffered from migraine?	Yes	107	54.6
	No		
Is lifestyle modification the best treatment for headache?	Yes	131	66.8
	No		
If your friend or relative is suffering from migraine, would you recommend consulting a doctor?	Yes	183	93.4
	No		
Had prophylactic medications for headache been beneficial for you? n=116	.00	80	40.8
	Yes	90	77.6
	No	26	22.4

DISCUSSION

This study found that patients who came to the hospital with headache complaint, the majority were female (74%) and the median age group 34 years ($q1= 27$; $q^2= 45$) which is quite comparable to a population-based nationwide study conducted by Manandhar et al., on the prevalence of primary headache disorder in Nepal where female participants were 59% and mean age 36.4±12.8 years.[6] Our study was not aiming for estimating the explanation of this female preponderance of headache occurrence, but it could be due adopting traditional lifestyle and high chance of having triggered factors which further explained by strongly following social and religious belief by Nepalese female.

We found that the prevalence of MH (82.2%) and CDH (10%) in our study is much higher than the mean global estimate of 14.7% and 7.7%, respectively. Similarly, TTH (5.6%), which is less than the estimated global average (40%) respectively.[18] Of the 196 patients with primary headache, MH (81.1%) was the most prevalent followed by unspecified headache (9.7%) and then TTH (5.6%). On the contrary, previous studies of prevalence in Nepal have shown the prevalence of TTH to be more than that of MH.[14,17-20] The prevalence of pMOH (4.1%) and CDH (10%) in our study was also higher compared to other studies.[6,14,18-20] However, the prevalence of pMOH in our study was less compared to that of Mongolia (5.7%) and Zambia.[19,21] And unclassified headache 7.7% in our study was greater than that found in India (0.5%), Zambia (5.3%), Mongolia (1.7%) and Ethiopia (1.6%).[21-24] Since our study is hospital-based study, our study found higher prevalence of migraine headache just because migraine is the most debilitating type of headache which last longer than one day and give feeling of impending doom with the association of nausea and vomiting that compels patient for seeking medical help.

Almost half, 103 (52.6%) participants reported having more than one precipitating factor as supported by previous study.[25,26] Most reported triggering factors in our study was Sunlight (64,8%) and followed by Crowd (54.7%), Stress (39.8%), Fasting (31.7%) and cold (26.3%). These factors are also commonly reported in previous studies. However, in most previous studies, stress is the most reported triggering factor.[27] In this 21st century, the modern lifestyle is quite different from the traditional one, from the childhood we were raised by an ambitious life where stress is considered as part of life, which could explain why stress is not a major triggering factor.

Regarding knowledge about headache, majority participants have knowledge about headache and its association with hypertension, stress, predisposing factors, and lifestyle disorder but do not have knowledge about its association with medication overuse, chronic neurological disease and vascular and brain structural anomalous disorder. Similarly, regarding attitude towards headache, majority of population seek medical doctor if headache is recurrent, willing to change lifestyle and would go to regular follow up for treatment. Likewise, while practicing handing the headache problems, again majority participants would like to suggest their friend or relatives to visit doctors for recurrent headache, would like to adopt lifestyle changes and think being on prophylactic therapy would be beneficial for them. These findings inferred that comparing other country like Egypt, Nepalese population have better knowledge, attitude, and practice regarding primary headache.[16] This is hospital-based study, to confirm this need to do community-based studies with larger sample size.

In our patient, majority are on amitriptyline ie. Tricyclic anti-depressant followed by beta-blocker as a prophylactic medicine and use NSAIDs and acetaminophen as abortive medicine. While searching for study related with use of medication pattern in primary headache, none of the mention this with clarity.

Like other cross-sectional studies, this study had limitations. This study is a hospital-based study that could not explain the true scenario of society. Small sample size, short duration, educational level of patients and language barrier are other limitations.

The importance of these findings is its clear that patient presented with headache symptoms is common in our hospitals and prevalence of migraine type headache is quite high comparing to other national and international studies. This type of headache required a detailed history and through examination of patients by the health caregiver at hospital as most of them have trigger factor and lifestyle modification along with proper counselling and would be enough for proper management rather than prescribing medicine.

CONCLUSION

The result of this hospital-based study showed that, Migraine headache is the most common type of headache mostly in female that led patient visit to hospital occurring commonly on middle age group. Majority of patients with migraine have knowledge about its chronicity, trigger factor, and relieving factors. Almost half of them take medicine as abortive therapy and follows lifestyle modification as preventive therapy and few try avoidance of triggered factor. Although all have knowledge about seeking doctor help but practicing of hospital visit is less. So, awareness about treatment of headache is necessary.

REFERENCES

1. Mier RW, Dhadwal S. Primary headaches. Dental Clinics. 2018;62(4):611-28.
2. Headache Classification Committee of the International Headache Society (IHS). The International Classification of Headache Disorders, 3rd edition (beta version). *Cephalalgia*. 2013 Jul;33(9):629-808. doi: 10.1177/0333102413485658. PMID: 23771276.
3. Steiner TJ, Stovner LJ, Vos T. GBD 2015: migraine is the third cause of disability in under 50s. *J Headache Pain.* 2016 Dec;17(1):104. doi: 10.1186/s10194-016-0699-5. Epub 2016 Nov 14. PMID: 27844455; PMCID: PMC5108738.
4. Manandhar K, Risal A, Linde M, Steiner TJ. The burden of headache disorders in Nepal: estimates from a population-based survey. *J Headache Pain.* 2015;17(1):1-10.
5. Mateen FJ, Dua T, Steiner T, Saxena S. Headache disorders in developing countries: research over the past decade. *Cephalalgia*. 2008;28(11):1107-14.
6. Manandhar K, Risal A, Steiner TJ, Holen A, Linde M. The prevalence of primary headache disorders in Nepal: a nationwide population-based study. *J Headache Pain* [Internet]. 2015;16(1):95. Available from: https://doi.org/10.1186/s10194-015-0580-y
7. Manandhar K, Risal A, Linde M, Steiner TJ. Health-care utilization for headache disorders in Nepal: a population-based door-to-door survey. *J Headache Pain* [Internet]. 2018;19(1):116. Available from: https://doi.org/10.1186/s10194-018-0942-3
8. Takeshima T, Ishizaki K, Fukuhara Y, Ijiri T, Kusumi M, Wakutani Y, et al. Population-Based Door-to-Door Survey of Migraine in Japan: The Daisen Study. Headache: *J Head and Face Pain* [Internet]. 2004 Jan 1;44(1):8-19. Available from: https://doi.org/10.1111/j.1526-4610.2004.04004.x
9. Wang SJ, Fuh JL, Young YH, Lu SR, Shia BC. Frequency and Predictors of Physician Consultations for Headache. *Cephalalgia* [Internet]. 2001 Feb 1;21(1):25-30. Available from: https://doi.org/10.1046/j.1468-2982.2001.00138.x
10. Lipton RB, Scher AI, Steiner TJ, Bigal ME, Kolodner K, Liberman JN, et al. Patterns of health care utilization for migraine in England and in the United States. *Neurology* [Internet]. 2003 Feb 11;60(3):441. Available from: http://n.neurology.org/content/60/3/441.abstract
11. Lampl C, Buzath A, Baumhackl U, Klingler D. One-Year Prevalence of Migraine in Austria: A Nation-Wide Survey. *Cephalalgia* [Internet]. 2003 May 1;23(4):280-6. Available from: https://doi.org/10.1046/j.1468-2982.2003.00509.x
12. Lipton RB, Scher AI, Kolodner K, Liberman J, Steiner TJ, Stewart WF. Migraine in the United States. *Neurology* [Internet]. 2002 Mar 26;58(6):885. Available from: http://n.neurology.org/content/58/6/885.abstract
13. Edmeads J, Findlay H, Tugwell P, Pryse-Phillips W, Nelson RF, Murray TJ. Impact of migraine and tension-type headache on life-style, consulting behaviour, and medication use: a Canadian population survey. *Can J Neurol Sci.* 1993 May;20(2):131-7. doi: 10.1017/s0317167100047697. PMID: 8334575.
14. Yu S, Liu R, Zhao G, Yang X, Qiao X, Feng J, et al. The prevalence and burden of primary headaches in China: a population-based door-to-door survey. Headache: *The Journal of Head and Face Pain*. 2012;52(4):582-91.
15. Steiner TJ, Antonaci F, Jensen R, Lainez MJA, Lanteri-Minet M, Valade D. Recommendations for headache service organisation and delivery in Europe. *J Headache Pain* [Internet]. 2011;12(4):419–26. Available from: https://doi.org/10.1007/s10194-011-0320-x
16. Alkhudhairi OS, Alghthy AM, Hindi WSM, Alqassemi SIQ. Assessment of knowledge and attitude and practice towards migraine prevention and treatment among general population in Saudi Arabia. *Egypt J Hosp Med* [Internet]. 2018;73(4):6531–4. Available from: https://ejhm.journals.ekb.eg/article_15401.html
17. Manandhar K, Risal A, Steiner TJ, Holen A, Linde M. The prevalence of primary headache disorders in Nepal: a nationwide population-based study. *J Headache Pain* [Internet]. 2015;16(1):95. Available from: https://doi.org/10.1186/s10194-015-0580-y
18. Kulkarni GB, Rao GN, Gururaj G, Stovner LJ, Steiner TJ. Headache disorders and public ill-health in India: prevalence estimates in Karnataka State. *J Headache Pain* [Internet]. 2015;16(1):67. Available from: https://doi.org/10.1186/s10194-015-0549-x
19. Luvsannorov O, Tsenddorj B, Baldorj D, Enkhtuya S, Purev D, Thomas H, et al. Primary headache disorders among the adult population of Mongolia: prevalences and associations from a population-based survey. *J Headache Pain* [Internet]. 2019;20(1):114. Available from: https://doi.org/10.1186/s10194-019-1061-5
20. Herekar AA, Ahmad A, Uqaili UL, Ahmed B, Effendi J, Alvi SZ, et al. Primary headache disorders in the adult general population of Pakistan – a cross sectional nationwide prevalence survey. *J Headache Pain* [Internet]. 2017;18(1):28. Available from: https://doi.org/10.1186/s10194-017-0734-1
21. Mbewe E, Zairemthiama P, Yeh HH, Paul R, Birbeck GL, Steiner TJ. The epidemiology of primary headache disorders in Zambia: a population-based door-to-door survey. *J Headache Pain* [Internet]. 2015;16(1):30. Available from: https://doi.org/10.1186/s10194-015-0515-7

22. Kulkarni GB, Rao GN, Gururaj G, Stovner LJ, Steiner TJ. Headache disorders and public ill-health in India: prevalence estimates in Karnataka State. *J Headache Pain* [Internet]. 2015;16(1):67. Available from: https://doi.org/10.1186/s10194-015-0549-x

23. Luvsannorov O, Tsenddorj B, Baldorj D, Enkhtuya S, Purev D, Thomas H, et al. Primary headache disorders among the adult population of Mongolia: prevalences and associations from a population-based survey. *J Headache Pain* [Internet]. 2019;20(1):114. Available from: https://doi.org/10.1186/s10194-019-1061-5

24. Zebenigus M, Tekle-Haimanot R, Worku DK, Thomas H, Steiner TJ. The prevalence of primary headache disorders in Ethiopia. *J Headache Pain*. 2016;17(1):1–9.

25. Pellegrino ABW, Davis-Martin RE, Houle TT, Turner DP, Smitherman TA. Perceived triggers of primary headache disorders: A meta-analysis. *Cephalalgia* [Internet]. 2017 Aug 20;38(6):1188–98. Available from: https://doi.org/10.1177/0333102417727535

26. Iliopoulos P, Damigos D, Kerezoudi E, Limpitaki G, Xifaras M, Skiada D, et al. Trigger factors in primary headaches subtypes: a cross-sectional study from a tertiary centre in Greece. *BMC Res Notes* [Internet]. 2015;8(1):393. Available from: https://doi.org/10.1186/s13104-015-1390-7

27. Spierings ELH, Ranke AH, Honkoop PC. Precipitating and aggravating factors of migraine versus tension-type headache. *Headache*. 2001;41(6).