

ADDIS ABABA UNIVERSITY

COLLEGE OF HEALTH SCIENCE AND SCHOOL OF MEDICINE

DEPARTMENT OF NEUROLOGY



Utilization and outcomes of pharmacologic migraine prophylaxis: A multicenter cross-sectional study at Tikur Anbesa, Yekatit 12, and Zewditu Hospitals, Addis Ababa, Ethiopia.

BY:

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(YEAR – III)

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Acronyms and abbreviations

AAU – Addis Ababa University

CHS – College of Health Science

EF – Emotional function

HIT-6 - Headache Impact Test

MOH – Medication overuse headache

MIDAS - Migraine disability assessment test

MSQ – Migraine specific quality of questionnaire

RFR – Role function restrictive

RFP – Role function preventive

RPC – Research and publication committee

TASH – Tikur Anbesa Specialized Hospital

Operational Definition

1. Migraine: A recurrent headache with moderate to severe pain, lasting 4-72 hours.
2. Pharmacologic Preventive Therapy: Medications to reduce migraine frequency, severity, or duration.
3. HIT-6: A 6-item scale measuring headache-related disability.
4. MIDAS: A scale measuring migraine-related daily activity impairment.
5. MSQ: A tool assessing migraine's impact on quality of life.

Abstract

Background: Migraine is a common and disabling neurological disorder that significantly impacts an individual's quality of life. Globally, headache disorders rank third among causes of disability, with migraine being a leading contributor. In Ethiopia, migraine accounts for 17.7% of headache disorders, yet remains underdiagnosed and undertreated. While international studies have highlighted gaps in migraine prophylaxis, there is limited data on its utilization and effectiveness in Ethiopia. This study aims to assess the use of pharmacologic migraine prophylaxis and evaluate patient outcomes at specialized centers in Addis Ababa.

Methods: The study included migraine patients aged 18 years and older who were receiving regular follow-up care in neurology outpatient departments. Data were collected from patient records and follow-up visits between August 2024 and January 2025. A total of 90 patients were included in the analysis, after accounting for incomplete records and non-respondents. Key migraine-related variables, including attack frequency, pain severity, episode duration, and emergency room visits, were collected using structured questionnaires administered through the KoboToolbox platform. Data collection involved both in-person and phone interviews with patients. Descriptive statistics were used to analyze the data, with a p-value of <0.05 considered statistically significant.

Result: Among the 90 participants, 80% reported being prescribed migraine prophylactic medications. Of those on prophylaxis, 66.7% experienced improvements in frequency, severity, and duration of migraine attacks. Regarding treatment effectiveness, 45.8% found the prophylactic therapy very effective, 38.8% rated it moderately effective, and 15.2% found it ineffective. Treatment adherence was reported as good in 66.7% of patients, with 72.2% continuing their prescribed therapy.

Conclusion: This study demonstrates a high utilization of pharmacologic preventive therapy (80%) among migraine patients at three specialized hospitals in Addis Ababa, significantly higher than the 3-13% and 12.4% reported in international studies. Preventive therapy effectively reduced migraine frequency, duration, and severity.

1. Background

1.1. Introduction

Globally, Headache disorders are in the third rank to cause disability, with medication overuse headaches (MOH) and Migraine being the most common. In Ethiopia, Migraine headache accounts for about 17.7% of Headache disorders (1). Migraine is a common neurologic disorder often causing serious impairment to an individual (2). It is classified into chronic or episodic migraine based on the frequency of headache over the last three months. (3). The first American migraine study showed that migraine was underdiagnosed and under-treated. Migraine prevalence is substantially higher in women than in men (4).

Women encounter sex hormonal changes like withdrawal of estrogen which is associated with migraine occurrence (5). The American Prevalence and Prevention Large Population study revealed at least one-fourth of patients with migraine were candidates for preventive therapy, however only 3-13% were getting prophylactic treatment. Hence, Migraine prevention remained underutilized. The possible determinant factors could be a lack of patient awareness, challenges with appropriate patient selection, and unfamiliarity with an assessment of response to preventive therapy. The purpose of migraine prophylaxis is to decrease the severity, duration, frequency, and disability of attacks as well as to improve response to abortive treatment (6),(7).

The Available options for pharmacologic prophylactic medications include Beta blockers, anticonvulsants, and antidepressants of which first-line drugs are Propranolol, Amitriptyline, and Divalproex. The effectiveness of prophylaxis may be affected by poor adherence and unfavorable side effects such as weight gain, somnolence, and depression (8).

Indications to start prophylaxis include the following; At least four headaches per month, intolerance or severe attacks despite appropriate Abortive therapy, presence of a contraindication to acute treatment, and medication-overuse headache (9).

A narrative review explored the application of novel therapeutics targeting calcitonin gene-related peptide (CGRP) in various clinical situations, such as treatment-resistant cases, combination therapy, switching regimens, and therapy discontinuation. These treatments have

notably improved migraine management, especially for patients with challenging-to-treat migraines. Strong evidence supports the efficacy of all currently available anti-CGRP(-R) monoclonal antibodies (mAbs), including fremanezumab, galcanezumab, , erenumab and eptinezumab in individuals who have not responded to previous therapies. By directly inhibiting the CGRP pathway, these prophylactic medications offer a promising solution for refractory migraine sufferers. The flexibility to switch, combine, or discontinue CGRP-targeting treatments enables a more tailored approach to migraine care. (10)

The direct inhibition of CGRP or its receptor offers a novel preventive approach for migraine management, particularly for patients who are unresponsive to standard therapies or unable to use existing treatments, such as triptans, due to contraindications.(11)

Several migraine-specific questionnaires have been created to evaluate various aspects of episodic headache burden; however, none provide a comprehensive assessment of its overall impact. To bridge this gap, the Headache Impact Test (HIT-6) was developed in the United States to measure a wider range of headache-related effects. The HIT-6 classifies headache impact into four categories: minimal or no impact (scores of 49 or below), moderate impact (scores between 50 and 55), considerable impact (scores from 56 to 59), and severe impact (scores of 60 or higher). (12)

1.2. Statement of the problem

A cross-sectional study conducted in several headache centers in Austria showed that about one-third of migraines reported that their headaches had a detrimental effect on their careers whereas around 21.5% of patients had a negative impact on their income (13).

Studies suggest that only 13% of individuals with migraine in developing countries are diagnosed by a health-care professional. In Russia, migraine prophylaxis is offered to less than 1% of patients with migraine, despite an estimated need of 17% in the population with migraine (14).

An Italian study revealed that there is limited use of prophylactic treatment and many migraine patients do not benefit (15). It is essential to further train physicians and reinforce migraine patient information, and assess patients' drug choices to improve their treatment adherence (16).

1.3. Significance of the study

Migraine is a common disease among headache disorders that negatively affect the quality of life of an individual. In Ethiopia, There is limited data about the effectiveness of migraine prophylaxis and how many of the candidates of migraine patients are getting preventive therapy. The proportion of migraine patients on preventive therapy is not well studied. This study is crucial to identify the gaps and will serve as a major clue for clinicians to provide the best service to patients. It will also help patients with migraine to have better outcomes, follow up, and Satisfaction. This study will also serve as a reference material for the future to compare similar works in the area.

2. Literature Review

A validated self-administered headache questionnaire was employed to evaluate how migraine diagnoses and acute and preventive treatments are managed in the United States. The survey involved 85,284 women and 77,292 men. The findings revealed that the percentage of women and men who had migraine was 17.1 % and 5.6 %, respectively. This research indicated that merely 12.4% of individuals with migraine were utilizing preventive medication for their condition. Among those who were prescribed medications known to be effective for preventing migraines but did not acknowledge their use for headache management, the percentage was 17.2%. Moreover, the majority of those already on preventive therapy stopped taking their prescribed medication (17).

A retrospective cohort study was used to assess pharmacologic acute and preventive treatment patterns, including initiation time, type of drug, and duration of use in migraine patients on prophylaxis in the United States. Prescribed preventive drugs evaluated were topiramate, beta-blockers, and TCAs. The study included 107,122 patients, with 49% taking topiramate, 21%

initiating beta-blockers, and 30% initiating TCAs. Persistence with migraine prophylactic drugs was low; 81% of patients had gaps of more than 3 months in their migraine prophylaxis in the first year. The gap in therapy occurred early in treatment (mean, 95 days), and only 10% of patients restarted prophylactic therapy within that year. One year after commencing prophylaxis, two-thirds of patients were not getting any preventive therapies (18).

The PANORAMA survey aimed to fill gaps in understanding migraine healthcare practices in Germany during 2017/2018. The study was conducted across 119 specialized centers. The findings showed strong continuity in specialist care, with most patients referred to migraine specialists continuing treatment at specialized centers. Prophylactic therapy was prescribed to 41.6% of patients. Beta blockers (45.4%) and anti-epileptics (28.1%) were the most commonly used first-line prophylactic treatments. Clinical decisions to start prophylaxis were mainly influenced by the frequency and severity of migraine attacks (58.0%), with treatment choices often tailored to patients' comorbidities and physical conditions (52.1%). However, frequent therapeutic failures led to discontinuations or switches between drug classes, highlighting the challenges of maintaining effective long-term prophylaxis. (19)

A retrospective study was done in Korea to assess 1,636,105 patients with migraine regarding their disease burden receiving prophylactic medication. Following the matching process, both the prophylaxis and non-prophylaxis groups comprised 633,709 patients each. The prophylaxis group exhibited significantly increased healthcare resource utilization compared to the non-prophylaxis group, including a higher number of outpatient visits, visits to neurologists, ED visits and hospitalization. Notably, the prophylaxis group incurred significantly greater annual costs per patient than non- prophylaxis group across various categories. In conclusion, migraine sufferers undergoing at least one prophylactic treatment experienced a greater disease burden compared to those without prophylaxis. This suggests that even with migraine prevention measures, the overall impact of migraine-related challenges remains significant, emphasizing the necessity for more effective prophylaxis strategies (20)

A cross-sectional study conducted among migraineurs at two neurology referral clinics in Addis Ababa assessed the extent of disability. The study utilized the Migraine Disability Assessment

Score (MIDAS) to measure disability. The mean MIDAS score in this study was notably higher than scores reported in previous research from Turkey (19.3 ± 12.3) and Italy (12 ± 8.2). Additionally, the proportion of patients with severe disability (MIDAS score ≥ 21) was significantly greater than that reported in a similar Turkish study, where only 40% of participants experienced severe disability. In contrast, the present study reported that 74.3% of participants had severe disability, with only a small fraction experiencing mild or no disability (8.6% and 1.4%, respectively). This highlights the considerable burden of migraines on patients in the study population. When compared to findings from South Korea, where the reported MIDAS score was 54.1 ± 49.9 among chronic migraine patients, the present study's mean MIDAS score of 46.7 ± 30 aligns with the severity observed in chronic migraine cases. This study found that only 31.5% of participants were receiving prophylactic migraine treatment. Amitriptyline was the most commonly used medication (25.1%), followed by propranolol (5.9%) and imipramine (0.5%). (21)

A prospective, multicenter, non-interventional study conducted in Germany from February 2006 to December 2007 aimed to evaluate the effectiveness and tolerability of **topiramate** as a preventive treatment for episodic migraines in a general practice setting. A total of 366 patients participated, with 87% being female. They were treated with topiramate (flexible dose) for an initial six-month core phase, with an option to continue for up to 12 months during the follow-up phase. By the end of the core phase, 76% of patients experienced at least a 50% reduction in migraine frequency compared to baseline, which increased to 80% during follow-up. By the end of the study, 21% of participants were completely free of migraine attacks. (22)

A cross-sectional survey conducted in the United States and five European countries analyzed data from the 2017 Adelphi Migraine Disease Specific Program to examine patient-reported outcomes in individuals with migraines. The study compared two groups: those qualifying for preventive treatment and those not eligible, while also evaluating regional differences between the US and Europe. To measure the impact of migraines, PRO tools such as the Migraine-Specific Quality-of-Life Questionnaire and the Migraine Disability Assessment Scale (MIDAS) were utilized. Among the 5,462 participants (US: 1,373; EU: 4,089), 2,526 qualified for preventive

treatment (US: 584; EU: 1,942), while 2,936 did not (US: 789; EU: 2,147). Patients eligible for preventive treatment exhibited significantly greater disability, functional limitations, and work-related challenges ($p < 0.0001$). Notably, a higher percentage of US patients in this group (29.0%) reported reducing work hours due to migraines compared to their European counterparts (24.7%). Overall, individuals experiencing four or more migraine days per month faced a heavier disease burden, with consistent patterns observed across both regions, emphasizing the substantial impact of migraines on daily life and productivity. (23)

A systematic review and network meta-analysis aimed to compare the effectiveness of various drugs for migraine prevention. Researchers conducted a thorough search of clinicaltrials.gov, MEDLINE, CENTRAL, and EMBASE databases from their inception until August 13, 2022, to find randomized controlled trials on pharmacological treatments for migraine prophylaxis in adults. The analysis included 74 eligible trials, involving a total of 32,990 patients. The findings provided high-certainty evidence that monoclonal antibodies targeting the calcitonin gene-related peptide (CGRP) or its receptor, as well as topiramate, significantly increased the proportion of patients experiencing at least a 50% reduction in monthly migraine days compared to placebo. Moderate-certainty evidence supported the effectiveness of beta-blockers, valproate, and amitriptyline in achieving similar reductions. In terms of safety, the study found high-certainty evidence that valproate and amitriptyline were associated with a higher risk of significant adverse events leading to treatment discontinuation. Moderate-certainty evidence indicated that topiramate and beta-blockers increased the likelihood of discontinuation due to side effects. In contrast, moderate to high-certainty evidence showed that CGRP-targeting monoclonal antibodies and gepants did not contribute to an increased risk of adverse events. Among all migraine prophylactic treatments, CGRP(r)mAbs exhibited the most favorable balance of efficacy and safety, followed closely by gepants. (24)

3. OBJECTIVES

3.1. GENERAL OBJECTIVE

To determine the utilization of pharmacologic prophylaxis among migraine patients and assessment of their outcome at TASH, Y12HMC, and ZMH Addis Ababa, Ethiopia.

3.2. SPECIFIC OBJECTIVE

- To determine the utilization of pharmacologic prophylaxis among migraine patients in adults visiting Neurology OPD from July 2024 - Jan 2025 at TASH, Y12HMC, and ZMH, Addis Ababa, Ethiopia.
- To assess the outcome of migraine patients on pharmacologic prophylaxis visiting the Neurology clinic at TASH, Y12HMC, and ZMH, Addis Ababa, Ethiopia

4. Methods and materials

4.1. Study setting and period

This study took place at the Neurology clinics of Tikur Anbessa Specialized Hospital (TASH), Yekatit 12 Hospital Medical College (Y12HMC), and Zewditu Memorial Hospital (ZMH) in Addis Ababa, Ethiopia. These hospitals are major referral and teaching centers, offering specialized neurological care, including migraine management.

TASH, Ethiopia's largest referral and teaching hospital under Addis Ababa University, provides advanced clinical services delivered by internal medicine residents, neurology residents, and neurologists. Its Neurology clinic operates five days a week, offering treatment and follow-up for migraine patients.

Y12HMC serves as a key teaching and referral hospital, delivering specialized neurology services. It plays a vital role in training medical students and residents while providing comprehensive care for patients with neurological conditions, including migraines.

ZMH is one of Addis Ababa's primary public hospitals, offering both general and specialized medical services. As a teaching hospital, it contributes to medical education and research while

providing dedicated neurology care. Its Neurology clinic offers specialized consultations, treatment, and follow-up for migraine patients.

Data for this study was collected from adult migraine patients attending the Neurology clinics at these hospitals for evaluation and management.

4.2. Study Design

A cross-sectional study design will be applied

4.3. Population

4.3.1. Source Population

All Adults who have migraine headaches are under follow-up in the Neurology outpatient clinic at TASH, Y12HMC, and ZMH.

4.3.2. Study Population

All migraine patients who qualify for inclusion criteria

4.4. Eligibility Criteria

4.4.1. Inclusion Criteria

Migraine Patients who have follow up at the neurology outpatient clinic in TASH, Y12HMC, and ZMH Addis Ababa, Ethiopia.

4.4.2. Exclusion criteria

Age less than 18 years

Severe Psychiatric comorbidities

4.5. Sample size determination

Since no prior study evaluated prevalence of pharmacologic preventive therapy utilization in Ethiopia, I assume a prevalence of 50% to maximize the sample size.

The sample size is calculated using Cochran's formula :-

$n = \frac{Z^2 \cdot P(1-P)}{d^2}$ Where: n- Initial sample size Z = 1.96 (Z-score for 95% confidence level)
P = 0.5(assumed prevalence) d = 0.05 (margin of error)

$n = \frac{(1.96)^2 \times 0.5(1-0.5)}{(0.05)^2} = 384$ (sample size for a large population)

Migraine patients visits per month = (TASH=15 patients ZMH= 4 patients Y12HMC = 5 patients)

Total visits over 6 months= 144 patients

Since our population is small (144patients), it's adjusted as:-

$n = \frac{384}{1 + (384 \div 144)} = 104.74$

Considering non-respondent rate of 10% the final sample size is = **115 patients**

4.5.1 Study Period

The study was conducted on migraine patients seen at neurology OPD over the past 06 months, starting from August 2024 - January 2025.

4.6. Data Collection Procedure

4.6.1. Data Collection Tool

The data collection was conducted using Kobo Toolbox, ensuring efficient and structured data entry. The Migraine Specific Quality of Life Questionnaire (MSQ) Score , version2.1 contains 14 questions asking about how quality of life is affected by migraine in three domains; Domain-1 is Role Function Restrictive (RFR), which has seven questions about how migraine limits daily social and work activities; Domain-2 is Role function Preventive (RFP), which has four questions about how migraine prevents migraineurs from performing routine work and social activities; and Domain-3 is Emotional Function (EF), which has three components assessing emotional aspect of migraine.

The MSQ questionnaire was found to be an important way of assessing quality of life of migraine patients undergoing preventive therapy. The items in the questionnaire are answered

using scale of 6 points. The dimension scores are the total of the answers and are adjusted from 0 to 100, where higher scores mean better quality of life.

4.6.2. Data Quality Control

To support the reliability and strength of this study, data quality control is carefully ensured. There was validation check to assess the accuracy of patient reported migraine episodes, ensuring that the duration and frequency of migraine episodes align with typical patterns. In addition, there was cleaning procedure to eliminate duplicate entries and address any missing values in clinical record.

4.7. Study Variables

4.7.1. Dependent Variables

- Utilization of pharmacologic prophylaxis among migraine patients
- Outcomes of the preventive medications

4.7.2. Independent Variables

Independent variables will be age, gender, socioeconomic status, level of education, access to healthcare service, comorbidities, duration of prophylaxis, adherence, severity of the illness, quality of life, class of medication and side effects.

4.8. Data Analysis Techniques

The raw data was inputted into and assessed through SPSS Version 30. The investigator alone will handle the process of data cleaning. The data is summarized descriptively, and the outcomes are displayed through tables and figures. Frequency distribution organized the collected responses, measures of central tendency and dispersion are computed and applied to examine the study variables appropriately.

4.9. Ethical Consideration

The study obtained ethical approval from the research and publication committee (RPC) of Department of Neurology, TASH, Addis Ababa Health bureau, Zewditu memorial hospital, and Yekatit 12 hospital medical college before collecting data. The study has respected the participants' right by informing them of the purpose and importance of the study. Participants were reassured that their response would be anonymous. This study notified the clients that their involvement would be confidential and their personal information are protected. Participants were given detailed clarification that they are free to engage or not in the study and that they could leave whenever they want without compromising the treatment they get or any other legal rights.

4.10. Dissemination of Results

The findings will be shared with key stakeholders, including Addis Ababa health bureau, CHS, AAU, TASH, Department of Neurology, Yekatit 12 hospital medical college and other relevant academic institutions. Furthermore, the results will be made available to the broader scientific community through abstract presentations at a conference and by being published in a respected scholarly journal.

5. Results

5.1. Socio-demographic and economic characteristics of study participants

A total of 90 participants out of 115 patients were included in this study.. Among the participants, 25.6% were male (n = 23), and 74.4% were female (n = 67). Regarding marital status, 60% were married, 33.3% were single, and the remaining 6.7% were either divorced or widowed. Regarding educational status, 42.2% had secondary education, and 55.5% had university courses. The vast majority (90%) had a monthly income below 10,000 ETB. (Table-1)

Table 1: Frequency distribution of the study participants according to their socio-demographic and economic characteristics in TASH, Y12HMC, and ZMH, Addis Ababa, Ethiopia.

Variables	Category	Frequency	Percentage
Age of participants	18-24	11	12.2
	25-34	26	28.9
	35-44	28	31.1
	45-54	15	16.7
	55-64	6	6.7
	65-75	4	4.4
Sex of participants	Female	67	74.4
	Male	23	25.6
Marital status	Married	54	60
	Single	30	33.3
	Divorced	4	4.5
	Widowed	2	2.2
Occupation	Have no job	33	36.7
	Employed	6	6.7
	Student	13	14.4
	Others*	38	42.2
Monthly income	<5000 E Birr	40	44.4
	10000-15000 E Birr	7	7.8
	5000-10,000 E Birr	41	45.6
	15,000-20,000 E Birr	2	2.2
Educational status	No formal education	1	1.1
	Primary school	1	1.1
	Secondary school	38	42.2
	University courses	50	55.5

5.2. Clinical-related characteristics of study participants

The duration of migraine diagnosis varied, with 48.9% diagnosed for over 10 years. About 34.4% of participants had comorbidities, with hypertension, epilepsy, and depression being the most common. 43.4% of participants experienced 4 and more migraine attacks per month. (Table-2)

Table 2: Frequency distribution of the study participants according to their clinical-related characteristics in TASH, Yekatit 12 Hospital Medical College, and Zewditu Memorial Hospital, Addis Ababa, Ethiopia.

Variables	Category	Frequency (n)	Percentage (%)
Duration of diagnosis with migraine	>10 years	44	48.9
	9-10 years	3	3.3
	7-8 years	5	5.6
	6-7 years	16	17.8
	5-6 years	11	12.2
	4-5 years	9	10
	Less than 1 year	2	2.2
Comorbidity in addition to migraine	Yes	31	34.4
	No	59	65.6
Type of comorbidity in addition to migraine (n=31)	Asthma	4	12.9
	CAD	2	6.45
	Depression	4	12.9
	Epilepsy	5	16.1
	Hypertension	13	41.9
	Hyperthyroidism	1	3.22
	Stroke	2	6.45
Frequency of migraine attacks per month	Fewer than 4 times	51	56.7
	4 – 7 times	27	30
	8 – 14 times	7	7.8
	Greater than 14 times	5	5.6

5.3. Migraine prophylactic preventive therapy-related characteristics

In this study, 80% reported that their doctors prescribed prophylactic medications to decrease the frequency, severity, and duration of headaches, other than commonly used pain relievers like Panadol, diclofenac, and Advil. Among those who began prophylactic treatment, the most common reason for starting was frequent migraine attacks (29.1%), followed by Severity (20.8%), neurologist recommendation (20.8%) and both severity and frequency (13.8%).

The length of prophylactic treatment varied among patients. While 11.1% had been on prophylaxis for under six months, 41.66% continued treatment for six months to two years, and 47.1% had been on prophylaxis for more than two years. The types of medications also varied, with 69.4% of patients using Amitriptyline, 18.05% using Propranolol, and 8.3% receiving dual treatment of Propranolol and Amitriptyline. Additionally, 2.77% of patients were prescribed Sodium Valproate.

Patients reported differing levels of improvement regarding treatment effectiveness. 66.7% reported improvement in combination of frequency, duration, and severity, while 11.1% experienced a decrease in headache frequency alone, 8.3% noted reduced headache severity. Specifically assessing changes in headache frequency, 45.8% experienced a significant reduction, 36.1% reported a moderate reduction, and 18.05% noticed little to no change. When evaluating headache duration, 76.3% found their migraine attacks became shorter, while 22.2% reported no significant change, and 1.38% experienced longer migraine durations.

When rating the overall effectiveness of their current preventive therapy, 45.8% of patients found it very effective, 38.8% rated it as moderately effective, and 15.2% found it ineffective. **(Table 3)**.

Table 3: Frequency distribution of the study participants according to their Migraine preventive therapy-related characteristics in TASH, Y12HMC, and ZMH, Addis Ababa, Ethiopia.

Variables	Category	Frequency	Percentage (%)
Physicians prescribed medication to reduce headache frequency, severity, and duration, other than Panadol, diclofenac, Advil	Yes	72	80
	No	18	20
If not prescribed medications, what was the reason? (n=18)	Side effect concern	3	3.3
	Resolve by its own	1	1.1
	Lack of awareness about treatment	2	2.2
	neurologists didn't consider	1	1.1
	Residents didn't consider prophylaxis	7	7.8
If yes, what made you decide to start prophylactic treatment? (n=72)	Others	4	4.4
	Frequency of migraine attack	21	29.1
	GP recommendations	1	1.38
	Neurologist recommendations	15	20.8
	Resident recommendation	7	9.72
	Severity	15	20.8
	Severity and frequency	10	13.8
How long have you been on prophylaxis? (n=72)	Severity, frequency, and headache effect	3	4.16
	Less than one month	2	2.77
	1 –< 6 months	6	8.33
	6 – <12 months	7	9.72
	1 - <2 years	23	31.94
	2 –< 5 years	24	33.3
Which type of prophylactic treatment have you used? (n=72)	More than 5 years	10	13.8
	Amitriptyline	50	69.4
	Propranolol	13	18.05
	Amitriptyline and Propranolol	6	8.3
	Propranolol and sodium valproate	1	1.38
Have you noticed a decrease in any of the following of your migraine attacks after starting prophylactic treatment	Sodium valproate	2	2.77
	Duration	1	1.38
	Frequency	8	11.1
	Severity	6	8.3
	No change	9	12.5
What is the change in the frequency of headaches after initiation of prophylaxis?	Others*	48	66.7
	No change	13	18.05
	Reduction by less than 50%	26	36.1
Has the duration of your migraine attack changed since you began prophylactic medication?	Reduction by more than 50%	33	45.8
	No, it's the same	16	22.2
	Yes it has decreased	55	76.3
How would you rate the effectiveness of your current preventive therapy?	Yes it has increased	1	1.38
	Not effective	11	15.2
	Somewhat effective	28	38.8
	Very effective	33	45.8

*- combination of frequency, duration, severity

5.4. Migraine prophylactic therapy adherence characteristics

According to the Morisky Medication Adherence Scale (MMAS), 66.7% of participants had good adherence, while 33.3% had moderate adherence. Regarding migraine prophylactic medication, 27.8% discontinued, and 72.2% continued treatment. The most common reasons for discontinuation were side effects and physician recommendations (each 25%). Other reasons included cost, unavailability, and ineffectiveness. **(Table 4)**

Table 4: Frequency distribution of the study participants according to their Migraine prophylactic therapy adherence-related characteristics Addis Ababa, Ethiopia.

*Combinations * - Side effects and medication do not work for me*

Variables	Category	Frequency	Percentage
Ever forget to take your prophylactic medication?	Yes	24	33.3
	No	48	66.6
Ever had problems remembering to take your prophylactic medication?	Yes	23	31.9
	No	49	68.1
Feel better when sometimes stop taking your prophylactic medication?	Yes	10	13.8
	No	62	86.2
Feel worse when you stop taking prophylactic medication?	Yes	65	90.2
	No	7	9.72
Adherence categories	Modrate	24	33.3
	Good	48	66.7
Have you discontinued your prophylactic medication?	No	52	72.2
	Yes	20	27.8
If discontinued, what was the reason? (n=20)	I can't afford	1	5
	Not available	3	15
	Physician recommendation	5	25
	Side effect	5	25
	Combinations*	2	10
	Medication did not work for me	2	10
	Others	2	10
Have you experienced adverse effects while on prophylactic treatment?	Yes	9	12.5
	No	63	87.5

5.5. Prophylactic medication adverse effects and related characteristics

Most participants (82.2%) did not report adverse effects from prophylactic migraine treatment, while 17.8% did. Among those with side effects, propranolol was associated with fatigue, insomnia, depression, nausea, vomiting, paresthesia, and pruritus, with some reporting just fatigue or paresthesia. Amitriptyline use was associated with fatigue, insomnia, and blurred vision.(Table-5)

Table 5: **Frequency distribution of the study participants according to their Prophylactic medication adverse effect characteristics**

**- combination of- fatigue,depression,insomnia,nausea/vomiting,paresthesia,pruritus,bradycardia*

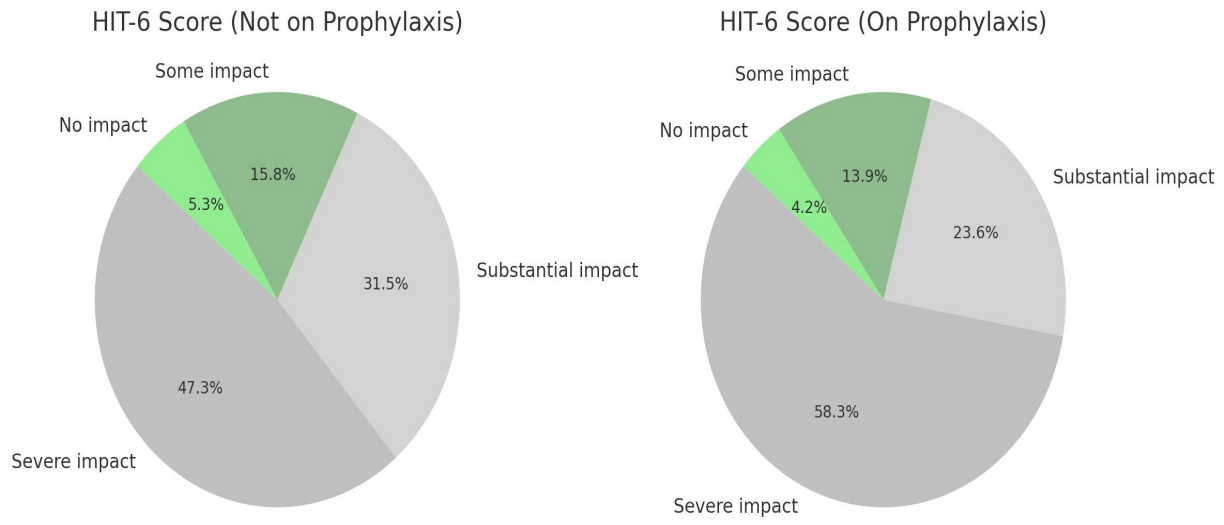
Variables	Category	Frequency	Percentage (%)
Have you experienced adverse effects while on prophylactic treatment?	Yes	16	17.8
	No	74	82.2
Propranolol, Metoprolol (Adverse effects) n = 16	Paresthesia	2	12.5
	Fatigue	5	31.25
	Bradycardia	1	6.25
	Others*	8	50
Amitriptyline, Nortriptyline (Adverse effects) n = 16	Blurred vision	3	18.75
	Fatigue	10	62.5
	Insomnia	3	18.75
Sodium Valproate (Adverse effects) n = 16	Dizziness	1	50
	Nausea and vomiting	1	50
Have you visited emergency for migraine attack after Starting prophylactic treatment? (n=72)	Yes	16	22.22
	No	56	77.78
If no, do you think that preventive treatment has affected your requirement for emergency care (n=56)	I don't know	19	33.92
	No	2	3.57
	Yes	35	62.5
If yes, how often do you visit ER for migraine despite prophylactic medication (n=15)	Frequently	1	6.25
	Occasionally	9	56.25
	Rarely	5	31.25
	Very frequently	1	6.25
Have you noticed a change in how quickly your migraines improve after treatment in the ER since starting prophylaxis? (n=16)	Yes, improves more quickly	10	62.5
	No, the same	6	37.5
	I do not know	0	0

5.6. Headache impact-related characteristics of study participants

Table 6: Frequency distribution of the study participants according to their headache impact-related characteristics in TASH, Y12HMC, and ZMH, Addis Ababa, Ethiopia.

Variables	Never n (%)	Rarely n (%)	Sometimes n (%)	Very often n (%)	Always n (%)
How often pain headache is severe	4(4.4)	6 (6.7)	53 (58.9)	20 (22.2)	7 (7.8)
How often do headaches limit the ability to do usual daily activities (household work, work, school, or social)?	3 (3.3)	10 (11.1)	45 (50)	29 (32.2)	3 (3.3)
When you have a headache, how often do you wish you could lie down?	15 (16.7)	7 (7.8)	23 (25.6)	27 (30)	18 (20)
In the past 4 weeks, how often have you felt too tired to do work or daily activities because of your headaches?	5 (5.6)	9 (10)	31 (34.4)	32 (35.6)	13 (14.4)
In the past 4 weeks, how often have you felt fed up or irritated because of your headaches?	10 (11.1)	10 (11.1)	44 (48.9)	21 (23.3)	5 (5.6)
In the past 4 weeks, how often did headaches limit your ability to concentrate on work or daily activities?	14 (15.6)	2 (2.2)	41 (45.6)	27 (30)	6 (6.7)

Figure 1 - HIT -6 Score summary for study participants (Not on prophylaxis Vs On Prophylaxis)



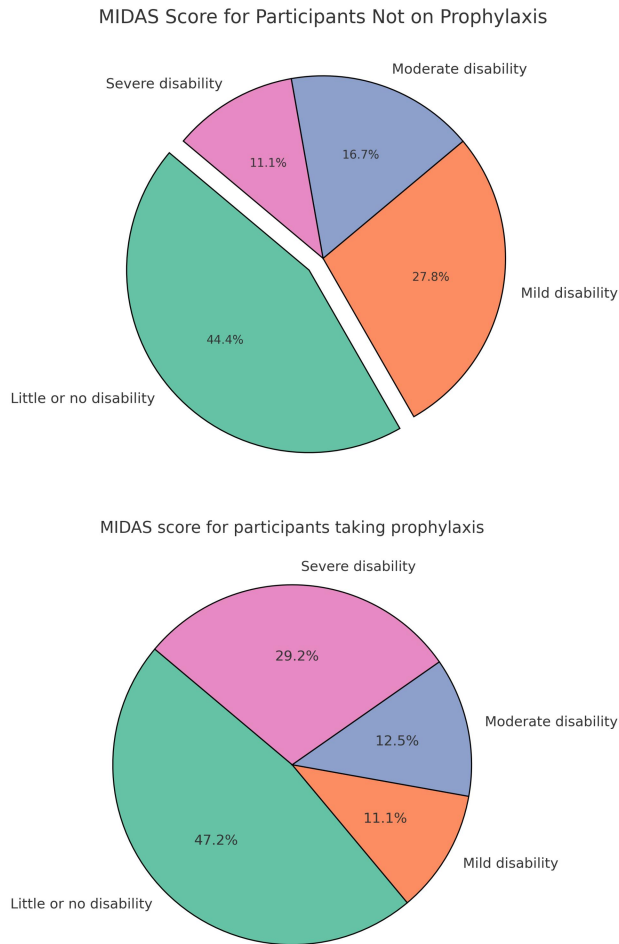
The HIT-6 assessed the impact of migraine on daily life for participants on and off prophylactic treatment. Among those on prophylaxis, 58.3% reported severe impact, 23.6% substantial impact, 13.9% some impact, and 4.2% no significant impact. For those not on prophylaxis, 50% had a severe impact, 33.3% substantial impact, 11.1% some impact, and 5.6% no impact.

5.7. Headache severity-related characteristics of study participants

Table 7: Frequency distribution of the study participants according to their headache severity-related characteristics in TASH, Yekatit 12 Hospital Medical College, and Zewditu Memorial Hospital, Addis Ababa, Ethiopia

Variables	Category	Frequency	Percentage (%)
On how many days in the last 3 months did you miss work or school because of your headaches?	Less than 15 days	76	84.4
	15 – 30 days	5	5.6
	30 – 45 days	2	2.2
	3 months	7	7.7
How many days in the last 3 months was your productivity at work or school reduced by half or more because of your headaches?	Less than 15 days	78	86.7
	15 – 30 days	5	5.6
	3 months	7	7.7
How many days in the last 3 months did you not do household work (such as housework, home repairs and maintenance, shopping, caring for children and relatives)	Less than 15 days	83	92.2
	15 – 30 days	6	6.6
	More than 30 days	1	1.1
How many days in the last 3 months was your productivity in household work reduced by half or more because of your headaches?	Less than 15 day	85	94.4
	15 – 30 days	4	4.4
	More than 30 days	1	1.1
On how many days in the last 3 months did you miss family, social, or leisure activities because of your headaches?	Less than 15 day	86	95.6
	15 – 30 days	2	2.2
	More than 30 days	2	2.2

Figure 2 – MIDAS summary for study participants on and off prophylaxis

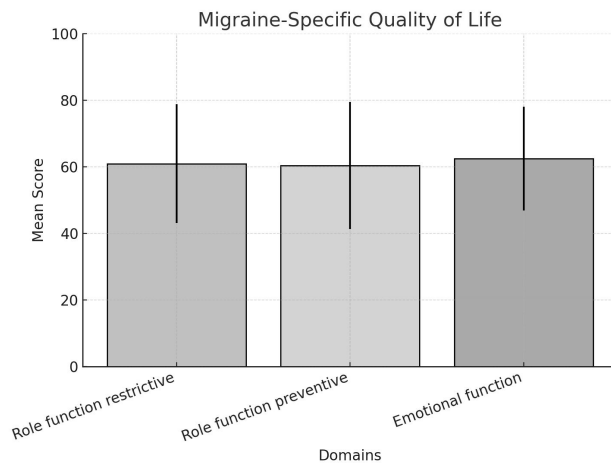


The MIDAS tool evaluated how migraine affected patients' ability to function for those with and without prophylactic treatment. Among those on prophylaxis, 47.2% reported no or minimal disability, 11.1% experienced mild disability, 12.5% had moderate disability, and 29.2% had severe disability. In contrast, patients not on prophylaxis had 44.4% with no or minimal disability, 27.8% with mild disability, 16.7% with moderate disability, and 11.1% with severe disability.

5.8. Migraine specific Quality-of-Life (QoL) of the participants

The mean (SD) of QoL was 53.7 ± 17.9 (95% CI: 50, 57.5). From the three domains, the lowest mean score was observed in the Role function preventive with a Mean \pm SD of 60.3 ± 19.1 followed by Role function restrictive with a Mean \pm SD of 60.9 ± 17.9 , whereas the highest Mean \pm SD score in the emotional function domain was 62.4 ± 15.6 .

Figure 3 - Migraine specific quality of life of the participants



Correlation among HIT-6, MSQ-RR, and MIDAS score

The study identified significant associations among Headache Impact Test-6 (HIT-6), Migraine Disability Assessment (MIDAS), and the Role Restriction domain of the Migraine-Specific Quality of Life Questionnaire (MSQ-RR), all with significance levels at 0.01.

Specifically, a moderate positive correlation ($r = 0.457$) was observed between HIT-6 and MIDAS scores, indicating that as the perceived impact of headaches increases, so does the level of migraine disability. Additionally, there was a strong negative correlation ($r = -0.669$) between HIT-6 and MSQ-RR scores, suggesting that higher headache impact is linked to greater role restrictions and a diminished quality of life.

Similarly, a moderate negative correlation ($r = -0.551$) between MIDAS and MSQ-RR scores implies that increased migraine-related disability is associated with more significant limitations in daily activities and reduced quality of life. These findings highlight the interconnectedness of headache impact, disability, and quality of life, emphasizing that interventions aimed at reducing headache severity or disability may lead to improvements in patients' role-related quality of life

Table -8 Correlation among HIT-6, MSQ-RR, and MIDAS score

	MIDAS-Score	MSQ-RR	HIT-6
MIDAS-Score	1		
MSQ-RR	-.551**	1	
HIT-6	.457**	-.669**	1

** . Correlation is significant at the 0.01 level (2-tailed).

6. Discussions

This study assessed the utilization of pharmacologic preventive therapy among migraine patients and their outcomes in three major hospitals in Addis Ababa, Ethiopia. The findings reveal important insights in the demographics of migraine patients, prophylactic treatment patterns, adherence levels, and overall treatment effectiveness.

This study found that 80% of patients were prescribed prophylactic medications to reduce migraine frequency, severity, and duration. This percentage is significantly higher than previous international studies, such as the American prevalence and prevention (AMPP) large population study which reported that only 12.4% of migraine patients received prophylactic treatment (7). This huge difference could be mainly due to study populations.

The AMPP study was a long-term, population-based survey that included a wide range of individuals from across the United States, covering people with different levels of migraine severity, including some who may not seek medical treatment. This study was conducted in specialized hospitals where patients likely had more severe migraines making them more eligible for prophylaxis. In contrast, the lower utilization rate in the AMPP study could suggest underdiagnosis or undertreatment in the general population, pointing to a potential gap in migraine management.

Our study is also significantly higher than the 41.6% reported in the PANORAMA survey of 119 specialized centers in Germany.(19) This difference may be attributed to the fewer specialized centers in our study and higher discontinuation rate in PANORAMA study.

Despite the high utilization of migraine prophylaxis, most prescriptions were based on neurologists' recommendations. In contrast, only 1.3% were prescribed by general practitioner, 8% by residents highlighting the significant role of specialists in guiding migraine management.

The most commonly prescribed medication was Amitriptyline (69.4%), followed by Propranolol (18%), and a combination of both (8.3%). Sodium valproate was used in a small proportion (2.77%). This prescribing pattern is consistent with international recommendations, where antidepressant, beta-blockers, and anticonvulsants are considered first line options for migraine prophylaxis. None of the patients in this study were prescribed gepants or topiramate as part of their preventive therapy.

Among 90 migraine patients, only 5 patients (5.6%) had chronic migraine, all on amitriptyline except one on propranolol plus amitriptyline. Four improved in severity, frequency, and duration, while one with moderate adherence had no change.

Out of 72 patients on prophylaxis, 13 patients (8 on amitriptyline, 2 on propranolol, 1 on sodium valproate, and 2 on amitriptyline plus propranolol) found it ineffective, with 3 showing moderate adherence. This indicates the importance of individualized treatment strategies and enhancing drug adherence for better outcomes. The study revealed that 66.7% of the participants had good adherence according to the morisky medication adherence scale, while 33.3% had moderate adherence. 84.72% of participants who are on prophylaxis reported side effects from preventive therapy, highlighting the need for better-tolerated treatments. Newer agents, such as gepants, hold promise for improved migraine management in the future.

Participants reported that their treating physicians prescribed prophylaxis primarily due to severity in 37.5% of cases and frequency in 41.6%, emphasizing the key factors influencing treatment decisions.

Regarding emergency visit after prophylaxis, Our study found that 77.78% of patients required fewer ER visits after starting migraine prophylaxis, while 22.22% still sought emergency care, though at a lower frequency (56% occasionally, 31.25% rarely). Among these, 62.5% reported faster recovery with acute treatment post-prophylaxis, but 37.5% saw no change, highlighting variability in outcomes and the need for personalized or optimized prophylactic strategies.

The HIT-6 tool assessed the impact of migraines on daily activities. Among those on prophylaxis, 65.3% reported severe impact, which was higher than the severe impact rate of 44.4% in those not receiving prophylaxis. Similarly, the MIDAS tool showed that among those on prophylaxis, 44.4% had no or minimal disability, compared to 55.6% in the non-prophylaxis group. This indicates that while prophylaxis helps reduce disability, some patients still experience significant functional limitations.

This study found significant links between HIT-6, MIDAS, and MSQ-RR ($p < 0.01$). HIT-6 and MIDAS showed a moderate positive correlation ($r = 0.457$), while HIT-6 and MSQ-RR had a strong negative correlation ($r = -0.669$), and MIDAS and MSQ-RR a moderate negative correlation ($r = -0.551$). This indicates higher headache impact relates to greater disability and

more role restrictions, while increased disability reduces quality of life, highlighting the potential benefits of targeted interventions.

A Korean study also found that patients on prophylaxis had increased healthcare utilization and costs, reflecting the ongoing burden of migraine despite preventive measures.

7. Limitations

The sample size may not be fully representative of the broader Ethiopian migraine population. Self reported data on adherence and effectiveness may introduce recall bias. The lack of baseline measurements for the MIDAS, HIT-6, and MSQ scales before initiating preventive therapy is a limitation to interpret results. None of the patients in this study were prescribed gepants, newer options for migraine preventions which limits the generalizability of findings regarding overall effectiveness. The non-pharmacologic preventive strategies were not assessed in this study.

8. Conclusion

This study highlights the high utilization of pharmacologic preventive therapy (80%) among migraine patients in specialized hospital centers in Addis Ababa, compared to lower rates 12.4% and 41.6% in international studies. The majority of patients were prescribed Amitriptyline (69.4%), followed by Propranolol (18%), with good adherence (66.7%). Preventive therapy was effective in reducing migraine frequency, duration, and severity, although some patients (15.2%) found it ineffective. The main barriers to adherence were side effects, cost and unavailability.

9. Recommendations

Based on the findings of this study the following recommendations are forwarded.

- To expand prophylactic options like gepants (CGRP-inhibitors) to improve efficacy and tolerability
- To enhance awareness of health professionals to have individualized approach for patients who find prophylaxis ineffective.
- To include baseline measurements of scales such as, HIT-6, MIDAS, MSQ

For Researchers

- Conduct larger scale study including patients from non-specialized centers to better understand migraine prophylaxis utilization in Ethiopia's general population
- Conduct further study through mixed qualitative and quantitative study design and longitudinal studies to get clear information about the outcome of migraine preventive therapy among patients.

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Annex

Annex 1 – participant information sheet and informed consent

Dear study participant

I am Dr Alembante Mulye, a third-year postgraduate Neurology resident at Addis Ababa University College of Health Science. My current research, part of my residency program, focuses on "The Utilization of pharmacologic preventive therapy among migraine patients and their outcome at TASH, Yekatit 12 Hospital Medical College, and Zewditu Memorial Hospital, Addis Ababa, Ethiopia".

This study aims to examine the utilization of pharmacologic preventive therapy among migraine patient and their outcomes. I will provide details and extend an invitation for your participation. Feel free to discuss the research topic with someone you trust before making a decision.

Your confidential information, as outlined in the information sheet, will be treated with utmost confidentiality during the study. The interview will require approximately 15-20 minutes of your time, and I kindly ask for truthful responses. Your voluntary participation is crucial in addressing the problem at hand. Please note that there is no compensation for participating, and you have the right to withdraw at any time without facing any consequences.

So do you agree to participate in this study? 1) Yes 2) No

Thank you for your cooperation

Data collector’s : Name _____ signature _____

Name of the principal investigator : Dr Alembante Mulye

Phone number +251927731850

Email - alememulye1@gmail.com

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ክ ቡ ር የ ጥ ና ት ተ ሳ ታ ፊ

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ለይያተኮረ ነው።

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ታዲያ በዚህ ጥናት ለመካፈል ትስማማለህ? 1)አዎ 2)አይደለም

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የዳታ ሰብሳቢ ስም _____ ፊርማ _____

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Annex 2 – Questionnaire

The utilization of pharmacologic preventive therapy among migraine patients and their outcome. A multicenter study at TASH, Y12HMC, and ZMH in Addis Ababa, Ethiopia.

Age of participant

A) 18-24 years B) 25-34 years C) 35-44 years D) 45-54 years

E) 55-64 years F) 65-75 years G) >75 years

Sex of participant

A) Male B) Female

Marital status

A) Married B) Single C) Divorced D) Separated E) Widowed F) Living together

Which is the category of your occupation?

A) Healthcare B) Education C) Technology D) Business and finance E) Art, design & Entertainment

F) Law & public safety G) Agriculture Marketing Construction & Engineering

H) Student I) I have no Job J) Tele-centre K) other (specify)

How much is your monthly income?

A) Less than 5,000 ETB B) 5,000 - 10,000 ETB C) 10,000-15,000 ETB D) 15,000-20,000 ETB

E) >20,000 ETB

What is your highest level of education?

A) Able to read and write B) Unable to read and write C) Primary school D) Secondary school E) University Courses

How long have you been diagnosed with migraine

- A) Less than 6 months B) Less than one year C) 1-2 years D) 3-4 years E) 5-6 years
F) 7-8 years G) 9-10 years H) > 10 years

Have you been diagnosed with any of the following in addition to your migraine?

- A) Asthma B) Hypertension C) Hyperthyroidism D) Insomnia E) Depression
F) Epilepsy G) BPH H) Stroke I) Coronary artery disease Anxiety

Frequency of migraine attack per month

- A) Fewer than 4 times B) 4-7 times C) 8-14 times D) >14 times

Did Physicians prescribe medication intended to reduce your headache frequency, severity and duration, other than panadol, diclofenac, advil?

- A) Yes B) No C) I don't know

If no, what was the reason?

- A) Physicians did not consider Prophylaxis. If so, who did not consider (GP, resident, internist, neurologist)
B) It may resolve on its own C) Concern about side effect
D) Financial issues E) Lack of awareness of available treatments F) Other (specify)

If yes, what made you decide to start prophylactic treatment?

- A) Severity of migraine attack B) Frequency of migraine attack C) Physician's recommendation

Which physician recommended? 1- GP 2- Resident 3- Internist 4- Neurologist 5- other specialty (specify)

- D) The headache affected my everyday activities E) other (specify)

How long have you been on prophylaxis?

- A) Less than a month B) 2-3 months C) 4-6 months
D) 7-12 months E) 1-2 years F) 2-5 years G) more than 5 years

Which type of prophylactic treatment have you used ?

- A) Propranolol B) Metoprolol C) Amitriptyline D) Nortriptyline E) Topiramate
F) Sodium Valproate G) Erenumab H) Fremanezumab I) Atogepant
J) Verapamil K) Rimegipant L) Imipramine M) Onabotulinumtoxin A

Have you noticed a decrease in any of the following of your migraine attack after starting prophylactic treatment?

- A) Severity B) Duration C) Frequency D) No Change

How is the change in the frequency of headache after initiation of prophylaxis?

- A) There is reduction by more than 50% B) There is reduction by less than 50%
C) There is no change D) The frequency has increased

Has the duration of your migraine attack changed since you began prophylactic medication?

- A) Yes, it has decreased B) No, it is the same C) Yes, it has increased

How would you rate the effectiveness of your current preventive therapy?

- A) Very effective B) Somewhat effective C) Not effective D) I do not know

Do you ever forget to take your prophylactic medication?

- A) Yes B) No

Do you ever have problems remembering to take your prophylactic medication?

- A) Yes B) No

When do you feel better, do you sometimes stop taking your prophylactic medication?

A) Yes B) No

Sometimes if you feel worse when you take prophylactic medication, do you stop taking it?

A)Yes B)No

Have you discontinued your prophylactic medication?

A) Yes B) No

If discontinued, what was the reason?

A) Side effects B) I cannot afford C) The medication did not work for me

D) Physician recommendation E) It is not availability F) Other (specify)

Have you experienced adverse effects while on prophylactic treatment?

A) Yes B) No

Propranolol, Metoprolol (Adverse effects)

A) Bradycardia B) Hypotension C) Fatigue D) Depression E) Insomnia

F) Dyspnea G) Nausea & or Vomiting H) Paresthesia I) Pruritis J) Other (Specify)

Amitriptyline, Nortriptyline (Adverse effects)

A) Dry mouth B) Diarrhea C) Dizziness D) Constipation E) Confusion F) Fatigue

G) Insomnia H) Syncope I) Weight gain J) Urinary retention K) Sweating L) Sexual Dysfunction

M) Orthostatic hypotension N) Blurred vision O) Nausea &or Vomiting P) Other (Specify)

Sodium Valproate (Adverse effects)

A) Nausea &or Vomiting B) Dizziness C) Tremor D) Dyspepsia E) Diplopia F) Diarrhea

G) Somnolence H) Alopecia I) Ataxia J) Rash K) Confusion L) Weight gain M) Vertigo

N) Tinnitus O) Other (Specify)

Topiramate (adverse effects)

- A) Ataxia B) Dizziness C) Fatigue D) Confusion E) Paresthesia F) Decreased memory
G) Weight loss H) Abdominal pain I) Edema J) Dry Mouth K) Taste change
L) Blurred vision M) Loss of appetite N) Nervousness O) Somnolence P) Other (Specify)

Verapamil (Adverse effects)

- A) Gingival hyperplasia B) Hypotension C) Dizziness D) Constipation
E) Dyspepsia F) Rash J) Edema K) Sleep disturbance L) Nausea M) Other (Specify)

Imipramine (Adverse effects)

- A) Fatigue B) Sedation C) Constipation D) Dry Mouth E) Blurred vision F) Sweating G) Nausea &or vomiting
H) Insomnia I) Anxiety J) Rash K) Sexual dysfunction L) Paresthesia M) Other (Specify)

Atogepant (adverse effects)

- A) Constipation B) Nausea C) Fatigue D) Somnolence
E) Weight loss F) Loss of appetite G) Dizziness H) Other (Specify)

Rimegipant (Adverse effects)

- A) Nausea B) Dyspnea C) Severe rash D) other (Specify)

Fremanezumab (Adverse effect)

- A) Injection site pain B) other (Specify)

Erenumab (adverse effects)

- A) Injection site pain B) Constipation C) Muscle spasm D) other (Specify)

OnabotulinumtoxinA (adverse effects)

- A) Dysuria, Hematuria B) Urinary retention C) Sedation and somnolence D) Dizziness

E) Ptosis F) Facial weakness J) Neck Pain K) Dry eye L) Abdominal pain M) Dry mouth

N) Nausea &or Vomiting O) Syncope P) Tinnitus Q) Vertigo R) Other(specify)

Have you visited emergency for migraine attack after Starting prophylactic treatment ?

A) Yes B) No

If no, do you think that preventive treatment has affected your requirement for emergency care

A) Yes B) No C) I do not know

If yes, how often do you visit ER for migraine despite prophylactic medication

A) Very frequently B) Frequently C) Occasionally D) Rarely

Have you noticed a change in how quickly your migraines improve after treatment in the ER since starting prophylaxis?

A) Yes, migraine attacks improve more quickly

B) No, migraine attacks are the same

C) I do not know

When you have headaches, how often is the pain severe?

A) Never B) Rarely C) Sometimes D) Very often E) Always

How often do headaches limit your ability to do usual daily activities including household work, work, school, or social activities?

A) Never B) Rarely C) Sometimes D) Very often E) Always

When you have a headache, how often do you wish you could lie down?

A) Never B) Rarely C) Sometimes D) Very often E) Always

In the past 4 weeks, how often have you felt too tired to do work or daily activities because of your headaches?

A) Never B) Rarely C) Sometimes D) Very often E) Always

In the past 4 weeks, how often have you felt fed up or irritated because of your headaches?

A) Never B) Rarely C) Sometimes D) Very often E) Always

In the past 4 weeks, how often did headaches limit your ability to concentrate on work or daily activities?

A) Never B) Rarely C) Sometimes D) Very often E) Always

On how many days in the last 3 months did you miss work or school because of your headaches? _____

How many days in the last 3 months was your productivity at work or school reduced by half or more because of your headaches? _____

On how many days in the last 3 months did you not do household work (such as housework, home repairs and maintenance, shopping, caring for children and relatives) because of your headaches? _____

How many days in the last 3 months was your productivity in household work reduced by half or more because of your headaches? _____

On how many days in the last 3 months did you miss family, social or leisure activities because of your headaches? _____

How often have migraines interfered with how well dealt with family, friends and others who are close to you?

A) Never B) Rarely C) Sometimes D) Pretty E) Almost F) Always

How often have migraines interrupted with your leisure time activities such as reading or exercising ?

A) Never B) Rarely C) Sometimes D) Pretty E) Almost F) Always

How often have you had difficulty in performing work or other daily activities ?

A) Never B) Rarely C) Sometimes D) Pretty E) Almost F) Always

How often have migraine kept you from getting as much accomplished as you normally do at work or at home ?

A) Never B) Rarely C) Sometimes D) Pretty E) Almost F) Always

How often have migraines limited your ability to work or do other activities as carefully as you usually do them ?

A) Never B) Rarely C) Sometimes D) Pretty E) Almost F) Always

How often have you had to cancel or delay work or social activities because you were exhausted ?

A) Never B) Rarely C) Sometimes D) Pretty E) Almost F) Always

How often have migraines left you with limited energy levels ?

A) Never B) Rarely C) Sometimes D) Pretty E) Almost F) Always

How often have you had to stop work or other activities ?

A) Never B) Rarely C) Sometimes D) Pretty E) Almost F) Always

How often have you needed the help of other people in handling routine tasks such as everyday household chores, doing necessary business, shopping, or caring for others when you had a migraine attack ?

A) Never B) Rarely C) Sometimes D) Pretty E) Almost F) Always

How often have you avoided social or family activities to treat your migraine attacks ?

A) Never B) Rarely C) Sometimes D) Pretty E) Almost F) Always

How often has it been difficult for you to go to social events such as parties ?

A) Never B) Rarely C) Sometimes D) Pretty E) Almost F) Always

how often have you felt fed up or frustrated ?

A) Never B) Rarely C) Sometimes D) Pretty E) Almost F) Always

How often have you felt like you were a burden on others?

A) Never B) Rarely C) Sometimes D) Pretty E) Almost F) Always

How often have you been afraid of letting others down ?

A) Never B) Rarely C) Sometimes D) Pretty E) Almost F) Always