ADDIS ABABA UNIVERSITY
COLLEGE OF HEALTH SCIENCE
SCHOOL OF PUBLIC HEALTH

ASSESSING PREVALENCE OF MIGRAINE HEADACHE, ASSOCIATED FACTORS AND ABSENTEEISM AMONG ETHIO-TELECOM CALL CENTER WORKERS IN ADDIS ABABA ETHIOPIA, A CROSS-SECTIONAL STUDY

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Acronyms

BMI----------Body mass index

DALYs----------Disability-adjusted life years

ETC----------Ethiopian Telecommunications Corporation

GBD----------Global Burden of Disease

GHE----------Global Health Estimate

ICHD----------International Classification of Headache Disorders

IHSC----------International Headache Standards Criteria

MIDAS----------Migraine Disability Assessment test

MS-Q----------Migraine screening questionnaire

PMOH----------Probable Medication Overuse Headache

TASH----------Tukur Anbessa Specialist Hospital

WHO----------World Health Organization

YLDs----------Years lived with Disability.

Contents

LIST OF TABLES

LIST OF FIGURES

Abstract

Background: Migraine headaches are one of the most disabling types of headaches that is a pain in and around the head region presenting as a throbbing pain or pulsating sensation. Stress among other triggers is a notable risk factor for migraine, However, research is scarce on the prevalence of migraine headaches and its impact on call center workers of Ethio-Telecom in Addis Ababa.

Objective: To assess the prevalence of migraine headaches, associated factors and absenteeism among Call center workers of Ethio-Telecom.

Methods: A Cross-sectional study was conducted at the call centers of Ethio-Telecom which are in Addis Ababa, Ethiopia. Data was collected from 482 participants using structured self-administered questionnaire, using migraine screening questionnaires according to international headache standards criteria, participants were stratified and selected through random sampling. Furthermore, observation was made using an observational checklist to explore the working conditions. The questionnaire response data was entered in to excel, and the data was cleaned and analyzed using the Statistical Package for the Social Sciences version 26 with descriptive statistics and regression models.

Results: From 482 participants, the prevalence of migraine headache was 44.2% among Ethio Telecom call center workers. Migraine headache was significantly associated with stress. Work stress (AOR = 32.0, 95% CI; 6.42 –166.01), the length of call duration for audio section (AOR = 5.9, 95% CI; 1.70 -18.60), negative effect of migraine on quality of life. (AOR = 23, 95% CI; 5.91 – 85.92), family history of migraine headache (AOR = 2.6, 95% CI; 1.01 – 6.72). Perceived aggravating factors associated with migraine headache was family stressor (57.7%), noise (68.1%), sunlight (75.5%) inadequate sleep (40.8%). An average of 2.9 workdays was lost per migraine attack, and a total of 565 workdays was lost due to migraine headache in the past 3 months at the time of data collection.

Conclusion: In this study, the prevalence of migraine headache was high among Ethio telecom call center workers. Stress, call duration for the audio call section, and having a negative effect of migraine headache like migraine limiting daily activities, emotional wellbeing and decline cognitive function were significantly associated with migraine headache.

Key words: Migraine headache, Risk factors, Call center workers, Ethio telecom

1. Introduction

1.1. Background

Headaches are characterized by pain or discomfort in the head, neck, and face, varying in both severity and duration. According to the Global Health Estimates (GHE), headache disorders represent the third leading neurological disease burden globally after stroke and dementia, this is measured using standardized disability-adjusted life years (DALYs) across age groups (1). Primary headache types include tension-type headaches, cluster headaches, and migraines, with migraine recognized as the most disabling form of headaches, imposing substantial burdens on individuals, families, and societies (2). Recurrent migraine attacks can significantly disrupt family and social life, reduce work productivity, and increase the risk of mental health disorders such as anxiety and depression (3). The World Health Organization (WHO) reports that headache disorders affect approximately 3.1 billion people globally, with a higher prevalence among women than men, these disorders impact all populations irrespective of race, income level, and geographical locations, although there are variations within each region (1).

Migraine is a specific type of headache disorder, often presenting as a severe, throbbing headache that lasts between 4 to 72 hours. It is accompanied by symptoms such as nausea, vomiting, and sensitivity to light and sound (4). Based on headache frequency, migraines are classified into episodic migraine (EM) fewer than 15 headache days per month and chronic migraine (CM) 15 or more headache days per month, with migraine features on at least 8 of those days (4). If left untreated, episodic migraines may progress into chronic migraines (5). Chronic pain caused by migraines are linked to work absenteeism, presenteeism, and increased levels of disability (6).

Call centers are recognized as high-stress work environments, characterized by repetitive tasks, performance monitoring, and demanding targets, which can elevate the risk of headache disorders including migraines (7). Such occupational stressors negatively affect physical, mental, and social health, leading to diminished quality of life and reduced workplace productivity (8).

Despite global research on headache disorders, there remains a notable gap in studies specifically assessing migraine prevalence among call center workers in Ethiopia. Addressing this research gap is essential for understanding the prevalence, triggers, and consequences of migraines in this occupational group. Such understanding can contribute to better workplace accommodations, and productivity enhancement within institutions such as Ethio Telecom.

1.2. Statement of the Problem

Migraine headache is a common, disabling neurological disorder that significantly impacts individuals' quality of life and work productivity. Globally, it is ranked among the top three causes of years lived with disability (YLDs), with working-age adults disproportionately affected (GBD 2017). Despite its burden, migraine remains underdiagnosed and undertreated, particularly in occupational groups with high exposure to known triggers such as call center workers. (9).

Call center employees are increasingly exposed to stressors associated with long screen time, irregular work schedules, artificial lighting, poor ergonomic environments, and continuous exposure to noise all these are known to trigger migraine headache (10). In Ethiopia, while national studies have highlighted the general burden of headache disorders with migraine prevalence estimated at 17.7% (11), and as low as 6.2% among those working in a textile mill in Addis Ababa (12), there is a lack of data on specific occupational groups like call center workers, who are at increased risk due to job-related physical and psychological stressors. Factors such as inadequate sleep, screen exposure without blue light protection, irregular meals, high work demand, and poor hydration are common in this industry and may significantly contribute to migraine onset and severity (13,14).

At the workplace, where there are several work-related potential triggers of headaches (7). Job stress is one of the most identified triggers for primary headaches leading to low productivity during attacks (15). Call centers manage large volumes of calls for customer support, handling inquiries, complaints, and technical issues. Additionally, they handle telemarketing, product promotion, order processing, and market research, the range of services they provide spans from the very simple to the highly complex which could predispose them to headaches (8). There are frequent headache complaints among the individuals who are working at Call center of Ethio-Telecom Company, and some of them were seen by neurologists at Tukur Anbessa Specialized Hospital (TASH). Despite these findings, there remains a gap in studies about the exact prevalence of migraine headache among call center workers both worldwide and in Ethiopia. Most available studies are limited to students, general working populations. Hence, having a study with a focus on the prevalence and burden of migraines and factors associated among call center workers and its findings will help to improve productivity, reduce disease burden, and improve the quality of life for sufferers as well as provide information for policymakers.

1.3. Rationale of the Study

The rationale of the study stems from the need to understand the prevalence and impact of migraine headaches among call center workers. Migraine, as many epidemiological studies have documented, is a common disabling primary headache. In the Global Burden of Disease Study (GBD 2010) (16), it was ranked as the third most prevalent disorder in the world. In GBD2015, it was ranked the third-highest cause of disability worldwide in both males and females under the age of 50 years (17).

Headache disorders significantly contribute to global disability, affecting an individual's quality of life and incurring economic costs due to reduced productivity from absenteeism and presenteeism (18). Despite the significance and prevalence of migraine headaches, few studies have assessed its prevalence and effect on workplace productivity among call center workers. This study seeks to assess the prevalence of migraine headaches, the factors associated with them, and its impact on productivity among call center workers.

1.4. Significance of the Study

This study is significant because call center workers have a responsibility to communicate with several people with different characters every day and are expected to be tolerant and responds kindly to the customers, as well as record conversations. In Ethiopia, there are population-based studies and few studies on subgroups of the population done in relation to migraine headaches, but there are no available literatures on the prevalence of migraine headaches among the call center workers, who potentially do have a significant risk of work-related headache disorder.

Determining the exact prevalence of migraine headaches and its burden on this subgroup of population can inform workplace ergonomics, stress management policies within the company. For the company, it will aid in maximizing productivity and service quality, as the missed working days are reduced, and better coping mechanisms are implemented. This study will also be valuable in generating data on migraine headache prevalence and burden for use by the national and international policymakers on health care.

2. Literature Review

Headache disorders ranked as the third highest cause of neurological disease burden globally, following stroke and dementia. Among these, primary headache disorders particularly migraine and tension-type headaches are the most common in the general population (1).

Prevalence Of Migraine Headache

Globally the overall prevalence of migraine affects approximately 14.4% of the global population, with a higher prevalence in women 18.9% compared to men 9.8% (19), both migraine and tension-type headaches affect women more often than men, while cluster headache is predominantly a disorder in men (20). Women are affected by migraine 2 to 3 times more than men and experience more disabling, more severe attacks with longer duration and increased risk of recurrent headaches (3). The reason for this could be fluctuations in estrogen levels, particularly during menstruation, pregnancy, and menopause, that are closely linked to migraine onset and severity.

Regarding similar high stressful job like the call center, a study found a 29.7% prevalence among healthcare professionals in Pakistan (21), and 18.2% among nurses and doctors in United Arab Emirate (22). Another study found a significant increase in migraine-related complaints among cabin crew after four consecutive long shifts (23) A study among Malaysian bank workers found a prevalence of 47.2% of migraine headache (24). This indicates that occupations like call center workers, cabin crews, medical workers, are more exposed to physical demands, environmental stressor such as noise are at higher risk of having migraine headache. In another study done among IT staff in China revealed a lower prevalence of 7.6% (25), in Akaki Textile mill Addis Ababa 6.2% (12).

Regarding prevalence among the general population, a 2007 study in Georgia, Eastern Europe reported migraine prevalence at 8.6% (26). In 2005, Florianopolis, Brazil, reported a 1-year headache prevalence of 80.8%, with migraines at 22.1% (27). In Norway migraines prevalence at 12% (28). A community-based study in Hongkong found migraine prevalence to be 12.5% (29). A general population-based study in Saudi Arabia found a prevalence of 37.2% (30). A nationwide study in Cameroon among working population found migraine headache prevalence to be 17.9% (31). Ethiopia's 1995 study reported that women have a 3% higher prevalence of migraine than men (32). A comprehensive population-based survey conducted across diverse regions of Ethiopia reported the prevalence of migraine to be 17.7% (11), a 10% prevalence in Addis Ketama sub city (33).

The differences in migraine prevalence across studies could be attributed to population demographics, methodology used, occupational stressors and migraine diagnostic criteria.

2.1. Risk Factors of Migraine Headache

Migraine headaches at work are triggered by several factors. The commonest triggers are emotional stress, fluctuating female hormones, missed meals, weather factors, sleep disturbance, odors, certain visual stimuli, alcohol, muscle tension, physical exercise, and being overheated. Stress is the number one trigger (34).

2.1.1. Personal Behavioral Triggering Factors

Emotional stress can lead to physiological changes that precipitate migraine headache (35) Meal skipping, caffeine intake, exercise, poor hydration, medication overuse, psychiatric comorbidities (such as anxiety, insomnia, and depression) (3) has been linked to migraine headache exacerbation. Chronic dehydration has also been recognized as a significant risk factor for headaches in general and we as migraine headache in multiple studies (36) Additionally, both sleep deprivation and excessive sleep can lead to severe and chronic headaches, highlighting the importance of getting seven to nine hours of sleep each night to help prevent them (37,38) Alcohol and smoking has been identified as a triggering factor for migraine headache (39)

2.1.2. Biological Triggering Factors

Fluctuations in estrogen, such as before or during menstrual periods, pregnancy and menopause, is found to trigger headaches in many women. Hormonal medications, like oral contraceptives, can worsen migraines (40).

Hormonal imbalances were found to be the second commonest triggers in women at 65.1% for migraine that occur less frequently and number one at 33.3% for women-specific factors (34,41). Menstruation as a trigger increased the risk of multiple triggers at the same time such as emotional stress, muscle tension in women, with menses accounting for 48% and ovulation at 8.5% (42). In another study 18.6% of women experienced worsening or occurrence of their migraine headache during menses (43). A study found 42% of migraine to be heritable, suggesting that migraine results from an interaction between genes and the environment (44). A family history of migraine was found to be associated with migraine headache is general population study in Saudi Arabia at 49.1% (30). The headaches were most burdensome in women between ages 15 and 49 years, with migraine causing 20·3 million YLDs (9).

2.1.3. Occupational Triggering Factors

Occupational exposures such as night shifts, physical exertion, and stress play a critical role in triggering or exacerbating migraine headache (34). Exposure to bright, flickering, fluorescent lights and computer screen glare can trigger migraines headache (14). Those working in high stressful jobs like call center, healthcare professionals, public transport drivers and airline crew have a higher risk of having migraine headache (23). Another study identified role conflict, low social climate, and harassment as the main predictors of workplace headaches including migraine headache aggravation (45).

In the telecom industry, employees like call center workers experience Call-time pressure, dealing with hostile customers, reading prescript conversations on the phone, system monitoring of call activities, and difficulty in providing good customer service while simultaneously meeting time targets were found to be significant sources of job stress among call center workers (7,46). These stressors impact workers physical, mental, and social health (47,48). A study done in 2017 in Italy using migraine disability assessment test (MIDAS) shows that all the call center workers who participated in the study had experienced some level of headache which makes headache to be considered as an occupational disease directly related to phone calls, the study found that 13% of their study participant suffered from depression, this is in correlation with another study done in Ethiopia that found major depressive disorder in patient suffering from migraine with aura, depression was associated with migraine headaches at 41.4% with occurrence of severe disability (49,50) Inadequate workstation setups, such as improper chair height or monitor positioning, can lead to musculoskeletal strain and trigger migraines, ergonomic assessments can help in creating a more comfortable work environment (51).

2.1.4. Environmental Triggering Factors

People who suffer from migraines frequently identify various environmental triggers for their headaches, including changes in barometric pressure, noise, bright sunlight, flickering lights, air quality, and certain odors (52). Exposure to air pollutants, including particulate matter (PM2.5 and PM10), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2), has been linked to an increased risk of migraine attacks (52).

Research so far suggests that individuals with migraines have lower thresholds for discomfort caused by light, including light-induced distortions and illusions, as well as reduced tolerance to noise and heightened sensitivity to smells, compared to the general population (53). Weather

was one of the most frequent precipitating factors for migraines with 71% of patients reporting it as their triggers (54).

2.2. Absenteeism (Missed workdays) related to migraine headache.

The Global Burden of Disease (GBD) studies in the past two decades have shown headache disorders to be a major cause of global ill health, and it emerges as the second highest cause of disability (55). A systematic review of GBD 2017, highlighted that headache disorders together with low back pain and depressive disorders were among the top four leading causes of Years lived with Disability (YLDs), collectively causing 162 million YLDs in 2017 and representing nearly one in five YLDs, with Migraine headache affecting about 45.1 million YLDs globally (56).

A study conducted among working population with migraine headache reported that 77% of the participant missed work due to headache attacks (57) A Malaysian study among bank employees found migraine was responsible for a 1.9% loss of work time (absenteeism) (24)

A 2008 study in Akaki textile mill in Addis Ababa revealed that over 60% of migraine sufferers and over 20% with tension headaches missed work due to headaches attacks (12). A study among medical and paramedical emergency workers found 16.8% of participants reported absenteeism due to headache-related issues (58) Migraine also impact healthcare workers with a loss of an average of 10.2 workdays per year due to headache attacks among Swiss hospital workers (59). These findings align with prior research showing that migraine leads to not only to physical discomfort but also to functional limitations in the workplace. The study highlights the need for comprehensive workplace interventions, including migraine-specific treatment access and mental health support, to reduce productivity loss and absenteeism.

The economic loss due to absenteeism caused by headache disorders in Ethiopia is substantial, with estimates suggesting that Ethiopia may lose up to 1.6% of its Gross Domestic Product (GDP) due to reduced productivity associated with headaches (11). A cross-sectional study among Ethiopian migraine sufferers, found a significant association between migraine-related disability and co-morbid depression, this relationship suggests that migraines may have broader implications for mental health, further affecting individuals' quality of life and productivity (60).

The public health significance of headaches is from its causal association with personal and societal burdens of pain, disability, damaged quality of life, and financial lost due to

absenteeism and presenteeism (61). Headache disorders are prevalent in productive years (late teens to 50s) and incur financial costs to society due to lost working hours and reduced productivity (62). In a 2002 Italian study, young patients with primary headaches experienced a significant decline in quality of life, which affected their psychosocial, physical, and social functioning (63). Headaches do not just cause pain, they deeply impact day-to-day life and overall well-being, the migraine-related productivity loss to Fujitsu in terms of absenteeism and presenteeism was estimated at 900 USD per year per employee with a migraine headache disease (64). Headaches can affect work and other activities, with most migraine sufferers and around half of tension-type headache sufferers reporting limitation of activities during a headache attack (65,66).

The societal impact of headaches is usually measured in economic terms, direct costs consist primarily of health care utilization for diagnosing and treating primary headaches (67). Indirect costs include missed work and reduced productivity while at work due to migraine headaches, because the direct costs are far less than the indirect costs, improving healthcare delivery for primary headaches could be cost-effective from a societal perspective (62).

Migraine can negatively impact work productivity even on non-headache days as 40% of people with migraine have interictal symptoms such as cognitive impairments like deficits in attention, executive function, processing speed, and memory (68). Due to the high prevalence of migraine headaches and the associated factors, the presence of migraine headaches among call center should be investigated.

2.3. Conceptual Framework

The conceptual framework of this study was developed by synthesizing major variables that affect stress and migraine based on previous studies. It offers an organized way to learn how these variables are related to each other and their role in stress, migraine headache. This conceptual framework will illustrate the prevalence, association and impact of migraine headaches. Factors such as biological, personal, occupational and environmental factors could result in stress which could cause migraine headaches which will impact productivity as well as the quality of life.

Similarly, missed workdays leads to reduced productivity and low quality of life could lead to more headache attacks, which could predispose an individual to develop migraine headaches.

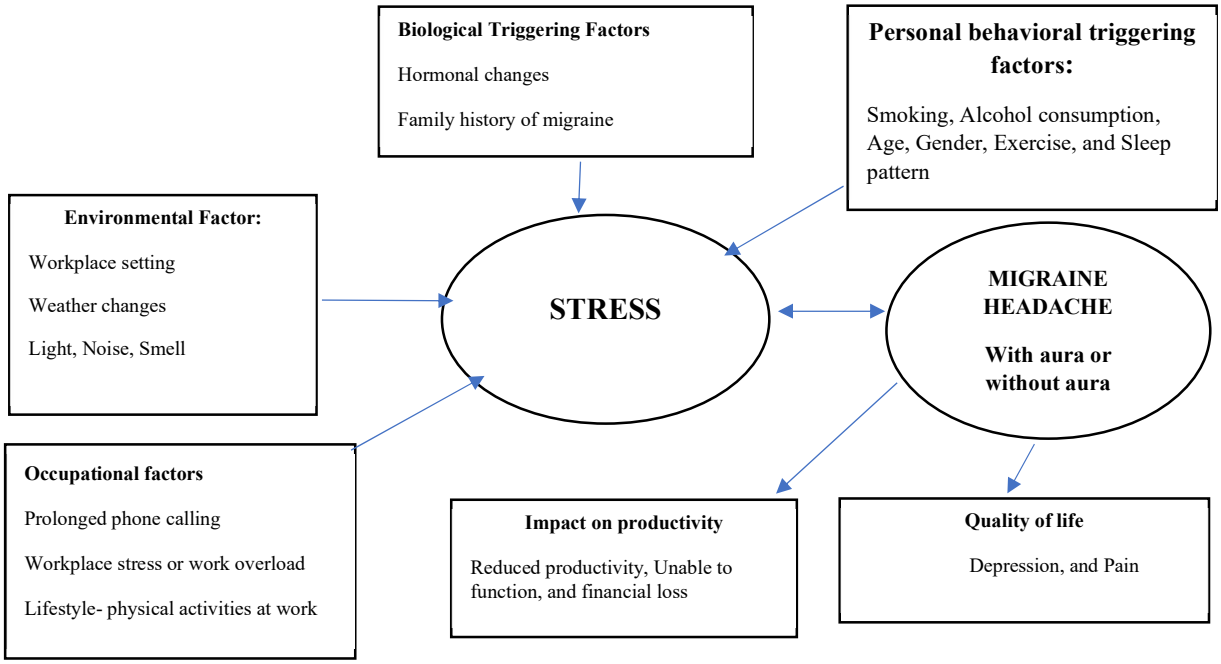

Figure 1: Conceptual Framework for assessing the prevalence of migraine headache, associated factors and absenteeism among Ethio telecom call center workers in Addis Ababa Ethiopia (Created by the author based on the variables adopted from 13,34,35,41,49)

3. Objectives

3.1. General objectives

- To determine the magnitude of migraine headache, associated factors and missed workdays among Call Center Workers of Ethiopia-Telecom Addis Ababa, Ethiopia, 2025.

3.2. Specific objectives

- To determine the prevalence of migraine headaches among Ethio telecom Call Center workers in Addis Ababa, 2025.
- To determine the factors that trigger migraine headaches among Ethio telecom call center workers Addis Ababa, 2025.
- To know the missed workdays related to migraine headache among Ethio telecom call center workers Addis Ababa, 2025.

4. Methods

4.1. Study Setting

Addis Ababa, Ethiopia's capital, is in the central highlands at an altitude of ~2,355 m above sea levels, characterized by a temperate climate with temperatures between 10°C and 25°C and It covers a total area of 527 km2. Addis Ababa is the capital and largest city in Ethiopia. It is also referred to as “the political capital of Africa.”

This study was conducted at Ethio-Telecom (ET), formerly known as Ethiopian Telecommunications Corporation as established in 1894, evolved to ETC on 2nd December 2011. Ethio Telecom is the largest telecommunications service provider in Ethiopia. The research specifically targeted call center departments of Ethio-Telecom located in Addis Ababa, the capital city, where many of the company’s customer service operations are centralized.

Ethio-Telecom has two call center services in Addis Ababa Ethiopia, namely Jemo and Wello Sefer branches with a total staff number of 905, at the time of the study, sample was drawn from 356 and 549 of Jemo and Wello Sefer call center workers respectively excluding managers and supervisors. The call center services work 24/7 to support customer inquiries by providing full information about ET products and services, subscription requirements, billing and related inquiries, activation of value-added services, fault registration, status updates and follow-up.

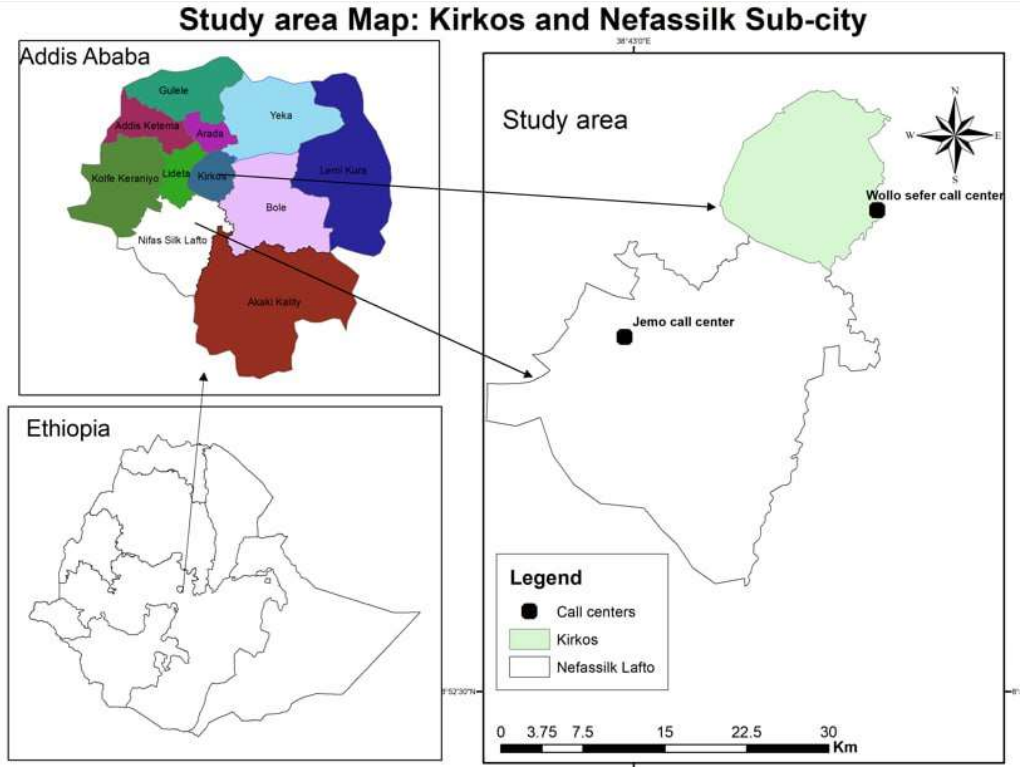

Figure 2: **Study area: Map of Ethio telecom, Wolle Sefer and Jemo branches.**

4.2. Study Design

In this study, a descriptive and analytical cross-sectional study was applied to determine the prevalence and associated factors of migraine headache among Ethio telecom centers in Addis Ababa, in one month period, from March 26, 2025, to April 6, 2025.

4.3. Population

4.3.1. Source Population

The source population includes all audio call and digital center workers at Wolle Sefer and Jemo call centers of Ethio-Telecom in Addis Ababa.

4.3.2. Study Population

Randomly selected audio call center and digital center workers from the call centers of Ethio Telecom at Wello Sefer and Jemo.

4.4. Eligibility criteria

4.4.1. Inclusion criteria

All those who have worked for more than one year who were likely to have been exposed sufficiently to occupational stressor relevant to this research and, who have given consent to participate in the study.

4.4.2. Exclusion criteria

Those who have secondary causes of headache and are on follow-up such as:

Head Injuries: Trauma to the head can trigger migraines.

Neurological Disorders: Conditions such as epilepsy or tumors can also lead to migraine-like symptoms.

Metabolic Disorders: Issues like high blood pressure, diabetes, or thyroid disorders may be associated with migraines.

Panic attacks: Episode of intense anxiety which causes physical sensation of fear.

4.5. Sample Size Determination

4.5.1. Sample size for objective 1 & 3

The sample size was calculated based on the prevalence of migraine headache reports in other studies with adjustments made for design effect and potential non-response (using 95% confidence level and 90% power). The prevalence estimate is based on the findings from headaches in the workplace analysis of factors influencing headaches in terms of productivity (69). The sample size for Migraine Prevalence was calculated using the following statistic formula:

$$n = \frac{Z^2_{1-\alpha/2}}{d^2} p(1-p)$$

Where:

- n = minimum sample size required.
- z1-α/2 -is the standard normal variable at (1-α) % confidence level and α is mostly 0.05 i.e. with 95% CI
- z1-α/2 = 1.96
- d-is the margin of error to be tolerated (5 %)
- P = estimated Prevalence (taken from the previous study p= 0.488).

In this sample size determination, we take p= 48.8 (69), d= 0.05 because there are no published articles based on the approach of our study; So that sample size will be:

n= (1.96)2*48.8(1-48.8) ÷ (0.05)2

n =384 by adding 10% non-response rate the sample size will be 422

Because the populations under consideration are less than 10,000, the above formula would be modified by the following sample correction method.

nf = n/(1+(n/N)) = 289 participants

Where N= (total number of Call Center Workers at the – call centers)

4.5.2. Sample size for objective 2 (Risk factors)

The sample size for objective 2 is adopted from the study done on headache characteristics and risk factors among healthcare workers (70) coffee consumers and non-consumers at 6.3% and 0.9% respectively.

$$n = \frac{(Z\frac{\alpha}{2} + Z\beta)^2 * (p1(1-p1) + p2(1-p2)}{(p1-p2)^2}$$

The final sample size of 498 with the confidence level of 95% and power 90% will be used.

Where:

n = required sample size per group

Zα/2 = Z-value corresponding to the desired confidence level (1.96 for 95% confidence level)

Zβ = Z-value corresponding to the power of the study (1.28 for 90% power)

p1 = proportion in the exposed group from similar study (Coffee consumers 6.3%)

P2 = estimated proportion in the unexposed group (non-consumers of coffee 0.9%)

p1−p2 = the difference in proportions between the two groups in the risk factor

The largest sample size will be taken for this study which is 498 participants to be used for all three objectives.

4.6. Sampling procedure

In this study the total workforce at Ethio telecom call centers is 905 at the time of the study for Jemo and Wolle Sefer A total of 498 were stratified and randomly selected from the reference population. A total of 498 were randomly selected for the study. Six of those were excluded based on the exclusion criteria. And a total of 482 participated in the study.

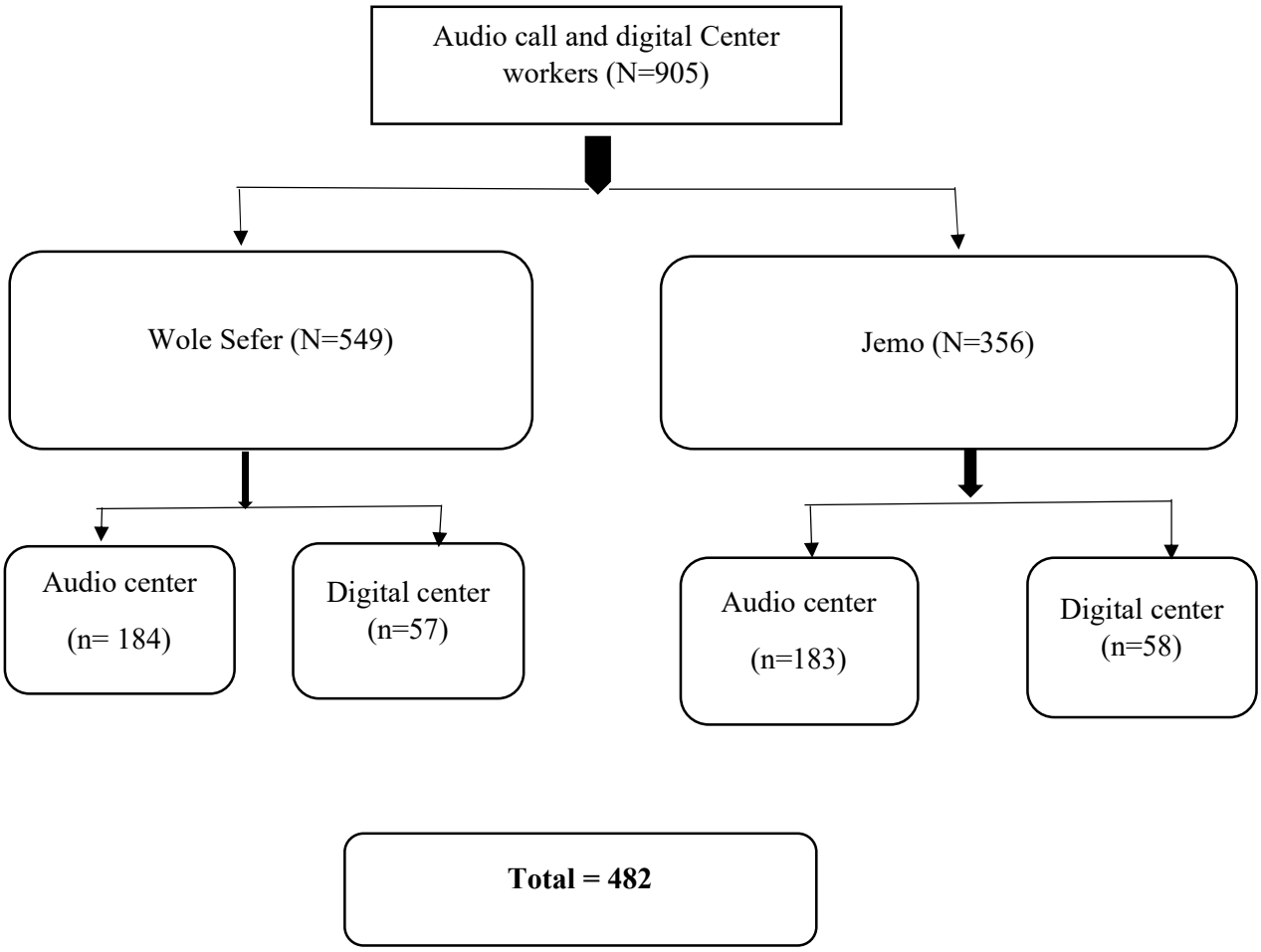

Figure 3: SHOWS SAMPLING PROCEDURE OF SAMPLES FROM STUDY POPULATION, 2025

4.7. Data Collection tools and procedure

Questionnaire: A structured self-administered questionnaire was utilized as the primary data collection tool. (A modified version from (71,72,73). The questionnaire was distributed to the participant and was collected back after 20 minutes. The questionnaire gathered self-reported socio-demographic information, migraine related information, factors that trigger migraine headache and missed workdays.

Observational Checklist: At the time of data collection, an observational checklist was utilized to assess the: availability of clean drinking water near the worksite, provision of regular breaks during work hours, availability of a designated resting area for workers, availability of fully stocked first aid kit, availability of trained health professionals present on site to handle emergencies, adequate ventilation in the workspace, sufficient lighting in the working area, availability of comfortable chairs for workers while working, unpleasant odor in the room, and presence of noise pollution in the workspace.

4.8. Study Variables

4.8.1. Dependent Variables

Migraine headache

4.8.2. Independent Variables

- Sex
- Age
- Family history of migraine headache
- Lifestyle
- Sleep disorder
- Period pain
- No of hours exposure per week
- No of weeks exposed.
- Noise
- Total number of calls per
- Time length of calls
- Content of calls
- Work-related stress.
- Exercise
- Family and social stressors
- Strong smell
- Sunlight
- Food

4.9. Operational Definitions

A migraine without aura: This recurrent headache attack lasts 4 to 72 hours. Usually with unilateral pain, pulsating in quality, moderate-to-severe in intensity, aggravated by physical activity, and associated with nausea, light (photophobia), and sound sensitivity (phonophobia) (70).

Migraine with aura: This is also recurrent, fully reversible attacks lasting minutes, typically presenting with 1 or more unilateral symptoms which include visual, sensory, speech and language, motor, brainstem, or retinal disturbances, it is accompanied by headache and other migraine symptoms (70).

Chronic migraine: This is defined as a headache that occurs on 15 or more days in a month for more than 3 months, with migraine features present on at least 8 or more days in a month (70).

Probable migraine: This is a symptomatic migraine attack that lacks 1 of the features required to fulfill the criteria for 1 of the above and does not meet the criteria for another type of headache (70).

Number of attacks: There are at least five attacks that meet the criteria (70).

Call center: A call center is a centralized office used for receiving or transmitting a large volume of telephone inquiries, typically for customer service, technical support, telemarketing, or information requests. Call centers may be inbound (handling incoming calls), outbound (making outgoing calls), or a combination of both (blended) (8).

Audio call center workers: Audio call center workers are customer service agents who handle communication strictly via voice calls, often using headsets and phones (7).

Digital Call center workers: Digital call center workers communicate with customers via non-voice digital channels such as live chat, email, and social media platforms (16).

4.10. Data management

The primary data was collected through a structured self-administered questionnaire and observation. Data was stored securely with regular backups and access restricted to authorized personnel. Data cleaning, coding, and analysis were conducted using SPSS version 26. From

logistic regression, first, bivariate analysis was done, which means every independent variable was computed with the dependent variable by identifying the reference category for each categorical variable. Variables with p-value less than 0.25 was considered for the final model. The final model (multivariable analysis) assessed independent associations, with significance set at $p < 0.05$. Then the data was interpreted and analyzed to produce research findings.

4.11. Data Analysis

4.11.1. First and third Specific Objective

To identify the prevalence of migraine headache among Ethio telecom call center workers, descriptive statistics were done separately for each variable. The frequency tables were applied to estimate the number of participants who reported having migraine headache, secondly, the prevalence of migraine headache was calculated.

4.11.2. Second Specific Objective

Using bi-variables and multivariable analysis, the associated factors of migraine headache among participants were investigated. Binary logistic regression was used to identify factors associated with migraine headaches. Variables with P-value of less than 0.25 were considered as a candidate for multivariate analysis. Multiple logistic regression models were fitted to control the possible effect of confounders and finally, the variables which had an independent association with migraine headache were identified based on AOR, with 95% CI and p-value less than 0.05.

4.12. Data quality assurance

The questionnaire was prepared in English and to assure data quality it was translated into Amharic for clarity of understanding. Questionnaire was reviewed severally by a headache expat. The questionnaire was administered to participants in Amharic, it was a self-administered questionnaire, respondents received consistent instructions on how to complete the questionnaires. Field supervisors reviewed each completed questionnaire and checklist daily for completeness, clarity, and consistency. Following data entry, a thorough cleaning process was conducted, which included checks for missing values, outliers, and logical inconsistencies. Any errors or anomalies were traced back to the original instruments and corrected as necessary. all questionnaires were anonymous, and participants were assured of the confidentiality of their responses.

4.13. Ethical Consideration

This study adhered to ethical standards approved by the Addis Ababa University School of Public Health and Emergency Management Directorate. Ethical approval was obtained from the School of Public Health REC. Ethical clearance was also obtained from Addis Ababa Health bureau. Written informed consent was obtained from all participants, On the consent form, participants were fully briefed on the study's purpose, procedures, risks, and benefits. Participant confidentiality was strictly maintained, with personal data anonymized and securely stored. An ethics committee reviewed the research to ensure compliance with all ethical guidelines and standards.

4.14. Dissemination of Results

The findings from this study will be disseminated through various channels to ensure broad reach and impact. Results will be shared to Addis Ababa University School of Public Health (AAU SPH) and Emergency Management Directorate, as well as published in peer-reviewed journals related to occupational health and safety. A summary report will be shared with the Ethiopia Telecom Company. Additionally, findings will be communicated to policymakers and organizations to inform future interventions and policies regarding migraine headache prevention and management.

5. Results

5.1. Socio-Demographic and Characteristics Data of Workers

From the total (498) expected participants, 482 participated in the study, making the response rate 97%. Four hundred and seventy-six (98.8%) of the participants have worked for 3 years and above. One hundred and fifteen of the participants (23.9%) work in the Digital center, and 367 (76.1%) work in the Audio call center. The mean age of the respondents was 30.55, with a standard deviation of ±3.9 for both digital and audio call centers. Among all participants, 245 (50.8%) were male and 237 (49.2%) were female. Two hundred and sixty-nine participants (55.8%) held master's degrees, and 213 (44.2%) were BSc holders. Additionally, 284 (58.9%) of participants were married. Participants who reported having a pre-existing history of sinusitis 88 (18.3%), and 159 (33.0%) for depression. Most of the participants, 377 (78.2%), worked 6-8 hours a day without taking a break. And one hundred and sixty-eight (34.9%) rated their general health as fair and 31 (6.4%) as poor. (Table 1)

Table 1: Socio-Demographic Characteristics of Ethio Telecom Audio Call and Digital Center Respondents, 2025 (n=482)

Variables	Categories	Total (N=482)
Age Category	20-29	217 (45.0%)
	30-39	247 (51.2%)
	>=40	18 (3.7%)
Gender	Male	245 (50.8%)
	Female	237 (49.2%)
Educational Level	BSC	213 (44.2%)
	Masters	269 (55.8%)
Marital Status	Single	188 (39.0%)
	Married	284 (58.9%)
	Others	10 (2.1%)
Number of years worked in Ethio Telecom	1-2 years	2 (0.4%)
	3-5 years	213 (44.2%)
	5-10 years	263 (54.6%)
	>10 years	4 (0.8%)
Section working currently	Audio call center	367 (76.1%)
	Digital Center	115 (23.9%)
Existing Illnesses	Glaucoma	21 (4.4%)
	Sinusitis	88 (18.3%)
	Depression	159 (33.0%)
Working hours/day without a break	<6 hours	60 (12.4%)
	6-8 hours	377 (78.2%)
	9-10 hours	27 (5.6%)
	>10 hours	18 (3.6%)
General Health	Excellent	103 (21.9%)
	Good	169 (35.1%)
	Fair	168 (34.9%)
	Poor	31 (6.4%)

5.2. Prevalence of Migraine Headache.

The overall prevalence of migraine headache was (44.2%; 95% CI: 38.9% - 48.6%). Regarding migraine headache on both section of work, seventy-seven (21%) of those who work in the audio call section have migraine without aura, and 13 (11.3%) of those in the digital section, and 86 (23.4%) of those who work in the audio call section and 37 (32.2%) of those in digital section have migraine headache with aura respectively. About 364 (75.5%) of all respondents have experienced headache in their lifetime.

About two hundred and six (45.4%) of participants had at least one family member with migraine headache. One hundred and thirty-seven (28.4%) of the participants have their migraine diagnosed but only 25 (5.2%) of those diagnosed were diagnosed by a neurologist.

Regarding the frequency of attacks, thirty-six (17.5%) of participants reported having one migraine headache attack on average per week, 67 (32.5%) two attacks, 63 (30.6%) 3- 4 attacks and 40 (19.4%) reported having more than five attacks per week.

Participants who experienced mild pain intensity during their headache attacks were Forty-three (19.1%), 76 (29.8%) moderate pain intensity, 83 (37.9%) severe pain intensity, and 32 (14.2%) very severe pain intensity during their headache attacks. One hundred and sixty-three (33.8%) and 43 (8.9%) participants get relief from rest and quiet and darkness, respectively. (Table 2)

Table 2: Prevalence of Migraine headache among Ethio Telecom center, 2025 (n=482)

Variables	Categories	Call center workers N (%)	Digital center workers N (%)	In both centers N (%)
History of Headache	Yes	281(76.6)	83 (72.2)	364 (75.5)
	No	86 (23.4)	32 (27.8)	118 (24.5)
Overall Migraine headache	Yes	163 (44.4)	50 (43.5)	213 (44.2)
	No	204 (55.6)	65 (56.5)	269 (55.8)
Migraine headache without aura	Yes	77 (21)	13 (11.3)	90 (18.7)
	No	290 (79)	102 (88.7)	392 (81.3)
Migraine headache with aura	Yes	86 (23.4)	37 (32.2)	123 (25.5)
	No	281 (76.6)	78 (67.8)	359 (74.5)
Family history of headache	Yes	148 (43.1)	58 (52.3)	206 (45.4)
	No	195 (56.9)	53 (47.7)	276 (54.6)
Migraine Diagnosed	Yes	104 (28.3)	33 (28.7)	137 (28.4)
	No	249 (67.6)	79 (68.7)	345 (71.5)
Migraine attacks per week	1 attack	22 (61.1)	14 (38.9)	36 (17.5)
	2 attacks	48 (71.6)	19 (28.4)	67 (32.5)
	3 -4 attacks	54 (85.7)	9 (18.4)	63 (30.6)
	>5 attacks	33 (82.5)	7 (14.3)	40 (19.4)
Pain intensity or degree during headache attacks	Mild	30 (17.8)	13 (17.5)	43 (19.1)
	Moderate pain	45 (26.6)	22 (39.3)	76 (29.8)
	Severe pain	69 (40.8)	14 (25)	83 (36.9)
	Very severe pain	25 (14.8)	7 (12.5)	32 (14.2)
Headache relief methods	Rest	121 (33.0)	42 (36.5)	163 (33.8)
	Quiet and darkness	33 (9.0)	10 (8.7)	43 (8.9)

5.3. Perception of triggering or aggravating factors of migraine headache

The most triggers reported for migraine headache by participants were family stressor 113 (57.7%), sunlight 163 (75.5%), work stress 137 (92.6%), inadequate sleep 87 (40.8%), noise 162 (68.1%), social stressor 71 (33.3), and among female participants mensuration accounts for 54 (80.4%) aggravating factor. (Table 3)

Table 3: Perception of participants regarding aggravating factors of Migraine headache Ethio Telecom center, 2025 (n=213)

Variables	Yes Frequency (%)	No Frequency (%)
Environmental and Physical Factors		
Headache aggravated by sunlight	163 (75.5)	50 (23.4)
Headache aggravated by strong smell	92 (43.2)	121 (56.8)
Headache aggravated by exposure to Noise	162 (68.1)	51 (31.9)
Sleep disturbance due to noise and environmental factors	72 (33.9)	141 (66.1)
Work related and social stressors		
Headache aggravated by work stress	137 (92.6)	76 (22.8.)
Headache aggravated by family stressors	113 (57.7)	100 (35.0)
Headache aggravated by social stressor	72 (33.3)	141 (66.2)
Biological physiological Factors		
Headache aggravated by menstruation	54 (80.4)	13 (19.4)
Headache aggravated by pregnancy	14 (6.6)	199 (93.4)
Headache aggravated by birth control pills	11 (5.2)	202 (94.8)
Lifestyle and behavioral factors		
Headache aggravated by doing additional work	58 (27.2)	155 (72.7)
Headache aggravated by inadequate sleep	87 (40.8)	126 (59.1)
Headache aggravated by watch TV at night	146 (68.5)	67 (31.4)
Water intake	< 1 liter 12 (2.5) 1-2 liters 417 (86.5) >2 liters 53 (11.0)	
Headache aggravated by intense exercise	166 (74.4)	47 (22.1)

5.4. Absenteeism (Missed workdays)

One hundred and ninety-seven (92.4%) of participants who had migraine headache reported missing work because of migraine headache and 162 (75.9%) reported not being able to do housework like cleaning and washing in the last 3 months because of migraine headache. (Table 4)

Table 4: Missed workdays reported by respondents from Ethio Telecom center, 2025. (n=213)

Variable	Categories	Audio call center Frequency (%)	Digital center Frequency (%)	Total Yes (%)	No (%)
Missed workdays in the past 3 months	Low=1-2 days	56 (75.7)	18 (24.3)	197 (92.4)	16 (7.5)
	Moderate=3-5 days	53 (74.6)	18 (25.4)		
	High=6-10 days	35 (81.4)	8 (18.6)		
	Very high=>10days	7 (77.8)	2 (22.2)		
Unable to do Housework in the past 3 months	Low=1-2	31 (70.5)	13 (29.3)	162 (75.9)	51 (23.9)
	Moderate=3-5	47 (69.1)	21 (30.9)		
	High=6=10	34 (89.5)	4 (10.5)		
	Very high=>10 days	11 (91.7)	1 (8.3)		

5.5. Logistics Regression Analysis

Based on the result of bivariate logistic regression analysis, variables with p-value less than 0.25 includes:

Gender of participants (COR =1.6, 95% CI; 1.12- 2.32) p <0.009

Call duration for audio call center participants (COR = 3.7, 95% CI; 2.24- 6.40) p < 0.001

Depression (COR = 2.4, 95% CI; 1.68 -3.65) p <0.001

Family history of migraine headache (COR = 2.6, 95% CI; 1.77-3.78) p < 0.001

Work stress (COR = 42.2, 95% CI; 21.73-82.24) p < 0.001

Quality of life (COR = 13.1, 95% CI; 5.08 - 33.54) p = <0.001

Family stressor (COR = 2.5, 95% CI; 1.74-3.67) p < 0.001

Social stressor (COR = 2.1, 95% CI; 1.34-3.06) p < 0.001

General health (COR = 2.2, 95% CI; 1.00 – 5.19) p <0.001.

These variables were prioritized for further analysis. On the other hand, variables with p-values greater than 0.25, indicating a weaker association with the outcome variable were excluded.

These include age, education level, marital status, and work section. These variables were not considered in the final model. (Table 5 and 6).

Table 5: Bivariate logistic regression analysis of socio-demographic characteristics of migraine headache among Ethio telecom call center workers, 2025 (n=213)

Variables	Category	Prevalence of migraine headache		COR (95% Cl)	p-Value
		Yes	No		
Age Group	20-29	94 (43.3%)	123 (56.7%)	1.0	0.817
	30-39	112 (45.3%)	135 (54.7%)	1.1 (0.75 -1.56)	
	>=40	7 (38.9%)	11 (61.1%)	0.8 (0.31 -2.23)	
Gender	Male	94 (38.4%)	151 (61.6%)	1.0	0.009*
	Female	119 (50.2%)	118 (49.8%)	1.6 (1.12 -2.32)	
Education Level	BSc	92 (43.2%)	121 (56.8%)	1.0	0.619
	Masters	121 (45.0%)	148 (55.0%)	1.1 (0.74-1.75)	
Marital Status	Single	77 (41.0%)	111 (59.0%)	1.0	0.972
	Married	131 (46.1%)	153 (53.9%)	1.2 (0.85-1.75)	
Work section	Audio call center	166 (45.6%)	198 (54.4%)	1.2 (0.81-1.91)	0.273
	Digital center	47 (39.8%)	71 (60.2%)	1.0	
Audio call duration	<5 minutes	102 (51.0)	98 (49.0)	1.0	<0.001*
	5 -10 minutes	83 (52.5)	75 (47.5)	3.7 (2.24- 6.40)	

*Indicates p-value < 0.25, included in multivariable logistic regression.

Table 6: Bivariate logistic regression analysis of migraine headache among Ethio telecom call center workers, 2025 (n= 213)

Variables	Category	Prevalence of migraine headache		COR (95% CI)	P-Value
		Yes	No		
Depression	Yes	94 (59.1%)	119 (36.8%)	2.4 (1.68-3.65)	<0.001*
	No	65 (40.9%)	204 (63.2%)	1.0	
Family history of Migraine	Yes	121 (58.7%)	88 (35.5%)	2.6 (1.77-3.78)	<0.001*
	No	85 (41.3%)	160 (64.5%)	1.0	
Work stress	Yes	137 (92.6%)	11 (7.4%)	42.2 (21.7-82.2)	<0.001*
	No	76 (22.8%)	258 (77.2%)	1.0	
Family stressor	Yes	113 (57.7%)	100 (35.0%)	2.5 (1.74-3.67)	<0.001*
	No	83 (42.3%)	186 (65.0%)	1.0	
Social stressor	Yes	72 (57.1%)	141 (39.6%)	2.1 (1.34-3.06)	0.001*
	No	54 (42.9%)	215 (60.4%)	1.0	
Effect of migraine on Quality of life	Very extreme	48 (85.7%)	8 (14.3%)	13.1 (5.08- 33.54)	<0.001*
	Extreme	89 (88.1%)	12 (11.9%)	16.2 (7.02-37.11)	
	Moderately	59 (80.8%)	14 (19.2%)	9.3 (4.04 – 20.78)	
	Little	17 (31.5%)	37 (68.5%)	1.0	
General health	Excellent	30 (29.1%)	73 (70.9%)	1.0	0.001*
	Good	75 (44.4%)	94 (55.6%)	1.9 (1.15- 3.27)	
	Fair	92(54.8%)	76 (45.2%)	2.9 (1.74- 4.96)	
	Poor	15 (48.4%)	16 (51.6%)	2.2 (1.00 – 5.19)	

*Indicates p-value < 0.25, included in multivariable logistic regression.

5.6. Multiple Logistics regression

After controlling for possible confounders four variables Family history, work related stress, call duration for audio call center and quality of life became statistically significant in the final model ($p < 0.05$).

Work stress was significantly associated with migraine headaches. Those who experience work related stress are 32 times more likely to experience migraine headache than those who do not (AOR = 32, 95% CI; 6.42 – 166.01) p <0.001

The length of time spent in a call for audio call section was significantly associated with migraine headache. Those who make calls that last for 5 to 10 minutes have a 5.9 times increased risk of having migraine headache than those who work in the digital section (AOR = 5.9, 95% CI; 1.70-18.60) $p < 0.010$

A family history of migraine was significantly associated with migraine headache. Participants who have a family member with migraine headache are 2.6 times more likely to experience migraine compared to those without any family history of migraine headache (AOR = 2.6, 95% CI: 1.01–6.72, p < 0.046

The negative effect of migraine headache on quality of life of participants was significantly associated with migraine headache, those who have very extreme negative impact in the physical functioning, emotional wellbeing, social life, decline cognitive function because of migraine headache attacks were 23 times more likely to have migraine headache than those who did not experience the negative impact on their quality of life. (AOR = 23, 95% CI; 5.91 – 85.92), p <0.001 (Table 7)

Table 7: Multivariable logistic regression analysis of the associated factor and migraine headache among Ethio Telecom call center workers, 2025 (n=213)

Variable	Categories	Prevalence of migraine headache		COR (95%Cl)	AOR (95%Cl)	p-Value
		Yes (%)	No (%)			
Gender	Male	94 (38.4)	151 (61.6)	1.0	1.0	0.973
	Female	119 (50.2)	118 (49.8)	1.6 (1.12 - 2.32)	1.0 (0.42- 2.27)	
Work stress	Yes	137 (92.6)	11 (7.4)	42.0 (21.73 -82.24)	32.0 (6.42 – 166.01)	<0.001*
	No	76 (22.8)	258 (77.2)	1.0	1.0	
Depression	Yes	94 (59.1)	119 (36.8)	2.4 (1.68 -3.65)	0.7 (0.28-1.95)	0.538
	No	65 (40.9)	204 (63.2)	1.0	1.0	
Effect of migraine on Quality of life	Very extreme	48 (85.7)	8 (14.3)	13.1 (5.08 -33.54)	22.5 (5.91- 85.92)	<0.001*
	Extreme	89 (88.1)	12 (11.9)	16.2 (7.02-37.11)	13.8 (4.03-47.79)	
	Moderate	59 (80.8)	14 (19.2)	9.3 (4.04- 20.78)	10.1 (2.90-34.52)	
	Little	17 (31.5)	37 (68.5)	1.0	1.0	
Audio call duration	< 5 minutes	77 (21.0)	290 (79.0%)	1.0	1.0	0.032*
	5 -10 minutes	13 (11.3)	102 (88.7%)	3.7 (2.24 -6.40)	5.9 (1.70 -18.60)	
Family stressor	Yes	113 (57.7)	100 (35.0)	2.5 (1.74 – 3.67)	2.2 (0.91 -5.58)	0.078
	No	83 (42.3)	186 (65.0)	1.0	1.0	
Family history	Yes	121 (58.7)	88 (35.5)	2.5 (1.77- 3.78)	2.6 (1.01- 6.72)	0.046*
	No	85 (41.3)	160 (64.5)	1.0	1.0	
General health	Excellent	30 (29.1)	73 (70.9)	1.0	1.0	0.110
	Good	75 (44.4)	94 (55.6)	1.9 (1.15- 3.27)	4.2 (1.23-14.87)	
	Fair	92 (54.8)	76 (45.2)	2.9 (1.74 -4.96)	2.7 (0.82-9.27)	
	Poor	15 (48.4)	16 (51.6)	2.2 (1.00 -5.19)	1.2 (0.19-8.46)	

**Indicates as a variable with P-value <0.05 were statistically significantly

5.7. Observational Findings

For this research, a standard checklist was used to assess the working conditions at Ethio Telecom customer service centers. We observed that each staff members have access to one liter of drinking water per day. Regular breaks are available as observed.

The first aid kit available was empty, there was no trained health professional present to manage emergencies. There was poor lighting, and the windows were closed which obstructed air circulation in the hall. Noise was in moderation. Each staff member has a dedicated workstation. There was a designated rest area. Workers sat on comfortable arm rest chairs and no odor perceived in the room.

6. Discussion

This study found the prevalence of migraine headaches among call center workers (CCWs) at Ethio-Telecom, to identify associated risk factors, and evaluate the impact of migraine headaches on work productivity. Specifically, the objectives were to determine the prevalence of migraine headaches within this occupational group, explore the risk factors contributing to migraine headache occurrences, and the extent to which migraines affect productivity, particularly through missed working days. These objectives provide a framework for interpreting the study's findings in the context of occupational health and workplace efficiency.

According to the study, the overall prevalence of migraine headaches among Ethio Telecom call center employees was 44.2%, with audio call center employees at higher risk for migraine headache. Lack of sleep (40.8%), sunlight (75.5%), family conflicts (57.7%), and work stress (92.6%) were the most frequently reported triggers. Average days lost per migraine attack by participants was 2.9 days and a total of 565 workdays was lost in the last three months due to migraines headache at the time of data collection, and the majority had a negative impact on their quality of life. Independent predictors of increased risk of migraine headaches were call duration for audio call section, poor quality of life and work-related stress from multiple logistic regression analysis.

In this study, the overall prevalence of migraine headaches was found to be 44.2%. This finding is higher compared to studies done among workers in similar stressful job. A study found a 29.7% prevalence among healthcare professionals in Pakistan (21), and 18.2% among nurses and doctors in United Arab Emirate (22), In Brazil among working population 22.1% (27). The elevated prevalence in the current study may be attributed to the unique and stressful work environment of call centers, which involves high call volumes, demanding performance targets, and frequent interaction with difficult customers, factors that can contribute significantly to psychological and physiological stress, thus increasing the risk of migraines. A study done among IT staff in China revealed a 7.6% prevalence (25), which is much lower than the findings of this study. This difference in prevalence might be attributed to the stressful nature of call center worker and the work demands of call center workers compared to other populations work environment.

However, A study among Malaysian bank workers found a slightly higher prevalence of 47.2% of migraine headache (24), compared to this study. The high prevalence and the significant impact of migraines among call center workers and other high stressful jobs emphasize the

need for workplace interventions. Employers should consider implementing stress-reduction programs, adjusting workloads, offering regular breaks, and providing access to mental health support. Additionally, screening for migraine and its risk factors during regular health check-ups can help in early identification and management. These measures could not only improve the well-being of employees but also enhance productivity and reduce absenteeism in the long term.

Job stress is one of the most identified triggers of primary headaches including migraine headache (34). In this study, work stress like doing too much work was found to have a significant association with migraine headaches. Individuals who have a perceived high work stress are more likely to experience migraines headaches compared to those without perceived work stress (AOR =32, 95% CI: 6.42 – 166.01, p = <0.001). Migraineurs were found to have significant higher stress level compared to non-migraineurs (74). This finding is consistent with (69), high stress levels from life events and daily hassles are associated with the onset of migraine headaches (75). This is also in line with a study in bank call center that found perceived job stress to significantly impacts the health of call center workers, irrespective of whether they handle inbound or outbound calls (54).

In this study among the factors that aggravates the onset of migraine headache are noise, sixty-eight percent of participants reported having their migraine headache aggravated by exposure to noise. Regarding sunlight, (75.5%) of those who had migraine headache, had headache aggravation by exposure to sunlight.

Short sleep duration is associated with both migraine and non-migraine-related headache frequency (76), eighty-seven 40.8% of the participant in this study who suffer migraine headache reported that lack of sleep aggravated their migraine headaches. A study found 54% of those with migraine headaches, as well as a family history of migraine reported that insufficient sleep aggravates their migraine headache (77).

Migraine headache was found to have a strong negative association with quality of life, particularly among individuals reporting higher levels of perceived impairment. In this study, those who rated the impact of migraine as very extreme were significantly more likely to experience reduced quality of life (AOR = 23, 95% CI: 5.91– 85.92, p = <0.001). This finding emphasis that migraine is not only a neurological condition but also a serious public health issue that disrupts physical, emotional, and social functioning. This finding aligns with previous studies that shows that as health-related quality of life diminishes, as migraine attack

frequency increases (78). Individuals with frequent headaches are more prone to developing chronic migraine (69), which is associated with disabling symptoms and greater interference in daily life, including reduced cognitive performance, emotional instability, and physical limitations (70). This evidence highlights the urgent need to treat migraine as a condition with broad, multidimensional consequences. Beyond medical treatment, comprehensive management should include psychosocial support, lifestyle adjustments, and workplace accommodations. Employers and healthcare providers should work collaboratively to create supportive environments that recognize the invisible burden of migraine headache (79). Early intervention strategies, including routine screening, behavioral therapy, and stress reduction programs, can play a crucial role in mitigating the condition's long-term effects on quality of life.

One of the key factors significantly associated with migraine headache in this study was having a family history of migraine, which increased the likelihood of experiencing migraines by 2.6 times (AOR = 2.6, 95% CI: 1.01–6.72, p = 0.046) compared to those without a family history. This is in line with a general population study in Saudi Arabia that found family history of migraine to be significantly associated with migraine headache (30). The consistent association observed across studies shows that genetic factors play a significant role in the development of migraines. A family history of migraines likely indicates an inherited trait, which may involve biological mechanisms such as increased sensitivity of nerve cells, disruptions in pain signaling pathways, or genetic variations that affect the regulation of serotonin and blood vessel function factors all believed to contribute to migraine occurrence (43). From a public health and workplace perspective, this finding highlights the importance of early screening and risk assessment for individuals with a known family history of migraine. In occupational settings like call centers, where stress is already a significant trigger, identifying at-risk employees through health questionnaires or routine screenings could allow for targeted prevention strategies. These may include stress management programs, ergonomic adjustments, and flexible work arrangements to reduce migraine episodes and their impact on productivity and quality of life.

In this study, migraine headaches were shown to have a substantial impact on missed workdays and daily functioning. Descriptively, 92.4% of participants who had migraine reported missing work due to migraine headache. An average of 2.9 workdays was lost per migraine attack in the last three months at the time of data collection. Additionally, 75.9% were unable to perform housework due to migraine headache. This is in line with a study among medical and paramedic

emergency workers who 16.8% had missed work due to migraine headache (58). This is also comparable with Addis Ababa community-based study that found 78.3% of working population missed work because of migraine headaches (32), A study at Akaki textile mill in Addis Ababa reported (60%) of migraine sufferers missed work dues to migraine headache (12). These figures illustrate the burden of pain, disability, and diminished quality of life, all of which contribute to a significant economic cost. Prior studies have reported that migraine and other headache disorders result in lost working hours and reduced productivity, creating both personal and societal burdens (60,61). In Ethiopia, the economic loss resulting in absenteeism due to headache disorders is estimated to account for 1.6% of the country's GDP, this arises to productivity loss (11).

These findings emphasize the critical need for early identification, prevention, and effective management of migraine headaches in the workplace. Employers and policymakers should prioritize workplace wellness programs, including access to headache clinics, flexible work arrangements, and employee education on migraine triggers and management strategies. From a public health perspective, integrating migraine care into primary healthcare services and raising awareness about its disabling impact can reduce long-term disability and economic losses. Additionally, support systems for migraine sufferers including counseling, workplace accommodations, and affordable treatment options can improve both individual well-being, employers and national productivity.

A different model was ran specifically for those working in Audio call section in this study, and the findings shows that those who work in the audio call section and spend 5 to 10 minutes in a call on average have more than 5.9 times (AOR = 5.9, 95% CI; 1.70, 18.60, p = 0.032) chance of having migraine headache than those who work in the digital center. The finding is supported by the study done in Italy, where 100% of the call center workers reported having headache attacks (49), this indicates that working in a call center especially audio center predisposes the workers to headache attacks. The higher risk of migraines among audio call center workers could be attributed to several factors, including prolonged phone conversations, and frequent exposure to communication-related stressors such as dealing with dissatisfied customers, multitasking, and meeting performance targets (7). These stressors can elevate mental and physical tension, which may trigger headache episodes. Recurrent headaches under such conditions can evolve into chronic migraine disorders, especially when combined with other risk factors like inadequate rest or pre-existing conditions (4). This finding highlights the need for targeted workplace interventions in audio

call centers, such as shorter call durations, regular breaks, job rotation, and stress management support. Improving the work environment and offering early migraine screening and mental health services can help reduce migraine frequency and enhance employee well-being and productivity.

7. Strengths and limitations of the study

Strengths

- Conducting this study is important because of the nature of call center work, constant talking, with headphones on, engaging with customers of varied personality so, the research is important as it confirms the opportunity to assess migraine prevalence and its determinates, in the call center setting where migraine exerts a relevant negative impact.
- Multivariate logistic regression for analysis of data was a useful tool to control confounders.

Limitations

- A cross-sectional study captures exposure and outcome data at one point in time which limits the ability to establish causal relationships. It does not show cause and effect relationship.
- Additionally, the study may be subject to positive selection bias. Individuals experiencing high levels of workplace stress may have been more motivated to participate in a study focused on migraine headaches, potentially resulting in an overrepresentation of stressed participants. This could inflate the observed prevalence of migraine and contribute to an artificially elevated crude odds ratio (COR) for stress as a risk factor.
- Another limitation was using a self-administered questionnaire, respondents might misinterpret questions without the opportunity to ask clarifying questions.
- The study focused on one institution which limits its generalizability.
- Another limitation of this study, it was conducted in a workplace during work hours within a tight time limit.
- Another potential limitation was three months recall bias.

8. Conclusion

- This study reveals that 44.2 % of Ethio Telecom call center employees in Addis Ababa suffer from migraines headache.
- The independent factors that were strongly linked to migraine were work stress, length to call for the audio call center section, family history of migraine headache and poor quality of life.
- According to the results, migraine headaches had a significant impact on absenteeism, as about 92% of respondents reported being absent from work and unable to perform everyday tasks and 2.9 days of workdays lost per migraine attack per participant in the past three months at the time of data collection.
- This Research concluded that migraine is an important occupational and public health problem, which has the potential to affect people's lives, careers, and even employers especially in highly stressful call center environments.

9. Recommendations

For Ethio Telecom Company

- With the high prevalence of 44.2% of migraine headache found among Ethio Telecom call center workers. I would recommend implementing workplace health programs focused on migraine prevention and management, including stress reduction strategies especially in the audio call center.
- Provide awareness training for supervisors and staff on migraine symptoms, triggers, and coping mechanisms to foster a supportive work environment.

For Ethio Telecom Workers

- To be proactive to identify their migraine triggers and adopt lifestyle changes to avoid triggers and mitigate frequent headache attacks such as adequate hydration, sleep, stress management, and taking breaks when needed.
- Seek timely medical attention for persistent headache attacks.

For Public Health Policymakers

- Support workplace-based health surveillance systems that can help identify trends, guide interventions, and monitor the burden of migraine across high-risk job sectors like call centers.
- Allocate resources for public awareness campaigns highlighting the impact of migraines and the importance of early diagnosis and treatment.

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11. Annexes

Annex I: Participant's Information Sheet

Study Title: Assessing the prevalence of migraine headache, risk factors and absenteeism among Call Center Workers at Ethiopia Telecom, Addis Ababa, 2025.

Principal Investigator: Ngozi Odawayi Nwosu, MPH Candidate, School of Public Health, Addis Ababa University.

Contact: +251 946271646 / ngozi.odawayi@gmail.com

Purpose of the Study: The purpose of this study is to evaluate the magnitude of migraine headache, risk factors and absenteeism among Ethio Telecom call center workers. Results will facilitate recommendation to Ethiopia Telecom management on how to support their call center workers suffering from migraine and to maximize productivity.

What Participation Involves: If you take part in the study, you will answer 59 questions in a questionnaire, and this will take about 20 minutes. The questionnaire comprises migraine headaches, work related stress, Days missed at work due to headaches.

Risks: There are no known risks. Your personal information is not required for this study.

Benefits: While there is no direct benefit to you, your participation will contribute to understanding the prevalence of migraine headaches and improving workplace conditions for workers in similar environments.

Confidentiality: Your responses will be confidential. Personal details will be anonymized, and the findings will be presented without identifying any participants. If you wish, you may request a summary of the results after the study.

Voluntary Participation: Participation is voluntary. You may withdraw at any time without penalty, and any collected data will be destroyed if requested.

Results of the Research: The study results will inform policymakers and workplace managers about the prevalence and burden of migraine call center workers. Results may be published or presented at conferences.

Consent to Participate: If you agree to participate, you will sign a consent form attached to the questionnaire. You can withdraw at any time.

If your response is YES to these diseases, you are excluded from this study.

a: Chronic illness (Diabetes/Hypertension)

b: Brain tumor

c: History of Stroke

Annex II: Participant's Information Sheet (Amharic version)

የጥናት ርዕስ፡ የማይግሬን ራስ ምታት መጠን እና ተያያዥ ምክንያቶች በኢትዮጵያ ቴሌኮም፣ አዲስ አበባ የጥሪ ማእከል ተወካዮች 2024/25

ዋና መርማሪ፡ ንጎዚ ኦዳዋይ ንዎሱ፣ ሁለተኛ ዲግሪ እጩ፣ ህብረተሰብ ጤና ትምህርት ቤት፣ አዲስ አበባ ዩኒቨርሲቲ።

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የጥናቱ ዓላማ፡- ይህ ጥናት በኢትዮ ቴሌኮም የጥሪ ማእከል ተወካዮች መካከል ያለውን የማይግሬን ራስ ምታት እና ተያያዥ ምክንያቶችን መጠን ለመገምገም ያለመ ነው። ግኝቶቹ ኢትዮጵያ ቴሌኮም በማይግሬን የሚሰቃዩትን የጥሪ ማእከል ወኪሎቻቸውን እንዴት መርዳት እንደሚችሉ እና ምርታማነትን ለማሳደግ በመረጃ ላይ የተመሰረተ ውሳኔ እንዲሰጥ ያግዛል።

ተሳትፎው ምን ያካትታል፡ ከተሳተፉ ከ20-30 ደቂቃ ቃለ መጠይቅ ይደረግልዎታል በማይግሬን ራስ ምታት ስላጋጠመዎት ችግር፣ ከስራ ጋር የተያያዘ ጭንቀት ምክንያት በስራ ላይ ስላመለጡ ቀናት።

አደጋዎች: ምንም የሚታወቁ አደጋዎች የሉም. ቃለመጠይቆች የግል ይሆናሉ

ጥቅማ ጥቅሞች፡ ለእርስዎ ምንም አይነት ቀጥተኛ ጥቅም ባይኖርም፣ የእርስዎ ተሳትፎ የማይግሬን ራስ ምታት መስፋፋትን ለመረዳት እና በተመሳሳይ አካባቢ ላሉ ሰራተኞች የስራ ቦታ ሁኔታን ለማሻሻል አስተዋፅኦ ያደርጋል።

ምስጢራዊነት፡ የእርስዎ ምላሾች ሚስጥራዊ ይሆናሉ። የግል ዝርዝሮች ስማቸው አይገለጽም, እና ግኝቶቹ የትኛውንም ተሳታፊዎች ሳይገልጹ ይቀርባሉ. ከፈለጉ፣ ከጥናቱ በኋላ የውጤቶቹን ማጠቃለያ መጠየቅ ይችላሉ።

በፈቃደኝነት ተሳትፎ፡ ተሳትፎ በፈቃደኝነት ነው። በማንኛውም ጊዜ ያለ ቅጣት መውጣት ይችላሉ፣ እና ማንኛውም የተሰበሰበ መረጃ ከተጠየቀ ይጠፋል።

የጥናቱ ውጤቶች፡ የጥናት ውጤቶቹ በጥሪ ማእከል ተወካዮች መካከል ስለ ማይግሬን ስርጭት እና ሸክም ፖሊሲ አውጪዎች እና የስራ ቦታ አስተዳዳሪዎች ያሳውቃሉ። ውጤቶቹ በስብሰባዎች ላይ ሊታተሙ ወይም ሊቀርቡ ይችላሉ።

ለመሳተፍ ስምምነት፡ ለመሳተፍ ከተስማሙ ቃለ መጠይቁ ከመጀመሩ በፊት የስምምነት ፎርም ይፈርማሉ። በማንኛውም ጊዜ ማውጣት ይችላሉ።

ለእነዚህ በሽታዎች ምላሽዎ አዎ ከሆነ፣ ከዚህ ጥናት ተገለሉ።

ሀ፡ ሥር የሰደደ ሕመም (የስኪር በሽታ/ከፍተኛ የደም ግፊት)

ለ: የአንጎል ዕጢ

ሐ፡ የስትሮክ ታሪክ

Annex VI: Consent Form

Study Title: Assessing the prevalence of migraine headache, risk factors and absenteeism among Call Center Workers of Ethiopia Telecom Addis Ababa, 2025.

Principal Investigator:

Ngozi Odawayi Nwosu, MPH Candidate, School of Public Health, Addis Ababa University.

I have been provided with information about the study, including its purpose, procedures, risks, and benefits. I understand that my participation is voluntary and that I may withdraw from the study at any time without penalty.

I understand that all the information I provide will remain confidential and that my identity will not be disclosed in any reports or publications. By signing below, I consent to participate in this study and understand that I may ask any questions regarding the research at any time.

Participant's Signature: _____

Date: _____

Annex VII: Consent Form (Amharic version)

የጥናት ርዕስ፡ የማይግሬን ራስ ምታት መጠን እና ተያያዥ ምክንያቶች በኢትዮጵያ የጥሪ ማእከል ተወካዮች መካከል የቴሌኮም አዲስ አበባ፣ 2025

ዋና መርማሪ፡- Ngozi Odawayi Nwosu, MPH እጩ, የህዝብ ጤና ትምህርት ቤት, አዲስ አበባ ዩኒቨርሲቲ.

ስለ ጥናቱ ዓላማ፣ አካሄዶች፣ ስጋቶች እና ጥቅማ ጥቅሞችን ጨምሮ ስለ ጥናቱ መረጃ ተሰጥቶኛል። የእኔ ተሳትፎ በፈቃደኝነት እንደሆነ እና በማንኛውም ጊዜ ያለ ምንም ቅጣት ከጥናቱ መውጣት እንደምችል ተረድቻለሁ።

የማቀርበው መረጃ ሁሉ በሚስጥር እንደሚቆይ እና ማንነቴ በማንኛውም ዘገባ ወይም ህትመቶች ላይ እንደማይገለጽ ተረድቻለሁ። ከዚህ በታች በመፈረም በዚህ ጥናት ለመሳተፍ ተስማምቻለሁ እናም ጥናቱን በሚመለከት ማንኛውንም ጥያቄ በማንኛውም ጊዜ እንደምጠይቅ ተረድቻለሁ።

የተሳታፊ ፊርማ፡ _____

ቀን፡- _____

Annex III: Data collection Tools.

Questionnaire (English version)

Table 8: ENGLISH VERSION QUESTIONNAIRE FOR MIGRAINE HEADACHE PREVALENCE, RISK FACTORS AND ABSENTEEISM

PARTS		**RESPONSES**	**Remark and comment**
Employee ID: _____ Date: ---------- **Form ID_____**			
Part 1: Demographics Information	1. How old are you?	_____years	
	2. Gender	a. Male b. Female	
	3. Education Level	a: BSc b: Masters c: PhD	
	4. What is your Marital Status	a. Single b. Married c. Divorced d. Widowed e. Living Together	
	5. How long have you worked in the current section?	a. < 1 year b. 1 – 2 Years c. 3-5 years d. 5-10 years e. > 10 years	
	6. In which section are you working currently?	a: Audio Call center b: Digital center c: Both	

	7. Please specify how long you have been working there?	a: Audio Call center for_____ years b: Digital center for _____ years	
	8. Which of the following illnesses do you have? Tick all that apply.	a. Glaucoma b. Sinusitis c. Depression d. Specify other_____	
	9. How many hours do you work without break time per day on average?	a. < 6 hours b. 6-8 hours c. 9 - 10 hours d. > 10 hours	
	10. Have you ever had any type of headache?	a. Yes b. No	
If yes to question number 10; please answer questions number 11 to 15, if no to question 10, jump to question 41.			
Part-II Criteria to diagnose migraine	11. Does your headaches last up to 4 to 72 hours, Untreated or successfully treated	a. Yes b. No	
	12. Which of the following options have you experience during your headache attacks (select all that applies) *(at least 2 options)*	a: Unilateral location b: Pulsating quality (a rhythmic throbbing or beating sensation) c: Moderate to severe pain intensity d: Worsen by activities like walking.	

	13. Do you have any of the following during your headache attacks? (Select all that applies) *(at least 1 option)*	a. Nausea and/ Vomiting b. Photophobia and phonophobia	
	14. Have you experienced at least five headache attacks that fulfil the above three criteria's	a. Yes b. No	
	15. From the above four criteria's how many of them you have fulfilled?	A. One criterion B. Two criteria's C. Three criteria's D. All the criteria's	
	If your answer to Q#15 is not D, then proceed to the second criteria's below (Criteria I to III)		
	I. One or more of the following fully reversible aura symptoms:	A. Visual (Flickering lights, spots) B. Sensory (Numbness) C. Speech and/or Language disturbance) D. Motor Weakness E. Brainstem Retinal	
	II. At least three of the following six	A. At least one aura symptom spreads gradually over ≥5	

	characteristics	min B. Two or more aura symptoms occur in succession. C. Each individual aura symptom lasts 5-60 min. D. At least one aura symptom is unilateral. E. At least one aura symptom is positive. F. The aura is accompanied, or followed within 60 min, by headache	
	III. At least two attacks fulfilling criteria I and II	A. Yes B. No	
	If your answer to Q#15 is option D or yes to Option III above, that means you have a migraine headache. Please proceed to the next questions.		
	16. Do any of your family members have migraine headaches?	a. Yes b. No	
	17. Have you been diagnosed of Migraine	a. Yes b. No	

	headache before?		
	If yes to Q#17 or selected option D on Q#15, or YES to Option III above, please answer the rest of the questions. But if no, jump to question 41 and answer the rest of the questions		
	18. Who gave you the diagnosis?	a. Neurologist b. Internist c. Generalist d. Public Health officer e. Nurse f. Family member g: specify other_____	
	19. For how long you have had migraine after your diagnosis?	a. < 1 year b. 1- 2 years c. 3 – 5 years d. 5-10 years e. above 10 years	
	20. How many migraine headaches do you experience per week on average?	a. 1 attack b. 2 attacks c. 3-4 attacks d. 5 and above	
	21. How many migraine headaches do you experience per last week?	a. Not at all b. 1 attack c. 2 attacks d. 3-4 attacks e. 5 and above	
	22. How many migraine headaches did you experience per month?	a. Less than 2 attacks b. 2-4 attacks c. More than 4 attacks	

	23. Are you taking headache medication?	a: Yes, many times, b: Yes, sometimes c: No	
	24. (If you answered yes to Q# 23) From the following: which type of medication are you taking?	a: Paracetamol/Panadol b: Ibuprofen/ Advil c: Diclofenac d: Aspirin e: Sumatriptan f: Tramadol g: Specify others_____	
	25. (If you answered yes to Q# 23) Does medication reduce/stop your migraine headache?	a. yes b. no	
	26. How painful are your migraine headaches?	a: Mild b: Moderate c: Severe d: Very severe	
	27. Do any of the following make your migraine headaches better?	a: Rest b: Exercise c: Quiet and darkness d: Hot or cold compress e: Massage f: Warm shower g: Pressure over migraine headache area h: Others _____	
	28. During headache attack, do you feel:	Mark all that is applicable. a: Flickering lights or spots b: Loss of vision c: Numbness	

		d: Difficulty to speak	
Part III: Productivity and quality of life			
	29. How many days in the last 3 months have you missed work because of your migraine headaches?	_____	
	30. How many days in the last 3 months did you not do household work (such as housework, washing/cleaning, shopping, caring for children and relatives) because of your migraine headaches?	_____	
	31. Is your Headache aggravated by stress	a. Yes b. No	
	32. Is your Headache aggravated by sunlight	a. Yes b. No	
	33. Is your Headache aggravated by inadequate sleep?	a. Yes b. No	
	34. Is your Headache aggravated by	a. Yes b. No	

	noise		
	35. Is your Headache aggravated by strong smells (perfume/ deodorant)	a. Yes b. No	
	36. Is your Headache aggravated by a particular type of food	a. Yes b. No	
	37. (If you answered yes to Q#36) please specify the type of food	_____	
	38. Is your Headache aggravated by intense exercise	a. Yes b. No	
	39. If you are female, do your migraine headaches change with the following? (Check all that apply)	□Menstrual periods □Birth control pills □Pregnancy □Other _____	
	40. To what extent do your migraine headaches affect your quality of life?	a: Very Extremely b: Extreme c: Moderately d: Little	
Part IV: Associated Factors	41. Do you experience stressors in your family (e.g., conflicts with family members,	a. yes b. no	

	financial difficulties, lack of support)?		
	42. Do you experience stressors in your social life (e.g., peer pressure, social isolation, conflicts with friends)?	a. yes b. no	
	43. Do you live in places where noise and other environmental factors disturb sleep?	a. yes b. no	
	44. Do you drink/ indulge alcohol on weekends or on a daily basis?	a. yes b. no	
	45. Do you eat meal/food before starting your work?	a. yes b. no	
	46. Do you do additional work on top of this occupation during off time?	a. yes b. no	
	47. If yes to Q#46, specify the work	_____	
	48. If yes to Q#46, for how many hours	_____Hours	

	you extra work		
	49. Do you stay up late at night watching TV and mobile or doing home activities at home?	a. yes b. no	
	50. Do you take breaks/ rest in between your work?	a. yes b. no	
	51. If yes to Q#50, for how many minutes?	_____	
	52. While working do you sit with feet flat, knees at 90°, and looking at the monitor at eye level.? (Select all that apply)	a. yes b. no	
	53. While working do you use a desk that allows you to sit and stand comfortable to reduce strain?	a. yes b. no	
	54. While working do you use a chair with supportive backrest, armrests, and lumbar support?	a. Yes b. No	
	55. How many	a: < 1 liter	

	liters/fluids of water do you drink per day	b: 1 - 2 Liters c: > 2 liters	
	56. If you work in an audio call center, how many minutes do you spend on average on an individual call?	a: < 5 minutes b: 5 – 10 minutes c: > 10 minutes	
	57. If you work on the computer/laptop, do you have a blue light filter	a: Yes b: No	
	58. What is the level of noise in the room/hall	a: No noise b: Less noisy c: Moderately noisy d: Very noisy	
	59. How would you rate your general health in the last month?	a: Excellent b: Good c: Fair d: Poor	

Annex IV: Amharic version Questionnaire.

Table 9: AMHARIC VERSION QUESTIONNAIRE FOR MIGRAINE HEADACHE PREVALENCE, RISK FACTORS AND ABSENTEEISM

የሚግሬይን(ራስ መርዘን) ግምገማን በተመለከተ የአማርኛ ቃለመጠይቅ

ሰራተኛ መለያ ቁጥር፡_____ ቀን፡_____ የተጠያቂው መለያ ቁጥር_____			ምርመራ እና አስተያየት__
የክፍሎች	**ጥያቄዎች**	**ምላሾች**	
ክፍል ፡ የስነ ሕዝብ አወቃቀር መረጃ	1. እድሜዎ/ሽ/ክ ስንት ነው?	_____ዓመት	
	2. ፆታ	ሀ/ ሴት ለ/ ወንድ	
	3. የትምህርት ደረጃዎት?	ሀ) ቢኤስሲ (BSC) ለ) ማስተርስ (MSC) ሐ) ፒኤቺዲ (PhD)	
	4. የጋብቻ ሁኔታዎ	ሀ. ገና ያላገባ ለ. ያገባ ሐ. ፍቺ የፈጸመ መ. የትዳር ጓደኛ የሞተበት/ባት ሠ. ሳይጋቡ ከተቃራኒ ጾታ ጋር የሚኖር	
	5. በኢትዮ ቴሌኮም ውስጥ ለምን ያህል ጊዜ አገልግለዋል?	ሀ. ከ1 አመት በታች ለ. 1-2 ዓመት ሐ. 3-5 ዓመት መ. ከ 5-10 ዓመት ሠ. ከ10 ዓመት በላይ	
	6. የሚሰሩበት ክፍል የት ነው?	ሀ/ ድጂታል ሚዲያ (Digital) ለ/ የድምጽ (voice call center) ሐ/ ሁለቱም ጋር(Both)	
	7. ምን ያህል ግዜ አገለገሉ?	ሀ/ ድጂታል ሚዲያ (Digital) _____ዓመት ለ/ የድምጽ (voice call center) _____ዓመት	

	8. ከዚህ በቀኝ በኩል ከተዘረዘሩት ህመሞች መካከል እርሶን የሚያሞት ህሜም አለ ወይ? (ካለ ምረጡ)	ሀ. ግላኮማ(የዓይን ግፍት) ለ. የሳይነስ ህመም (Sinusitis) ሐ. ቁዜማ/ ድባቴ/ (Depression) መ. ስር የሰደደ በሽታ (Chronic diseases) (ስኪር/ግፊት) ሠ. የአንጎል ዕጢ (Brain Tumor) ረ. የአንጎል ደም ስር መዘጋት/ አንጎል ላይ ደም መፍሰስ(Stroke) ሰ. ለላ ዓይነት ህመም ካለ ይጻፉት_____	
	9. በአማካይ በቀን ስንት ሰአታት ያለ እረፍት ጊዜ ይሰራሉ?	ሀ. ከ 6 ሰዓት በታች ለ. ከ6-8 ሰአት ሐ. ከ9-10 ሰአት መ. ከ10 ሰአት በላይ	
	10. ከዚህ በፍት በማንኛውም ዓይነት ራስ ምታት ታመው ያውቃሉ?	ሀ/ አዎ ለ/ አይደለም	
ጥያቄ ቁጥር 10 <u>አዎ</u> ከሆነ፤ እባኮን ከጥያቄ ቁጥር 11 እስከ 15 ያሉትን ይመልሱ ; <u>አይደለም ከሆነ ወደ</u> ጥያቄ ቁጥር 16 ይዝለሉ			
ክፍል-II ሚግሬይን ለመመርመር የሚያስፈልጉ አንደኛ መስፈርቶች	11. ራስ ምታትዎ ከ4 እስከ 72 ሰአት ድረስ ይቆያል (ያልታከመ ወይም በተሳካ ሁኔታ የታከመ ልሆን ይችላል)	ሀ/ አዎን ለ/ አይ	
	12. ከሚከተሉት አማራጮች ውስጥ የትኛው ራስ ምታት በሚያምዎት ጊዜ ያጋጥሞታል (የሚመለከተውን ሁሉ ይምረጡ) *(ቢያንስ 2 አማራጮች)*	ሀ፡ በአንድ ጎን ብቻ ከፍሎ የሚያም ራስ ህመም ለ: እንደ ልብ ምት ድዉድዉ የሚል የእራስ ምታት (ተደጋጋሚ የመምታት ስሜት) ሐ: ከመካከለኛ እስከ ከባድ የህመም ስሜት መ: እንደ መራመድ ባሉ እንቅስቃሴዎች እየተባባሰ የሚሄድ ራስ ህመም።	
	13. ራስ ምታት በሚያሞት ጊዜ ከሚከተሉት ውስጥ የትኛውን አለዎት? (የሚመለከተውን ሁሉ ይምረጡ) *(ቢያንስ 1 አማራጭ)*	ሀ. ማቅለሽለሽ እና / ማስታወክ ለ. ብርሃን ለማየት መፍራሃት እና የድምጽ ፍራቻ	
	14. ከላይ የተጠቀሱትን ሶስት መስፈርቶች የሚያሟሉ ቢያንስ አምስት ግዜ የራስ ምታት ህመም አጋጥመውዎታል	ሀ/ አዎ ለ/ አይ	
	15. ከላይ ከተዘረዘሩት አራት	ሀ. አንድ መስፈርት	

	መስፈርቶች ስንቱን አሟልተዋል?	ለ. ሁለት መስፈርቶች ሐ. ሶስት መስፈርቶች መ. ሁሉም መስፈርቶች	
	ለጥያቄ ቁጥር 15 ምላሽዎ "መ" ከሆነ ወደ ጥያቄ ቁጥር 16 ይሀዱ፤ ምላሽዎ "መ" ካልሆነ ወደ ቀጣዩ መስፈርት (I,II,III) ይቀጥሉ		
	I/ ከሚከተሉት ውስጥ የትኛው ምልክት ነዉ ከራስ ምታቶ ልያሞት ስፈልግ በፊት መጥቶ ወድያው የምጠፋው? (ቢያንስ አንድ) N.B "የኦውራ ምልክት (ራስ ምታት ከመከሰቱ በፊት የከሰቱ ምልክቶች)"	ሀ/ የማየት ችግር (visual) ለ/ የስሜት ህዋሳት ችግር (sensory) ሐ/ ንግግር እና/ወይም የቋንቋ ችግር (Speech and/or Language) መ/ የጡንቻ ችግር (motor) ሠ/ የአንጎልስር(brainstem) ረ/ ከአይን ወደ አንጎል መላእክት የማስተላለፍ ችግር (retinal)	
	II/ ከሚከተሉት ስድስት ባህሪያት የትኛው ነው ያጋጠሞት (ቢያንስ ሦስቱ)	ሀ/ ቢያንስ አንድ የኦውራ ምልክት (ጥያቄ ቁጥር 16 ላይ የተዘረዘሩት) ቀስ በቀስ በ5 ደቂቃ እና ከዝያ በላይ ይሰራጫል ለ/ ሁለት ወይም ከዚያ በላይ የኦውራ ምልክቶች በተከታታይ ይከሰታሉ ሐ/ እያንዳንዱ የኦውራ ምልክት ከ5-60 ደቂቃ ይቆያል መ/ ቢያንስ አንድ የኦውራ ምልክት በአንድ-ጎን ነው ሠ/ ቢያንስ አንድ የኦውራ ምልክት በ 60 ደቂቃ ውስጥ ይኖራል ረ/ ራስ ምታት በ 60 ደቂቃ ውስጥ አብሮ ይመጣል ወይም ኦውራን ይከተለዋል.	
	III/ ከላይ የተጠቀሱትን ሁለት መስፈርቶች(ጥያቄ ቁጥር **I** እና **II**) የሚያሟሉ ቢያንስ ሁለት ግዜ የራስ ምታት ህመም አጋጥመውዎታል?	ሀ/ አዎን ለ/አይደለም	
	ጥያቄ ቁጥር 15 ምላሽዎ "መ" ከሆነ ወይም ለጥያቄ ቁጥር III ምላሽዎ "ሀ" ከሆነ ይህ ማለት የሚግሬይን ራስ ምታት አለብዎት ማለት ነው። (ከሁለቱ ብያንስ አንዱ)		
ክፍል II፡ ስለ ማግሬይን/ራስ መርዘን	16. ከቤተሰብዎ(እህት/ወንድም/አባት/እናት) መካከል ማግሬይን/ራስ መርዘን/ አለበት የተባለ ሰው አለ ወይ?	ሀ) አለ ለ) የለም	
	17. ከዚህ በፊት ሚግሬይን እንዳለቦት ተነግሮት ያውቃል ወይ?	ሀ) አለ ለ) የለም	

	(ለጥያቄ ቁጥር 17 መላሽዎ <u>አዎ</u> ከሆነ ወይም ለጥያቄ ቁጥር 15 ምላሽዎ "<u>መ</u>" ከሆነ ወይም ለጥያቄ ቁጥር 111 ምላሽዎ "<u>ሀ</u>" ከሆነ) እባኮን ከጥያቄ ቁጥር 21 እስከ መጨረሻው ይመልሱ፣ <u>የለም</u> ከሆነ ወደ ጥያቄ ቁጥር 41 ይዝለሉ		
	18. ሚግሬይን እንዳለቦት ማነው የነገሮት?	ሀ) የነርቭ ሃኪም ለ) የውስጥ ደዌ ሃኪም ሐ) የአጠቃላይ ሃኪም መ) የጤና መኮንን ሠ) ነርስ ረ) የቤተሰብ አባል ሰ) ሌላ ይግለጹ_____	
	19. ሚግሬይን አለብሽ/ህ ከተባለ ስንት ዓመት ሆኖት?	ሀ: <1 ዓመት ለ: 1-2 ዓመት ሐ: 3 - 5 ዓመት መ: ከ5-10 ዓመት ሠ፡ ከ10 ዓመት በላይ	
	20. በአማካይ በሳምንት ውስጥ ስንት ግዜ ሚግሬይን ትታመምያለሽ/ህ?	ሀ/ አንድ ግዜ ለ/ ሁለት ግዜ ሐ/ ከ3-4 ግዜ መ/ 5 ና ከዛ በላይ	
	21. ያለፈው አንድ ሳምንት ውስጥ ስንት ግዜ ሚግሬይን ትታመምያለሽ/ህ?	ሀ/ ምንም የለም ለ/ አንድ ግዜ ሐ/ ሁለት ግዜ መ/ ከ3-4 ግዜ ሠ/ 5 ና ከዛ በላይ	
	22. የሚግሬይን ራስምታት በወር ውስጥ ስንት ግዜ ያምሃል/ሻል?	ሀ/ ከ 2 ግዜ በታች ለ/ ከ 2-4 ግዜ ሐ/ ከ4 ግዜ በላይ	

	23. የራስ ምታት መድሀኒት ይወስዳሉ?	ሀ/ አዎ; ብዙ ግዜ እወስዳለሁ ለ/ አዎ; አንዳንዴ እወስዳለሁ ሐ/ አይ አልወስድም	
	24. (ለጥያቄ ቁጥር 23 አዎ ከሆነ፣) ከሚከተሉት ውስጥ የትኛውን መድሀኒት ይወስዳሉ?	ሀ/ፓራስታሞል (Panadol/ paracetamol) ለ/አይቡፕሮፍን (Ibuprofen/Advil) ሐ/ ዳይክሎፈናክ (Diclofenac) መ/ አስፕርን(Aspirin) ሠ/ ሱማትርፕታን (sumatriptan) ረ/ ትራማዶል (Tramadol) ረ/ ሌላ ከሆነ ይገለጽ_____	
	25. (ለጥያቄ ቁጥር 23 አዎ ከሆነ፣) መድሃኒት ስወስዱ የሚግሬይን ራስ ምታትዎ ይቀንሳል/ያስቆመናል?	ሀ/ አዎ ለ/ አይ	
	26. የራስ ምታትዎን የስቃይ መጠን እንዴት ለኩት/ ደረጃ ስጡት ቢባሉ?	1. መጠነኛ 2. መካከለኛ 3. ሃይለኛ/ከባድ 4. በጣም ሃይለኛ/ በጣም ከባድ	
	27. ከሚከተሉት ውስጥ የትኛው ራስምታትዎን ያስታግስሎታል?	ሀ/ እረፍት ለ/ አካል ብቃት እንቅስቃሴ ሐ/ ጸጥ ያለ እና ጨለማ ቦታ መ/ በሙቅ ወይም በቀዝቃዛ ውሃ እምቅ አድርጎ መያዝ ሠ/ ማሳጅ/ ማሸት ረ/ ሙቅ ሻወር ሰ/ በጨርቅ ማሰር ሸ/ ሌላ _____	

	28. የሚግሬይን ራስ ምታት ስትታመሙ ምን አይነት ባህርይ አለው?	1) አይን ላይ የሚያብረቀርቅ ጥቃቅን ብርሃን መታየት 2) የእይታ ማጣት 3) መደንዘዝ 4) ለመናገር መቸገር	
ክፍል III: ምርታማነት እና የህይወት ጥራት	29. ባለፈው 3 ወራት ውስጥ ስንት ቀናት በሚግሬይን ምክንያት ስራ ትተዉ ነበር?	_____ቀናት	
	30. ባለፈው 3 ወራት ውስጥ በሚግሬይን ምክንያት ስንት ቀናት ነው የቤት ውስጥ ስራዎችን ያልሰሩት? (እንደ የቤት ውስጥ ስራ፤ ልብስ አጠባ/ጽዳት፤ ገበያ፤ ልጆችን እና ዘመዶችን መንከባከብ)	_____ቀናት	
	31. ለረዥም ጊዜ ሥራ መስራት ራስ ምታትዎን ያባብሳል ወይ?	ሀ. አዎ ለ. አይ	
	32. ፀሐይ ስመታዎት ራስ ምታትዎ ይባባሳል?	ሀ. አዎ ለ. አይ	
	33. በቂ እንቅልፍ ያላገኘህ/ሽ ግዜ ራስ ምታትዎ ይባባሳል ወይ?	ሀ. አዎ ለ. አይ	
	34. የጎላ/ከፍ ያለ ድምጽ ወይም ጩሄት ራስ ምታትዎ ያባብሳል ወይ?	ሀ. አዎ ለ. አይ	
	35. ጠንካራ ሽታዎች(ሽቶ/ዶድራንት) ወይም ሌላ ጠንካራ ጥሩም መጥፎም ሽታዎች ራስ ምታትዎ ያባብሳል ወይ?	ሀ. አዎ ለ. አይ	
	36. ራስ ምታትዎን የሚቀሰቅስ የምግብ	ሀ. አዎ	

	አይነት አለ ወይ?	ለ. አይ	
	37. (ለጥያቄ ቁጥር 36 አዎ ከሆነ፣) በምን አይነት ምግብ እንደሆነ ይግለጹ?	_____	
	38. ራስ ምታትዎ በዛ ያለ የአካል ብቃት እንቅስቃሴ ስያደርጉ ይባባሳል ወይ?	ሀ. አዎ ለ. አይ	
	39. ሴት ከሆኑ የሚግሬይን ራስ ምታትዎ በሚከተሉት ነገሮች ይቀያየራል? (የሚመለከተውን ሁሉ ይመልሱ)	ሀ/ በወር አበባ (menstruation) ለ/ በወሊድ መከላከያ ክኒኖች ሐ/ በእርግዝና መ/ በሌሎች ይግለጹ_____	
	40. የሚግሬይን ራስ ምታትዎ በህይወትዎ ጥራት ላይ ምን ያህል ተጽዕኖ አሳድራል? (አንዱን ይመልሱ)	ሀ/ በጣም ከባድ ለ/ መካከለኛ ሐ/ መጠነኛ መ/ ዝቅተኛ	
ክፍል IV፡ ተጓዳኝ ምክንያቶች	41. በቤተሰብዎ ውስጥ የሚያስጨንቂ ሁኔታዎች ያጋጥሙዎታል (ለምሳሌ ከቤተሰብ አባላት ጋር ግጭቶች, የገንዘብ ችግሮች, የድጋፍ እጦት)?	ሀ. አዎ ለ. አይ	
	42. በማህበራዊ ህይወትዎ ውስጥ የሚያስጨንቂ ሁኔታ ያጋጥሙዎታል (ለምሳሌ፡ የጓደኞች ጫና፣ ማህበራዊ መገለል፣ ከጓደኞች ጋር ግጭት)?	ሀ. አዎ ለ. አይ	
	43. ከፍ ያለ ድምጽ እና ሌሎች የአካባቢ ሁኔታዎች እንቅልፍን በሚረብሹ አከባቢ ይኖራሉ?	ሀ. አዎ ለ. አይ	
	44. በሳምንቱ መጨረሻ ወይም በየቀኑ አልኮል ይጠጣሉ?	ሀ. አዎ ለ. አይ	

	45. ስራዎን ከመጀመርዎ በፊት ምግብ ይጠቀማሉ?	ሀ. አዎ ለ. አይ	
	46. ከዚህ ስራ በተጨማሪ ለሎች ስራዎችን በእረፍት ጊዜዎ ይሰራሉ?	ሀ. አዎ ለ. አይ	
	47. (**ለጥያቄ ቁጥር 46 አዎ ከሆነ**) ስራ አይነቱን ይግለጹ	_____	
	48. ለስንት ሰአት ተጨማሪ ስራ ይሰራሉ?	_____ ሰዓት	
	49. በቤት ውስጥ እያሉ ቴሌቪዥን ና ሞባይል ሲመለከቱ ወይም የቤት ዉስጥ ስራ እየሰሩ ምሽት ላይ ይቆያሉ?	ሀ. አዎ ለ. አይ	
	50. በስራዎ መካከል እረፍት ይወስዳሉ?	ሀ. አዎ ለ. አይ	
	51. (**ለጥያቄ ቁጥር 50 አዎ ከሆነ**፤) ለምን ያህል ደቂቃ?	_____ደቂቃ	
	52. ስራ በሚሰሩበት ጊዜ እግሮች ለጥ ባለ ወለል ላይ ያርፋሉ፣ ጉልበቶች በ90◦ ይሆናሉ፣ እና ከምጥተሮን በአይን ደረጃ ቀጥ ብለው ያያሉ?	ሀ/ አዎ ለ/ አይደለም	
	53. ስራ በሚሰሩበት ጊዜ ያለገደብ ለመቀመጥም ሆነ ለመቆም የሚያስችልዎ ጠረጴዛ ይጠቀማሉ?	ሀ/ አዎ ለ/ አይደለም	
	54. ስራ በሚሰሩበት ጊዜ የኋላ ድጋፊ ያለው ወንበር፣ የእጅ ማስቀመጫዎች ያለው ወንበር ይጠቀማሉ?	ሀ/ አዎ ለ/ አይደለም	
	55. በቀን ውስጥ ስንት ሊትር ውሃ/ፈሳሽ በአጠቃላይ ይጠጣሉ?	ሀ) ከ 1 ሊትር ያነሰ ለ) 1 - 2 ሊትር	

		ሐ) ከ 2 ሊትር በላይ	
	56. በስልክ ጥር በሚደረግ የአገልግሎት ክፍል ዉስጥ አንድን ደንበኛ ለማስተናገድ በአማካይ ስንት ደቂቃ ይፈጅብዎታል?	ሀ/ ከ5 ደቂቃ በታች ለ/ 5 - 10 ደቂቃ ሐ/ ከ 10 ደቂቃ በላይ	
	57. ኮምፒዩተር/ላፕቶፕ የምጠቀሙ ከሆነ ሰማያዊ ብርሃን ማጣሪያ ኮምፒዩተርዎ ላይ አለ?	ሀ) አዎ ለ) አይ	
	58. በክፍሉ/አዳራሹ ውስጥ ያለው የምረብሽ ድምፅ ደረጃው ምን ያህል ነው?	ሀ/ ምንም የምረብሽ ድምፅ የለም ለ/ ትንሽ የምረብሽ ድምፅ ሐ/ መጠነኛ የምረብሽ ድምፅ መ/ በጣም የምረብሽ ድምፅ	
	59. ባለፈው ፣ ወር አጠቃላይ ጤናዎን ሁኔታ እንዴት ይመዝኑታል? (አንዱን ምልክት ያድርጉበት)	ሀ/ እጅግ በጣም ጥሩ ለ/ በጣም ጥሩ ሐ/ መካከለኛ መ/ ዝቅተኛ	

2. Checklist for Observational

Table 10: CHECKLIST FOR MIGRAINE HEADACHE PREVALENCE, RISK FACTORS AND ABSENTEEISM, 2025

Sr. No	Contents	Yes	No	Comment
Water Availability	Is clean drinking water readily available near the worksite?			
Health and safety	Are there regular breaks provided during work hours?			
	Is there a designated resting area for workers?			
	Is a fully stocked first aid kit available?			
	Are trained health professionals present to handle emergencies?			
Work environment	Is the workspace adequately ventilated?			
	Is there sufficient lighting in the working area?			
	Is there any unpleasant odor in the room?			
	Is noise pollution present in the workspace?			
	Are blue light filters installed on work screens?			
Ergonomics	Are there enough chairs for workers to sit comfortably while working			

MIGRAINE HEADACHE MEASUREMENT TOOLS

Table 1

ICHD-3 Diagnostic Criteria for Migraine With and Without Aura

Migraine Without Aura

≥5 attacks with these characteristics:

I. Headache episode lasts 4-72 h, with or without treatment

II. Headache has ≥2 of these characteristics:
- A. Unilateral location
- B. Pulsating quality
- C. Moderate-to-severe pain intensity
- D. Worsened by routine physical activity (e.g., walking, climbing stairs)

III. During headache, ≥1 of these characteristics is present:
- A. Nausea
- B. Vomiting
- C. Phonophobia
- D. Photophobia

Migraine With Aura

Fulfills criteria for migraine headache with aura:

I. Headache begins during or ≤60 min following aura symptoms

II. ≥2 headache episodes occur that fulfill these criteria:
- A. Aura involves no motor weakness, but includes ≥1 of these fully reversible symptoms:
  - 1. Visual symptoms:
    - a. Positive features (e.g., flickering lights, spots, or lines in visual field)
    - b. Negative feature (e.g., loss of vision in half of visual field of one or both eyes, blind spot)
  - 2. Sensory symptoms:
    - a. Positive features (e.g., paresthesias)
    - b. Negative features (e.g., numbness)
  - 3. Dysphasic speech disturbance

III. Aura symptoms can occur together or alone in accordance with these criteria:
- A. ≥1 aura symptom develops gradually over ≥5 min, or aura symptoms occur in succession over ≥5 min
- B. Each aura symptom lasts ≥5 min, but no longer than 60 min

ICHD-3: International Classification of Headache Disorders, 3rd edition; min: minute.
Source: Reference 4.

MS-Q (Migraine Screening Questionnaire-)

INSTRUCTIONS: The questions below refer to the headaches or migraine episodes without headache that you may have experienced in your lifetime. Answer each question as indicated. If you are not sure how to answer a given question, please answer what you believe is most correct.

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1. Do you have frequent or intense headaches?	0. No 1. Yes
2. Do your headaches usually last more than 4 hours?	0. No 1. Yes
3. Do you usually suffer from nausea when you have a headache?	0. No 1. Yes
4. Does light or noise bother you when you have a headache?	0. No 1. Yes
5. Does headache limit any of your physical or intellectual activities?	0. No 1. Yes

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