ARSI UNIVERSITY

COLLEGE OF HEALTH SCIENCE

SCHOOL OF MEDICINE

DEPARTMENT OF INTERNAL MEDICINE

MAGNITUDE OF POST-STROKE DEPRESSION AND ASSOCIATED FACTORS AMONG STROKE SURVIVORS ON FOLLOW-UP AT NEUROLOGY AND MEDICAL REFERRAL CLINICS AT ASELLA REFERRAL AND TEACHING HOSPITAL, ARSI UNIVERSITY, ASELLA, ETHIOPIA

BY: DENEBO BULBULA (MD, INTERNAL MEDICINE RESIDENT)

JANUARY, 2026

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A RESEARCH THESIS SUBMITTED TO THE DEPARTMENT OF INTERNAL MEDICINE, SCHOOL OF MEDICINE, COLLEGE OF HEALTH SCIENCE IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR A SPECIALTY CERTIFICATE IN INTERNAL MEDICINE

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Research project Thesis submission form

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Title of the research project	Magnitude of post-stroke depression and associated factors among stroke survivors on follow-up at neurology and medical referral clinics at AU, ARTH, Asella, Ethiopia.
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Lists of Acronyms and Abbreviations

ARTH- Asella Referral and Teaching Hospital

AU- Arsi University

CoHS-College of Health Science

DALYs- Disability-adjusted life-years

DSM- Diagnostic and Statistical Manual of Mental Disorders

PSD - Post-Stroke Depression

PHQ-9- Patient Health Questionnaire-9

mRS -modified Rankin scale

PRIME-MD-Primary Care Evaluation of Mental Disorders

QOL- Quality of Life

WHO-World Health Organization

ETB- Ethiopian Birr

SPSS- Statistical Package for Social Sciences

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Abstract

Background: Post-stroke depression is among the most common neuropsychiatric complications in stroke survivors, affecting approximately one-third of stroke survivors at any point in time after stroke. Clinicians often under-recognize and under-treat post-stroke depression. Studies on post-stroke depression have been done in various countries. However, there are limited studies done in the Oromia region, and no studies have been done in the study area in particular.

Objective: To assess the magnitude of post-stroke depression and associated factors among stroke survivors on follow-up at neurology and medical referral clinics at ARTH from June 1, 2025, to December 31, 2025.

Methods: An institution-based cross-sectional study was conducted based on a structured questionnaire, patient interviews, and a review of patient charts

All the necessary data were collected from patients on follow-up at neurology and medical referral clinics using the pre-developed data collection format by Kobo Toolbox. A systematic random sampling method was used to identify the participants' charts. After data collection was completed, data on kobo Toolbox were downloaded as Excel and exported to the SPSS 27 version software database for analysis. Bivariate logistic regression analysis was used to identify the candidate variables at p value <0.25, and multivariable logistic regression analysis was employed to identify significant factors at p value <0.05

Results: A total of 148 stroke survivors participated in the study, with a response rate of 97.4%. The overall prevalence of post-stroke depression was 33.1%(95% CI:25.5%-40.7%). It was significantly associated with the degree of disability, marital status, occupation, and diabetes mellitus.

Conclusion: The study showed that one-third of stroke survivors in our study area had post-stroke depression. It had a strong association with the degree of disability, marital status, occupation, and diabetes mellitus, with the degree of disability showing the strongest and most independent association with post-stroke depression. Routine screening and early management of depression should be integrated into post-stroke follow-up care.

Keywords: Stroke, post-stroke depression, Prevalence**,** Associated factors**,** Neurology Clinic, Asella

1. Introduction

1.1 Background

A stroke, or cerebrovascular accident, is defined as a sudden onset of a neurologic deficit that is attributable to a focal vascular cause(1). Stroke typically results in permanent damage in the form of cerebral infarction, intracerebral hemorrhage (ICH), and/or subarachnoid hemorrhage (2). Ischemic stroke (Infarction) is the result of atherosclerotic development of thrombi and emboli. A decrement or absence of cerebral circulation causes neuronal cellular injury and death. Intra-cerebral hemorrhage occurs due to rupture of cerebral vessels, usually as a result of hypertension (3).

Stroke has become one of the top causes of mortality and disability-adjusted life-years (DALYs) lost globally (4). Even though the incidence of stroke has grown worldwide, it is declining among the affluent and rising among those with less access to medical care (1). “The incidence of stroke has doubled in low-and-middle-income countries over 1990–2016 but declined by 42% in high-income countries over the same period.” Globally, stroke is still the second-leading cause of death and the third-leading cause of death and disability combined in 2019. There is a substantial increment in the annual number of strokes and deaths due to stroke from 1990 to 2019 (5)

Depression and stroke are the two major causes of socioeconomic burden. The World Health Organization has recently reported that depression is the leading cause of disability worldwide, with an estimated more than 300million suffer from depression, and it has been attributed as a major contributor to the overall global burden of disease(4)

Advances in acute stroke management have improved survival rates; however, a substantial proportion of stroke survivors experience long-term complications. These complications extend beyond physical disability and include cognitive impairment, emotional disturbances, and behavioral changes that significantly affect functional independence, social participation, and quality of life(6). As a result, attention has increasingly shifted toward the long-term outcomes and holistic management of stroke survivors.

Psychiatric disorders are known to complicate a significant proportion of patients in the post-stroke period. In the acute phase of stroke, delirium and other neuropsychiatric complications become a focus of interest as they disturb the process of care and are indicators of worse outcomes. Psychiatric disturbances strongly contribute to a low quality of life among stroke survivors in the long term(7).

Stroke is associated with multiple neuropsychiatric complications such as depression, anxiety, and adjustment disorders. Among these, Post-Stroke Depression (PSD) is the most frequent and disabling complication (8).

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM)-5, post-stroke mood disorders are defined as mood disorders due to stroke with depressive features, major depressive like episode, or mixed-mood features. “A patient with a diagnosis of mood disorder due to stroke with a major depression-like episode must have depressed mood or loss of interest or pleasure along with four other symptoms of depression lasting 2 or more weeks(9).

PSD is common, affecting around one-third of stroke survivors at some point in time after stroke. Stroke survivors with PSD are at increased risk for suboptimal recovery, recurrent vascular events, poor quality of life, and mortality(10,11). PSD is commonly under-recognized and untreated in clinical practice, and emphasis has to be given to the importance of the psychiatric examination of post-stroke patients(10).

Even though the pathophysiology of PSD is poorly understood, it is thought that the cause of PSD is likely multifactorial with biological and psychosocial components, and may vary depending on timing after the event. Understanding the pathophysiology of PSD will aid in the management because it will guide the selection of therapy. For example, for PSD due to biological causes, pharmacological therapy would be preferred, whereas PSD resulting from psychosocial causes could respond more favorably to psychotherapy and social support interventions than to pharmacological therapy(11).

An association between PSD and post-stroke cognitive and functional deficits has been revealed by different studies, indirectly suggesting that PSD may be a psychological reaction to these deficits (12,13). In addition to this, multiple psychosocial risk factors for PSD are also risk factors for depression without stroke. Some of these risk factors are past psychiatric history, premorbid neurotic personality traits, and social isolation(14,15).

In contrast to this, different evidences suggest that PSD has underlying biological causes and is not a mere psychological response to new disability or a life-threatening event. Some of the contributing biological factors to PSD include: lesion location, genetic susceptibility, inflammation, neurogenesis in response to ischemia, alterations in neurotrophic factors, disruption of cortico-striato-pallido-thalamic-cortical projections, and alterations in serotonergic, noradrenergic, and dopaminergic pathways, leading to changes in amine levels (16).

1.2 statement of the problem

Post-stroke depression is a mood disorder that occurs following a cerebrovascular event and is characterized by persistent sadness, loss of interest, fatigue, feelings of worthlessness, impaired concentration, and in severe cases, suicidal ideation(17)

Evidence indicates that PSD affects approximately one-third of stroke survivors, with reported prevalence ranging from 25% to 40%, depending on the study population, diagnostic tools, timing of assessment, and study design(8)

Depression and stroke are the two major causes of socioeconomic burden. The World Health Organization has recently reported that depression is the leading cause of disability worldwide, and it has been attributed as a major contributor to the overall global burden of disease(18). Depression is a common mental health disorder that can affect both mental and physical health. It is estimated that more than 300 million people in the world suffer from depression, which is listed by the World Health Organization (WHO) as the single largest factor contributing to global disability(19). The findings from global burden of disease study on the global pattern of depression from 1990-2017 showed that the number of incident cases of depression worldwide increased from 17.2 million in 1990 to 25.8 million in 2017, representing an increase of 49.86%(6).

According to data from the Ethiopian National Health Survey, the prevalence of depression is 9.1% nationally. The most important associated risk factors were older age, being divorced or widowed, the number of diagnosed chronic non-communicable diseases, and alcohol drinking(17).

Perhaps, increased mortality associated with PSD is the most dramatic clinical phenomenon following PSD. During a 10-year follow-up period, a diagnosis of depression during the acute phase of stroke recovery was linked to a more than threefold increased risk of mortality(14). A study done in United Kingdom also showed that even mild severity of PSD was associated with higher mortality as early as 1 year after stroke(15). Another study also showed that in stroke survivors, post-stroke depression is linked to a noticeably higher chance of death(16). Increased mortality in the long term after stroke has been associated with depression, and this association is stronger among younger stroke survivors with an age of less than 65(20).

PSD is also associated with poorer functional outcomes after stroke. Even though not explored in a systematic review or meta-analysis, different individual studies have shown an association between PSD and reduced post-stroke Quality of Life (QOL)(11).

The burden of functional impairment following a stroke may raise the risk of PSD, which can then result in further impairment, such as increased disability, fewer social interactions, a failure to recover on time, failure to return to work, and longer institutional care, all of which have an impact on quality of life(21).

Many strokes are preventable, however, through judicious medical or surgical therapies. In addition, emerging thrombolytic and neuroprotective drugs, administered early after stroke onset, may minimize or eliminate some of the residual deficits associated with stroke. A massive educational effort is needed to raise public and professional awareness about stroke and emerging stroke therapies (22).

A review meta-analysis of 16 randomized controlled trials (12 using antidepressants and four evaluating the efficacy of psychotherapy) that included 1,655 patients found a significant beneficial effect of antidepressant medication, whereas psychotherapy was not more effective than a control intervention(23). Brief psychosocial therapies, however, that

place emphasis on care management, psycho-education, and family support can be beneficial to treat or prevent PSD in combination with antidepressant treatment(24,25) .

The most recent meta-analysis of prevention trials summarized the findings of eight randomized controlled trials assessing the efficacy of preventive interventions among 776 initially non-depressed stroke patients. Pooled analyses revealed that the likelihood of developing PSD was reduced among subjects receiving active pharmacologic treatment, especially following a 1-year treatment, and with the use of an SSRI(26).

Even though there are different institution-based cross-sectional studies done in Ethiopia, which have shown a high prevalence of PSD, there is a paucity of updated local data that signifies the magnitude of the problem. Therefore, this study aims to assess the Magnitude of Poststroke depression and associated factors and, in turn, add relevant data for the development of efficient strategies for screening, early detection, and treatment of PSD among stroke survivors

1.3 significance of the study

A lot of studies have been done regarding post-stroke depression in many European and American countries, showing a significant proportion of stroke survivors develop PSD. But little was known about the magnitude of PSD and associated factors in the context of developing countries like Ethiopia, especially in the Oromia region, and in particular, in the study area. This study aims to assess the magnitude of depression and associated factors among stroke survivors on follow-up at the outpatient neurology and medical referral clinics of Asella Referral and Teaching Hospital.

The result of this study will add a lot by assessing the burden of PSD in the study area and identifying at-risk groups for the development of PSD. The study will contribute a lot to improving the quality of healthcare delivery for stroke survivors. Also, the data can be used in other African countries because of the related demographic and socioeconomic factors.

The study also helps the leadership of the health system, program managers, and policymakers to know the status and consider establishing national guidelines and allocate budget

2. LITERATURE REVIEW

2.1 Epidemiology and global burden of stroke

The incidence of stroke varies significantly over the life course based on age, sex, and ethnicity. Every year, there are approximately 795,000 new or recurrent cases of stroke, among which 610,000 are new attacks, and 185,000 are cases with recurrent stroke. Females have been shown to have a higher lifetime risk of stroke. And each year, there are approximately 55,000 more females than males with a case of stroke(27). To the contrary, the Global Burden of Diseases (GBD) 2013 study identified men having consistently greater incidence of ischemic stroke than women(28).

The most recent systematic review and meta-analysis on the burden of stroke and modifiable risk factors shows the pooled burden of hemorrhagic and ischemic stroke were 46.42% and 51.40%, respectively. The overall magnitude of modifiable risk factors of hypertension, alcohol consumption, and dyslipidemia among stroke patients were 49%, 24.96%, and 20.99%, respectively, with more than 90% of stroke patients having one or more modifiable risk factors(29).

2.2. Prevalence of PSD

2.2.1. Global prevalence of PSD

The incidence and prevalence of PSD have been studied in many countries of the world. A systematic review and meta-analysis of 51 studies performed by Hackett et al., which was conducted before June 2004, revealed a pooled frequency estimate of PSD of 33%(30).

The most recent meta-analysis of 61 cohorts, including 25,488 patients, done by ML Hackett et al., reported that 31% of patients developed depression at any time point up to 5 years following stroke(31). According to a prior meta-analysis of 43 studies published in 2013, including 20,293 patients pooled prevalence of PSD was 29% at any time point within 5 years following stroke(32).

A study done in Germany in the year 2015, which included 289 patients found in rehabilitation clinics, showed a prevalence of PSD to be 31.1% in the first 6 weeks following stroke(33).The prevalence of post-stroke depression in Saudi Arabia, done in a tertiary hospital, showed 70.6%(34). Another cross-sectional study done in Bangladesh shows that the prevalence of PSD is 70 %(35).

2.2.2. Prevalence of PSD in Africa

A systematic review and meta-analysis done on depression after stroke in sub-Saharan Africa, comprising seventeen studies and 1483 stroke survivors, was done in 2017 showed the pooled frequency of clinically diagnosed PSD was 31%. PSD was significantly associated with low education, cognitive impairment, physical disability, poor quality of life, and divorced marital status(36).

A systematic review and meta-analysis of the prevalence and associated factors of post-stroke depression in Africa shows that the pooled prevalence (estimate) of post-stroke depression at any time after stroke was 38.35%. The pooled estimate of post-stroke depression using clinical assessment tools was 38.53% and 36.81% by using the rating scale. Central Africa (50.92%) had the highest pooled estimate of PSD, followed by West Africa (35.76%). Physical disability was significantly associated with the incidence/prevalence of post-stroke depression(37).

A systematic review and meta-analysis on Exploring the occurrence and risk factors of post-stroke depression among stroke survivors in Africa, twenty-two relevant studies with 3175 stroke patients included, show that the overall estimated pooled prevalence and incidence of depression among stroke survivors in Africa were found to be 42.5% and 33.2%, respectively. The subgroup analysis further revealed that Nigeria had the highest prevalence of depression at 47.6%, followed by Ethiopia at 44.4%. But this study did not identify any factors that were positively associated with post-stroke depression(38).

According to institutional based cross sectional study done in two tertiary hospital in Uganda shows that the prevalence of PSD is 31.5 %, PSD was higher among patients assessed within 6 months after the onset of stroke and patient's inability to undertake activities of daily life(39)

An Egyptian hospital-based study done in 2020 also concluded that PSD is a common complication seen in stroke survivors, with a prevalence of 36.9 %. Low educational level and socioeconomic status, as well as smoking and functional impairments, were considered as risk factors for the occurrence of post-stroke depression. The study also showed that PSD has a significant impact on the quality of life(21).

2.2.3. Prevalence of PSD in Ethiopia

An institution-based cross-sectional study done in 2020, in Tikur Anbessa specialized hospital and Zewditu hospital, has found that depressive symptoms among ischemic stroke patients were common, with a prevalence of 32.2%(40).

Another institution-based study done in Saint Paul hospital Millennium Medical College, which was published in 2021, has also shown a prevalence of PSD to be 43.4%, with age of 45-64 years of age and shorter duration of stroke less than 6 months were significantly associated with increased PSD(41).

An institution-based prospective cross-sectional study conducted in 2023 in government hospitals in Bahir Dar city showed that the overall prevalence of post-stroke depression was found to be 42.9%(42).However, another study done in Zewditu Memorial Hospital in 2022 on the prevalence of post stroke depression showed Point prevalence for post stroke depression was 27.5%(43).

An institution-based cross-sectional study done in Hawassa Comprehensive Specialized Hospital, in 2024, has found that post stroke depression prevalence was 29.2%, with physical disability, cardiac illness, and shorter duration being significant predictors of PSD(44).

Another prospective multicenter study done in 5 tertiary hospitals in Amhara Regional State on the burden of post-stroke depression and anxiety and their predictors among stroke survivors in 2024 shows that the prevalence of post-stroke depression and anxiety among stroke survivors in the Amhara Regional State was 64.1%, and male sex, stroke complication presence, and comorbidity presence were significantly associated with post-stroke depression(45)

2.3. Factors associated with PSD

Several studies have been done in the past to assess factors associated with depression following stroke. Several systematic reviews have also reviewed these studies. Among these studies, a study published by A De Ryck et al in 2014 found that the most frequently cited risk factors for PSD in the literature were sex (female), history of depression, stroke severity, functional impairments or level of handicap, level of independence, and family and social support(46).

Another systematic review and meta-analysis showed that disability after stroke and a history of depression pre-stroke are the most consistently reported predictors of depression after stroke. Some of the other important predictors of depression were cognitive impairment, stroke severity, lack of social or family support, and anxiety. However, there has been no association found between depression and other variables representing neurological damage, such as stroke subtype, lesion location, or laterality of stroke. The importance of neurological damage on depression after stroke appears to be limited to cognitive impairment and stroke severity(32).

A 2017 scientific statement for healthcare professionals from the American Heart Association and American Stroke Association also stated that physical disability, stroke severity, depression before stroke, and cognitive impairment consistently had a positive association with the development of PSD(21). Other factors that have been associated as predictors of depression following stroke include a lack of family and social support after stroke, and anxiety after stroke(32,46).

In contrast to other studies, an updated systematic review done by Kutlubaev et al published in 2014 has not shown a consistent association between factors like old age, female sex, diabetes mellitus, stroke subtype, education level, living alone, and previous stroke on subsequent development of depression(47).

In a 2020 study done in Egypt, low educational level, low socioeconomic status, cigarette smoking, and a more severe functional impairment were found to be strong predictors for the development of PSD. However, no significant association was found between age, gender, marital status, and job status and PSD. In addition to these, no significant association was found between PSD and past psychiatric history of depression or family history of depression in a first-degree relative(21).

According to institutional based cross-sectional study done in two tertiary hospitals in Uganda shows that the prevalence of PSD is 31.5 %. PSD was higher among patients assessed within 6 months after the onset of stroke, and patients' inability to undertake activities of daily life(39).

A recent case-control study done in Ethiopia in the year 2022 concluded that many factors were associated with PSD, among which male gender, prior history of stroke, physical disability, severity of stroke, subcortical location of the lesion, and ischemic heart disease were found to be important factors in the occurrence of PSD(48).

Another study done in Ethiopia at Zewditu Memorial Hospital, Addis Ababa, a cross-sectional study, shows that the point prevalence of PSD is 27.5% with Female gender, unemployment, low social support level, diabetes mellitus, and post-stroke period under two years were statistically significant and independent predictors for post-stroke depression(43).

An institution-based cross-sectional study done in Hawassa Comprehensive Specialized Hospital, in 2024, has found that post stroke depression prevalence was 29.2%, with physical disability, cardiac illness, and shorter duration being significant predictors of PSD(44)

An institution-based prospective cross-sectional study was conducted from September to December 2023 on 394 patients in two tertiary level hospital in Bahir Dar shows the overall prevalence of post-stroke depression was found to be 42.9%. Patients with known depression before stroke, ischemic heart disease, and significant physical disability were at a higher risk of developing PSD(42).

2.4 Conceptual framework

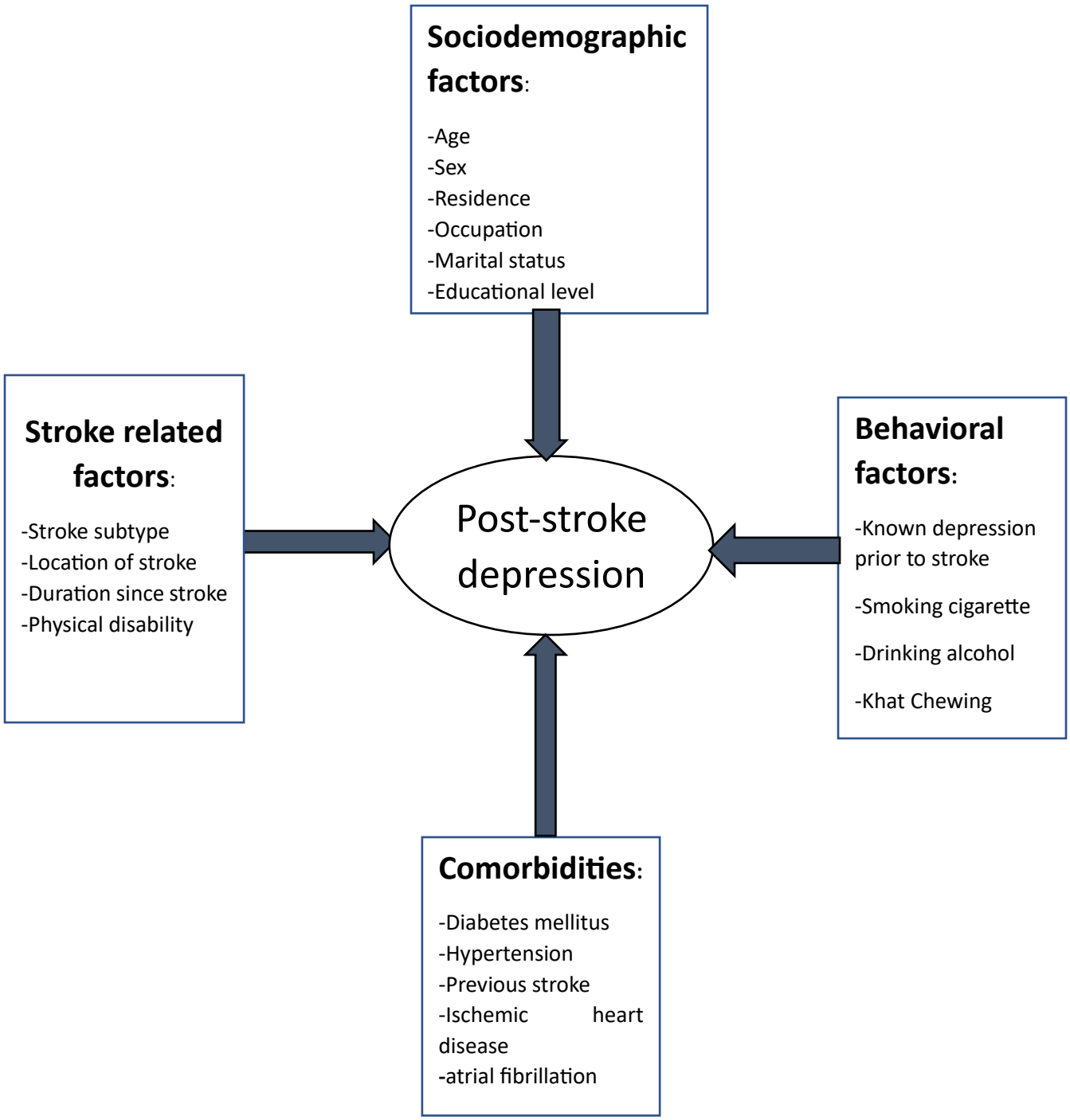

Figure 1: Conceptual framework of factors associated with post-stroke depression among stroke survivors attending outpatient neurology and medical referral clinics, ARTH, Asella, Ethiopia,2025

3. Objectives of the Study

3.1. General Objectives

To assess the magnitude of post-stroke depression and associated factors among stroke survivors on follow-up at neurology and medical referral clinics at ARTH, AU, Asella, Ethiopia, from June 1, 2025, to December 31, 2025

3.2. Specific Objectives

To determine the magnitude of post-stroke depression among stroke survivors on follow-up at neurology and medical referral clinics at ARTH, AU, Asella, Ethiopia, from June 1, 2025, to December 31, 2025

To identify factors associated with post-stroke depression among stroke survivors on follow-up at neurology and medical referral clinics at ARTH, AU, Asella, Ethiopia, from June 1, 2025, to December 31, 2025

4. Methods

4.1. Study Design

An institution-based cross-sectional study was conducted based on a structured questionnaire, patient interviews, and a review of patient charts

4.2. Study Area and Period

The study was conducted at Arsi University, College of Health Science, Asella teaching& referral hospital, which is located in the town of Asella, from June 1, 2025, to December 31, 2025. Asella is a town in central Ethiopia, which is located in the Arsi Zone of the Oromia Region about 175 kilometers from Addis Ababa, the capital city of the country. Arsi University is one of the young universities in Ethiopia, established in 2014. Since 1964, Asella teaching and referral hospital has been serving populations in Arsi and the nearby zones with a current population of 3.8 million. The hospital has 321 beds with more than 6 departments (Internal Medicine, Surgery, Pediatrics, Gynecology and Obstetrics, Orthopedics, and Oncology). The hospital is involved in training undergraduate and postgraduate students in different specialties in 04 major departments (Internal Medicine, Surgery, Pediatrics and Child Health, and Gynecology and Obstetrics). The hospital has been improving its health service delivery, and currently has modern investigation modalities like Digital X-rays, portable X-ray, different types of Ultrasounds, Echocardiography, Computerized tomography scan, Endoscopy, and culture service. The Department of Internal Medicine has a separate Neurologic follow-up clinic, which is run by 2 Neurologists, Internal Medicine Residents & 2 nurses & functional 2 days per week. There are, on average, 216 patients on regular follow-up at the clinics, as taken from the HMIS logbook of the clinics.

4.3. Source Population

All patients with a history of stroke who were on follow-up at outpatient neurology and medical referral clinics of ARTH were the source population.

4.4. Study Population

All adult patients with a history of stroke and on follow-up at neurology and medical referral clinics at ARTH during the study period, and who met the inclusion criteria were the study population.

4.5. Inclusion Criteria

All adult patients with a history of stroke who were 18 years or older, who gave informed consent, and who had brain imaging documented on their respective charts, and on follow-up during the study period were included in the study.

4.6. Exclusion Criteria

Patients with severe language impairment, incomplete medical charts, and a history of major psychiatric illness other than depression, stroke patients less than 2weeks post-stroke were excluded.

4.7. Study Variables

4.7.1. Dependent Variables

Magnitude of post-stroke depression

4.7.2. Independent Variables

Socio-demographic factors

- Age
- Sex
- Residence
- Occupation
- Marital status
- Educational level

Stroke-related factors

- Stroke type
- Location of stroke

- Duration since stroke
- Degree of physical disability

Comorbidities

- Diabetes mellitus
- Previous stroke
- Ischemic heart disease
- Hypertension

Behavioral factors

- Known depression before stroke
- Drinking alcohol
- Smoking cigarette
- Khat chewing

4.8. Operational Definitions

Stroke: is defined as a sudden onset of a neurologic deficit that is attributable to a focal vascular cause, and the diagnosis must be confirmed by imaging interpreted by a radiologist or clinically diagnosed by a neurologist(1).

Depression: The patient must fulfil the defining criteria for depression according to PHQ-9.e, a score of 10 or greater (49).

Post-stroke depression: new onset of depression at least 2 weeks after the occurrence of the stroke(50)

Mild disability: modified Rankin Scale score of (0-2) (51)

Moderate disability: modified Rankin Scale score of 3,(51)

Severe disability: modified Rankin Scale score of (4-5) (51)

4.9. Sample size determination and procedure

4.9.1. Sample size determination

The sample size was determined by using the following assumptions: single population proportion formula, taking the p-value from another similar study conducted with p 43.4%(41), level of significance 5% (a=0.05), margin of error 5% (d=0.05), and the estimated population size was 216.

$$n = \frac{[Z^{2.} .p (1-p)]}{d^2}$$

Were

n = sample size.

Z = 95% confidence limit (1.96)

p = proportion of the post stroke depression from the previous study, which took prevalence of 43.4%

d = margin of error or degree of accuracy desired (0.05)

$$n= \frac{(1.96)^2 x (0.434) (0.566)}{(0.05)^2} =378$$

Since the samples were obtained from a relatively small population (N = 216);

correction formula was used. $n^* = \frac{n}{1+\frac{n-1}{N}}$

$$n^* = \frac{378}{1 + 377/216}$$

$$n^* = 138$$

Adding 10% of the non-response rate, the final sample size was n= 152

4.9.2. Sampling technique

A systematic random sampling method was used to select the study participants. To select the first participant, a simple random sampling technique (lottery method) was used, and then every Kth interval was followed until the pre-determined sample size was obtained

4.10. Data Collection Tools and Procedures

Data were collected by interviewing the study participants using a structured pretested questionnaire (PHQ-9) and patient chart review. The Patient Health Questionnaire (PHQ) is a self-administered version of the PRIME-MD diagnostic instrument for common mental disorders. The PHQ-9 is the depression module, which scores each of the 9 DSM-IV criteria as 0–3 (0 = not at all, 1 = several days, 2 = more than half the days, and 4 = nearly every day). A sum of all these scores forms the basis for the scale score that ranged between zero and twenty-seven (score 0–4 = no depression, score of 5–9 = minimal symptoms, score of 10–14 = minor depression, score of 15–19 = moderately severe depression, and score of 20–27 = severe depression). A score of 10 or more was used to classify patients as having depression or not. A PHQ-9 score ≥10 has been found to have a sensitivity of 88% and a specificity of 88% for major depression(49).

4.11 procedures

The tool was translated into local languages, Afaan Oromo and Amharic, then back to English, to ensure its consistency. Individuals who were proficient in both languages translated it.

for survey, patients were invited and asked whether they agreed to participate in the questionnaire-based interview. Clients were recruited randomly by the study nurse. Data was collected in a separate room to avoid the introduction of bias during the interview.

Data was collected using a structured questionnaire through face-to-face interviews and patients' chart review. The interviewer administered and recorded review methods. The training manual was developed to provide a half-day training before the data collection for the four data collectors, nurses, and Internal medicine residents who work at outpatient clinics. Training was provided on sampling procedure, inclusion criteria, ethical consideration, and data collection procedure, including how to approach study participants.

The researcher was checked for completeness, accuracy, and consistency of collected data on a daily basis on kobo toolbox.

Other factors like patient demographics, stroke type, location of stroke, duration since stroke, Imaging finding, and prior known depression were collected from patient chart review.

4.12. Data Quality Assurance

The data was collected by trained health professionals (trained nurses who work in outpatient clinics & medical residents). Training was given on how to proceed with filling the questionnaire and collecting data from patient charts on kobo toolbox. Data collection was supervised by internal medicine residents. The pre-test was conducted with 5% of the total sample size at Adama Hospital and Medical College.

4.13. Data Processing and Analysis

The data was checked for completeness and quality before being entered. The data was transferred from kobo toolbox to an Excel sheet and then exported to and analyzed by SPSS version 27 software. The descriptive analysis was done by simple frequencies and proportions, and the results were presented by tables, bar graphs, and pie charts. Simple logistic regression analysis was performed to evaluate the strength of association between PSD, socio-demographic, stroke-related factors, comorbidities, and psychosocial factors. Multiple logistic regression analysis of all statistically significant variables was performed to control potential confounders. A p-value less than 0.05 was considered statistically significant. Both simple and multiple regression analyses were expressed as odds ratios (OR) with 95% confidence intervals (CI).

4.14 Ethical Considerations

Ethical clearance was obtained from the ethical review committee of Arsi University, College of Health Science (CoHS), before the initiation of the study, and administrative approval was obtained from ARTH. Informed verbal and written consent were obtained from the respondents. Strict confidentiality was assured, and the privacy of the respondent was maintained throughout data collection and analysis. The confidentiality of the data collected was maintained, and the

names of the patients were not included during data collection. The information gained wasn't exposed to third parties.

Data obtained in the course of study was only handled by the research team.

4.15 Dissemination of the result

After research completion and finalizing the report, the findings of this study will be submitted to the graduate programs coordinating office and the College of Health Sciences of Arsi University, Internal Medicine Department, Asella Teaching & Referral Hospital, and other stakeholders. Will also be disseminated through publications in national or international journals, presentations at scientific meetings, and conferences

5. Results

5.1. Socio-demographic characteristics of the study participants

Key variables such as age, sex, religion, educational level, monthly income, and marital status were collected to understand the background of study participants attending the neurology and medical referral clinics of Asella Referral and Teaching Hospital.

Of the 152 stroke survivors selected for the study, 148 of them participated in the study, resulting in a response rate of 97.4%. of these participants 85(57.4%) were male, while 63(42.6%) were female, indicating male to female ratio of 1.35:1.

The overall age of our respondents ranges from 28 to 89 yrs. 69 (46.6%) of participants were in the older age group (>= 65 years). Only 20 (13.5%) of participants were in the young age category (18 to 44 years).

Most of the study populations were Muslim and Orthodox in religion, each accounted for 43.2%, and protestant accounts for 13.5%.

Eight out of ten of the study participants were married 119(80.4%) & dwelling in urban 84 (56.8%). Regarding educational status majority attended primary school, 52(35.1%), followed by those who didn't attain formal education 40(27%).

Of these study participants majority were farmers, 62(41.9%), and most of the study participants' monthly income was less than 5000ETB (49.3%).

Table 1.Socio-demographic characteristics of stroke survivors attending the neurology &medical referral clinics at Asella Referral &Teaching Hospital, Ethiopia,2025

Variables	Category	Frequency	Percent (%)
Age in year	18-44	20	13.5
	45-64	59	39.9
	>=65	69	46.6
Sex	Male	85	57.4
	Female	63	42.6
Religion	Muslim	64	43.2
	Orthodox	64	43.2
	Protestant	20	13.5
Marital status	Married	119	80.4
	Single	4	2.7
	Widowed	19	12.8
	Divorced	6	4.1
Residence	Urban	84	56.8
	Rural	64	43.2
Education	Illiterate	40	27
	Primary	52	35.1
	Secondary	20	13.5
	Degree and above	36	24.3
Occupation	Farmer	62	41.9
	Gov't employee	26	17.6
	Merchant	23	15.5
	Other	37	25
Monthly Income	0-4999 ETB	73	49.3
	5000-9999 ETB	57	38.5
	≥10000 ETB	18	12.2

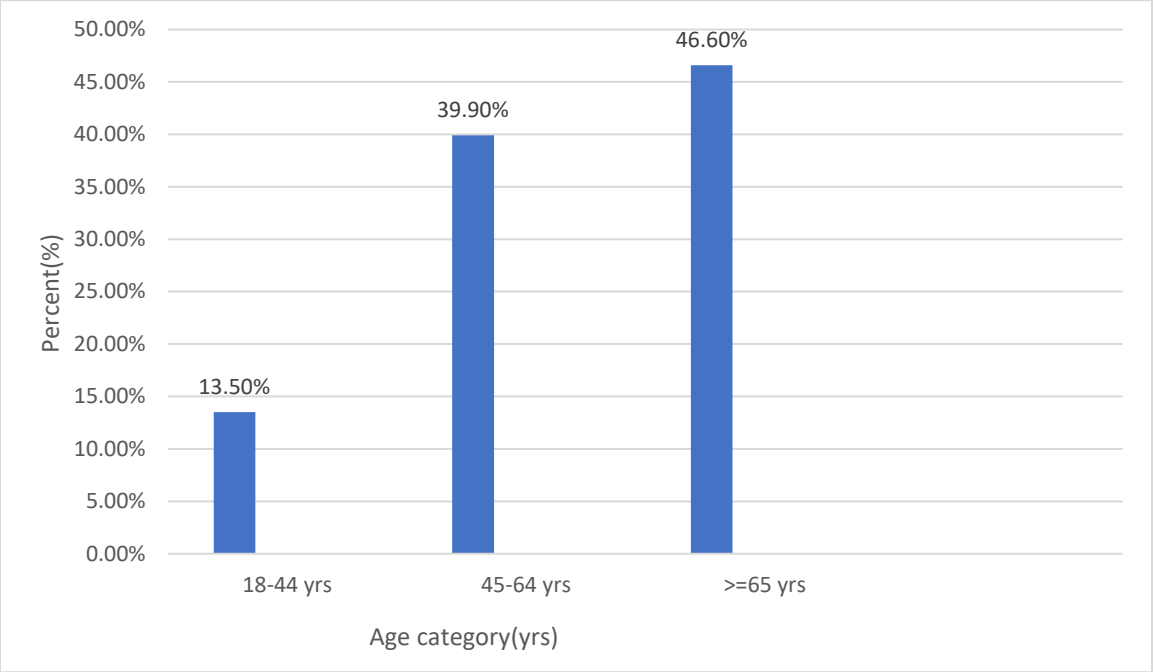

Figure 2:Frequency percentage of age category of study participants on follow-up at ARTH, Asella, Ethiopia,2025

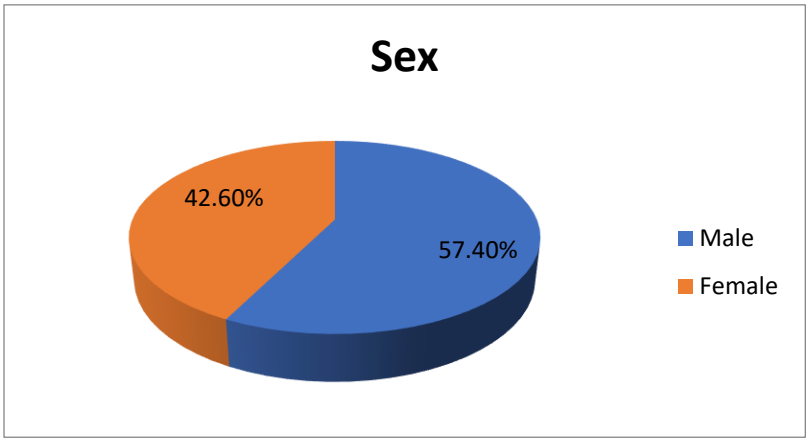

Figure 3: Frequency percentage of sex distribution of study populations on follow-up at ARTH, Asella, Ethiopia,2025

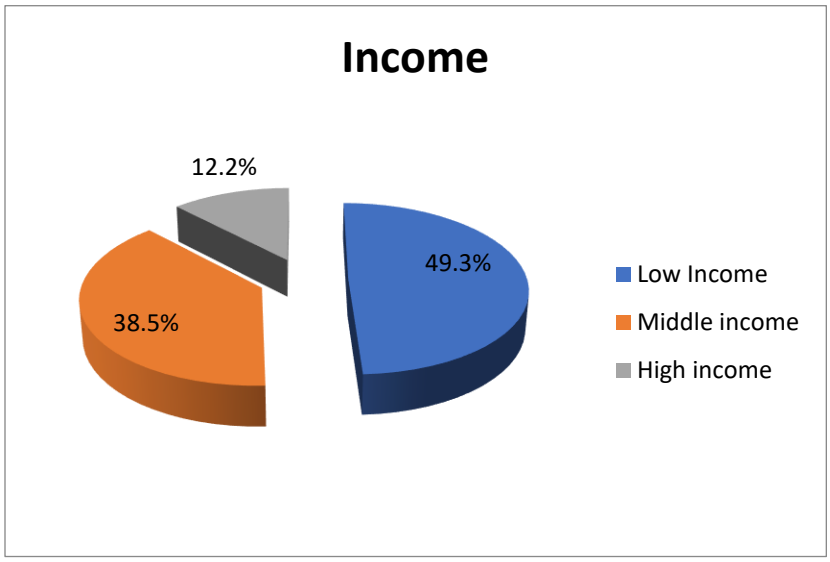

Figure 4: Frequency of monthly income category of study participants on follow-up at ARTH, Asella, Ethiopia,2025

5.2. Behavioral characteristics and comorbidities of study participants

The behavioral characteristics and comorbidities of the study participants included key variables such as smoking, alcohol consumption, and chewing, and comorbid risk factors of stroke, like hypertension, diabetes mellitus, atrial fibrillation, and ischemic heart disease, to understand the behavioral characteristics and comorbidities of stroke patients attending the neurology and medical referral clinics at Asella Referral and Teaching Hospital.

Of the total study participants, 34(23%) had a history of previous stroke. The majority of respondents had Hypertension 84.5%, but only 29.7% had diabetic mellitus.

Ischemic heart disease accounts for 27%. Study participants with atrial fibrillation account for 17.6%.

Among the study participants,24.3% had a history of alcohol consumption,5.4% had a history of smoking. only 2.7% had a history of previous depression.

Table 2: Behavioral characteristics and comorbidities of stroke survivors on follow-up at ARTH, Asella, Ethiopia,2025

	Category	Frequency	Percent (%)
Previous stroke	Yes	34	23
	No	114	77
HTN	Yes	125	84.5
	No	23	15.5
DM	Yes	44	29.7
	No	104	70.3
IHD	Yes	40	27
	No	108	73
Atrial fibrillation	Yes	26	17.6
	No	122	82.4
Smoking	Yes	8	5.4
	No	140	94.6
Drinking alcohol	Yes	36	24.3
	No	112	75.7
Chat chewing	Yes	19	12.8
	no	129	87.2
Previous depression	Yes	4	2.7
	No	144	97.3

5.3. Stroke-related factors of study participants

Variables assessed include the type of stroke, stroke anatomic location, duration since stroke, history of previous transient ischemic attack (TIA) or stroke, and functional status as measured by the Modified Rankin Scale (mRS). Frequencies and percentages are provided for each category. Among the participants, ischemic stroke was the major subtype, accounting for 90(60.8%) of study participants, while haemorrhagic stroke comprised 58(39.2%).

Regarding the lesion location, 54.7% of patients had left hemispheric involvement, 41.2% had right hemispheric involvement, and 4.1% had bilateral lesions.

With respect to duration since stroke onset,25.7% of the participants were within 1-6 months of the index stroke, while 27% were 7-12 months post-stroke. Nearly half of the participants (47.3%) had a duration of more than 12 months since stroke.

Stroke severity as assessed by the modified Rankin Scale (mRS) showed that 62.2% of participants had mild disability,28.4% had moderate disability and 9.5% had severe disability.

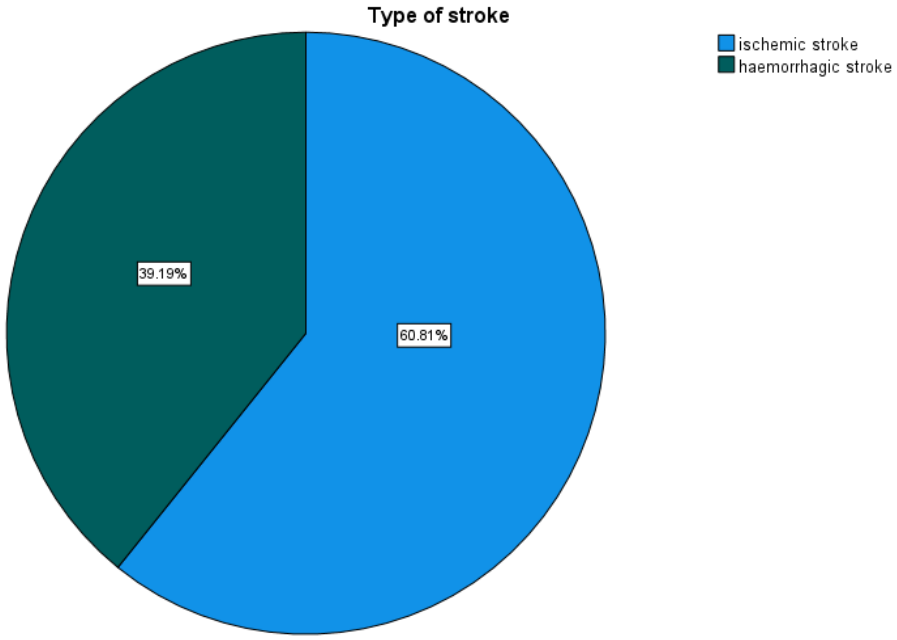

Figure 5:Frequency percentage of type of Stroke of study participants on follow-up at ARTH, Asella, Ethiopia,2025

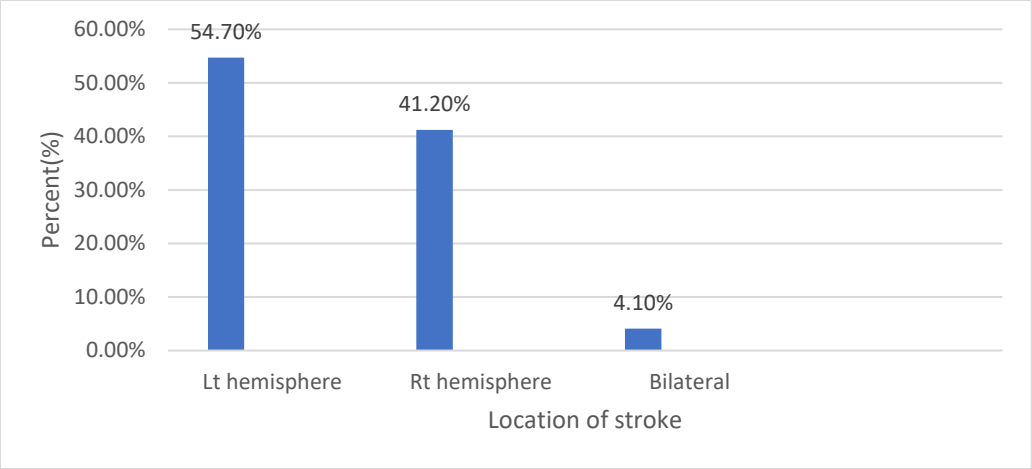

Figure 6: Frequency percentage of location of stroke of study participants on follow-up at ARTH, Asella, Ethiopia,2025

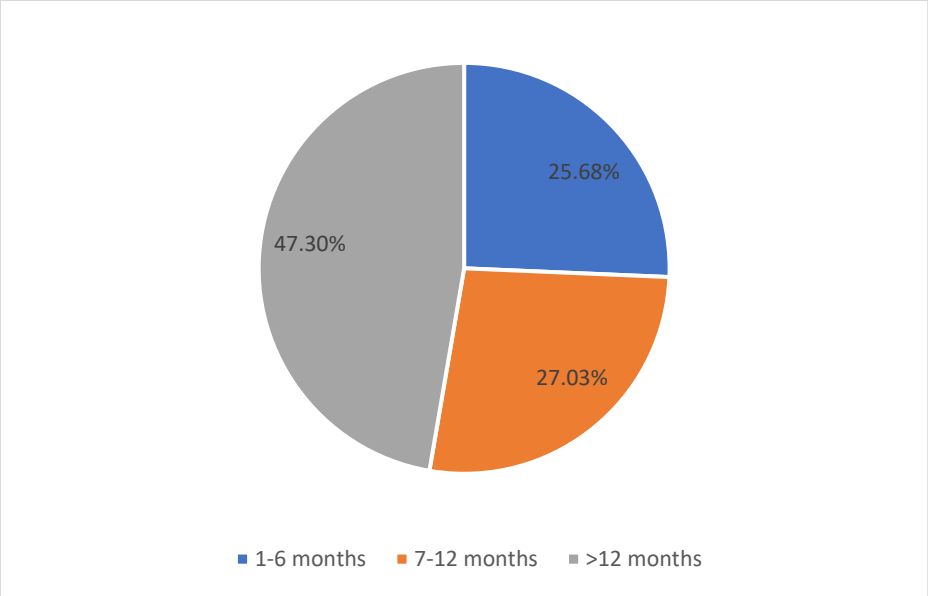

Figure 7: Frequency percentage of duration post-stroke of study participants on follow-up at ARTH, Asella, Ethiopia,2025

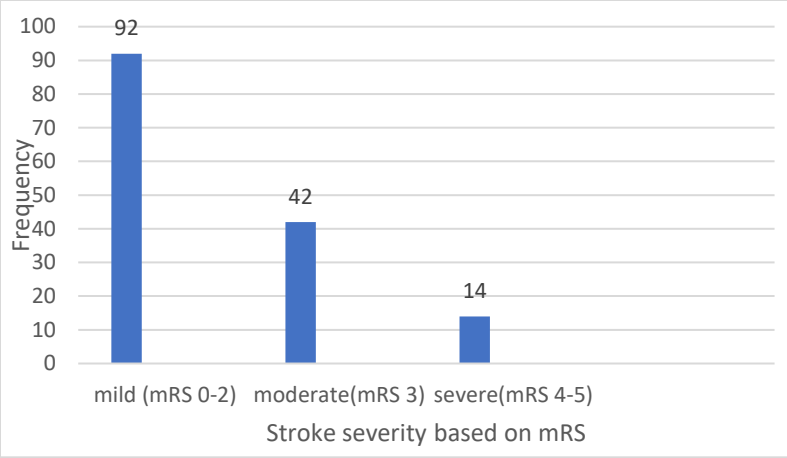

Figure 8: Frequency of stroke severity based on mRS of study participants on follow-up at ARTH, Asella, Ethiopia,2025

5.4. prevalence of post-stroke depression

By using PHQ-9 as a screening tool for depression assessment in stroke survivors, with a value >=10, 33.1% (95% CI: 25.5%-40.7%)of study participants had post-stroke depression.

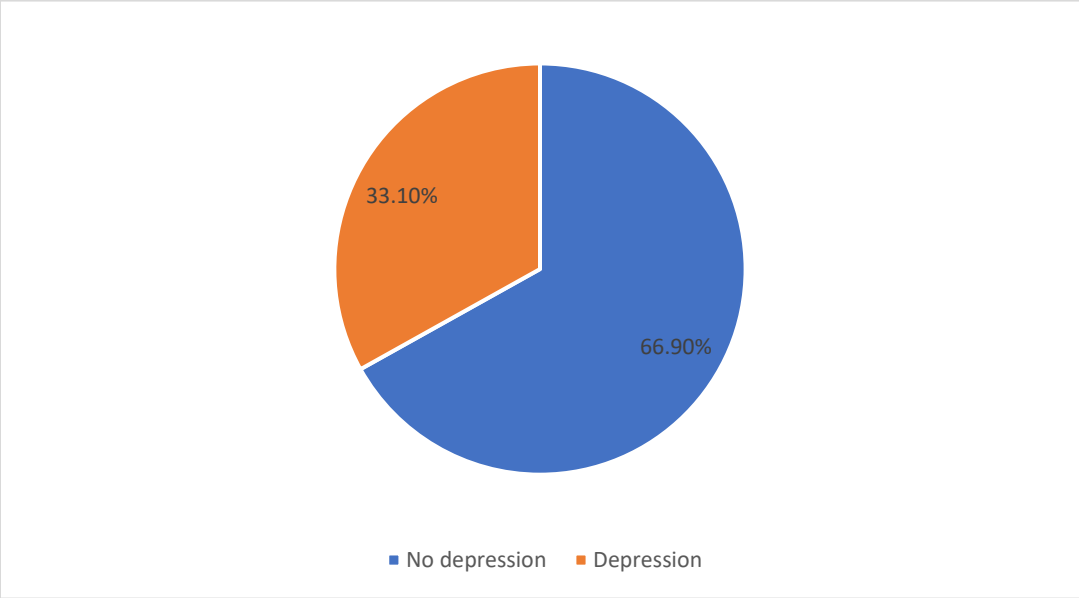

Figure 9: The overall post-stroke depression among stroke survivors on follow-up at ARTH, Asella, Ethiopia,2025

5.5. Factors associated with post-stroke depression

In multivariable logistic regression analysis, marital status, occupation, diabetes mellitus and stroke severity based on the modified Rankin Scale were associated with post-stroke depression.

Regarding marital status, using married study participants as a constant category, widowed and divorced participants had higher odds of post-stroke depression. Widowed participants were 23x more likely to develop post-stroke depression compared to married study participants (AOR: 23.32;95% CI:4.76-114.16; P-value <0.001). Similarly, divorced study participants had increased odds of post-stroke depression (AOR=99.04; 95% CI: 4.6-2132.66; P-value=0.003). nevertheless, being single was not statistically significant(p=0.162). The 95% CI of both widowed and divorced study participants was very wide due to the small number of these subgroups.

About occupation, with farmers as the reference group, being a Marchant was significantly associated with higher odds of post-stroke depression. Marchants were 10x higher chance of having post-stroke depression compared to farmers (AOR=10.6;95% CI:1.81-62.14; P-value=0.009). Government employees and study participants in other occupations didn't show statistically significant associations.

Study participants who had diabetes mellitus had 5x higher odds of post-stroke depression compared to those without diabetes mellitus (AOR=5.27;95% CI;1.57-17.65; P=0.007).

As to stroke severity, using mild stroke severity as the reference category, stroke severity showed a strong independent association with post-stroke depression. Study participants with moderate stroke severity had 12.1x higher odds of having post-stroke depression (AOR=12.10;: 95% CI:3.32-44.05; P<0.001), whereas participants with severe disability had significantly increased risk of post-stroke depression (AOR=136.25; 95% CI: 17.13-1084.03; P<0.001).

Table 3: Factors associated with post-stroke depression by cross-tabulation, binary & multivariable logistic regression of study participants of ARTH, Ethiopia,2025

Variable	Category	Post-stroke depression		COR (95% CI)	P-value	AOR (95% CI)	P-value
		Depressed	Nondepressed				
Marital status	Married	29/119 (24.4%)	90/119 (75.6%)	1		1	
	Single	2/4(50%)	2/4(50%)	3.103(0.418-23.0270)	0.268	6.892(0.460-103.213)	0.162
	Widowed	13/19 (68.4%)	6/19 (31.6%)	6.724(2.344-19.292)	<0.001	23.320(4.764-114.163)	<0.001*
	Divorced	5/6 (83.3%)	1/6 (16.7%)	15.517(1.741-138.295)	0.014	99.041(4.599-2132.661)	0.003*
Occupation	Farmers	20/62 (32.26%)	42/62 (67.74%)	1	1	1	1
	Government employee	13/26 (50%)	13/26 (50%)	1.726(0.670-4.449)	0.258	2.671(0.596-11.970)	0.199
	Merchant	8/23 (34.78%)	15/23 (65.22%)	3.625(1.210-10.859)	0.021	10.601(1.809-62.136)	0.009*
	Others	8/37 (21.62%)	29/37 (78.38%)	1.933(0.605-6.176)	0.266	2.673(0.411-17.399)	0.304
Diabetes Miletus	Yes	18/44 (40.9%)	26/44 (59.1%)	1.630(0.783-3.394)	0.191	5.268(1.572-17.650)	0.007*
	No	31/104 (29.8%)	73/104 (70.2%)	1	1	1	1
Atrial fibrillation	Yes	15/26(57.7%	11/26(42.3%	3.529(1.474-8.449)	0.005	3.765(0.826-17.172)	0.087
	No	34/122(27.9%	88/122(72.1%	1	1	1	1
Alcohol drinking	Yes	17/36(47.2%	19/36(52.8%	2.237(1.033-4.841)	0.041	3.188(0.851-11.945)	0.085
	No	32/112(28.6%	80/112(71.4%	1	1	1	1
Chat chewing	Yes	11/19(57.9%	8/19(42.1%	3.293(1.228-8.829)	0.018	4.706(0.969-22.856)	0.055
	No	38/129(29.5%	91/129(70.5%	1	1	1	1

Stroke severity	Mild (mRS 0-2)	16/92 (17.4%)	76/92 (82.6%)	1		1	
	Moderate (mRS 3)	21/42 (50%)	21/42 (50%)	4.750(2.113-10.680)	<0.001	12.097(3.322-44.050)	<0.001*
	Severe (mRS 4-5)	12/14 (85.7%)	2/14 (14.3%)	28.500(5.806-139.906)	<0.001	136.250(17.125-1084.033)	<0.001*

*Indicates statistically significant association, COR=crude odds ratio, AOR=adjusted odds ratio, CI= confidence interval

6. Discussion

This cross-sectional study provides the first institution-specific evidence on the prevalence of post-stroke depression among 148 stroke survivors on follow-up at neurology and medical referral clinics, ARTH, Asella, one of the major regional referral centers in Oromia, Ethiopia. The prevalence of post-stroke depression among stroke survivors at ARTH was assessed using a standardized tool, the Patient Health Questionnaire 9 (PHQ-9), which was 33.1% (95% CI:25.5%-40.7%). Multivariable logistic regression analysis (adjusted odds ratios, AOR) was performed on the study to identify independent predictors of post-stroke depression among stroke survivors, controlling for potential confounders. In summary, the multivariate analysis confirms that marital status, occupation, degree of disability, and diabetes mellitus were statistically significant associations with post-stroke depression.

Prevalence of post-stroke depression in our study shows 33.1%, indicating that one-third of stroke survivors experienced clinically significant depressive symptoms. This finding is comparable with several studies done in Ethiopia and other African countries.

Comparing with global meta-analyses done in 2023 systematic review estimating 27% and earlier pooled estimates of 29% (95% CI: 25–32%)(32), Our study had a slightly higher prevalence of PSD; this might be potentially due to socioeconomic challenges and limited rehabilitation access in low- and middle-income countries (LMICs) like Ethiopia.

Within Africa Our study had a comparable prevalence of post-stroke depression with studies done at some sub-Saharan pooled figures of 31% (95% CI: 26–36%), West African estimates of 35.76% (95% CI: 31.01–40.51%)(36), and an Egyptian hospital-based study, which showed a prevalence of post-stroke depression of 36.9%(21).

In Ethiopia, our study had a slightly higher prevalence of post-stroke depression than lower national reports, done at Zewditu Memorial Hospital, Addis Ababa, and Hawassa Comprehensive Specialized Hospital, which reported a prevalence of 27.5% (95% CI:21.7%-33.3%), 29.2% (95% CI: 23.1%-35.2%), respectively (43,44). These differences might be explained by variations in the study population in sociodemographic factors, assessment tools, the distribution of stroke severity, and access to a rehabilitation center. Our study had a comparable prevalence with a national study done at Addis Ababa with pooled prevalence of 32.2%(52).

However, some studies have reported even higher prevalence rates than the current finding highlight higher-burden contexts. Globally, the prevalence of post-stroke depression in Saudi Arabia, as done in a tertiary hospital, shows 70.6%(34).Another cross-sectional study done in Bangladesh shows that the prevalence of PSD is 70 %(35).these differences might be due to differences in assessment tools, sociodemographic characteristics, and stroke severity.

In Africa, it is below Nigeria's national high of 47.6%, and the Central African pooled rates of 50.92%(37). Within Ethiopia, it is notably lower than a 2024–2025 multicenter study in the Amhara Region at 64.1% (95% CI: 59.3–68.6%)(45), a study done in Bahir Dar Hospital, which reported a prevalence of 42.9%(95% CI:37.9-47.9%)(42) and St Paul's hospital, which reported a prevalence of post-stroke depression 43.4%(95% CI:35.7%-51.1%)(41).this difference might be related to a sample size difference or due to differences in sociodemographic characteristics and stroke severity of study participants.

In our study, marital status showed a statistically significant association with post-stroke depression. Widowed and divorced participants had higher odds of developing post-stroke depression when compared with married individuals (68.4% vs 24.4%) and (83.3% vs 24.4%), respectively. This finding supports previous Ethiopian(53) and African studies(36) that showed being widowed and divorced had higher odds of post-stroke depression. This increased risk may be attributed to loss of emotional support, social isolation, and increased caregiving and financial stress following stroke. In contrast, married stroke survivors may benefit from spousal support, which facilitates emotional coping and adherence to treatment.

In our study, occupation had also shown a statistically significant association with post-stroke depression. Being a merchant had slightly higher odds of PSD when compared with farmers' stroke survivors (34.78% vs 32.26%). But other occupation categories didn't confer statistical significance. This study aligns with other studies conducted at Zewditu Memorial Hospital, Addis Ababa, and Bahir Dar Hospital(42,43), which have shown occupation to be a strong association with PSD. However, these studies did not specifically consider merchants, but rather unemployment in general. This might be explained by the job insecurity of merchant stroke survivors.

In this study, Diabetes Mellitus also showed a significant association with post-stroke depression. With higher odds of post-stroke depression in Diabetic stroke survivors when compared with non-diabetic stroke survivors (40.9% vs 29.8%). The study done at Zewditu Memorial Hospital, Addis Ababa, also showed higher odds of post-stroke depression in diabetic stroke survivors(43). This might be due to dual disease burden and potential biological (inflammation) or psychological pathways.

In this study degree of disability based on the modified Rankin Scale showed a statistically significant association with post-stroke depression. Compared with mild disability, moderate and severe disability had higher odds of post-stroke depression (AOR=12.09; CI: 3.322-44.050) and (AOR=136.250;95%CI:17.125-1084.033) respectively. The wide confidence interval in severe disability in this study can be explained by the small size of these subgroups. This finding supports previous studies done in sub-Saharan Africa(36), Uganda(38), Egypt(21), and Ethiopia(42,44,48). This might be due to difficulty performing basic activities of daily living, which leads to dependence on caregivers and financial stress, decreased social interactions, and delayed access to rehabilitation services in developing countries like ours.

7. Limitations of the study

This study had a relatively small sample size, which may limit the statistical power and precision of the findings; some subgroups' sizes were small, resulting in very wide 95% CI's for certain estimates, indicating imprecision in the magnitude of the observed associations. Some patients may not have provided accurate information when responding to the PHQ-9, introducing the possibility of information bias. Since the study was conducted at a single center, the findings may not be fully generalizable to all stroke patients across the country. The cross-sectional design limits our ability to infer causality between identified factors and PSD.

8. Conclusion and Recommendation

8.1. Conclusion

The study showed that one-third of stroke survivors in this study were suffering from post-stroke depression. It had a statistically significant association with the degree of disability, marital status, occupation and diabetes mellitus. The degree of disability showed the strongest and most independent and strong association with post-stroke depression.

8.2. Recommendations

Considering the high prevalence of post-stroke depression (33.1%), the following recommendations are given to stakeholders,

For health care professionals

Regular screening for depression among stroke survivor patients should be integrated into routine check-ups.

Implement comprehensive care strategies that address both physical and mental health.

Targeted rehabilitative interventions for patients at high risk to improve functional recovery, quality of life, and long-term outcomes

For policymakers

Advocate for the integration of mental health services into national stroke management guidelines, allocating resources for widespread PSD screening programs in public hospitals and outpatient clinics.

Funding for training healthcare workers, procuring affordable diagnostic tools, and establishing referral systems to mental health specialists

Emphasize preventive strategies, such as public awareness campaigns on stroke risk factors and PSD symptoms, alongside policies promoting equitable access to rehabilitation and social support networks.

For patients and caregivers

Stroke survivors and their families should be encouraged to monitor for PSD symptoms and seek prompt medical advice.

Advice to engage in self-care practices like exercise, healthy eating, and stress-reduction techniques, and to openly discuss mental health concerns without stigma

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10. Annex

Consent Form

I am ----------working as data collector on behalf of Dr. Denebo Bulbula(Final year Internal Medicine Resident of Arsi University), in this study that assess the prevalence of depression among stroke patients and associated factors in the neurology and medical referral clinics in Arsi university, Asella referral &teaching hospital which is the common non communicable chronic disease in our country. On this questionnaire, your name will not be written, and I am going to ask some questions that may touch your personal life and secrets, in which all your answers will be kept completely confidential.

The findings of this research will help patients, health workers, hospital administrators, and all concerned bodies to help to create awareness about the prevalence of depression among stroke patients and to give holistic treatment for stroke patients.

You have been selected randomly from the patients who have follow-ups here. By participating in this research, you have no risk, but it is your precious time. The survey will take 20-30 minutes of your time. You do not have to answer questions that you do not want to answer; you may end this interview at any time you want to. However, your honest answer to these questions will help us understand better the level of depression among stroke patients and factors contributing to it, to develop good strategies and solve the problems for the future. We would greatly appreciate your truthful and keen participation in responding to this questionnaire.

Identification Number----------

Date of Interview----------

Interviewer Name----------

Supervisor----------

Questionnaire

1. socio-demographic characteristics

No	Question	Coding categories	Code
101.	Age(years)	1.18 -44 2.45-64 3.>=65	
102.	Sex	1. Male 2. Female	
103.	Marital status	1. Married 2. Single 3. widowed 4. Divorced	
104.	Religion	1. Muslim 2. Orthodox 3. protestant 4. others	
105.	Education	1. illiterate 2. Primary school 3. secondary school 4. degree and above	
106.	Occupation	1. Farmer 2 Government employee. 3. merchant 4. other,	
107.	Residence	1. urban 2. Rural	
108.	Monthly income(birr)	1.0 - 4999 2.5000-9999 3. >=10000	

2. Behavioral characteristics and comorbidities of stroke patients

Code	Question	Coding	
201	Do you have previous history of stroke?	1.yes 2. no	
202	Do you have hypertension?	1. yes 2. no	
203	Do you have diabetes mellitus?	1.yes 2. no	
204	Do you have ischemic heart disease?	1.yes 2. no	
205	Do you have atrial fibrillation?	1.yes 2. no	
206	Do you smoke?	1.yes 2. no	
207	Do you drink alcohol?	1.yes 2. no	
208	Chat chewing	1. yes 2. no	
209	Previous diagnosis before stroke	1. yes 2. no	

3. Stroke related factors

Code	Question		
301	Type of stroke	1. ischemic stroke 2. haemorrhagic stroke	
302	Duration since the stroke	1. <6 months 2. 6-12 months 3. > 12 months	
303	Location of stroke	1. left hemisphere 2. right hemisphere 3. bilateral	
304	Modified Rankin Scale(mRS)_Degree of disability	0:No symptoms at all 1:No significant disability despite symptoms;able to carry out all usual duties and activities 2:Slight disability;unable to carry out all previous activities ,but able to look after own affairs without assistance 3:Moderate disablity;requiring some help,but able to walk without assistance 4:Moderately severe disability;unable to walk without assistance and unable to attend to own bodily needs without assistance 5: death	

4. PATIENT HEALTH QUESTIONNAIRE-9 (PHQ-9)

Over the last 2 weeks, how often have you been bothered by any of the following problems?

No	Question	Not at all	Several days	More than half of the days	Almost every day
1	Little interest or pleasure in doing things	0	1	2	3
2	Feeling down, depressed, hopeless	0	1	2	3
3	Trouble falling or staying asleep or sleeping too much	0	1	2	3
4	Feeling tired or having little energy	0	1	2	3
5	Feeling bad about yourself or that you are a failure or have let yourself or your family down	0	1	2	3
6	Poor appetite or overeating	0	1	2	3
7	Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8	Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9	Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

Gaaffii

1.Amaloota hawaas-dimoogiraafii

*Umrii(woggaadhaan)_____

*Saala

1. Dhiira
2. Dhalaa

*Haala gaa'elaa

1.kan fuudhe/heerume

2, kan hin fuune/hin heerumne

3. Kan abbaan worraa /haati manaa jelaa du'e/duute

4. kan wolhiikan

*Amantaa

1.Musiliima

2.Ortoodoksii

3.pirootestaantii

4.kan biraa

*Sadarkaa barnootaa

1.dubbisuu fi barreessuu kan hin dandeenye

2.Hanga sadarkaa 1ffaa kan barate/tte

3.Hanga sadarkaa 2ffaa kan barate/tte

4.kan sadarkaa kolleejjii fi isaa oli barate/tte

*Hojii

1.Qotee bulaa/tu

2,Hojjataa mootummaa

3.Daldalaa/tu

4.kan biraa

*Iddoo jireenyaa

1.Magaalaa

2.Baadiyaa

*Galii ji'aa(birri)

2.Amaloota amala fi dhukkuboota waliin dhufan dhukkubsattoota dhiigni sammuu keessatti dhangala'uu yookiin kantaruu

*Seenaa dhiigni sammuu keessatti dhangala'uu ykn kantaruu kanaan dura qabduu?

1.Eeyyee

2.Miti

*Dhiibbaa dhiigaa qabdaa?

1.Eeyyee

2.Miti

*Dhukkuba sukkaaraa qabdaa?

1.Eeyyee

2.Miti

*Dhukkuba onnee iskeemikii jedhamu qabdaa?

1.Eeyyee

2.Miti

*Dhukkuba onnee (atrial fibrillation) qabdaa?

1.Eeyyee

2.Miti

*Tamboo ni xuuxxaa?

1.Eeyyee

2.Miti

*Alkoolii ni dhugduu?

1.Eeyyee

2.Miti

*Caatii ni qaamtuu?

1.Eeyyee

2.Miti

*Duraan qorannoodhaan dhiphinna sammuu osoo dhiigni sammuu keessatti dhangala'uu ykn kantaruu dura ni qabduu?

1.Eeyyee

2.Miti

3.Wantoota dhiigni sammuu keessatti dhangala'uu ykn kantaruu (stroke) wajjiin walqabatan

*Gosaa Istirookii

1.Dhiigni mataa keessatti kantaruu

2.Dhiigni mataa keessatti dhiiguu

*Erga Istirookii dhukkuffattee hagam turte (ji'aan)_____

*Bakka dhiigni sammuu keessatti dhangala'u ykn Kantaruu

1. hemisfeera bitaa
2. hemisfeera mirgaa
3. hemisfeera lachuu

*Modified Rankin Scale(mRS)_Sadarkaa qaama miidhamummaa

0: Mallattoon dhukkubaa tasumaa hin jiru

1: Mallattoon mul'atus hir'ina qaamaa guddaan hin jiru;hojii fi hojiiwwan barame hunda raawwachuu danda'u

2: Qaama miidhamummaa xiqqoo;hojii kanaan duraa hunda raawwachuu dadhabuu ,garuu gargaarsa malee dhimma ofii ilaaluu danda'uu

3: Hir’ina qaamaa giddu galeessaa;gargaarsa tokko tokko kan barbaadu,garuu gargaarsa malee deemuu kan danda'u

4: Hir’ina qaamaa cimaa giddu galeessaa;gargaarsa malee deemuu kan hin dandeenyee fi gargaarsa malee fedhii qaamaa ofii guutuu kan hin dandeenye

5: Hir’ina qaamaa cimaa;siree irra ciisee,kan ofirraa ittisuu dadhabuu,fi kunuunsaa fi xiyyeeffannoo narsii yeroo hunda kan barbaadu

4. GAAFFII FAYYAA DHUKKUBSATAA-9 (PHQ-9)

Torban 2 darban keessatti yeroo meeqa rakkoolee armaan gadii keessaa tokkoon dhiphattee?

Lak	Gaafii	Gonkumaa miti	guyyoota hedduu dhaaf	guyyaa walakkaa ol	guyyaa hunda jechuun ni danda'ama
1	Fedhii ykn gammachuu xiqqoo waan tokko hojjechuuf	0	1	2	3
2	Miira gadi bu'uu, dhiphina, abdii dhabuu	0	1	2	3
3	Rakkoo hirribni si fudhachuu diduu ykn hirriba keessa turuu ykn garmalee rafuu	0	1	2	3
4	Miira dadhabbii ykn humna xiqqaa qabaachuu	0	1	2	3
5	Ofii kee irratti miira hamaa ykn kufaatii ta'uu kee ykn ofii kee ykn maatii kee gadi dhiibdee akka jirtu sitti dhaga'amuu	0	1	2	3
6	Fedhii nyaataa xiqqaa ykn garmalee qabaachuu	0	1	2	3
7	Fedhii nyaataa xiqqaa ykn garmalee qabaachuu	0	1	2	3
8	Sochii ykn suuta jettee dubbachuu kee kan namoonni sirratti beekan? Ykn faallaa kanaa baay'ee fidgety ykn boqonnaa dhabuun yeroo biraa caalaa baay'ee socho'aa turtee?	0	1	2	3
9	Yaada du'uu ykn karaa tokkoon of miidhuu siif wayya jedhu yaaddee beektaa?	0	1	2	3

መጠይቅ

1.የሶሺዮ-ስነ-ሕዝብ ባህሪያት

*ዕድሜ (ዓመታት)_____

*ጾታ

1.ወንድ

2.ሴት

*የጋብቻ ሁኔታ

1.ባለትዳር

2.ያላገባ

3.ባል/ሚስት የሞተባት

4.የተፋታ

*ሃይማኖት

1.ሙስሊም

2.ኦርቶዶክስ

3.ፕሮቴስታንት

4.ሌላ

*ትምህርት

1.ያልተማረ

2.የመጀመሪያ ደረጃ ትምህርት

3.ሁለተኛ ደረጃ ትምህርትዲ

4.ግሪ እና ከዚያ በላይ

*ሥራ

1.ገበሬ

2.የመንግስት ሰራተኛ

3.ነጋዴ

4.ሌላ

*መኖሪያ

1.ከተማ

2.ገጠር

*ወርሃዊ ገቢ (ብር)_____

2.የስትሮክ ታማሚዎች የባህርይ ባህሪያት እና ተጓዳኝ በሽታዎች

*ከዚህ ቀደም የስትሮክ ታሪክ አለህ?

1.አዎ

2.አይ

*የደም ግፊት አለብህ?

1.አዎ

2.አይ

*የስኪር በሽታ አለብህ?

1.አዎ

2.አይ

*ischaemic የልብ በሽታ አለብዎት?

1.አዎ

2.አይ

*ኤትሪያል ፋይብሪሌሽን አለብህ?

1.አዎ

2.አይ

*ታጨሳለህ?

1.አዎ

2.አይ

*አልኮል ትጠጣለህ?

1.አዎ

2.አይ

*ቻት መቃም

1.አዎ

2.አይ

*ከስትሮክ በፊት የድብርት ምርመራ

1.አዎ

2.አይ

3.ከስትሮክ ጋር የተያያዙ ምክንያቶች

*የስትሮክ አይነት

1.አይስኬሚክ ስትሮክ

2.የደም መፍሰስ ስትሮክ

*ከስትሮክ በኋላ የቆየበት ጊዜ(ወራት)_____

*የስትሮክ ቦታ

1.ግራ ንፍቀ ክበብ

2.የቀኝ ንፍቀ ክበብ

3.በሁለቱም በኩል

*የተሻሻለው Rankin Scale(mRS)_የአካል ጉዳተኝነት ደረጃ

0: ምንም ምልክቶች የሉምየ

1: ሕመም ምልክቶች ቢታዩም ጉልህ የሆነ የአካል ጉዳት የለም፤ ሁሉንም የተለመዱ ተግባራትን እና ተግባሮችን ማከናወን ይችላል

2: መጠነኛ የአካል ጉዳተኝነት፤ ሁሉንም የቀድሞ ተግባራትን ማከናወን አለመቻል፣ ነገር ግን ያለ እርዳታ የራሱን ጉዳዮች መከታተል ይችላል

3: መጠነኛ የአካል ጉዳተኝነት፤ የተወሰነ እርዳታ የሚፈልግ፣ ነገር ግን ያለ እርዳታ መራመድ ይችላል

4: መጠነኛ ከባድ የአካል ጉዳት፡ ያለ እርዳታ መራመድ አለመቻል እና ያለ እርዳታ የሰውነት ፍላጎቶችን ማሟላት አለመቻል

5: ከባድ የአካል ጉዳት፡ የአልጋ ቁራኛ፣ አህጉር የሌለው እና የማያቋርጥ የነርሲንግ እንክብካቤ እና ትኩረት የሚያስፈልገው

4.የታካሚ ጤና ጥያቄ-9 (PHQ-9)

ባለፉት 2 ሳምንታት ውስጥ ከሚከተሉት ችግሮች ውስጥ ምን ያህል ጊዜ አስጨንቀው ነበር?

ቁ/ር	ጥያቄ	አይደለም	በርካታ ቀናት	ከቀኑ ከግማሽ በላይ	በየቀኑ ማለት ይቻላል
1	ነገሮችን ለመስራት ትንሽ ፍላጎት ወይም ደስታ	0	1	2	3
2	የመንፈስ ጭንቀት, የመንፈስ ጭንቀት, ተስፋ መቁረጥ	0	1	2	3
3	የመውደቅ ወይም የመተኛት ችግር ወይም ከመጠን በላይ መተኛት	0	1	2	3
4	የድካም ስሜት ወይም ትንሽ ጉልበት	0	1	2	3
5	ስለራስዎ መጥፎ ስሜት ወይም ውድቀት እንደሆንክ ወይም እራስህን ወይም ቤተሰብህን አሳጥተሃል	0	1	2	3
6	ደካማ የምግብ ፍላጎት ወይም ከመጠን በላይ መብላት	0	1	2	3
7	እንደ ጋዜጣ ማንበብ ወይም ቴሌቪዥን መመልከት ባሉ ነገሮች ላይ ማተኮር ላይ ችግር	0	1	2	3
8	ሌሎች ሰዎች ሊያስተውሉት ይችሉ ነበር ብሎ መንቀሳቀስ ወይም መናገር? ወይም ተቃራኒው -	0	1	2	3

	በጣም ግትር መሆን ወይም እረፍት ስለሌለዎት ከወትሮው በበለጠ ብዙ ሲንቀሳቀሱ ነበር				
9	ብትሞት ይሻላል ወይም እራስህን በሆነ መንገድ ብትጎዳ ይሻልሃል የሚል ሀሳብ	0	1	2	3

Declaration Investigator

I undersigned resident, declare that this research thesis paper is my original work, has never been conducted in the study area and that all the resources and materials used for the research thesis have been duly acknowledged.

Investigator: _____

Signature: _____

Date: _____

Declaration Advisors

We, the undersigned Advisors, declare that this thesis is our original work in partial fulfillment of the requirement for a specialty certificate in Internal Medicine for the above resident, to the best of our knowledge. We confirmed that this thesis is ready for defense with our approval as the advisors.

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