

# A study to assess the awareness on warning signs of stroke among hypertensive patients seeking care in a tertiary care centre

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## Abstract

**Background :** Stroke is a leading cause of death and disability worldwide, with significant social and economic burdens. Hypertension significantly contributes to the development of both ischemic and hemorrhagic strokes, making it a modifiable risk factor that demands attention. Since, hypertensive patients are the most vulnerable individuals for stroke, early recognition of warning signs of stroke is critical for prompt medical intervention, as timely treatment can greatly improve outcomes and reduce the risk of long-term disability.

**Objective :** The study aims to assess the awareness of warning signs of stroke among hypertensive patients and establish an association between demographic data and awareness levels.

**Methodology :** The study used a descriptive cross-sectional design, and data was collected from 80 hypertensive patients using a close-ended structured questionnaire.

**Results:** The study found that 60% of participants had heard of stroke, with majority getting to know from family and friends. 67.5% correctly identified the brain as the organ affected in stroke. Majority recognised facial weakness or deviation (68.8%), sudden weakness in one or both sides of the body (71.3%), and sudden difficulty in speech (77.5%) as signs of stroke.

55% of participants correctly acknowledged that the time of treatment matters in the prognosis of stroke, but only 21.3% said treatment should be started within one hour of symptoms, which means majority of the population does not possess the knowledge regarding golden hour. 76.3% of participants stated they would seek immediate medical care in an event of stroke.

**Conclusion :** The study concludes that awareness about stroke is multifaceted, with various socio-demographic factors influencing knowledge levels. Younger individuals demonstrated higher awareness, emphasizing the need for targeted education and awareness campaigns for older populations.

**Recommendations :** The study emphasizes the need for tailored and region-specific public health initiatives to enhance stroke awareness among diverse populations particularly focussing on Hypertensive patients ultimately improving outcomes and reducing the burden of this life-threatening condition.

**Key Words:** Stroke , Warning signs of stroke , Hypertension

## I. Introduction

Stroke is a serious medical condition significant global health concern, with substantial disease burden both in India and around the world, placing a considerable strain on healthcare systems and societies at large. The impact of stroke extends beyond individual suffering, affecting families and communities. According to WHO Stroke is the leading cause of disability worldwide and the second leading cause of death, and it is also a leading cause of long-term disability [N1].

Stroke is a complex medical condition with various risk factors, including modifiable and non-modifiable risk factors. One of the main risk factors of stroke is hypertension. Other risk factors include tobacco use, physical inactivity, unhealthy diet, alcohol and drug abuse, diabetes, elevated cholesterol levels etc [1]. The signs and symptoms of a stroke can vary depending on the type of stroke (ischemic or hemorrhagic) and the area of the brain affected. The primary indicators of a stroke typically include a sudden, asymmetrical facial droop or numbness, abrupt weakness or numbness in the upper or lower extremities, difficulties in speaking with slurred speech, sudden vision impairment, and an intense, unexplained headache [N2].

Treatment of stroke though depends upon the cause of the disease, it's a medical emergency, and timely intervention is crucial. In the case of a hemorrhagic stroke, the condition can develop suddenly and worsen rapidly. Similar to an ischemic stroke, receiving prompt treatment is essential for a complete recovery. Patients might require medications to manage high blood pressure or surgical interventions such as aneurysm clipping, coil embolization, or other surgical procedures to address the underlying issue.

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The primary treatment for an ischemic stroke involves the use of a medication called tissue plasminogen activator (tPA), which is administered intravenously to dissolve blood clots obstructing blood flow to the brain. It's crucial for this medication to be given within a 3-hour window from the onset of stroke symptoms [N3]. The effectiveness of intravenous (IV) thrombolytic therapy for acute brain ischemia is highly influenced by the timing of administration. It is most beneficial when administered within the first minutes after symptom onset and declines rapidly during the next 4.5 hours [2]. Swift action is vital in both types of strokes to enhance the chances of a successful recovery.

Adequate knowledge regarding the warning signs can help the individual/ family seek immediate medical help and can save life and improve outcome for survivors. The first hour is considered to be the most crucial or in other terms "golden" because stroke patients have a high chance of survival and prevention of long-term brain damage if they receive medical treatment and drug therapy within the first 60 minutes of the onset of symptoms.

## **II. Background of the study:**

"Knowledge is power. Understanding the warning signs of stroke can empower hypertensive patients to take immediate action and potentially save lives."

Stroke is a leading cause of death and disability worldwide, with significant social and economic burdens. Hypertension, or high blood pressure, is a well-established risk factor for stroke, contributing to the development and progression of cerebrovascular diseases. Hypertension significantly contributes to the development of both ischemic and hemorrhagic strokes, making it a modifiable risk factor that demands attention [N4, N5, N6].

Hypertension can damage the delicate blood vessels within the brain, increasing their vulnerability to ruptures or blockages. This vascular damage sets the stage for hemorrhagic strokes, where weakened blood vessels can burst and cause bleeding into the brain. For ischemic strokes, high blood pressure can lead to the formation of blood clots in the arteries, further obstructing blood flow to the brain. Hypertension often coexists with other risk factors such as diabetes, high cholesterol, and obesity, amplifying the overall risk of stroke. Therefore, effectively managing high blood pressure can have a cascading effect in reducing the chances of a stroke. Since, hypertensive patients are the most vulnerable individuals for stroke, early recognition of stroke warning signs is critical for prompt medical intervention, as timely treatment can greatly improve outcomes and reduce the risk of long-term disability [N7, N8, N9].

### **NEED OF THE STUDY**

The researcher in the day to day clinical experience in emergency department realized that most of the acute stroke patients are seeking medical help after the window period, and on detailed enquiry this was observed that the knowledge regarding warning signs among these patients are inadequate and mostly the onset of symptoms are being ignored. It was also observed that most of the acute stroke patients presenting to the department are hypertensive patients. Most of these patients are either ignorant regarding the warning signs or are not aware of the window period and the treatment options. Stroke is the second commonest cause of death in India. About 1,85,000 strokes occur every year in India with nearly one stroke every 40 seconds and one stroke death every four minutes. In a low resource country like India, primary prevention and imparting adequate knowledge among public can have a great magnitude in decreasing the burden on health sector. This will also help clients in seeking timely help. Hypertension being one of the main risk factors make the hypertensive patients the main target of the study. Others reasons include

1. Lack of awareness: Many hypertensive patients may not be aware of the warning signs of stroke, which can delay timely medical intervention. Assessing their knowledge levels can shed light on any gaps or misconceptions that need to be addressed.
2. Importance of early intervention: Stroke is a time-sensitive condition where every minute counts. Prompt recognition of warning signs and seeking immediate medical attention can significantly reduce the risk of long-term disability or even death. By assessing the knowledge of hypertensive patients, we can identify areas where education and awareness campaigns can be targeted to encourage early intervention.
3. Impact on healthcare resources: Stroke is a leading cause of disability and places a significant burden on healthcare resources. By assessing the knowledge of hypertensive patients regarding stroke warning signs, we can identify areas where education can be improved to potentially reduce the incidence of stroke and alleviate the strain on healthcare systems.
4. Empowering patients: Knowledge is empowering. By assessing the knowledge of hypertensive patients regarding stroke warning signs, we can equip them with the information they need to take control of their health. This can lead to better self-management, increased adherence to treatment, and improved overall health outcomes.

In summary, conducting a study to assess the knowledge of warning signs regarding stroke among hypertensive patients is essential to improve awareness, promote early intervention, optimize healthcare

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resource allocation, and empower patients to make informed decisions about their health.

#### **AIM**

A study to assess the awareness of warning signs of stroke among hypertensive patients seeking care in a tertiary care hospital, Bangalore.

#### **OBJECTIVES**

- a) To assess the awareness on warning signs of stroke among hypertensive patients
- b) To establish an association of various demographic data with awareness on warning signs

**Study Duration :** August 2023 to OCTOBER 2023

**Study location :** Tertiary Care Centre Bangalore

**Sample Size :** 80

### **III. REVIEW OF LITERATURE**

***"Knowledge is power. Information is liberating. Education is the premise of progress, in every society, in every family." - Kofi Annan***

A research study often involves a review of the existing literature on the topic of interest. This chapter provides a comprehensive overview of the relevant studies, research articles, and scholarly works that have been conducted in the field. The purpose of this chapter is to critically analyze and synthesize the existing literature, highlighting the gaps, inconsistencies, and areas of agreement.

In this chapter, we will delve into a comprehensive review of the existing literature on the awareness of warning signs of stroke among hypertensive patients seeking care in a tertiary care hospital. This review aims to critically analyze and synthesize the available knowledge, identifying gaps, inconsistencies, and areas of agreement in order to provide a solid foundation for the current research study. It will provide valuable insights into areas where healthcare providers can focus their efforts to improve stroke awareness, ultimately leading to better prevention and management strategies for hypertensive patients.

**Adane Birhanu Nigat et al (2021)**, conducted a study to assess the knowledge on stroke warning signs and associated factors among hypertensive patients in northwest Ethiopia. among the two hundred and fifty- three hypertensive patients completed the questionnaire 15% of participants had good knowledge of stroke warning signs.

Younger age, urban residence being educated and having long duration hypertension follow up were significantly associated with good knowledge of stroke warning signs. Among the total respondents, 15% of participants had good knowledge of stroke warning signs. A strong association was found between good knowledge of stroke warning signs and younger age, residing in urban areas, having a higher level of education, and maintaining long-term hypertension follow-up. The study suggested that health information dissemination needs to be strengthened for hypertensive patients, particularly for older, rural residents, the non-educated and those having short duration of hypertension follow up.

**Addis Taye Abate et al (2019)** conducted a cross sectional study to assess hypertensive patients' knowledge of risk factors and warning signs of stroke at Felege Hiwot Referral Hospital, Northwest Ethiopia. Out of the total 284 selected hypertensive patients, 278 of them responded completed the survey with a response rate of 97.9%. In their study 77% (214 individuals), failed to identify any stroke risk factors, and 72.3% (201 individuals) were unable to recognize stroke warning signs. Overall, only 18.3% of the respondents demonstrated a good level of knowledge about stroke suggesting the necessity for a more robust emphasis on stroke education, particularly concerning risk factors and warning signs, through channels such as public or social media and targeted health education efforts aimed at individuals with low income and high-risk factors.

**Forte Kebede Woldetsadik et al (2021)** conducted a cross-sectional study to assess stroke related knowledge, prevention practices and associated factors among hypertensive patients at University of Gondar comprehensive specialized hospital, Northwest Ethiopia among 393 hypertensive patients. The study showed that participants had adequate knowledge of stroke and good prevention practices in 40.7% (95% CI: 35.9, 45.5) and 51.7% (95 CI: 46.8, 56.5) of cases, respectively. Attending secondary education and above, knowing someone who has had a stroke 13.17 (95% CI: 7.3, 23.77), and physical activity 4.05 (95% CI: 2.23, 7.36) were all significantly associated with adequate stroke knowledge.

**Lawrence et al (2023)** conducted a study to assess the public's level of awareness and responsiveness to stroke in Tamil Nadu, India, among relatives of patients who had no history of stroke and were visiting the outpatient department of a tertiary care hospital. 36 percent of the study's participants correctly identified the brain as the organ that is harmed in stroke. The paralysis of one side of the body was the

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warning sign that was answered by more than half of study participants (53%), followed by deviation of the mouth (20%), and speech impairment (16%). In reaction to having or seeing a warning sign, one-fourth of study participants (25.7%) said that the right action was to immediately go to the emergency room of a nearby hospital. One-tenth of participants (10.5%) were aware that clot lysis may be used as a therapy for stroke. Only 4.8% participants indicated that they should hurry to get to the hospital within the golden hour. The lack of knowledge about the organs involved, the causes of strokes, and how to respond to the warning symptoms of a stroke hence the authors concluded that continual education initiatives are required to raise public awareness.

**Alhowaymel et al (2023)** conducted a study to investigate the KAP of hypertensive patients in Saudi Arabia's rural population for stroke prevention. Most of the respondents (88.8%) were male, 86.2% were below 35 years of age, nearly three-fourth (73.5%) had college degree and about half were unemployed (56.1%). More than three-fourth of study participants (77%) had heard of stroke. 68.9% of the respondents correctly answered that stroke occurs due to insufficient blood supply, and 60.7% of them correctly answered that stroke is a damage of a specific part of the brain. Nearly three-quarter (71.4%) said they would call emergency/ take stroke patient immediately to hospital in case of an event. Younger patients (< 35 years), participants with higher education had better understanding about stroke.

**Setyopranoto et al (2021)** conducted a study in Indonesia to investigate stroke awareness-related variables among hypertension patients among 457 hypertensive individuals. Most patients (77.46%) had little knowledge about strokes. Female participants had better awareness regarding stroke, and study subjects greater than 55 years of age had slightly higher knowledge but the difference was statistically not significant. The participants in the study with higher education were having lower awareness regarding stroke but the difference was statistically not significant.

**Melak et al (2021)** conducted a systematic review regarding awareness on stroke preventive practices and related risk factors among patients with hypertension and diabetes. The awareness regarding stroke varied between studies ranging from 4.4% to 79%, awareness regarding stroke symptoms varied from 23.6% to 87%. Age, female gender, lack of education, single status, living in a rural area, were associated with inadequate stroke awareness and preventative practices. The study further emphasized on the need for health education initiatives to be developed as a crucial means of raising stroke awareness among high-risk groups.

**Sathiya K et al (2021)** conducted a non-experimental descriptive research in Medical ward and OPD to assess the awareness of knowledge and warning signs of stroke among hypertensive patients. The study concluded that majority of the study subjects (73.3%) had poor knowledge on risk factors and more than half of the study participants (52.0%) had poor knowledge on warning symptoms and were unable to identify any risk factors and warning signs of stroke. These authors suggested that there is need for all stakeholders to emphasize stroke education in a wider level to help individuals to understand and manage stroke risk factors as well as its warning signs through public or social media, school and health education crucially for high-risk population which can decrease the burden impact on health care system.

**Edith Kayode-Iyasere (2018)** conducted a study to assess the awareness of stroke risk factors and warning symptoms amongst one hundred and forty-four hypertensive patients in a city of Nigeria. Almost all (97.3%) study participants had heard of stroke, 38.7% correctly mention the brain as the organ affected in stroke while 13.9% mentioned the heart as the organ affected in stroke. The most common warning sign identified was sudden onset of speech problem 397 (77.3%), followed by sudden onset of arm and leg weakness 382 (74.8%), while about 20% of respondents had considered chest pain as a warning sign of stroke. There was no association between gender of respondents and their awareness of at least one risk factor for stroke ( $p$  value = 0.589) and their ability to identify at least one warning sign of stroke ( $p$  value = 0.06).

## IV. RESEARCH METHODOLOGY

### INTRODUCTION

Research methodology is a systematic way to help researcher describe how the research will be conducted. Different steps generally taken to do the research on ground can easily be communicated to the reader by the research methodology. It sums up the entire research work in a compact form. All the scientific work involved in the study is described briefly in the research methodology.

This chapter provides a portrayal of the method adopted by the researcher to conduct the study. This also explains the research approach, research design setting up the study, selection of sample and the sampling technique and also deals with the tools, procedure for data collection and plan for data analysis.

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**Research Approach**

For this study face-to-face interaction by the investigator followed by administration of study questionnaire.

**Research Design**

A research design is the overall strategy and framework for carrying out a research project. It is a blue print of the entire study. In order to answer research questions or test the research hypothesis, it is necessary to describe the research environment of the study, the sample size, the sampling procedure, the instruments and techniques of data collecting and analysis. This research used a descriptive cross-sectional study method to assess the awareness of warning signs using a close ended structured questionnaire.

**Variables**

A research question's variables are the observable and quantifiable aspects of the study. In quantitative studies, the ideas of interest are reduced to their measurable component parts, or variables.

**Independent Variable:**

An independent variable is a variable which is not influenced by any other variables in the study.

**Dependent Variable:**

The result being studied is the dependent variable. A dependent variable is the variable that changes as a result of change in independent variable. It's the outcome of interest that is measured.

**Population**

Both the intended and attainable demographics are included. Patients with hypertension make up the study population here.

**Target Population**

It's the population to which the results are intended to apply/ extrapolate. Patients with hypertension who visit the outpatient departments of participating hospital and who are seeking care are the study's primary focus.

**Sample:**

Patients with hypertension who visit the outpatient departments of the hospitals and have been enrolled in the study encompass the sample

**OPERATIONAL DEFINITIONS**

**A. Awareness :**

In this study 'awareness' refers to the understanding of warning signs of stroke which includes FAST acronym which is assessed by a close ended structured questionnaire.

**B. Warning signs**

This includes the FAST acronym defined by AHA

- **F = Face Drooping** – Does one side of the face droop or is it numb? Ask the person to smile. Is the person's smile uneven?
- **A = Arm Weakness** – Is one arm weak or numb? Ask the person to raise both arms. Does one arm drift downward?
- **S = Speech Difficulty** – Is speech slurred?
- **T = Time to call 911** – Stroke is an emergency. Every minute counts. Call 911 immediately. Note the time when any of the symptoms first appear.

**C. Stroke**

According to WHO Stroke is defined as "rapidly developing clinical signs of focal (or global) disturbance of cerebral function, lasting more than 24 hours or leading to death, with no apparent cause other than that of vascular origin.

**D. Selected socio-demographic variables**

The selected socio-demographic variables in the present study are age, gender, education, place of residence, duration of treatment.

**E. ASSUMPTIONS OF THE STUDY**

The knowledge about warning signs of stroke is inadequate among patients with hypertension.

#### PLAN FOR DATA ANALYSIS

The data was analysed using both descriptive and inferential statistics. The data was analysed by considering the study's aims and objectives. Information was collected, tabulated in MS excel master chart. and analyzed using software OpenEpi version

3.01 and Statistical Package for Social Sciences (SPSS) version 22 (IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY, USA: IBM Corp.).

#### A. DESCRIPTIVE STATISTICS

Categorical data have been presented as numbers and percentages (%)

#### B. INFERENCE STATISTICS

Variables have been analysed using Pearson's chi-square test and Fisher exact tests (when the expected count of 20% of cells is less than 5). A p value of <0.05 has been considered as statistically significant.

#### DATA COLLECTION PROCEDURE

Official permission was obtained from the administrative head of the tertiary care hospital. The study was approved by the ethical committee of the institution. The researchers first introduced themselves and the motive of conducting the study was explained to the study participants. The need and the purpose of the study were also informed. An informed consent was taken from each participant after explaining about the purpose of the study. The investigator explained how the questionnaire was to be filled. The participants were given sufficient time to think and to give their responses according to their knowledge level and understanding.

#### PROTECTION OF HUMAN SUBJECTS

Ethical clearance was obtained from institutional ethical committee and informed consent was taken from each participant before the data collection. Assurance was given to the study participants regarding the confidentiality of the data collected.

### I. RESULTS

A total of 80 participants were included in the present study.

Table 1: Socio-demographic characteristics of study subjects

Parameters	Frequency	Percentage
<b>Age group</b>		
20-39 years	8	10.0%
40-59 years	34	42.5%
60-79 years	37	46.3%
≥ 80 years	1	1.3%
<b>Gender</b>		
Male	39	48.8%
Female	41	51.3%
<b>Education status</b>		
Illiterate	19	23.8%
Upto high school	31	38.8%
Graduate	22	27.5%
Post-graduate	8	10.0%
<b>Employment status</b>		
Unemployed	43	53.8%
Employed	37	46.3%

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Marital status		
Married	53	66.3%
Single	3	3.8%
Separated	7	8.8%
Widow/ widower	17	21.3%

Residence		
Urban	67	83.8%
Rural	13	16.3%
Total	80	100.0%

Table 1 presents socio-demographic characteristics of study subjects. Majority of participants were in the 60-79 years age group (37 study subjects, 46.3%) followed closely by the 40-59 years age group (34 study subjects, 42.5%) (figure 1).

The study had a nearly equal distribution between male (39 study subjects, 48.8%) and female (41 study subjects, 51.3%) participants (figure 2). Education status varied (figure 3), with the highest proportion being individuals with up to a high school education (31 study subjects, 38.8%), followed by graduates (22 study subjects, 27.5%), illiterate participants (19 study subjects, 23.8%), and post-graduates (08 study subjects, 10.0%). Employment status showed that the 53.8% (43 study subjects) were unemployed while 46.3% (37 study subjects) were employed. Marital status revealed that most participants were married (53 study subjects, 66.3%), followed by widow/ widowers (21.3%), separated (8.8%), and single individuals (3.8%). In terms of residence, the majority resided in urban areas (67 study subjects, 83.8%), while 16.3% lived in rural settings.

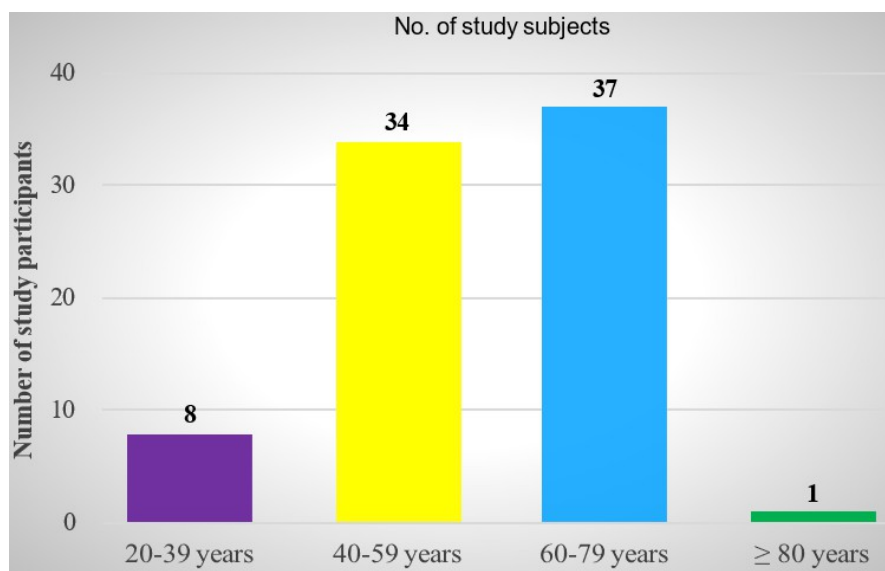


Figure 1: Age-wise distribution of study participants

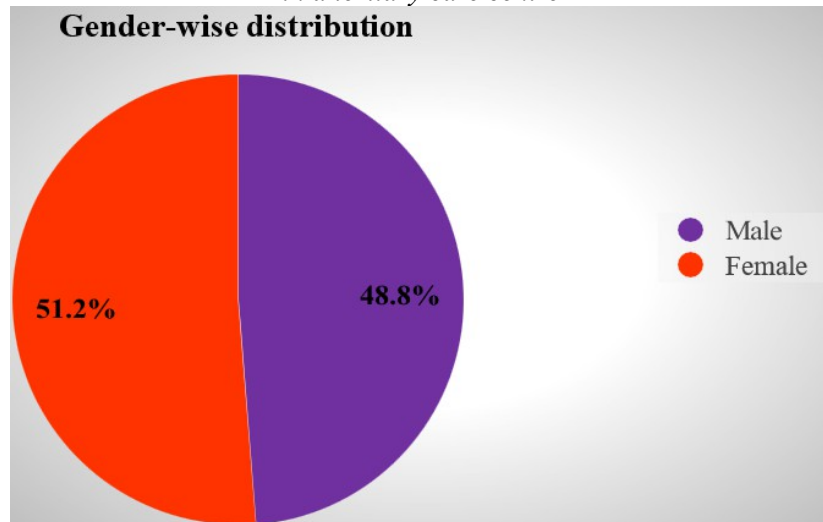


Figure 2: Gender-wise distribution of study participant

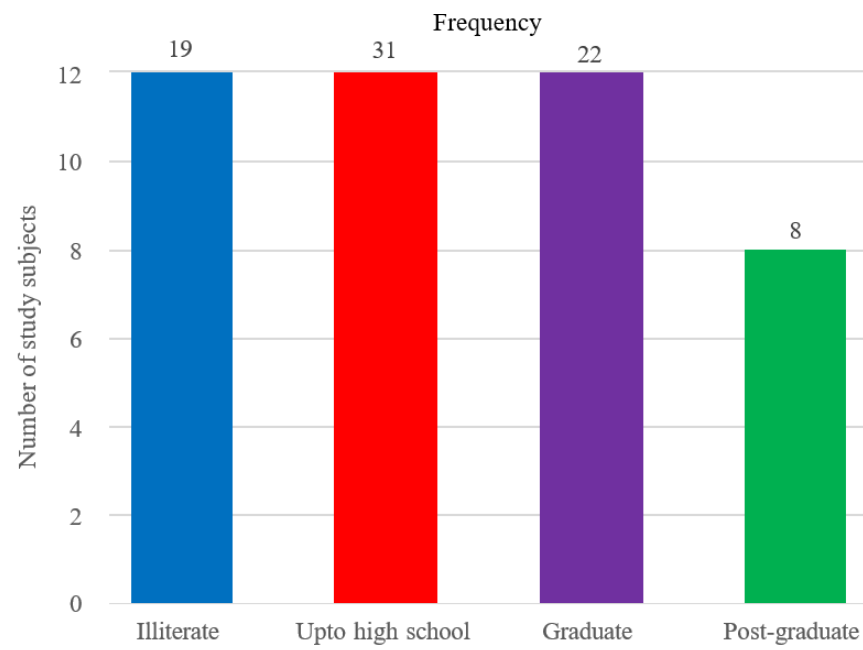


Figure 3: Distribution of study subjects based on education status

Table 2: Hypertension status and drug compliance among study participants

Parameters	Frequency	Percentage
<b>Hypertension status</b>		
Newly detected	28	35.0%
Less than 10 years	28	35.0%
More than 10 years	24	30.0%
<b>Anti-hypertensive drug compliance</b>		
Yes	50	62.5%
No	30	37.5%
<b>Frequency of follow-up</b>		
Once a month	7	8.8%
Once in 3 months	17	21.3%
Once in 6 months	24	30.0%
Not regular	32	40.0%
<b>Total</b>	<b>80</b>	<b>100.0%</b>

In the present study, 35.0% of study participants (28 cases) were newly detected hypertensive patients, while an equal percentage had been diagnosed with hypertension for less than 10 years, and the remaining 30.0% of the participants had been diagnosed with hypertension for more than 10 years. When it came to anti- hypertensive drug compliance, majority of participants (50 study subjects, 62.5%) reported adhering to their prescribed medications, while 37.5% (30 study subjects) indicated non-compliance. A small proportion of participants (07 study subjects, 8.8%) reported attending follow-up visits once a month, whereas 21.3% (17 study subjects) had follow-up once every 3 months. Nearly one-third study participants (24 study subjects, 30.0%) followed up with healthcare providers every 6 months, but a significant portion (32 study subjects, 40.0%) admitted to not maintaining a regular schedule for these visits (figure 4).

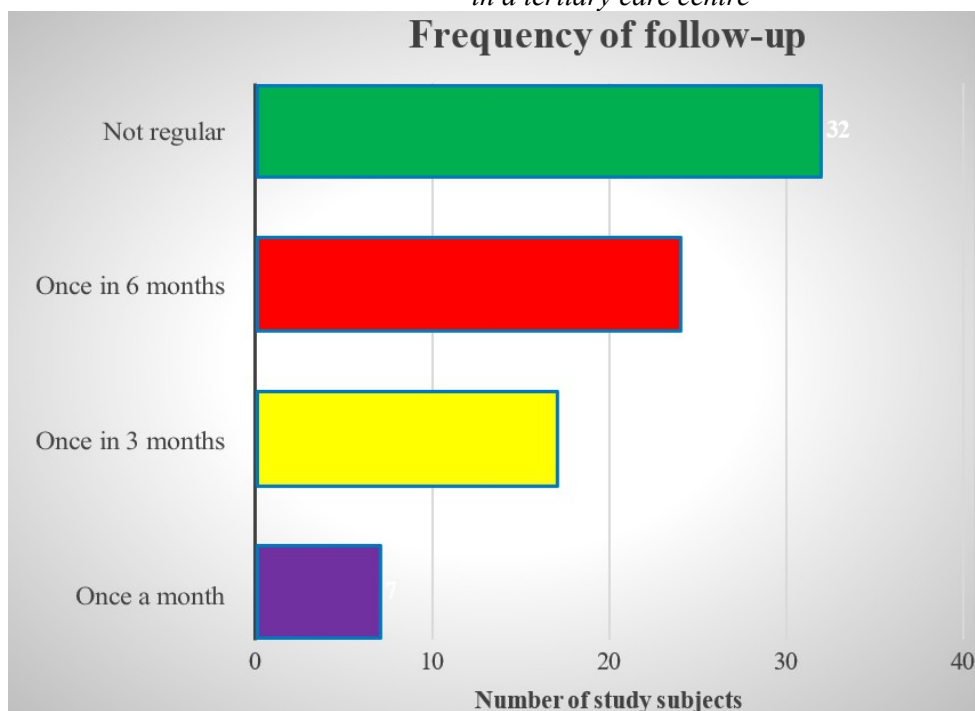


figure 4: Frequency of follow up by study subjects for hypertension management

Parameters	Frequency	Percentage
<b>Known case of diabetes</b>		
Yes	22	27.5%
No	58	72.5%
<b>Known case of heart disease</b>		
Yes	18	22.5%
No	62	77.5%
<b>Known case of kidney disease</b>		
Yes	13	16.3%
No	67	83.8%
<b>Total</b>	80	100.0%

Table 3: Co-morbidities among study participants

Table 3 highlights the co-morbidities among the study participants. 27.5% were known cases of diabetes (22 study subjects), 22.5% of the participants (18 study subjects) were known cases of heart disease and 16.3% of the participants (13 study subjects) were known cases of kidney disease.

Table 4: Substance abuse among study participants

Parameters	Frequency	Percentage
<b>Smoking</b>		
<b>Yes</b>	8	10.0%
<b>No</b>	58	72.5%
<b>Reformed</b>	14	17.5%
<b>Tobacco</b>		
<b>Yes</b>	9	11.3%
<b>No</b>	62	77.5%
<b>Reformed</b>	9	11.3%
<b>Alcohol</b>		

<b>Yes</b>	4	5.0%
<b>No</b>	59	73.8%
<b>Reformed</b>	17	21.3%
<b>Total</b>	80	100.0%

Table 4 presents a detailed breakdown of substance abuse patterns among the study participants. In terms of smoking, 8 participants (10.0%) reported that they were current smokers, while the majority, comprising 58 individuals (72.5%), had never smoked. Additionally, 14 participants (17.5%) had successfully quit smoking. For tobacco use, 9 participants (11.3%) acknowledged using tobacco, with 62 participants (77.5%) never having used it, and another 9 participants (11.3%) having quit tobacco use. In the context of alcohol consumption, 4 participants (5.0%) admitted to currently drinking alcohol, whereas 59 participants (73.8%) abstained from alcohol. A total of 17 participants (21.3%) reported having quit alcohol consumption.

Table 5: Knowledge of study subjects regarding awareness about stroke and source of information

Parameters	Frequency	Percentage
<b>Heard of stroke</b>		
<b>Yes</b>	48	60.0%
<b>No</b>	32	40.0%
<b>Total</b>	80	100.0%
<b>Family and friends</b>	45	56.3%
<b>Television</b>	15	18.8%
<b>Newspaper</b>	06	7.5%
<b>Other social media</b>	12	15.0%

Table 5 provides an insightful into the knowledge of the study subjects concerning stroke awareness. Out of the total of 80 participants, 48 individuals (60.0%) reported that they had heard of stroke, while 32 participants (40.0%) had not. Among those who were aware of stroke, majority (45 participants, 56.3%) got to know from family and friends. Television was another source, with 15 participants (18.8%) obtaining information from this medium. A smaller group of participants, 6 individuals (7.5%), mentioned newspapers as their source of stroke-related information. Additionally, 12 participants (15.0%) indicated other social media platforms as source of knowledge about stroke.

Table 6 presents a detailed overview of the awareness levels regarding signs and symptoms of stroke among the study participants. When asked about the body part affected in a stroke, 67.5% of participants correctly identified the brain, while 32.5% mistakenly thought it was the heart. In terms of specific stroke symptoms, the majority recognized that facial weakness or deviation is a sign of stroke, with 68.8% answering affirmatively, while 10.0% disagreed, and 21.3% didn't know. Similarly, 71.3% correctly identified sudden weakness in one or both sides of the body as a stroke symptom, whereas 10.0% disagreed, and 18.8% were unsure. Regarding sudden difficulty in speech as a stroke sign, 77.5% of participants correctly identified it, while 10.0% disagreed, and 12.5% were uncertain.

Table 6: Awareness regarding signs and symptoms of stroke among study participants

Parameters	Frequency	Percentage
<b>Body part affected in stroke</b>		
Heart	26	32.5%
Brain	54	67.5%
<b>Is facial weakness or deviation a sign of stroke?</b>		
Yes	55	68.8%
No	8	10.0%
Don't know	17	21.3%
<b>Is chest pain a sign of stroke</b>		
Yes	28	35.0%
No	31	38.8%
Don't know	21	26.3%
<b>Is sudden weakness in one or both side of body stroke?</b>		
Yes	57	71.3%
No	8	10.0%
Don't know	15	18.8%
<b>Is sudden difficulty in speech a sign of stroke?</b>		
Yes	62	77.5%
No	8	10.0%
Don't know	10	12.5%
Total	80	100.0%

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Table 7 offers a comprehensive insight into the awareness levels regarding the treatment of stroke among the study participants. In response to the question of whether the time of treatment matters in the prognosis of stroke, 55.0% of participants correctly acknowledged that it does, while 12.5% thought otherwise, and 32.5% were uncertain. When asked about the timing for initiating stroke therapy, 37.5% of participants believed it should start within 12 hours, 21.3% opted for within one hour, 15.0% thought anytime is appropriate, and 26.3% were unsure. Regarding their intended course of action if they suddenly experienced stroke symptoms, an overwhelming majority of 76.3% stated they would seek immediate medical care, while 2.5% would wait for symptoms to resolve on their own, 1.3% would discuss with family and friends, and 20.0% were uncertain

Table 7: Awareness regarding treatment of stroke among study participants

Parameters	Frequency	Percentage
<b>Does time of treatment matter in prognosis of stroke?</b>		
<b>Yes</b>	44	55.0%
<b>No</b>	10	12.5%
<b>Don't know</b>	26	32.5%
<b>When should stroke therapy be started?</b>		
<b>Anytime</b>	12	15.0%
<b>Within one hour</b>	17	21.3%
<b>Within 12 hours</b>	30	37.5%
<b>Don't know</b>	21	26.3%
<b>What would you do if you suddenly develop any symptoms of stroke?</b>		
<b>Wait for symptoms to resolve on its own</b>	2	2.5%
<b>Discuss with family and friends</b>	1	1.3%
<b>Seek medical care immediately</b>	61	76.3%
<b>Don't know</b>	16	20.0%
<b>Total</b>	80	100.0%

Table 8 presents a comparison of socio-demographic parameters with awareness regarding stroke among the study subjects.

Table 8: Comparison of socio-demographic parameters with awareness regarding stroke among study subjects

*A study to assess the awareness on warning signs of stroke among hypertensive patients seeking care in a tertiary care centre*

Parameter		Heard of stroke		Total	p-value
		Yes	No		
Age group					
	Frequency	7	1	8	

20-39 years	Percentage	87.5%	12.5%	100.0%	
	Frequency	29	5	34	

40 -59years	Percentage	85.3%	14.7%	100.0%	<0.001
60-79 years	Frequency	12	25	37	
	Percentage	32.4%	67.6%	100.0%	
≥ 80 years	Frequency	0	1	1	
	Percentage	0.0%	100.0%	100.0%	
Gender					
Male	Frequency	25	14	39	0.465
	Percentage	64.1%	35.9%	100.0%	
Female	Frequency	23	18	41	
	Percentage	56.1%	43.9%	100.0%	
Education status					
Illiterate	Frequency	10	9	19	0.109
	Percentage	52.6%	47.4%	100.0%	
Upto high school	Frequency	15	16	31	
	Percentage	48.4%	51.6%	100.0%	
Graduate	Frequency	16	6	22	
	Percentage	72.7%	27.3%	100.0%	
Post-graduate	Frequency	7	1	8	
	Percentage	87.5%	12.5%	100.0%	
Residence					
Urban	Frequency	39	28	67	0.458
	Percentage	58.2%	41.8%	100.0%	
Rural	Frequency	9	4	13	
	Percentage	69.2%	30.8%	100.0%	
Total	Frequency	48	32	80	
	Percentage	60.0%	40.0%	100.0%	

The awareness levels were highest among participants aged 20-39 years (87.5%) and 40-59 years (85.3%), while those aged 60-79 years exhibited lower awareness (32.4%), and one participant aged 80 years or older had not heard of stroke (figure 5). The above difference was found to be statistically significant ( $p$  value  $< 0.001$ ). Gender did not show a significant association with awareness ( $p = 0.465$ ). However, in terms of education status, there was a trend towards higher awareness among participants with higher levels of education, with the most awareness seen among post-graduates (87.5%), followed by graduates (72.7%). Residents in urban areas and rural areas did not exhibit a significant difference in awareness ( $p = 0.458$ ).

Figure 5: Age-wise comparison of awareness regarding stroke among study subjects

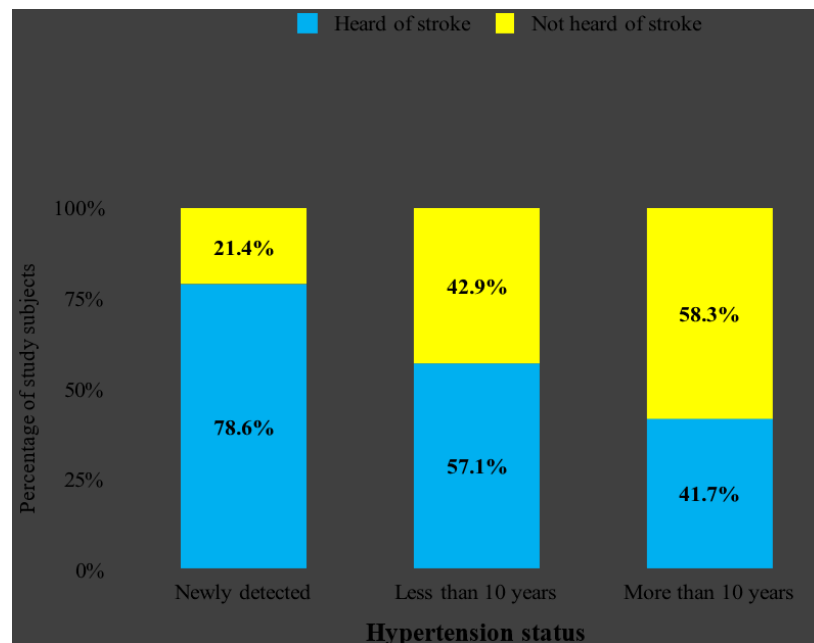


Figure 6: Comparison of hypertension status with awareness regarding stroke among study subjects

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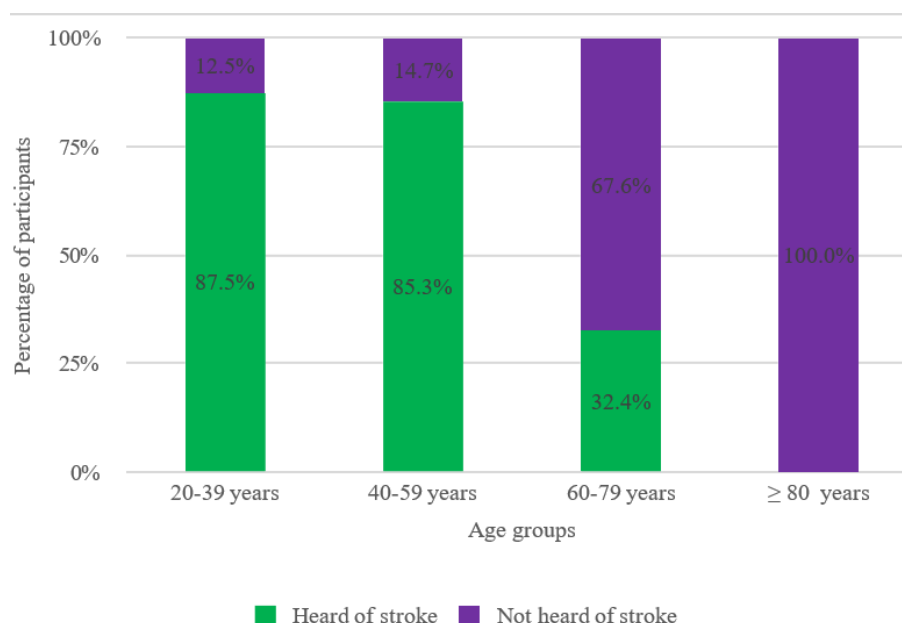


Table 9: Comparison of hypertension status with awareness regarding stroke among study subjects

Hypertension status		Heard of stroke		Total	p-value
		Yes	No		
Newly detected	Frequency	22	6	28	0.024
	Percentage	78.6%	21.4%	100.0%	
Less than 10 years	Frequency	16	12	28	
	Percentage	57.1%	42.9%	100.0%	
More than 10 years	Frequency	10	14	24	
	Percentage	41.7%	58.3%	100.0%	
Total	Frequency	48	32	80	
	Percentage	60.0%	40.0%	100.0%	

Table 9 presents a comparison of hypertension status with awareness regarding stroke among the study subjects. Participants with newly detected hypertension exhibited the highest level of awareness, with 78.6% of them having heard of stroke. In contrast, participants with hypertension for less than 10 years showed a slightly lower awareness level, with 57.1% having heard of stroke. Notably, awareness was lowest among participants with hypertension for more than 10 years, with only 41.7% being aware of stroke (figure 6). The table reveals a statistically significant association ( $p = 0.024$ ) between the duration of hypertension and awareness of stroke among the study participants.

Table 10: Comparison of socio-demographic parameters with awareness among study subjects regarding body part affected in stroke

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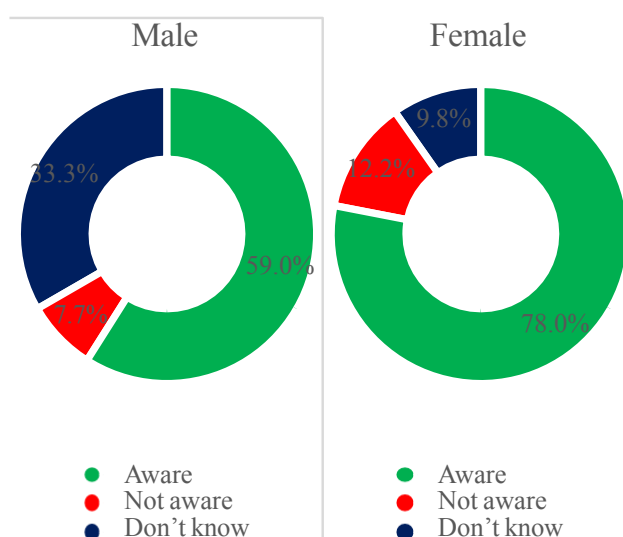
Parameter		Body part affected in stroke		Total	p-value
		Heart	Brain		
Age group					
20-39 years	Frequency	1	7	8	0.427
	Percentage	12.5%	87.5%	100.0%	
40-59 years	Frequency	10	24	34	
	Percentage	29.4%	70.6%	100.0%	
60-79 years	Frequency	15	22	37	
	Percentage	40.5%	59.5%	100.0%	
≥ 80 years	Frequency	0	1	1	
	Percentage	0.0%	100.0%	100.0%	
Gender					
	Frequency	17	22	39	

Male	Percentage	43.6%	56.4%	100.0%	0.039
Female	Frequency	9	32	41	
	Percentage	22.0%	78.0%	100.0%	
Education status					
Illiterate	Frequency	3	16	19	0.287
	Percentage	15.8%	84.2%	100.0%	
Upto high school	Frequency	13	18	31	
	Percentage	41.9%	58.1%	100.0%	
Graduate	Frequency	7	15	22	
	Percentage	31.8%	68.2%	100.0%	
Post-graduate	Frequency	3	5	8	
	Percentage	37.5%	62.5%	100.0%	
Residence					
Urban	Frequency	20	47	67	0.333
	Percentage	29.9%	70.1%	100.0%	
Rural	Frequency	6	7	13	
	Percentage	46.2%	53.8%	100.0%	
Total	Frequency	26	54	80	
	Percentage	32.5%	67.5%	100.0%	

Table 10 presents a detailed comparison of socio-demographic parameters with awareness among study subjects. Regarding age groups, the table shows no significant association ( $p = 0.427$ ) between age and awareness of the body part affected in stroke. However, among gender categories, a statistically significant relationship ( $p = 0.039$ ) emerges, with a higher percentage of males (56.4%) correctly identifying the brain as the affected body part compared to females (78.0%). Education status did not reveal a significant association ( $p = 0.287$ ) with awareness, although the highest awareness was among post-graduates (62.5%). Additionally, residence did not show a significant relationship ( $p = 0.333$ ) with awareness levels, although urban residents had a slightly higher awareness rate (70.1%) compared to rural residents (53.8%).

Table 11 presents a comparison of hypertension status with awareness among study subjects regarding the body part affected in stroke. The highest awareness levels were among those with newly detected hypertension, with 82.1% correctly identifying the brain as the affected body part. For those with less than 10 years of hypertension, 60.7% were aware of the brain's involvement in stroke, while for those with more than 10 years of hypertension, 58.3% exhibited awareness in this regard. However, the above difference was not found to be statistically significant.

Table 11: Comparison of hypertension status with awareness among study subjects regarding body part affected in stroke



Hypertension status		Body part affected in stroke		Total	p-value
		Heart	Brain		
Newly detected	Frequency	5	23	28	
	Percentage	17.9%	82.1%	100.0%	

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<b>Less than 10 years</b>	Frequency	11	17	28	0.120
	Percentage	39.3%	60.7%	100.0%	
<b>More than 10 years</b>	Frequency	10	14	24	
	Percentage	41.7%	58.3%	100.0%	
<b>Total</b>	Frequency	26	54	80	
	Percentage	32.5%	67.5%	100.0%	

Figure 7: Gender-wise comparison of awareness among study subjects regarding facial weakness or deviation as a sign of stroke

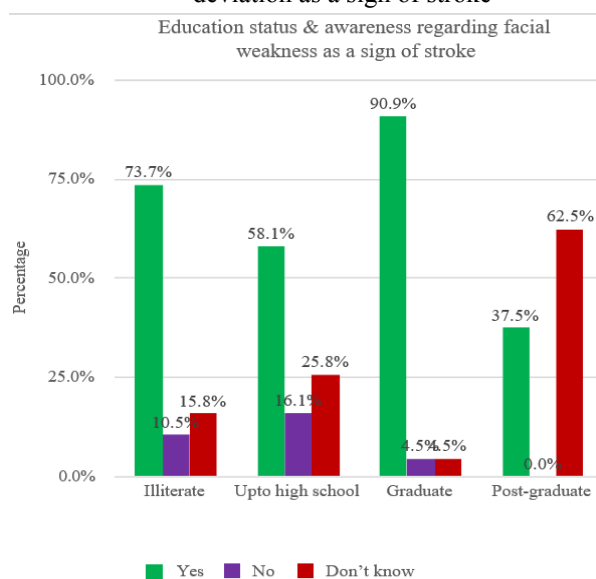


Figure 8: Comparison of education status with awareness among study subjects regarding facial or deviation as a sign of stroke

Table 12: Comparison of socio-demographic parameters with awareness among study subjects regarding facial weakness or deviation as a sign of stroke

Parameter		Is facial weakness or deviation a sign of stroke			Total	p-value
		Yes	No	Don't know		
Age group						
20-39 years	Frequency	6	1	1	8	0.154
	Percentage	75.0%	12.5%	12.5%	100.0%	
40-59 years	Frequency	28	1	5	34	
	Percentage	82.4%	2.9%	14.7%	100.0%	
60-79 years	Frequency	20	6	11	37	
	Percentage	54.1%	16.2%	29.7%	100.0%	
≥ 80 years	Frequency	1	0	0	1	
	Percentage	100.0%	0.0%	0.0%	100.0%	
Gender						
Male	Frequency	23	3	13	39	

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Male	In a tertiary care centre					0.035
	Percentage	59.0%	7.7%	33.3%	100.0%	
Female	Frequency	32	5	4	41	
	Percentage	78.0%	12.2%	9.8%	100.0%	
Education status						
Illiterate	Frequency	14	2	3	19	0.018
	Percentage	73.7%	10.5%	15.8%	100.0%	
Upto high school	Frequency	18	5	8	31	
	Percentage	58.1%	16.1%	25.8%	100.0%	
Graduate	Frequency	20	1	1	22	
	Percentage	90.9%	4.5%	4.5%	100.0%	
Post- graduate	Frequency	3	0	5	8	
	Percentage	37.5%	0.0%	62.5%	100.0%	

<b>Residence</b>						0.712
<b>Urban</b>	Frequency	47	6	14	67	
	Percentage	70.1%	9.0%	20.9%	100.0%	0.712
<b>Rural</b>	Frequency	8	2	3	13	
	Percentage	61.5%	15.4%	23.1%	100.0%	0.712
<b>Total</b>	Frequency	55	8	17	80	
	Percentage	68.8%	10.0%	21.3%	100.0%	

Table 12 offers a comprehensive comparison of socio-demographic parameters with awareness among study subjects regarding facial weakness or deviation as a sign of stroke. In terms of age groups, although participants in the 40-59 years age group exhibited the highest awareness at 82.4% and study subjects in the age group of 60-79 years had the least awareness (54.1%), the difference was not found to be statistically significant ( $p = 0.154$ ). For gender, a statistically significant association ( $p = 0.035$ ) was noted, with more females (78.0%) recognizing facial weakness or deviation as a stroke symptom compared to males (59.0%). Education status (figure 8) also showed a significant relationship ( $p = 0.018$ ) with awareness levels, highest awareness observed among graduates (90.9%), followed by illiterate participants (73.7%). Residence did not reveal a significant difference ( $p = 0.712$ ) in awareness levels between urban and rural participants.

Table 13: Comparison of hypertension status with awareness among study subjects regarding facial weakness or deviation as a sign of stroke

Hypertension status		Is facial weakness or deviation a sign of stroke			Total	p-value
		Yes	No	Don't know		
<b>Newly detected</b>	Frequency	23	1	4	28	
	Percentage	82.1%	3.6%	14.3%	100.0%	

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<b>Less than 10 years</b>	Frequency	15	4	9	28	0.207
	Percentage	53.6%	14.3%	32.1%	100.0%	
<b>More than 10 years</b>	Frequency	17	3	4	24	
	Percentage	70.8%	12.5%	16.7%	100.0%	
<b>Total</b>	Frequency	55	8	17	80	
	Percentage	68.8%	10.0%	21.3%	100.0%	

Table 13 presents a detailed comparison of hypertension status with awareness among study subjects regarding facial weakness or deviation as a sign of stroke. The highest awareness levels were among participants with newly detected hypertension, with 82.1% of them recognizing facial weakness or deviation as a stroke symptom. Among those with less than 10 years of hypertension, 53.6% exhibited awareness, while for those with more than 10 years of hypertension, 70.8% were aware of this symptom. The results indicated that there was no statistically significant association ( $p = 0.207$ ) between the duration of hypertension and awareness of facial weakness or deviation as a sign of stroke among the study participants.

Table 14: Comparison of socio-demographic parameters with awareness among study subjects regarding treatment of stroke

Parameter		Does time of treatment matter in prognosis of stroke			Total	p-value
		Yes	No	Don't know		
Age group						
20-39 years	Frequency	2	0	6	8	0.025
	Percentage	25.0%	0.0%	75.0%	100.0%	
40-59 years	Frequency	19	2	13	34	
	Percentage	55.9%	5.9%	38.2%	100.0%	
60-79 years	Frequency	22	8	7	37	
	Percentage	59.5%	21.6%	18.9%	100.0%	
≥ 80 years	Frequency	1	0	0	1	
	Percentage	100.0%	0.0%	0.0%	100.0%	
Gender						
Male	Frequency	23	6	10	39	0.415
	Percentage	59.0%	15.4%	25.6%	100.0%	
Female	Frequency	21	4	16	41	
	Percentage	51.2%	9.8%	39.0%	100.0%	
Education status						
Illiterate	Frequency	10	2	7	19	
	Percentage	52.6%	10.5%	36.8%	100.0%	

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Upto high school	Frequency	17	6	8	31	
	Percentage	54.8%	19.4%	25.8%	100.0%	
Graduate	Frequency	11	2	9	22	0.753
	Percentage	50.0%	9.1%	40.9%	100.0%	
Post- graduate	Frequency	6	0	2	8	
	Percentage	75.0%	0.0%	25.0%	100.0%	
Residence						
Urban	Frequency	34	9	24	67	0.239
	Percentage	50.7%	13.4%	35.8%	100.0%	
Rural	Frequency	10	1	2	13	
	Percentage	76.9%	7.7%	15.4%	100.0%	
Total	Frequency	44	10	26	80	
	Percentage	55.0%	12.5%	32.5%	100.0%	

Table 14 provides a comprehensive comparison of socio-demographic parameters with awareness among study subjects regarding whether the time of treatment matters in the prognosis of stroke. Participants in the 60-79 years age group exhibited the highest awareness at 59.5%, followed by the 40-59 years age group at 55.9%. In terms of age groups, there was a statistically significant association ( $p = 0.025$ ) between age and awareness of the importance of timely treatment in stroke prognosis. For gender, there was no significant association ( $p = 0.415$ ) with awareness levels. In terms of education status, there was no significant difference ( $p = 0.753$ ) in awareness levels across different educational backgrounds. Residence also did not show a significant relationship ( $p = 0.239$ ) with awareness levels.

Table 15: Comparison of hypertension status with awareness among study subjects regarding treatment of stroke

<b>Hypertension status</b>		<b>Does time of treatment matter in prognosis of stroke</b>			<b>Total</b>	<b>p-value</b>
		Yes	No	Don't know		
<b>Newly detected</b>	Frequency	6	2	20	28	<0.001
	Percentage	21.4%	7.1%	71.4%	100.0%	
<b>Less than 10 years</b>	Frequency	21	2	5	28	
	Percentage	75.0%	7.1%	17.9%	100.0%	
<b>More than 10 years</b>	Frequency	17	6	1	24	
	Percentage	70.8%	25.0%	4.2%	100.0%	
<b>Total</b>	Frequency	44	10	26	80	
	Percentage	55.0%	12.5%	32.5%	100.0%	

Table 15 provides comparison of hypertension status with awareness among study subjects regarding whether the time of treatment matters in the prognosis of stroke. Participants with newly detected hypertension had the lowest awareness level, with only 21.4% recognizing the significance of timely treatment. In contrast, participants with less than 10 years of hypertension exhibited a much higher awareness level, with 75.0% acknowledging the importance of timely treatment. Those with more than 10 years of hypertension also showed relatively high awareness, with 70.8% understanding the significance of timely treatment in stroke prognosis. The result demonstrates a highly significant association ( $p < 0.001$ ) between hypertension status and awareness of the importance of timely treatment in stroke prognosis among the study participants.

## VI. DISCUSSION

Hypertension, being a major risk factor for stroke, and individuals with uncontrolled hypertension are at a significantly higher risk of experiencing this life-threatening event. Awareness about stroke empowers hypertensive patients to take proactive measures in managing their blood pressure. By understanding the link between hypertension and stroke, they are more likely to adhere to prescribed treatments, lifestyle modifications, and medication regimens, ultimately reducing their stroke risk. Knowledge of stroke warning signs allows individuals to recognize the symptoms and seek immediate medical attention. Quick response and treatment are critical in minimizing stroke-related damage and improving the chances of recovery.

The present study was carried out in a tertiary care hospital to have an insight regarding awareness of hypertensive patients about stroke and the key areas to focus upon to improve the knowledge and practices for early identification and seeking prompt treatment in an event of stroke.

A total of 80 participants were included in the present study. The study encompassed a diverse group of participants, primarily concentrated in the age range of 40-79 years, with 46.3% falling in the 60-79 age group and 42.5% in the 40-59 age group. Gender distribution was nearly equal, with 48.8% male and 51.3% female participants. Education levels varied, with the largest proportion having up to a high school education (38.8%), followed by graduates (27.5%), illiterate participants (23.8%), and post-graduates (10.0%). Urban residence was predominant, with 83.8% living in urban areas and 16.3% in rural settings.

In terms of medication adherence, the majority (62.5%) reported compliance, while 37.5% acknowledged non-compliance. Regarding follow-up appointments, a small fraction (8.8%) had monthly visits, 21.3% visited every three months, and 30.0% attended appointments every six months. Notably, 40.0% of participants admitted to inconsistent follow-up schedules.

In the present study 60% of the study participants had heard of stroke and the remaining 40% had not heard of stroke. Among those who had heard of stroke, majority (45 participants, 56.3%) got to know from family and friends. On enquiry about the body part affected in stroke 67.5% correctly identified brain as the main organ affected, while 32.5% thought it was heart which is responsible for stroke.

Sathiya K et al (2021) in their descriptive research had observed that the majority of study subjects had poor knowledge of stroke risk factors (73.3%) and warning signs (52.0%), indicating a lower level of awareness compared to the present study. Alhowaymel et al (2023) noted that 77% of participants had heard of stroke, 68.9% correctly identified insufficient blood supply as a cause of stroke, and 60.7% knew that it results in damage to a specific part of the brain. The findings were very similar to the observations in our study. Setyopranoto et al (2021) found that 77.46% of participants in their study had limited knowledge about strokes, suggesting a lower level of awareness. This contrasts with the present study's higher awareness percentage (60%). In another study by Edith Kayode-Iyasere (2018), almost all study participants had heard of stroke (97.3%). However, the knowledge regarding the organ affected by stroke was less accurate, with 38.7% correctly mentioning the brain, while 13.9% thought it affected the heart. A systematic review by Melak et al (2021) found that the awareness of stroke varied widely in the studies included in the review, with awareness ranging from 4.4% to 79%. This indicates substantial variability in stroke awareness among hypertensive patients across different regions and populations.

These comparative findings highlight the variability in stroke awareness levels among hypertensive patients in different regions and populations. While awareness is higher in some studies, there is still a substantial gap in knowledge, particularly in understanding the link between hypertension and stroke, which is a critical aspect of stroke prevention.

On enquiry about specific stroke symptoms in the present study, majority (68.8%) of participants correctly recognized that facial weakness or deviation is indicative of a stroke. Similarly, 71.3% correctly identified sudden weakness in one or both sides of the body as a symptom of stroke, and with regard

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to sudden difficulty in speech, 77.5% of participants correctly identified it to be a sign of stroke.

In contrast to the findings in our study, Addis Taye Abate et al (2019) in their research observed that only 18.3% of participants demonstrating good knowledge about stroke and majority failed to identify any stroke risk factors (77%) or recognize stroke warning signs (72.3%). Lawrence et al (2023) findings were similar to our study wherein the authors noted that the most commonly recognized warning sign was paralysis of one side of the body (53%). Other signs included deviation of the mouth (20%) and speech impairment (16%). Sathiya K et al (2021) observed a lack of knowledge among participants, with more than half (52.0%) having poor knowledge of warning symptoms and an inability to identify any risk factors or warning signs of stroke. Edith Kayode-Iyasere (2018) findings were very similar to the observations in our study wherein the authors noted that, the sudden onset of speech problems (77.3%) and sudden onset of arm and leg weakness (74.8%) were the most commonly recognized warning signs of stroke. However, approximately 20% of respondents incorrectly considered chest pain as a warning sign which is also similar to the findings in our study. While some studies showed relatively better awareness of specific stroke symptoms, others revealed poor knowledge about both symptoms and risk factors. Overall, these findings stress upon the need for public education campaigns and healthcare initiatives to improve stroke awareness and knowledge, especially in identifying both risk factors and warning signs.

In the current study, we also enquired the study participants about timing of treatment and approach in case of an event of stroke. More than half of the study subjects (55%) were of the opinion that timing of treatment matters in the prognosis of stroke while 12.5% thought otherwise, and 32.5% were uncertain. 37.5% of participants believed it should start within 12 hours, 21.3% opted for within one hour, 15.0% thought anytime is appropriate, and 26.3% were unsure. In case of development of symptoms of stroke, majority of 76.3% stated they would seek immediate medical care, while 2.5% would wait for symptoms to resolve on their own, 1.3% would discuss with family and friends, and 20.0% were uncertain. Lawrence et al (2023) in their study conducted in Tamil Nadu, observed a relatively lower awareness among study participants when compared to the present study as only one-fourth of the participants (25.7%) indicated that the right action in response to a stroke warning sign was to immediately go to the emergency room of a nearby hospital. Only 4.8% of participants recognized the concept of the "golden hour" and that they should hurry to get to the hospital within that timeframe. In a study by Alhowaymel et al (2023) the awareness regarding approach in an event of stroke was comparatively higher than our study wherein nearly three-quarters (71.4%) of participants expressed their intention to call emergency services or take a stroke patient immediately to the hospital in the event of a stroke.

While the present study demonstrated relatively good awareness about stroke timing and immediate medical care, the study in Tamil Nadu revealed the need for improved knowledge about the "golden hour." In contrast, the study by Alhowaymel et al indicates a readiness to respond promptly to stroke events. Collectively, these findings emphasize the significance of tailored public education campaigns and interventions to enhance stroke awareness, knowledge, and response in diverse populations, ultimately improving outcomes for stroke patients.

A comparison of socio-demographic parameters with awareness regarding stroke among the study subjects was analysed in the present study. Awareness level was highest among younger patients (20 to 39 years – 87.5%) than the older study subjects whereas gender-wise comparison did not show a significant association with awareness. Residents in urban areas and rural areas did not exhibit a significant difference in awareness. Participants with newly detected hypertension exhibited the highest level of awareness, with 78.6% of them having heard of stroke.

With regards to awareness regarding organ affected in stroke, there was no significant association observed with respect to age. However, among gender categories, higher percentage of males (56.4%) correctly identifying the brain as the affected body part compared to females. Education status though did not reveal a significant association with awareness, the highest awareness was found among post- graduates. A statistically significant association was noted, with more females (78.0%) recognizing facial weakness or deviation as a stroke symptom compared to males (59.0%). Education status was also found to be an important factor influencing ( $p = 0.018$ ) awareness levels about warning symptoms of stroke, with highest awareness observed among graduates (90.9%). Place of residence did not reveal a significant difference in awareness levels between urban and rural participants with respect to stroke symptomatology.

On comparison of timing of treatment following symptoms of stroke, participants in the 60-79 years age group exhibited the highest awareness (59.5%), followed by the 40-59 years age group (55.9%). Participants with newly detected hypertension had the lowest awareness level, with only 21.4% recognizing the significance of timely treatment. In contrast, participants with less than 10 years of hypertension exhibited a much higher awareness level, with 75.0% acknowledging the importance of timely treatment.

Adane Birhanu Nigat et al (2021) identified that younger age, urban residence, higher education levels, and longer duration of hypertension follow-up were significantly associated with good knowledge of stroke warning signs, aligning with the present study's findings of higher awareness among

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younger individuals and urban residents. Similar to the present study's observations, Forte Kebede Woldetsadik et al (2021) concluded that attending secondary education and above was significantly associated with adequate stroke knowledge, emphasizing the role of education in increasing awareness. Alhowaymel et al (2023) study found that younger patients and those with higher education had better understanding of stroke, supporting the present study's findings of higher awareness among younger individuals and post-graduates. Setyopranoto et al (2021) study also observed that female participants had better awareness regarding stroke, similar to the present study, however they noted participants with higher education had lower awareness but the difference was statistically not significant.

Edith Kayode-Iyasere (2018) found no significant association between gender and awareness of stroke risk factors or the ability to identify warning signs, which contrasts with the present study's finding of more females recognizing facial weakness or deviation as a stroke symptom. The systematic review by Melak et al (2021) identified various socio-demographic factors associated with inadequate stroke awareness, including age, education, gender, marital status, and rural residence. These findings align with the multifaceted nature of stroke awareness and the influence of various socio-demographic factors.

The variations in awareness and its associated factors across these studies emphasize the importance of considering local and population-specific factors in stroke education efforts. While education consistently emerges as a significant influencer of awareness, other factors such as age, gender, and duration of hypertension follow-up play unique roles in shaping awareness levels. These findings emphasize the need for tailored and targeted public health campaigns to enhance stroke awareness among diverse populations, ultimately improving stroke outcomes and reducing its burden.

## **VII.CONCLUSION**

The present study sheds light on the state of stroke awareness among hypertensive patients, uncovering several significant findings. It is evident that awareness about stroke is multifaceted, with various socio-demographic factors influencing knowledge levels.

Younger individuals demonstrated higher awareness, emphasizing the need for targeted education and awareness campaigns for older populations. The study also highlights the vital role of timely treatment in stroke prognosis and highlights the importance of educating patients, especially those with newly diagnosed hypertension, about this critical aspect.

While education played a role in shaping awareness, the relationship between education and knowledge is complex. The study's findings emphasize the need for tailored and region-specific public health initiatives to enhance stroke awareness among diverse populations, ultimately improving outcomes and reducing the burden of this life-threatening condition.

Additionally, the study emphasizes the importance of continued efforts to improve stroke awareness and knowledge among hypertensive patients to ensure early recognition and timely intervention in the event of a stroke, thereby contributing to better health outcomes.

## **VIII.SUMMARY**

A total of 80 participants were included in the present study, majority were elderly population with near equal distribution of male and female participants. About one- third of study participants were newly detected hypertensive patients, while an equal percentage had been diagnosed with hypertension for less than 10 years, and the remaining 30.0% of the participants had been diagnosed with hypertension for more than 10 years.

60.0% of study participants had reported that they had heard of stroke, 67.5% of participants correctly identified brain as the organ involved in stroke. Majority recognized that facial weakness or deviation is a sign of stroke (68.8%), 71.3% correctly identified sudden weakness in one or both sides of the body as a stroke symptom, 77.5% of participants correctly identified sudden difficulty in speech as a stroke sign.

55.0% of participants correctly acknowledged that the time of treatment matters in the prognosis of stroke but only 21.3% said treatment to be started within one hour of symptoms. 76.3% of participants stated they would seek immediate medical care in an event of stroke.

Younger patients exhibited the highest level of awareness regarding stroke. Male participants had heard of stroke but female participants were more aware about the symptoms of stroke. Residents in urban and rural areas demonstrated similar levels of awareness. Patients with newly detected hypertension displayed the highest level of awareness about stroke. Level of education also influenced the awareness regarding stroke to certain extent.

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