A Cross Sectional Study To Assess The Knowledge Regarding Risk Factors and Warning Signs of Cerebrovascular Accident (Stroke) Among Patients Attending The Out-Patient Departments in A Selected Tertiary Care Centre, Shillong, Meghalaya

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Abstract

Cerebrovascular Accident (CVA), commonly known as stroke, is defined as a sudden loss of blood flow to a part of the brain resulting in damage to brain tissue and corresponding neurological defects.

Stroke remains the second leading cause of death and the third leading cause of disability combined globally, with incident cases, deaths, and disability – adjusted life years (DALYs) all having reason substantially from 1990 to 2021. The World Stroke Organization reports that about 87% of stroke deaths and nearly 89% of stroke related (DALYs) occur in low and lower middle-income countries, reflecting a disproportionate burden on resource limited settings.

A non-experimental cross-sectional study was conducted to assess the knowledge regarding risk factors and warning signs of Cerebrovascular Accident (Stroke) among patients attending the Selected-Out Patient Departments of NEIGRIHMS, Shillong.160 participants were selected for the study by and the data was collected Systematic Random Sampling Technique using a structured self-administered questionnaire.

The study reveals that the maximum participants have good knowledge regarding risk factors of cerebrovascular accident (stroke) 81 (50.6%) and maximum participants have average knowledge regarding warning signs of cerebrovascular accident (stroke) 68 (42.5%).

From the study it was found that the respondents having higher educational status, young age (18-28years) had

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good knowledge regarding risk factors and warning signs of cerebrovascular accident (stroke).

Introduction

Background of the Study

Cerebrovascular Accident (CVA), commonly known as stroke, is defined as a sudden loss of blood flow to a part of the brain resulting in damage to brain tissue and corresponding neurological defects**.**

Stroke remains the second leading cause of death and the third leading cause of disability combined globally, with incident cases, deaths, and disability – adjusted life years (DALYs) all having risen substantially from 1990 to 2021. The World Stroke Organization reports that about 87% of stroke deaths and nearly 89% of stroke related DALYs occur in low and lower middle-income countries, reflecting a disproportionate burden on resource-limited settings.

Well-established modifiable risk factors for stroke include hypertension, diabetes mellitus, smoking, dyslipidemia, obesity, physical inactivity, and unhealthy diet, whereas non-modifiable factors such as age and genetic predisposition further increase vulnerability.

Evidence indicates that effective control of key risk factors through population-wide and individual-level interventions could prevent a large proportion of stroke events.

Public awareness and appropriate health behaviour play a critical role in both primary and secondary prevention of stroke, including adherence to medications, blood pressure monitoring, smoking cessation, regular exercise, and timely recognition of stroke warning signs.

In this context, assessing the level of knowledge regarding cerebrovascular accident among selected populations is essential to identify gaps that hinder effective prevention, early recognition, and prompt treatment-seeking behaviour.

The present study therefore aims to measure the knowledge related to CVA, to analyse associated socio-demographic variables, and to increase awareness and recognition of risk factors and warning signs among the population.

Need of the study

The Cerebrovascular Accident burden has been rising in the last few decades and is a major disabling health problem in a developing country like India.

According to a study done on the Awareness of the warning signs and risk factors of stroke among adults seeking health care from a rural hospital of Odisha, India about 71% of participants had low level of awareness of stroke warning signs. In all, 41% of participants had low level of awareness about stroke risk factors. The awareness of stroke warning signs was significantly lower in low socio-economic group and among study subjects participants educated up to secondary level.

Therefore, there is a need to assess the knowledge about Cerebrovascular Accident (stroke) risk factors and warning signs. Thus, this study was conducted to assess the knowledge about the risk factors and warning signs of Cerebrovascular Accident (stroke) among the patients attending the Out Patient Departments of a selected hospital, in Shillong, Meghalaya.

Operational Definitions

Knowledge: It refers to the level of understanding regarding cerebrovascular accident (stroke) among the eligible study participants which is assessed by self administered questionnaires.

Risk factors: It refers to the characteristics, conditions or behaviour that increases the chances of developing cerebrovascular accident (stroke).

Warning signs: Warning signs of stroke are the sudden onset of neurological deficit that indicate impaired cerebral blood flow and require immediate medical evaluation and intervention.

Cerebrovascular accident (stroke): In Joanne V. Hickey's "The Clinical Practice of Neurological and Neurosurgical Nursing," Stroke is a heterogenous, neurological syndrome characterized by gradual or rapid, non-convulsive onset of neurological deficits that fit a known vascular territory and that lasts for 24 hours or more.[15]

Objectives of the study

Primary objective(s)

- To assess the knowledge regarding the risk factors associated with Cerebrovascular Accident (stroke) among patients attending Out Patient Departments in a selected Tertiary Care Centre, Shillong, Meghalaya.

- To assess the knowledge regarding the warning signs associated with Cerebrovascular Accident (stroke) among patients attending Out Patient Departments in a selected Tertiary Care Centre, Shillong, Meghalaya

Secondary objective(s)

- To determine the association between knowledge regarding the risk factors and warning signs of Cerebrovascular Accident (stroke) among patients attending Out Patient Departments in a selected Tertiary Care Centre, Shillong, Meghalaya with the selected demographic variables.

Methodology

Research Approach

In this study, quantitative research approach design was finalized to assess the knowledge regarding risk factors and warning signs of Cerebrovascular accident (stroke) among patients attending the out-patient departments in a selected tertiary care centre, Shillong, Meghalaya.

Research Design

In our study, the research design used is cross sectional study design.

Variables in the study

In this study, the variables are Socio demographic variables like Age, Gender, Educational Qualifications, Occupation, Area. Outcome variables include: knowledge regarding Risk Factors and Warning Signs of Cerebrovascular Accident (Stroke).

Setting of the study

The present study was conducted in Out Patient Departments (Neurology, Cardiology, ENT, Orthopaedic and General Medicine) of North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences, Shillong, East Khasi Hills, Meghalaya from 16th June - 21st June 2025.

Ethical consideration

The Study was conducted after the review from the Board of Thesis Review and Monitoring Committee and then permission was obtained from the Institute Ethics Committee (IEC) NEIGRIHMS. A written permission was taken from the Medical Superintendent and the Head of various Departments of the selected-Out Patient Departments of NEIGRIHMS Hospital, Shillong, Meghalaya. The written consent was obtained from the selected participants after giving a detailed written informed consent document which contains all the information related to the study and the study procedure. The participants were informed that they can withdraw from the study at any point of time. The confidentiality of the participants was maintained.

Study population

In this study, Patients attending Out Patient Departments (Neurology, Cardiology, ENT, Orthopaedic and General Medicine)of North Eastern Indira Gandhi Regional

Institute of Health and Medical Sciences, Shillong, East Khasi Hills, Meghalaya.

Sampling technique

Systematic Random Sampling Technique

Sample size

The total sample size is 160.

Criteria for sample selection

Inclusion criteria

- Patients aged 18 years and above attending Out Patient Departments (Cardiology, Neurology, General Medicine, Orthopaedic, ENT) of NEIGRIHMS, Shillong, Meghalaya
- Who are available at the time of data collection.

Exclusion criteria

- Participants who are not willing to give consent.
- Patients who are diagnosed with Cerebrovascular Accident (stroke)

Data collection procedure

The final data collection was carried out from 16th of June to 21st of June, 2025 at Out Patient Departments (Neurology, Cardiology, ENT, Orthopaedic and General Medicine) of North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences, Shillong, East Khasi Hills, Meghalaya.

Prior to data collection, approval was taken from the Principal College of Nursing, NEIGRIHMS and permission was obtained from the Medical Superintendent of NEIGRIHMS Hospital, Shillong, Meghalaya. The final data collection was carried out from the 16th of June, 2025 – 21st June, 2025 in selected Out Patient Departments (Neurology, Cardiology, ENT, Orthopaedic and General Medicine), NEIGRIHMS. The data was collected by providing questionnaires to each individual, prior to which informed consent was provided following which consent was taken.

Description of data collection tool

The data collection tools included the following sections-

SECTION I: Demographic variables

SECTION II: The section consists of self-administered knowledge-based questionnaires to assess knowledge related to risk factors

SECTION III: The section consists of self-administered knowledge-based questionnaires to assess knowledge related to warning signs.

Scoring: scoring method

SECTION I: It consists of Demographic characteristics and was not scored.

SECTION II: It consists of self-administered knowledge-based questionnaires to assess knowledge related to risk factors and warning signs. There were 15 questions; each question was allotted a score of 1.

SECTION III: It consists of self-administered knowledge-based questionnaires to assess knowledge related to risk factors. There were 9 questions; each question was allotted a score of 1.

SECTION IV: It consists of self-administered knowledge-based questionnaires to assess knowledge related to warning signs. There were 6 questions; each question was allotted a score of 1.

SECTION V: To determine the association between knowledge regarding risk factors and warning signs of cerebrovascular accident (stroke) with the selected demographic variables.

Interpretation of score

Section II:

Each correct answer is assigned a score of "1" and a score of "0" for an incorrect answer. The maximum score is when the participants obtain a score of 15, which represents 100% and is categorized as into three levels as follows:

Category of knowledge	Score	Percentage
Good	12-15	>75%
Average	8-11	50-75%
Poor	0-7	<50%

Section III

Each correct answer is assigned a score of "1" and a score of "0" for an incorrect answer. The maximum score is when the participants obtain a score of 9, which represents 100% and is categorized as into three levels as follows:

Category of knowledge	Score	Percentage
Good	7-9	>75%
Average	5-6	50-75%
Poor	0-4	<50%

Section IV

Each correct answer is assigned a score of "1" and a score of "0" for an incorrect answer. The maximum score is when the participants obtain a score of 6, which represents 100% and is categorized as into three levels as follows

Category of knowledge	Score	Percentage
Good	5-6	>75%
Average	3-4	50-75%
Poor	0-2	<50%

Analysis and Interpretation

The data collected from the participants were analysed by using descriptive statistics (frequency and percentage) and inferential statistics (chi- square test). The data are presented in the form of tables.

Organization of findings:

The data are presented under the following heading:

SECTION-I: Findings related to socio-demographic data of participants

SECTION-II: Findings related to the level of knowledge regarding risk factors and warning signs of cerebrovascular accident (stroke)

SECTION-III: Findings related to the knowledge regarding Risk Factors of Cerebrovascular Accident (Stroke)

SECTION-IV: Findings related to the knowledge regarding Warning Signs of Cerebrovascular Accident (Stroke)

SECTION-V: Findings related to the association between knowledge regarding risk factors and warning signs of cerebrovascular accident (stroke) with the selected demographic variables.

Section- I: Findings related to socio-demographic data of participants

Table 1: Frequency and percentage distribution of participants according to demographic variables n=160

Variables	Frequency(f)	Percentage (%)
Age (in years)		
18-28	65	40.60%
29-38	43	26.90%
39-48	32	20.00%
49 and above	20	12.50%
Gender		
Male	89	55.60%
Female	71	44.40%
Occupation		
Government employee	32	20.00%
Private employee	36	22.50%
Students	34	21.20%
Others	58	36.30%
Educational qualification		
Primary school	14	8.70%

level		
Secondary school level	26	16.30%
Higher secondary school level	49	30.60%
Graduation and above	71	44.40%
Area		
Rural	91	56.90%
Urban	69	43.10%

The data in Table 1 shows that majority of the participants belong to the age group of 18-28 years 65 (40.6%). Majority of the participants are 'Male' 89 (55.6%). Majority of the participants are of other jobs (homemaker, labourer, unemployed, shopkeeper, farmer) 58 (36.3%). Majority of the participants are of Graduation level and above qualifications 71 (44.4%). Majority of the participants are from Rural Locality 91 (56.9%).

Section II: Findings related to the level of knowledge regarding risk factors and warning signs of cerebrovascular accident (stroke) among patients attending the OPDs of a selected tertiary care centre, Shillong, Meghalaya.

Table 2: Frequency and percentage distribution of knowledge of participants regarding cerebrovascular accident (stroke)   n=160

Category of knowledge	Score	Frequency	Percentage (%)	Mean
Good	12-15	56	35%	
Average	08-11	81	50.60%	10.15
Poor	0-7	23	14.40%	

The data in Table 2 shows that 56 (35%) participants have good knowledge, 81 (50.6%) have average knowledge and 23 (14.4%) have poor knowledge regarding cerebrovascular accident (stroke).

Table 3: Frequency and percentage distribution of knowledge score of participants regarding cerebrovascular accident (stroke) with demographic variables. n=160

Variables	Good knowledge	Average knowledge	Poor knowledge
	56	81	23
Age (in years)			
18-28	24(15.0%)	28(17.5%)	13(8.1%)
29-38	19(11.9%)	19(11.9%)	05(3.1%)
39-48	07(4.4%)	21(13.1%)	04(2.5%)
49 and above	06(3.8%)	13(8.1%)	01(0.6%)
Gender			
Male	25(15.6%)	48(30.0%)	16(10.0%)
Female	31(19.4%)	33(20.6%)	07(4.4%)
Occupation			
Government employee	16(10.0%)	13(8.1%)	03(1.9%)
Private employee	12(7.5%)	22(13.7%)	02(1.3%)
Students	12(7.5%)	15(9.3%)	07(4.4%)
Others	16(10.0%)	31(19.4%)	11(6.9%)
Educational qualification			
Primary school level	01(0.6%)	11(6.9%)	02(1.3%)
Secondary school level	06(3.8%)	14(8.8%)	06(3.8%)
Higher secondary school level	12(7.5%)	28(17.5%)	09(5.6%)
Graduation and above	37(23.2%)	28(17.5%)	06(3.8%)
Area			
Rural	24(15.0%)	46(28.7%)	21(13.1%)
Urban	32(20.0%)	35(21.9%)	02(1.3%)

The data in Table 3 shows that the majority of the participants belonging to the age group of 18-28 years

(24) have good knowledge, majority of the participants who have good knowledge are females (31), majority of the participants who are government employees and have other jobs(homemaker, labourer, unemployed, shopkeeper, farmer) have good knowledge (32) majority of the participants who have good knowledge are graduated or have higher qualification (37) and majority of the participants who have good knowledge are from urban area (32).

Section III: Findings related to the knowledge regarding Risk Factors of Cerebrovascular Accident (Stroke)

Table 4: Frequency and percentage distribution of knowledge of participants regarding risk factors of cerebrovascular accident (stroke) n=160

Category of knowledge	Score	Frequency (f)	Percentage (%)	Mean
Good	07-09	81	50.60%	
Average	05-06	54	33.80%	6.325
Poor	0-4	25	15.60%	

The data in Table 4 shows that 81 (50.6%) participants have good knowledge, 54 (33.80%) have average knowledge and 25 (15.6%) have poor knowledge regarding risk factors of cerebrovascular accident (stroke).

Table 5: Frequency and percentage distribution of knowledge score of participants regarding risk factors of cerebrovascular accident (stroke) with the demographic variables. n=160

Variables	Good knowledge	Average knowledge	Poor knowledge
	81	54	25
Age (in years)			
18-28	35(21.9%)	19(11.9%)	11(6.9%)
29-38	24(15.0%)	13(8.1%)	06(3.8%)
39-48	12(7.5%)	14(8.8%)	06(3.8%)
49 and above	10(6.3%)	08(5.0%)	02(1.3%)
Gender			
Male	42(26.3%)	32(20.0%)	15(9.4%)
Female	39(24.4%)	22(13.8%)	10(6.3%)
Occupation			
Government employee	21(13.1%)	08(5.0%)	03(1.9%)
Private employee	21(13.1%)	12(7.5%)	03(1.9%)
Students	16(10.0%)	13(8.1%)	05(3.1%)
Others	23(14.4%)	21(13.1%)	14(8.8%)
Educational qualification			
Primary school level	04(2.5%)	06(3.8%)	04(2.5%)
Secondary school level	09(5.6%)	11(6.8%)	06(3.8%)
Higher secondary school level	22(13.8%)	19(11.9%)	08(5.0%)
Graduation and above	46(28.8%)	18(11.2%)	07(4.3%)
Area			
Rural	37(23.1%)	34(21.3%)	20(12.5%)
Urban	44(27.5%)	20(12.5%)	05(3.1%)

The data in Table 5 shows that the majority of the participants belonging to the age group of 18-28 years (35) have good knowledge regarding risk factors of cerebrovascular accident (stroke), majority of the participants who have good knowledge are males (42), majority of the participants who have other jobs (homemaker, labourer, unemployed, shopkeeper, farmer) have good knowledge (23) majority of the participants who have good knowledge are graduated or have higher qualification (46) and majority of the participants who have good knowledge are from urban area (44).

Table 6: Association of knowledge of participants regarding risk factors of cerebrovascular accident (stroke) with the demographic variables n=160

Variables	Good knowledge	Average knowledge	Poor knowledge	Degree of freedom	Tabulated value	Calculated value
	81	54	25	(df)		
Age (in years)						
18-28	35 (21.9%)	19 (11.9%)	11 (6.9%)			
29-38	24 (15.0%)	13 (8.1%)	06 (3.8%)			
39-48	12 (7.5%)	14 (8.8%)	06 (3.8%)	6	12.59	3.935
49 and above	10 (6.3%)	08 (5.0%)	02 (1.3%)			
Gender						
Male	42 (26.3%)	32 (20.0%)	15 (9.4%)			
Female	39 (24.4%)	22 (13.8%)	10 (6.3%)	2	5.99	0.95
Occupation						
Government employee	21 (13.1%)	08 (5.0%)	03 (1.9%)			
Private employee	21 (13.1%)	12 (7.5%)	03 (1.9%)			
Students	16 (10.0%)	13 (8.1%)	05 (3.1%)			
Others	23 (14.4%)	21 (13.1%)	14 (8.8%)	6	12.59	9.076
Educational qualification						
Primary school level	04 (2.5%)	06 (3.8%)	04 (2.5%)			
Secondary school level	09 (5.6%)	11 (6.8%)	06 (3.8%)			
Higher secondary school level	22 (13.8%)	19 (11.9%)	08 (5.0%)			
Graduation and above	46 (28.8%)	18 (11.2%)	07 (4.3%)	6	12.59	12.503
Area						
Rural	37 (23.1%)	34 (21.3%)	20 (12.5%)	2	5.99	10.406*
Urban	44 (27.5%)	20 (12.5%)	05 (3.1%)			

*Depicting association

The data in Table 6 shows that the computed chi square value of area (10.406) was found to be statistically significant. However, the computed chi square of age (3.935), gender (0.950), occupation (9.076), and educational qualification (12.503) was found to be statistically not significant. Hence there is an association between area and knowledge regarding risk factors of cerebrovascular accident (stroke).

Section-IV: Findings related to the knowledge regarding Warning Signs of Cerebrovascular Accident (Stroke)

Table 7: Frequency and percentage distribution of knowledge of participants regarding warning signs of cerebrovascular accident (stroke)

Category of knowledge	Score	Frequency (f)	Percentage (%)
Good	05-06	64	40%
Average	03-04	68	42.50%
Poor	0-2	28	17.50%

The data in Table 7 shows that 64 (40%) participants have good knowledge, 68 (42.5%) have average knowledge and 28 (17.5%) have poor knowledge regarding warning signs of cerebrovascular accident (stroke).

Table 8: Frequency and percentage distribution of knowledge score of participants regarding warning signs of cerebrovascular accident (stroke) with demographic variables.   n=160

Variables	Good knowledge	Average knowledge	Poor knowledge
	64	68	28
Age (in years)			
18-28	22(13.8%)	27(16.9%)	16(10.0%)
29-38	20(12.5%)	18(11.2%)	05(3.1%)
39-48	11(6.9%)	16(10.0%)	05(3.1%)
49 and above	11(6.9%)	07(4.3%)	02(1.3%)
Gender			
Male	31(19.4%)	40(25.0%)	18(11.3%)
Female	33(20.6%)	28(17.5%)	10(6.3%)
Occupation			
Government employee	17(10.6%)	08(5.0%)	07(4.3%)
Private employee	16(10.0%)	13(8.1%)	07(4.3%)
Students	10(6.3%)	18(11.3%)	06(3.8%)
Others	21(13.1%)	29(18.1%)	08(5.0%)
Educational qualification			
Primary school level	07(4.3%)	03(1.8%)	04(2.5%)
Secondary school level	07(4.3%)	13(8.1%)	06(3.8%)
Higher secondary school level	17(10.6%)	23(14.4%)	09(5.6%)
Graduation and above	33(20.6%)	29(18.1%)	09(5.6%)
Area			
Rural	33(20.6%)	39(24.4%)	19(11.9%)
Urban	31(19.4%)	29(18.1%)	09(5.6%)

The data in Table 8 shows that the majority of the participants belonging to the age group of 18-28 years (22) have good knowledge regarding Warning signs of cerebrovascular accident (stroke) , majority of the participants who have good knowledge are females (33), majority of the participants who have other jobs (homemaker, labour, unemployed, shopkeeper, farmer) have good knowledge (21) majority of the participants who have good knowledge are graduated or have higher qualification (33) and majority of the participants who have good knowledge are from rural area (33).

Table 9: Association between knowledge of participants regarding warning signs of cerebrovascular accident (stroke) with the selected demographic variables n=160

Variables	Good knowledge 64	Average knowledge 68	Poor knowledge 28	Degree of freedom (df)	Tabulated value	Calculated value
Age (in years)						
18-28	22 (13.8%)	27 (16.9%)	16 (10.0%)	6	12.59	6.591
29-38	20 (12.5%)	18 (11.2%)	05 (3.1%)			
39-48	11 (6.9%)	16 (10.0%)	05 (3.1%)			
49 and above	11 (6.9%)	07 (4.3%)	02 (1.3%)			
Gender						
Male	31 (19.4%)	40 (25.0%)	18 (11.3%)	2	5.99	2.472
Female	33 (20.6%)	28 (17.5%)	10 (6.3%)			
Occupation						
Government employee	17 (10.6%)	08 (5.0%)	07 (4.3%)	6	12.59	7.893
Private employee	16 (10.0%)	13 (8.1%)	07 (4.3%)			
Students	10 (6.3%)	18 (11.3%)	06 (3.8%)			
Others	21 (13.1%)	29 (18.1%)	08 (5.0%)			
Educational qualification						
Primary school level	07(4.3%)	03 (1.8%)	04 (2.5%)	6	12.59	7.093
Secondary school level	07(4.3%)	13 (8.1%)	06 (3.8%)			
Higher secondary school level	17(10.6%)	23 (14.4%)	09 (5.6%)			
Graduation and above	33 (20.6%)	29 (18.1%)	09 (5.6%)			
Area						
Rural	33 (20.6%)	39 (24.4%)	19 (11.9%)	2	5.99	2.12
Urban	31 (19.4%)	29 (18.1%)	09 (5.6%)			

*Depicting association

The data in Table 9 shows that the computed chi square value of age (6.591), gender (2.472), occupation (7.893), educational qualification (7.093), area (2.120) was found to be statistically not significant. Hence there is no association between demographic variables and knowledge regarding warning signs of cerebrovascular accident (stroke).

Section V: Findings related to the association between knowledge regarding risk factors and warning signs of cerebrovascular accident (stroke) with the selected demographic variables.

Table 10: Association of knowledge regarding cerebrovascular accident (stroke) with the demographic variable n=160

Variables	Good knowledge (56)	Average knowledge (81)	Poor knowledge (23)	Degree of freedom (df)	Tabulated value	Calculated value
Age in Years						
18-28	24(15%)	28(17.5%)	13(8.1%)	6	12.59	9.103
29-38	19(11.9%)	19(11.9%)	5(3.1%)			
39-48	7(4.4%)	21(13.1%)	4(2.5%)			
49 and above	6(3.8%)	13(8.1%)	1(0.6%)			
Gender						
Male	25(15.6%)	48(30.0%)	16(10%)	2	5.99	4.98
Female	31(19.4%)	33(20.6%)	7(4.4%)			
Occupation						
Government employee	16(10%)	13(8.1%)	3(1.9%)	6	12.59	9.055
Private employee	12(7.5%)	22(13.8%)	2(1.3%)			
Students	12(7.5%)	15(9.4%)	7(4.4%)			
Others	16(10%)	31(19.4%)	11(6.9%)			
Educational Qualification						
Primary school level	1(0.6%)	11(6.9%)	2(1.3%)	6	12.59	19.674*
Secondary school level	6(3.8%)	14(8.8%)	6(3.8%)			
Higher secondary level	12(7.5%)	28(17.5%)	9(5.6%)			
Graduation and above	34(23.2%)	28(17.5%)	6(3.8%)			
Area						
Rural	24(15%)	46(28.7%)	21(13.1%)	2	5.99	15.602*
Urban	32(20.0%)	35(21.9%)	2(1.3%)			

*Depicting association

The data in Table 10 shows that the Computed Chi-Square value of educational status (19.674) and Area (15.602) were found to be statistically significant. However, the computed Chi-Square value of Age (9.103), Gender (4.980) and Occupation (9.055) were found to be statistically not significant. Hence, there is association between educational status and area with knowledge.

Discussion

In this section the major findings of the present study have been discussed with references of results obtained by other investigators in the same aspects. Our present study aims to assess the knowledge regarding risk factors

and warning signs of stroke among patients attending the Outpatient Departments of a tertiary care hospital, and it was found that the majority of the participants have good knowledge regarding risk factors and average knowledge regarding warning signs of cerebrovascular accidents (stroke). Participants with higher knowledge had higher educational status and were of younger age. A similar study conducted by Jogindra Vati et al. aimed to assess the baseline knowledge of stroke risk factors, warning signs, and immediate response among selected patients attending General Outpatient Departments and to determine the association of knowledge with selected demographic variables, and it was found that most participants had better knowledge about risk factors but lacked knowledge regarding warning signs and immediate response.

A) Association of knowledge regarding the Risk factors of Cerebrovascular Accident (Stroke) with selected demographic variables:

In our present study there was no association between the age of participants and knowledge regarding the risk factors of Cerebrovascular Accidents (Stroke). In a similar study conducted by Jacqueline Muller-Nordhorn et al. knowledge was higher among the young age population.[17]

In our present study, there is no association between gender of the participants and the risk factors of Cerebrovascular Accident (Stroke). In a similar study conducted by Sima Kurmi et al. males had more knowledge about the risk factors of Cerebrovascular Accident (Stroke)[9]

Also, in our study there was no association between the occupation and knowledge regarding risk factors of Cerebrovascular Accident (Stroke). In a similar study conducted by Sima Kurmi et al. government employees had more knowledge on risk factors.[9]

In our study there was an association between the area of living and Knowledge regarding the Risk factors of Cerebrovascular Accident (Stroke). In a similar study conducted by Jogindra Vati et al. there was no association between the area of living and the knowledge regarding risk factors of Cerebrovascular Accident (Stroke).[7]

B) Association of knowledge regarding the Warning signs of Cerebrovascular Accident (Stroke) with selected demographic variables:

In our present study there was no association between the age of the participants and the knowledge regarding the warning signs of Cerebrovascular Accident (Stroke). In a similar study conducted by Jogindra Vati et al. there was no association found between the knowledge regarding the warning signs of Cerebrovascular Accident (Stroke).[7]

In our study there was no association between the gender of the participants and the knowledge regarding the warning signs of Cerebrovascular Accident (Stroke). In a similar study conducted by Sanchit Mehta et al. the knowledge regarding the warning signs was better among females.

In our study there was no association found between the occupation and the knowledge regarding the warning signs of Cerebrovascular Accident (Stroke). In a similar study conducted by Sumi Kurmi et al. there was no association found.[9]

In our present study an association was found between the educational status and area of living with knowledge regarding warning signs. In a similar study conducted by Jogindra Vati et al. there was no association found between the educational status and the area of living with knowledge regarding the warning signs of Cerebrovascular Accident (Stroke).[7]

Major findings of the study

Major findings related to demographic variables:

The study shows that out of 160 participants maximum 65 (40.6%) were 18-28 years, 43 (26.9%) were 29-38 years, 32 (20.0%) were 39-48 years and 20 (12.5%) were 49 years and above. Among the participants 89 (55.6%) were male and 71 (44.4%) were female.

In terms of occupation 32 (20%) were government employees, 36 (22.5%) were private employees, 34 (21.3%) were students and 58 (36.3%) were from other occupations (homemaker, labourer, unemployed, shopkeeper, farmer). In terms of educational qualification 14 (8.8%) were Primary school level, 26 (16.3%) were from Secondary school level, 49 (30.6%) were from Higher secondary level, 71 (44.4%) were Graduates and above. Among the participants 91 (56.9%) were from rural area and 69 (43.1%) were from urban area.

Major findings related to knowledge regarding risk factors of cerebrovascular accident (stroke)

The study findings reveal that 81 (50.6%) participants have good knowledge, 54 (33.85%) have average knowledge and 25 (15.6%) have poor knowledge regarding risk factors of cerebrovascular accident (stroke).

The study shows that the majority of the participants belonging to the age group of 18-28 years were 35 (21.9%) have good knowledge regarding risk factors of cerebrovascular accident (stroke), majority of the participants who have good knowledge were males 42 (26.3%), majority of the participants who have other jobs (homemaker, labourer, unemployed, shopkeeper, farmer)have good knowledge 23 (14.4%), majority of the participants who have good knowledge were graduates or have higher qualification 46 (28.8%) and majority of the participants who have good knowledge were from urban area 44 (27.5%).

Major findings related to knowledge regarding warning signs of cerebrovascular accident (stroke)

The study findings reveal that that 64 (40%) participants have good knowledge, 68 (42.5%) have average knowledge and 28 (17.5%) have poor knowledge regarding warning signs of cerebrovascular accident (stroke).

The majority of the participants belonging to the age group of 18-28 years 22 (13.8%) have good knowledge regarding warning signs of cerebrovascular accident (stroke), majority of the participants who have good knowledge were females 33 (20.6%), majority of the participants who have other jobs (homemaker, labourer, unemployed, shopkeeper, farmer) have good knowledge 21(13.1%), majority of the participants who have good knowledge were graduates or have higher qualification 33(20.6%) and majority of the participants who have good knowledge were from rural area 33(20.6%).

Major findings related to association of knowledge regarding risk factors and warning signs of cerebrovascular accident (stroke) with selected demographic variables:

There was an association between educational status (Chi square, χ^2= 19.674) and area (Chi square, χ^2=15.602) with knowledge, the computed chi- square values were found to be statistically significant concluding that there is an association between educational status, area and knowledge.

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