Original Article

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Awareness Regarding Stroke among Adults in a Rural Community of Western Nepal

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ABSTRACT

Introduction: *Stroke is the second most common major cause of disability and death worldwide. Identification of risk factors and symptoms is a major focus, directed toward seeking early management. This study was intended to assess the awareness regarding stroke among adults residing in a community in western Nepal.*

Methods: *A descriptive cross-sectional study was conducted among 251 adults residing in Kaligandaki Rural Municipality, Syangja, Nepal. Data were collected using probability, systematic random sampling techniques through a semi-structured interview schedule and analyzed in SPSS version 16 by using descriptive and inferential statistics.*

Results: *The study showed that the correct meaning of stroke was stated by 78.9% of respondents; 88.8% said the brain was the main organ affected. Likewise, 89.2% of respondents mentioned high stress, 84% high blood pressure, and 82% advanced age as the main risk factors for stroke. The majority (82.5%) of the respondents said severe headaches, sudden facial drops, arm or leg weakness (80.5%), and dizziness (85.7%) were the warning signs of stroke. Very few (9.6%) of the respondents had good awareness; 75.3% had an average level of awareness regarding stroke. A statistically significant association was found between level of awareness with ethnicity ($p< 0.001$) and educational level ($p<0.001$) of respondents on stroke.*

Conclusion: *Very few adults in a community have a good level of awareness, so a community-level awareness program is recommended to raise awareness regarding stroke.*

Keywords: *Adults, Awareness of Stroke, Community*

INTRODUCTION

Stroke is a medical emergency that occurs due to an interrupted or reduced blood supply to the brain cells, either blocked by clots of blood or burst vessels, resulting in the death of brain cells within minutes of depriving them of oxygen and nutrients. Every two seconds, some person in the world will have stroke, and almost two-thirds of stroke survivors leave the hospital with a disability. [1] Globally, about 80 million people have had a stroke, and 50 million stroke survivors live with some form of permanent disability.[2]

Worldwide, cardiovascular diseases (CVDs) have emerged as the leading cause of deaths; more than three-quarters of the total deaths due to CVDs occur in low- and middle-income countries like Nepal.[3] Deaths and disability due to CVDs are largely preventable; ten modifiable risk factors explained 90% of the risk of stroke, which remains the foremost cause of death and disability in 2019, in recent decade this burden has been rising in almost all parts of the world.[4] Strokes are the leading cause of global mortality, a major contributor to disability, approximately 70% of deaths from stroke and 87% of stroke-related disability occur in low-income and

middle-income countries and also increase poor survival.[5] Disability-adjusted life years (DALYs) and years of life lost are also increasing significantly worldwide. The total number of DALYs due to stroke has risen steadily since 1990, reaching 143 million DALYs, 6.55 million deaths, and 101 million prevalent cases of stroke in 2019.[4] Nearly 54% of deaths and 44% of morbidity are due to non-communicable diseases (NCDs) in South Asian Region.[6] Developing countries have seven-fold higher DALYs than developed countries due to stroke.[7] Currently, in Nepal, NCDs account for 42% of all deaths, and it is estimated that this will increase by 66·3% in 2030.[8]

Globally, 90·5% of the stroke burden or disability-adjusted life is 74·2% due to behavioral risk factors, many of these risk factors associated with stroke can be controlled and eliminated.[9] The most common risk factors were hypertension (35%), dyslipidemia (28.6%), and diabetes (22.9%). Smoking, physical inactivity, obesity, air pollution, and a lack of appropriate screening programs are also equally responsible. Slightly more than half (53.6%) of patients with underlying hypertension, 25% with diabetes, and 11.7% with dyslipidemia were recognized as risk factors for stroke.[10]

Stroke is the leading cause of long-term disability and has the potential to be an enormous emotional and socioeconomic burden for people, their families, and health services.[11]In Nepal, stroke ranks as the 3rd leading cause of death, with 80.03 deaths per 100,000 people.[12]Approximately 80% of strokes are preventable; lack of information and control of stroke risk factors contribute to the increasing incidence of stroke among people all over the world.[7] It can be reduced through control of blood pressure and cholesterol levels, adopting a healthy lifestyle like regular exercise, eating more fruits and vegetables, low sodium consumption, and avoiding smoking.[12]

A group of people with the poorest level of knowledge have the highest risk of stroke over 75 years of age.[13] People from developed countries were more aware of stroke (76% in Australian and Jordanian (87.3%) than Asian or developing countries in Pakistan (50.8%), Amanda (34%), and India (45.5%).[14] Only half of the adult respondents had an average level of knowledge about the stroke, although there were wide knowledge gaps in risk factors, prevention of stroke also in perception, even in Japan.[15]Moderate level of knowledge regarding risk factors in relation to age, gender, diabetes, alcoholism, family history, etc. was found, and only one-third of participants identified smoking as a major risk factor in India.[16] Only 52.5% of Sub-Saharan African people were aware, and 45% had poor knowledge on CVD, stroke risk factors, and warning signs.[17]

Stroke is a rising global health problem, including in Nepal. The main reason behind the delay in hospital arrival after a stroke is a lack of knowledge about warning signs and risk factors.[18] Similarly, low threat perception, distance from the hospital, poor infrastructure, and hesitancy about hospital admission even with proper access ultimately contribute to high mortality and morbidity in stroke.[16] Adequate public awareness of stroke demands immediate medical attention, which leads to a positive outcome after stroke. Early identification of risk factors, recognition of warning signs, transportation, visits to healthcare centers, timely imaging or proper diagnosis, hospitalization, early interventions, use of thrombolytic drugs within 4.5 hours, and management with proper medical facilities increase treatment efficiency. that also reduce stroke-associated morbidity and mortality.[19, 20]

Level awareness is a major challenge in Nepal; only 65.8% of middle-aged adults in the eastern part of the community found an average level of awareness.[21]Forty-four percent of respondents reported hypertension as an identifiable risk, but very few 5% mention control of blood pressure as a measure of stroke prevention.[22] Ignorance and a lack of understanding about the prevention of favorably modifiable risk factors for stroke remained an unmet challenge in the community.[23] Likewise, lack of infrastructure and specialized stroke care units are other challenges that largely affect the mortality and morbidity related to stroke in Nepal.[24] Most of the studies were conducted in hospitals as well as in urban areas of the country, and a few were conducted in the eastern

part of the country, but none were conducted in Kaligandaki Municipality, so researchers were interested in assessing the awareness regarding stroke among adults residing in the Kaligandaki Municipality.

METHODS

A cross-sectional descriptive study design was adopted in the rural municipality of Syangja in the Gandaki Province of Nepal in December 2020. Initially, a probability, simple random sampling technique was used to select one ward out of seven in Kaligandaki rural municipality. Ward No. 4 was selected with the lottery method, with a total of 580 households in that ward. Each house was coded from 1 to 580, and then a systematic random sampling technique was used to obtain the sample. Data or information was obtained by the face-to-face interview technique using a structured interview schedule. Only one respondent was taken randomly from one household. The collected data was analyzed using Statistical Package for Social Science (SPSS) version 20. Descriptive statistics (frequency, percentage, mean, and standard deviation) and inferential statistics (Chi square test) were used to measure the association between level of awareness and the selected variable. Ethical clearance was obtained from the institutional review committee (IRC) of the Institute of Medicine.

RESULTS

Regarding socio-demographic characteristics, it reveals that 59% of respondents were in the age group of less than 50 years; the mean age was 49.02 (SD± 6.54) years, with a minimum age of 40 and a maximum age of 59 years. Ethnicity-wise, 61.4% of respondents belonged to Brahmin/ Chhetri, 85.7% were married, 28.3% completed secondary level education, 48.6% were involved in agriculture as an occupation, and economically, 56.2% of respondents had enough for 12-month expenditures from their income.

Table 1: Respondents' Personal Behaviors and Co-Morbidity related Information (n=251)

Variables	Number	Percent
Smoking/Tobacco		
Never smoked	177	70.5
Present smoker	55	21.9
Past smoker	19	7.6
Alcohol Consumption		
Never used	205	81.7
Current user	28	11.2
Past user	18	7.1
Diet Consumption		
Non-vegetarian	193	76.9
Vegetarian	58	23.1
Presence of Co-morbidity	40	15.9
Types of Co-morbidity (n=40)		
Hypertension	31	77.5
Diabetes	7	17.5
Heart disease	5	12.5
Regularly on HTN medication (n=31)	23	74.1
Types of co-morbidity present in family (n=65)*		
Hypertension	46	70.7
Diabetes	13	20.0
Heart disease	8	12.2
Stroke	4	6.1

Concerning the personal habits of respondents, 29.5% were smokers, and among them, 21.9% were present smokers. 18.3% consumed alcohol; 76.9% were non-vegetarian; likely 77.5% suffer from hypertension; out of them, 74.1% regularly take antihypertensive medication. Hypertension is a major (70.7%) comorbidity present in the family.

Table 2: Respondents' Awareness on Stroke: Meaning and Risk factors (n=251)

Variables	Number	Percent
Meaning of Stroke		
Interruption of blood supply to part of the brain	198	78.9
Risk Factors related to Stroke*		
High stress	224	89.2
High blood pressure	210	84.0
Advanced age	206	82.1
Lack of physical exercise	188	74.9
Over alcohol intake	177	70.5
Smoking	169	67.3
Positive family history	165	65.7
Obesity/ Overweight	164	65.3
High fat diet	137	54.6
Diabetes	57	22.7

**Multiple Responses*

Table 2 shows that 78.9% stated the correct meaning of stroke, and 88.8% said the brain was the main organ affected in stroke. Similarly, 34.7% of respondents said age over 60 years is a risk group for stroke; likewise, high stress (89.2%), high blood pressure (84%), and advanced age (82%) were mentioned as risk factors for stroke.

Table 3: Respondents' Awareness on Stroke: Sign & Symptoms (n=251)

Variables	Number	Percent
Warning Signs *		
Severe headache	207	82.5
Sudden facial, arm and leg weakness	202	80.5
Trouble walking	152	60.6
Trouble speaking or difficulty in speech	109	43.4
Trouble seeing	29	11.6
Sign and Symptoms *		
Dizziness	216	85.7
Severe headache	186	74.1
Problem in balancing	153	61.0
Confusion/Memory loss	146	58.2
Slurred speech	142	56.6
Weakness or paralysis	107	42.6
Facial drooping	77	30.7

*Multiple responses**

Table 3 showed that 82.5% of respondents said severe headache was the most identifiable warning sign of stroke; similarly, dizziness (85.7%) and severe headache (74.1%) were stated as the most identifiable signs and symptoms of stroke; likewise, 98.4% mentioned immediately visiting the hospital if a warning sign was present.

Table 4: Respondents' Awareness on Stroke : Management, Complications and Prevention (n=251)

Variables	Number	Percent
Early Intervention for better Outcome	240	95.2
Appropriate time to start treatment (within 3-4.5 hours)	191	76.1
Immediate action in Community*		
Getting to hospital immediately for better management	241	96.0
Check responses	105	41.8
Maintain well ventilation	51	20.3
Elevate head	30	12.0
Complications of Stroke*		
Hemiplegia	224	89.2
Immobility	222	88.4
Physical disability	211	84.1
Paraplegia	89	35.5
Risk of aspiration	26	10.4
Prevention of Stroke*		
Regular health checkups and minimize risk factors	242	96.4
Quit smoking	221	88.0
Avoid and minimize stress	213	84.9.
Regular check blood pressure	209	83.3
Regular exercise	194	77.3
Diet low in salt and fat, high in fruits and vegetable	189	75.3
Control Diabetes	52	20.7

**Multiple responses*

Table 4 depicted that 95.2% respondents had responded early intervention was needed for better outcome; 3-4.5 hours was best time to

start treatment at hospital stated by 76.1%; similarly, 96% mentioned sent the client immediately to hospital for better management as immediate action need to be done in community. Awareness on the common complication of stroke hemiplegia (89.2%), immobility (88.4%) & physical disability (84.1%) had stated. Likewise, regular health checkup and minimize risk factors (96.4%), followed by quit smoking (88%) respondents stated as the most important preventive measures of stroke.

Table 5: Respondents' Level of Awareness on Stroke

Level of Awareness	Number	Percent	95% Confidence Interval	
			Upper	Lower
Good (>75%)	24	9.6	13.24	5.95
Average (50-75%)	189	75.3	80.63	69.96
Poor (< 50%)	38	15.1	19.52	10.67
Total	**251**	**100.0**		

Table 5 showed that the majority (75.3%) of respondents had an average level of awareness, and only 9.6% of the respondents had a good level of awareness.

Table 6: Association between the Level of Awareness and Selected Socio-demographics Variables of the Respondents (n=251)

Variables	Level of Awareness			*^{2}-Value	p-Value
	Poor	Average	Good		
	No. (%)	No. (%)	No. (%)		
Age in Years					
<50	21(14.2)	115(77.7)	12(8.1)	1.289	0.525
>50	17(16.5)	74(71.8)	12(11.7)		
Sex					
Female	19(14.4)	97(73.5)	16(12.1)	2.131	0.344
Male	19(16.0)	92(77.3)	8(6.7)		
Ethnicity					
Brahmin/Chhetri	14(9.1)	121(78.6)	19(12.3)	13.408	<0.001
Others	24(24.7)	68(70.1)	5(5.2)		
Educational Level					
Informal education	15(29.4)	28(54.9)	8(15.7)	14.659	0.001
Formal education	23(11.7)	161(80.5)	16(8.0)		

*Level of Significance, <0.05, likelihood ratio**

Table 6 shows that a significant association exists between the level of awareness of stroke and ethnicity (p<0.000) and level of education (p<0.001). The respondents who had formal education had a higher level of awareness than respondents with informal education.

DISCUSSION

Regarding the meaning of a stroke 78.9% of respondents mentioned the correct meaning of stroke as an interruption of blood supply to part of the brain. Likely 97.4% of respondents in eastern Nepal mentioned the correct meaning of stroke.[21] Likewise, 87.6% of respondents in Poland and 76% of respondents in Pakistan also mentioned the correct definition of stroke.[25, 26]

Concerning the risk factors, the majority (89.2%) of the respondents mentioned high levels of stress, high blood pressure (84%), advanced age (82.1%), and diabetes (22.7%) as risk factors

for stroke. Silwal et al. mentioned hypertension (91.5%), stress (85.4%), smoking (27.4%), and diabetes (4.3%) as the risk factors for stork.[21] Contradictory findings were depicted by Wiszniewska et al. in 2000: hypertension (27.8%), smoking (6.1%), and diabetes (4.4%).[25] Likewise, Meira et al. (2018) explored that inadequate diet (42.3%), hypertension (33.7%), physical inactivity (28.3%), emotional stress (24%), alcohol use (21.6%), and smoking (21%). were stated as the risk factors for stroke by Brazilian participants.[27]

Concerning the signs and symptoms, in this study, 82.5% of respondents stated severe headaches; 80.5% mentioned sudden facial, arm, or leg weakness and trouble walking; and 60.6% mentioned a warning sign of stroke. Thapa et al. (2016) also revealed an almost similar finding: hypertension (74%) and sudden onset limb weakness or numbness (72%) as warning symptoms of stroke.[28] Dar et al., in a study from Pakistan, stated sudden onset numbness of limbs (66.9%) and hypertension (93.5%) as common warning symptoms.[26]

On signs and symptoms of stroke, the majority of the respondents stated that they experienced dizziness (85.7%), severe headaches (74%), problems balancing (61%), memory loss (58.2%), slurred speech (56.6%), trouble seeing (11.6%), and only 30.7% of them experienced facial dropping. This finding is supported by Silwal et al., who explored the sudden onset of dizziness (96.6%), headache (94.9%), slurred speech (53%), facial weakness (47%), and only 8.5% mentioned double vision.[21]

Relating to the management of stroke 95.2% of respondents correctly responded to the need for early and timely treatment for a better outcome, and 96% mentioned being immediately sent to the hospital for better management as an immediate action after the stroke. A study in Pakistan by Dar et al. (2019) also stated that 87.5% of respondents brought stroke patients to a hospital immediately.[26] Another study by Meira et al. (2018) mentioned that 66.8% of participants said to call an ambulance immediately after the stroke, and 17.8% went to the hospital.[27]

Regarding the common complication, 89.2% of respondents mentioned hemiplegia, followed by immobility (88.4%), physical disability (84.1%), and stroke as a complication. About the preventive measures, 96.4% of respondents stated regular health checkups, quitting smoking (88%), avoiding and minimizing stress (84.9%), and checking the blood pressure regularly can minimize the risk of stroke.

Concerning the level of awareness, the majority (75.3%) of the respondents secured an average score, and only 9.6% secured a good score on stroke. According to Silwal et al. (2019), the study in eastern Nepal depicted an almost similar finding.[21] Likely 65.8% of respondents had an average level of knowledge. Meira et al. (2018) in Brazil also found low knowledge about the clinical manifestations, risk factors, and management of stroke.[27]

A significant association existed between the level of awareness of stroke and ethnicity ($p<0.000$) and education level ($p<0.001$). likely significant association did not exist with age and sex of respondents. This finding is supported by Silwal et al. in the study conducted in the eastern part of Nepal.[21] Another study conducted in Pakistan by Dar et al. (2019) also revealed no significant association between level of knowledge and age ($p > 0.450$), gender ($p > 0.330$), religion ($p > 0.100$), or family history of stroke ($p > 0.25$).[26]

CONCLUSION

It is concluded that very few adults residing in a rural municipality had a good level of awareness, so formal and informal community-level awareness programs are recommended through community and governmental agencies to improve public awareness of stroke.

CONFLICT OF INTEREST: None

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