



Factors Influencing Stroke Awareness among Patients with Hypertension in a Tertiary Hospital of Nepal: A Cross-sectional Study

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ABSTRACT

Introduction: Stroke is the leading cause of death and disability globally. Hypertension is one of the major risk factors contributing to stroke. Therefore, awareness of stroke among patients with hypertension is essential for the prevention of stroke and if necessary the initiation of immediate effective treatment. We aimed to determine the current status and factors predicting stroke awareness among patients with hypertension.

Materials and methods: A cross-sectional study was conducted among 163 patients with hypertension who attended the out-patient clinic of the Medicine department of Chitwan Medical College Teaching Hospital, Bharatpur, Chitwan from March to April 2016. Data were collected by using semi-structured interview schedule. Descriptive statistics was used to identify the status of stroke awareness among patients with hypertension and multivariate logistic regression analysis was used to identify factors associated with stroke awareness.

Results: Of total 163 participants, stroke awareness was poor among 61.3%. In bivariate analysis awareness was significantly associated with age ($p=0.017$), educational status ($p=0.005$), level of education ($p=0.006$), occupation ($p=0.001$), place of residence ($p=0.011$), source of information [nurses ($p=0.027$) and internet ($p<0.001$)]. Regression analysis showed that education status [$p=0.028$; odds ratio (OR) 0.348, confidence interval (CI) 0.135-0.894] and internet as a source of information ($p=0.003$; OR 22.38; 95% CI 2.799-178.995) were the factors predicting stroke awareness.

Conclusion: Stroke awareness among patients with hypertension attending a tertiary care hospital of Central Nepal was commonly poor. Education status and internet as a source of information of stroke were significantly influencing good stroke awareness.

Keywords: Awareness, Stroke, Hypertension

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INTRODUCTION

Stroke is defined as clinical syndrome consisting of rapidly developing clinical signs of focal (or global in case of coma) disturbance of cerebral function lasting more than 24 hours or leading to death with no apparent cause other than a vascular origin.^[1] High blood pressure (also referred to as HBP, or hypertension) is when the blood pressure, the force of blood flowing through the blood vessels, is consistently too high. Hypertension Stage 1 is when blood pressure consistently ranges from 130-139 systolic or 80-89 mm Hg diastolic. Hypertension Stage 2 is when blood pressure consistently ranges at 140/90 mm Hg or higher.^[2] Worldwide, cerebrovascular accidents (stroke) are the second leading cause of death and the third leading cause of disability. Globally, 70% of strokes and 87% of both stroke-related deaths and disability-adjusted life years occur in low- and middle-income countries.^[3] Stroke remains the second leading cause of death worldwide, with 5.5 million (95% uncertainty interval [UI] 5.3–5.7) deaths attributed to this cause in 2016.^[4] Rates of stroke mortality and burden vary greatly among countries, but low-income countries are the most affected. There is a divergent, statistically significant trend in stroke incidence rates over the past four decades, with a 42% decrease in stroke incidence in high-income countries and a greater than 100% increase in stroke incidence in low to middle income countries.^[5] Based on disability-adjusted life years, stroke is one of the major causes of death and is among the top five diseases in Nepal. The mean age of stroke patients in Nepal is between 59 and 62 years, with males affected more frequently. Hypertension, cigarette smoking, alcohol consumption, and diabetes are the main predisposing factors for stroke.^[6] Individuals with hypertension are at risk of stroke, and patients with stroke histories are at risk of experiencing another stroke.^[7] The excessive high pressure on artery walls caused by HTN can damage blood vessels along with organ function. This increases the risk for developing several dangerous health conditions including heart attack, stroke, chronic heart failure (CHF), and kidney disease. About 80% of people who have their first stroke have

high blood pressure.^[8] The global economic impact of stroke may be dire if effective preventive measures are not implemented to help decrease the burden of this disease.^[9]

MATERIALS AND METHODS

Descriptive cross-sectional study was used to find out the awareness regarding stroke among hypertensive patients. The study was carried out at Chitwan Medical College Teaching Hospital Bharatpur 10, Chitwan. This hospital is a 750 bedded teaching hospital. The study population was all the diagnosed patients of hypertension and taking antihypertensive medicine attending medicine OPD of CMCTH for follow up treatment were included in the study. All 163 hypertensive patients were taken by non-probability purposive sampling. Semi structured interview schedule was developed by the researcher herself based on the literature review. The content validity of the research instrument was established by consultation with research advisor and content experts. The instrument was then translated into Nepali version and pretesting of the instrument was done with 15 hypertensive patients attending medicine OPD of College of Medical Sciences, Bharatpur, Chitwan. The research approval was taken from Thesis Committee of College of Nursing, Chitwan Medical College (P) Ltd, Bharatpur, Chitwan. Ethical clearance was taken from CMC-IRC, Bharatpur, Chitwan. The verbal informed consent was obtained from each respondent by clarifying the purpose of the study prior to the data collection. The data were entered in EPI data program 3.1 and exported into the IBM SPSS version 16 for analysis. Data were analyzed by using descriptive statistics and inferential statistics.

RESULTS

Out of 163 respondents, 29.4% were between the age group of 60-69 years whereas 1.2% of respondents were between the age group of 20-29 years. The mean age of the respondents was 55.18 with 13.053 of standard deviation. Regarding the sex of the respondents, 50.3% were female whereas

49.7% were male. Concerning the religion of the respondents, 49.7% were of Hindu religion and 12.3% were of Islam religion. As regard to the ethnicity of the respondents 38.7% were Brahmin / Chhetri whereas 5.5% were Madhesi. Out of 163 respondents, 77.3% were literate and 22.7% were illiterate. Among 126 literate respondents, 51.6% were general literate whereas 5.6% have achieved higher secondary education. Concerning the occupation of the respondents, out of 163 respondents 33.1% were involved in business and 4.3% were involved in daily wages. Regarding the place of residence, among 163 respondents 60.7% were from urban areas whereas 39.3% were from rural areas.

Regarding risk factors of stroke, 52.1% the respondents answered high blood pressure as a modifiable risk factor of stroke and 55.2% of them answered sex as a non-modifiable risk factor of stroke. Regarding awareness on warning signs of stroke, 80.4% of the respondents answered trouble speaking as warning signs of stroke.

The total mean awareness score of the respondents was 12.99 with 3.66 of standard deviation, 56.51% of mean score, range 3.75-20.75 and maximum possible score was 23 as shown in table 1. It was found more than half of the respondents (54.6%) had fair awareness regarding stroke as shown in table 2.

Table 1: Respondents' awareness regarding stroke (n=163)

Awareness regarding stroke	Mean \pm SD	Score	% Mean Score	Range	Maximum Score
Concept	2.02 \pm 1.43		50.61	0-4	4
Risk factors	0.76 \pm 0.32		38.49	0-1.75	2
Warning signs	6.30 \pm 2.09		57.33	0-10	11
Prevention	3.34 \pm 1.27		55.75	0-5.75	6
Total	12.99 \pm 3.66		56.51	3.75-20.75	23

Table 2: Respondents' level of awareness regarding stroke

Awareness level	Frequency	Percentage
Poor	52	31.9
Fair	89	54.6
Good	22	13.5
Total	163	100

Table 3 shows that there was statistically significant association between level of awareness regarding stroke with age ($p < 0.001$), educational status ($p = 0.048$), level of education ($p < 0.001$), occupation ($p < 0.001$) and place of residence ($p < 0.001$).

The table 4 is a regression model that shows that education status and internet as a source of information of stroke are significant predictors of good stroke awareness. The explanatory variables namely age (dichotomous), education status

(dichotomous), place of residence (dichotomous), occupation (nominal), source of information as nurse (dichotomous) and source of information as internet (dichotomous) which were independently associated with level of awareness (Good and Poor) at $p < 0.05$. The model suggests that illiterate individuals have 0.348 times lesser odds of having good level of stroke awareness than literate individuals (95% CI = 0.135 to 0.894; $p = 0.028$). Additionally, the odds of having good level of stroke awareness was 22.383 times higher among those whose source of information was internet as compared to those who did not have internet as a source of information and it was statistically significant at $p = 0.003$ (95% CI = 2.799 to 178.995).

DISCUSSION

Awareness regarding stroke is essential for the prevention and initiation of immediate effective treatment of stroke. The finding of this study is

comparable to other similar studies. The mean age of the respondents in this study was 55.18 ± 13.053. This finding is not supported by the findings of the study conducted by Tesha which shows that 32.8% were between the age group of 35-45 years

and the mean age of the participants was 50.77 years (SD. 14.454).^[9] Regarding sources of information, the finding showed that 59.5% had received information regarding stroke from friends.

Table 3: Association of socio-demographic variables with the level of awareness regarding stroke among patients with hypertension (n=163)

Variables	Level of Awareness			χ^2	p-value
	Poor n (%)	Fair n (%)	Good n (%)		
Age group in years					
≤50	18(28.1)	29(45.3)	17(26.6)	15.464	<0.001**
>50	34(34.3)	60(60.6)	5(5.1)		
Sex					
Male	22(27.2)	47(58.0)	12(14.8)	1.687	0.430
Female	30(36.6)	42(51.2)	10(12.2)		
Religion					
Hindu	21(25.9)	46(56.8)	14(17.3)	4.410	0.621
Buddhism	10(35.7)	15(53.6)	3(10.7)		
Islam	9(45.0)	9(45.0)	2(10.0)		
Christian	12(35.3)	19(55.9)	3(8.8)		
Ethnicity					
Dalit	10(32.3)	18(58.1)	3(9.7)	5.006	0.543
Janajati	15(31.9)	26(55.3)	6(12.8)		
Brahmin / Chhetri	17(27.0)	34(54.0)	12(19.0)		
All others	10(45.5)	11(50.0)	1(4.5)		
Educational status					
Literate	36(28.6)	69(54.8)	21(16.7)	6.065	0.048*
Illiterate	16(43.2)	20(54.1)	1(2.7)		
Level of education					
General literate	21(32.3)	40(61.5)	4(6.2)	45.704	<0.001**
Primary education	10(41.7)	11(45.8)	3(12.5)		
Secondary education	2(10.5)	15(78.9)	2(10.5)		
Higher secondary education	2(28.6)	1(14.3)	4(57.1)		
Bachelor and above	1(9.1)	2(18.2)	8(72.7)		
Occupation					
Service holder	4(18.2)	7(31.8)	11(50.0)	32.714	<0.001**
Business	17(31.5)	29(53.7)	8(14.8)		
All others	31(35.6)	53(60.9)	3(3.4)		
Place of residence					
Urban	23(23.2)	55(55.6)	21(21.2)	17.102	<0.001**
Rural	29(45.3)	34(53.1)	1(1.6)		
Duration of illness					
Less than 3 years	39(32.0)	63(51.6)	20(16.4)	3.795	0.150
More than 3 years	13(31.7)	26(63.4)	2(4.9)		
Comorbidities					
Yes	27(39.1)	33(47.8)	9(13.0)	2.984	0.225
No	25(26.6)	56(59.6)	13(13.8)		

*Significant at $P < 0.05$; **Significant at $p < 0.001$

Table 4: Factors predicting stroke awareness among patients with hypertension using binary Logistic regression analysis

Variables	Reference category	β (SE)	OR (95% CI)	P-value
Illiterate	Literate	-1.055(0.482)	0.348 (0.135 to 0.894)	0.028*
Source of information as internet	No	3.108(1.061)	22.383 (2.799 to 178.995)	0.003*
Constant		-.0334 (0.203)	0.716	0.100

Model $\chi^2=29.942$ ($p<0.001$), -2Log likelihood=187.551, Cox & Snell $R^2=0.168$, Nagelkerke $R^2=0.228$, Hosmer and Lemeshow test $p=0.966$

This finding is supported by the findings of the study conducted by Jones et al. and Pandian et al. which stated that a majority of subjects had heard about stroke through friends, 302 (32.1%), and relatives, 376 (39.9%), the rest heard through television, 85 (9%); radio, 10 (1.1%) whereas this study is not supported by the findings of the study conducted by Sallar et al. which stated that respondents (51.1%) indicated receiving stroke information from health professionals.^[10,11,12]

Concerning awareness regarding organ involved in stroke, this study concluded that 45.4% answered brain as an involved organ in stroke. This study is supported by the findings of the study conducted by Madae'en et al.^[13] which stated that 50% of the respondents answered that brain is the organ involved in stroke. Regarding meaning of stroke, this study revealed that 54.6% answered stroke occur due to lack of blood supply in the brain. This study is supported by the findings of the study conducted by Hickey et al.^[14] which stated that over half (58.6%) defined stroke as a blood clot in the brain. Likewise, awareness on modifiable risk factor for stroke, this study concluded that high proportion (52.1%) of the respondents answered high blood pressure as a modifiable risk factor of stroke. This finding of the study is supported by the findings of the study conducted by Sallar et al. which stated that out of 188 respondents, more than half identified high blood pressure as a risk factor of stroke whereas a smaller proportion of participants identified other risk factors of stroke including diabetes, smoking, and poor diet.^[12] Same finding was supported by the findings of the study conducted by Bridgeman and Monaliza which stated that high blood pressure was the most frequently identified risk

factor.^[15,16] Regarding non modifiable risk factor of stroke, in this study more than half (55.2%) answered sex as a non-modifiable risk factor of stroke. This finding is not supported by the findings of the study conducted by Madae'en et al. which stated that the most commonly recognized risk factors of stroke were getting older (58.8%).^[13]

Regarding warning signs of stroke this study shows that out of 163 respondents, 80.4% answered trouble speaking as warning signs of stroke. Sudden loss of speech was the most identified symptom of stroke by a (54.7%). This finding is not supported by the findings of the study conducted by Monaliza which stated that sudden numbness or weakness of the face, arm or leg, especially on one side of the body was the most common warning sign reported by majority of the study subjects (98.28).^[16] Regarding the extent of prevention, this study showed that 31.9% of the respondents answered stroke is moderately preventable. This finding is supported by the findings of the study conducted by Tesha which stated that 28.1% of the respondents answered that stroke is moderately preventable.^[9] Regarding overall awareness score, in this study out of 163 respondents, 54.6% had fair awareness level regarding stroke. This finding is not supported by the findings of the study conducted by Tesha which stated that that 49.20% of the participants scored low in the overall level of knowledge of stroke.^[9] This variability in findings might be due to more than of the respondents being literate. This study concluded that there was statistically significant association between level of awareness regarding stroke with age ($p<0.001$). This finding is also supported by the

findings of the study conducted by Hickey et al. (2012) which stated that there were significant gaps in knowledge, with poorest levels evident in those aged > 65 years. Regarding the place of residence, this study concluded that there was statistically significant association between level of awareness with place of residence ($p < 0.001$). This finding is supported by the findings of the study conducted by Ennen and Zerwic which stated that respondents living in rural areas have higher stroke knowledge scores compared to respondents living in non-rural areas.^[17]

In this study there was statistically significant association between educational status ($p = 0.048$) and level of education ($p < 0.001$) which means there was higher level of awareness regarding stroke among literate respondents and higher the level of education. This finding is supported by the findings of the study conducted by Jones et al.^[10] which stated that people generally with lower levels of education had consistently poor levels of stroke knowledge. Similarly, this finding is also supported by the findings of the study conducted by Sallar et al., Pandian et al. and Monaliza which stated that respondents with baccalaureate degrees and higher were more knowledgeable about stroke than the less educated.^[11,12,16]

CONCLUSION

Based on the findings of the study conclusion has been drawn. Study findings shows that more than half of the respondents' have fair level of awareness regarding stroke. The level of awareness regarding stroke among hypertensive patients is statistically significant with age, level of education, occupation, place of residence of respondents and sources of information from books, television and internet. It is also concluded that shows that education status and internet as a source of information of stroke are significant predictors of good stroke awareness.

COMPETING INTEREST

The authors declare that there is no conflict of interest regarding the publication of this paper.

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