Research Article

Effectiveness of Awareness Programme Regarding Warning Signs, Risk Factors, and Treatment of Stroke among Employees of Government Banks

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ABSTRACT

Aim: Stroke is progressively becoming a prime cause of early death and long lived ailment in adults globally due to lack of awareness of stroke. This leads to delay in seeking prompt treatment for stroke due to delay in reaching specialized health-care centers. The present study was done to determine the effectiveness of awareness program regarding warning signs, risk factors, and treatment of stroke among bank employees whose sedentary lifestyle makes them prone to get stroke. **Materials and Methods:** A quasi-experimental research study was carried out on bank employees. Total enumeration sampling technique was used and 100 bank employees were enrolled as study subjects. Questionnaire and teaching module that was validated by the experts in field of nursing and neurology was used for data collection. All the subjects were contacted personally for the data collection. They were asked to fill up the questionnaire and their biophysical measurements were done. The efficacy of the educational teaching module was assessed through pre- and post-educational intervention responses of the subjects using SPSS version. **Results:** The awareness regarding stroke improved after educational intervention. The awareness before the commencement of awareness program regarding stroke, its risk factors, warning signs, and treatment was 40.16%, 68.16%, 29.09%, and 44.60%, respectively, which improved to 94.80%, 86.83%, 81%, and 90, 20%. The overall awareness improved from 46.91% to 86.70%. **Conclusion:** Nurses and health-care professionals must take efforts to bring awareness through educational activities in general population keeping in mind the high risk groups for stroke.

Keywords: Risk factors, Treatment, Warning signs

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Introduction

Stroke also known as a brain attack is becoming a considerable cause of early death and ailment in developing countries like India, largely driven by demographic changes and enhanced by progressing prevalence of prime modifiable risk factors. Sedentary lifestyle, obesity, and stress are the few factors which could put the bank employees at risk of getting stroke.[1] The WHO has defined stroke as quickly progressing clinical signs of localized (or overall) disturbance of functions of cerebrum, which lasts for more

than 24 h, with no evident cause other than vascular origin.[2] A temporary clot usually leads to TIA or transient ischemic attack which is commonly called as mini-stroke. These warning strokes should be considered serious. If blood supply to an area of brain is obstructed for less than 5 min, the average is about a minute. Symptoms of TIA last for up to 10–20 min.[3]

It is predicted that stroke deaths will increase from 4.5 million globally in 1990–7.7 million in 2020.[1] In 2005, it was reported that 37% of deaths in developing countries were due to stroke and approximately 5.8 million people died from stroke globally.[1] The awareness of public regarding risk factors of stroke is still poor in our country. During 2001–2003, 19% of deaths in India were due to stroke and it is predicted to increase to 36% by 2030.[4] In current scenario, developing country like India requires more comprehensive studies to determine the effectiveness of preventive agents such as anti-hypertensive agents, anti-platelet agents, and role of educational drive in our country cannot be ignored rather it is of utmost importance.

Many of controllable risk factors of stroke can be eliminated by simple lifestyle changes. Advanced practice nurses' services include emphasis on health promotion and disease prevention (Ditillo and Betty, 1998).[5] This role enables nurses to educate and co-ordinate efforts that promote increase in knowledge regarding stroke signs and symptoms and risk factors and treatment and helps in coordinating with the public to promote lifestyle changes. Alteplase Intravenous tissue plasminogen activator is being used in 4.5 h of onset of ischemic stroke in certain eligible patients. Knowledge of warning signs of stroke and risk factors is essential for patients for effective utilization of thrombolytic therapy in acute stroke.[2] For promoting early treatment seeking behavior of people, it is important to make people aware of Facial drooping, Arm weakness, Speech difficulty, Time (FAST), and simultaneously telling about golden period for seeking treatment. As in developed countries, the incidence is decreasing since nurses are acting as task force to make public aware regarding stroke. Hence, a small initiative is taken by implementing educational intervention to spread awareness regarding stroke.

Materials and Methods

A quantitative approach with a quasi-experimental design was adopted for the study. Total enumeration technique was used to enroll 100 bank employees as study subjects. Only government bank employees were enrolled as study subjects to have uniformity in working hours and stress faced by them. A set of tools for data collection comprised of socio-demographic sheet, anthropometry and clinical profile sheet, stroke knowledge assessment questionnaire, and module for imparting awareness related to stroke.

1. Socio-demographic sheet: Information pertaining to demographic characteristics was included

2. Anthropometric and Clinical profile sheet: Anthropometric sheet comprised basic measurements such as height, weight, and BMI. In clinical profile sheet, keeping in mind the stroke risk factors, the blood pressure, random blood sugar monitoring of study subjects were performed and previous health history were included in the study

3. Stroke knowledge assessment questionnaire: In this section, questions related to stroke risk factors, warning signs, and treatment were included to assess knowledge pre- and post-educational intervention. The self-risk identifying ability of the study subjects was assessed on the basis of their knowledge about stroke

4. Teaching module for imparting information on stroke included information about stroke risk factors, warning signs, and treatment modalities.

The content validity of the tool was ensured through six experts in field of nursing and neurology. Permission for data collection was taken from the institute ethics committee and managers of the respective banks. Questioning and measurement techniques were used for data collection. Before the commencement of data collection, a pre-informed consent was obtained in writing from the subjects. The subjects were explained the purposes, aims, and benefits of being a part of the study. It took 20–25 min for the commencement of questionnaire and measurements relevant to the study. All the subjects contacted personally for obtaining and imparting information on stroke. Pre- and post-educational intervention awareness level was compared.

Statistics

Data were analyzed using descriptive (frequency, percentage, mean, and standard deviation) and inferential statistics (Paired *t*-test).

Results

Data were analyzed using descriptive and inferential statistical measures in SPSS Version 20.

Table 1 depicts the socio-demographic profile of the study subjects. The age ranged from 22 to 59 years and mean age was 42.87 ± 12.20 years. More than half of the study population comprised of males (61%). Most of subjects were married and were staying with their families, that is, 82% and 87%, respectively. Based on educational qualification, it was a mixed group having educational level till 12th, graduation and post-graduation (32%, 32%, and 36%, respectively). Majority of the subjects were Hindu (83%). Just less than half of the subjects had nuclear (45%) family. The household income was above 50,000 for more than half of the respondents (56%).

Table 2 depicts the clinical profile of the respondents. Half of the respondents (50%) had their BMI within normal

Table 1: Demographic profile sheet of the participants. (N=100)

Variable	*n* (%)
Age (years)	
Mean age: 42.87±12.2	
20–39	56
40–60	44
Gender	
Male	61
Female	39
Marital status	
Married	82
Unmarried	18
Present living status	
With family	87
Away from family	13
Educational status	
Up to 12th	32
Graduate	32
Postgraduate	36
Religion	
Hindu	83
Sikh	16
Christian	1
Type of family	
Joint	55
Nuclear	45
Household income (Rs.)	
<20,000	3
20,000–29,999	1
30,000–39,999	14
40,000–49,999	26
>50,000	56

Table 2: Clinical profile of the respondents. (N=100)

Variable	*n* (%)
BMI (kg/m^2)	
<18.5 (underweight)	1
18.5–25 (normal)	50
25–29.9 (overweight)	41
>30 (obese)	8
Self-reported health status	
Poor	2
Fair	30
Good	65
Excellent	3
Medical history	
Diabetes	6
Hypertension	23
Cardiac disease	1
Stroke	1
Diabetes and hypertension	6
Stroke and hypertension	1
No comorbidity	62
Blood pressure categorization*	
For unknown hypertension status (*n*=79)	
SBP (mm Hg) – DBP (mm Hg)	
<120 - <80 (normal)	39 (49.37)
120–139 - 80–89 (pre hypertensive)	37 (46.83)
140–159 - 90–99 (Stage1 hypertension)	3 (3.8)
For known hypertensives on drugs (*n*=21)	
SBP (mm Hg) - DBP (mm Hg)	
<120 - <80 (normal)	9 (42.85)
120–139 - 80–89 (pre hypertensive)	10 (47.61)
140–159 - 90–99 (Stage 1 hypertension)	2 (9.54)
Blood sugar categorization**	
For unknown diabetic status (*n*=92)	
RBS (mg/dl)	
70–140 (normal)	72 (78.26)
140–180 (pre-diabetic)	11 (11.95)
>180 (diabetic)	9 (9.78)
For known diabetics on drugs (*n*=8)	
RBS (mg/dl)	
70–140 (normal)	1 (12.5)
140–180 (Pre-diabetic)	4 (50)
>180 (diabetic)	3 (37.5)

*, **According to AHA

limits while 41% of the respondents were overweight. Out of total study subjects, 23% were having medical history of hypertension, 6% were known diabetics, and only 1% had a medical history of cardiac disease. More than half of the respondents (65%) believed their health status to be good while 30% of the subjects reported the health status as fair. For subjects with unknown hypertension status, it is reflected that 46.83% subjects were in pre-hypertension stage while 3.8% were having Stage 1 hypertension. Among hypertensive subjects on medication it was observed that 43% of subjects were able to achieve the optimal goal of blood pressure and the remaining were in pre-hypertensive stage or in Stage 1 of hypertension, that is, 47.61% and 9.54%, respectively. For subjects with unknown diabetic status, it is evident that 11.95% subjects were in pre-diabetic state whereas 9.78% were diabetic. Among known diabetic subjects (*n* = 8) who were taking hypoglycemic agents, it was observed that only one subject reflected good blood glucose control. Rest all had poor diabetic control.

Table 3 reveals the personal practices of the respondents. For smoking and tobacco use, the findings in the table reveals that 9% were smokers where as 3% were using other tobacco products. Sleep duration was normal in 69% study subjects. Severely inadequate sleep duration was reported by 2% subjects where as 29% subjects were sleeping for 4–6 h which is again insufficient to some extent. Just less than half of the respondents (48%) were having no physical activity as a part of the daily routine. Physical activity was a part of daily routine for ½ h and 1 h in 44% and 8% subjects, respectively. Majority of the respondents (63%) prefer vegetarian food while 37% of the subjects prefer non-vegetarian. About 21% of study subjects preferred fried and oily food.

Pre- and post-test knowledge scores of different aspects of stroke were compared using paired t-test as shown in Table 4. Significant improvement in the overall knowledge of stroke

Table 3: Personal practices of the respondents. (N=100)

Variable	*n* (%)
Smoking	
Smoker	9
Tobacco products	
Consumers	3
Sleep duration (h)	
<4	2
4–6	29
6–8	68
8–12	1
Physical activity	
No physical activity	48
½ h Walk daily	44
1 h daily	8
Dietary habits	
Vegetarian	63
Non-vegetarian	37
Food preferences	
High fat diet (fried and oily)	21

Table 4: Comparison of pre-test and post-test knowledge about stroke. (N=100)

Knowledge aspects	Pre-test knowledge score	Post-test knowledge score	"t" df *P*-value
Knowledge about	**Mean (SD)**	**Mean (SD)**	
Stroke	2.41 (1.776)	5.69 (0.706)	17.009 99 <0.01
Risk factors	8.18 (1.982)	10.42 (1.505)	9.112 99 <0.01
Warning signs	3.20 (1.729)	8.91 (1.902)	23.619 99 <0.01
Treatment	2.23 (1.053)	4.52 (0.703)	18.819 99 <0.01
Overall knowledge	15.95 (4.356)	29.50 (3.280)	26.747 99 <0.01

was observed as the mean score in post-test is significantly high as compared to pre-test ($t = 26.7$, $P \leq 0.01$). The awareness status regarding different aspects of stroke also showed significant improvement. The mean score (5.69 ± 0.706) of knowledge about stroke in post-test was also higher as compared to mean score (2.41 ± 1.776) of pre-test in total study subjects. There was significant enhancement in risk factors knowledge ($t = 9.11$, $P \leq 0.001$). Awareness regarding warning signs improved significantly as reflected by pre- and post-test mean score, that is, 3.20 and 8.91, respectively. Significant difference also existed in pre-test and post-test mean scores regarding treatment of stroke ($t = 26.7$, $P \leq 0.01$). From Figure 1, it is evident that after imparting information on various aspects of stroke, the 98% of subjects were able

to identify brain as an organ involved in stroke and all the subjects were aware of the acronym FAST which is used to identify early stroke. Pre-teaching only 3% subjects were able to elaborate FAST whereas post-intervention 85% could elaborate FAST. Out of total, 98% of subjects were now sure of treatment modalities available for stroke. Self-risk assessment ability also improved post intervention from 26% to 45%.

From Table 5, it is quite evident that no. of subjects recognizing diabetes mellitus as a risk factor increased post education, that is, from 55% previously to 98% presently. However, most of them (93%) were well aware of high B.P. as a risk for stroke before intervention. Post-education 92% and 74% could recognize high cholesterol and heart disease, respectively, as risk factors for stroke. The subjects taking distractors such as thyroid disorders and kidney disease as risk factors for stroke reduced to 8% and 3%, respectively, post-educational intervention. Post-educational intervention, 92% of subjects were aware of unhealthy diet as risk factor for stroke. After awareness program, 44% of subjects could recognize oral contraceptive pills as a risk for stroke. Smoking, alcohol, stress, and obesity were identified after teaching program as risks for stroke by 99%, 96%, 94%, and 89% of respondents, respectively. Sedentary lifestyle and tobacco use were described as risks by 83% and 77% study subjects, respectively.

From Table 6, it is quite evident that after educational intervention there was significant improvement in warning signs awareness of subjects. Post-educational intervention 89% could identify arm drift as warning sign for stroke. Out of total, 86% respondents could identify slurred speech as warning sign of stroke after awareness program. The study subjects who could identify facial drooping as a warning sign of stroke increased significantly from 30% pre-educational intervention to 82% post-educational intervention. However, headache was identified by most of the respondents (82%) post-educational intervention. Of total, 46% could identify double vision as a warning sign and 45% reported loss of consciousness as a risk factor post-educational intervention.

Discussion

This study was conducted with objective to assess the awareness of bank employees regarding stroke warning signs, risk factors, and treatment modalities. The mean or average age of the study participants was 42 ± 12 years. Various studies conducted on awareness of stroke reported almost same mean age (40 ± 12.9 years) of the respondents as that of the current study subjects.[6] Males (61%) are slightly more as compared to females (39%) in the present study. In the current study, 68% of the subjects had educational level higher than senior secondary school. This is supported by the fact that job profile of bank employees that demand higher education levels. These findings are almost similar to the study conducted in Jordan in which more than 70%
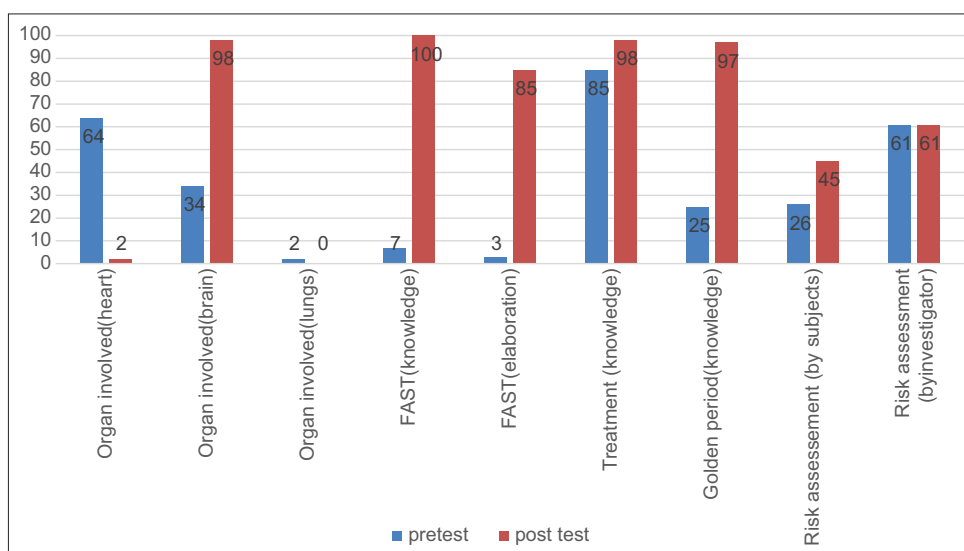
Figure 1: Pre- and Post-education stroke awareness status. *n*=100

Table 5: Risk factor awareness status. (N=100)

Variable	Pre-education *n* (%)	Post-education *n* (%)
Health problems regarded as risks for stroke:		
Diabetes	55	98
High blood pressure	93	96
High cholesterol	77	92
Heart disease	64	74
Thyroid disorder	17	8
Kidney disease	21	3
Habits regarded as risk factors of stroke:		
Smoking	85	99
Alcohol	87	96
Stress	87	94
Unhealthy diet	57	92
Obesity	73	89
Sedentary lifestyle	75	83
Tobacco use	57	77
Taking oral contraceptive pills	15	44

Table 6: Awareness status of warning signs of stroke. (N=100)

Variable	Pre-education *n* (%)	Post-education *n* (%)
Warning signs of stroke		
Arm drift	26	89
Slurred speech	46	86
Facial Drooping	30	82
Headache	71	81
Double vision	40	46
Loss of consciousness	78	45
Nose bleed	47	12

of the subjects have educational level higher than senior secondary school.[6]

In the literature, obesity is among the documented risks for stroke and in current study nearly half of the respondents (49%) come under overweight to obese category which makes them more prone to have TIA or stroke. As it is one of the modifiable risk factor, so through awareness campaigns it is possible to talk to people about ideal body weight and teach them how to reduce overweight by involving them in various physical activities and modifying dietary pattern. The study subjects were asked to rate their health status ranging from poor to excellent. Merely 2% of the respondents rated their health status as poor but the investigator found 61% of study subjects at risk for stroke so it can be said that they are feeling healthy yet they have hidden risk for stroke.

Hence, educational intervention will help to increase their self-risk identification ability. Rest were taking themselves as healthy individuals. High blood glucose levels can result in vascular endothelial injury which explains diabetes as a risk for stroke. In the present study, diabetes was seen as a comorbid condition in 6% of subjects. Among 92 subjects with unknown diabetic status, it was seen that 11.6% were in pre-diabetic state and 9.7 % were diabetic. In pre-diabetics, lifestyle and dietary modifications are of utmost importance to regulate blood glucose level. These dietary modifications were the part of our educational intervention hence the present educational intervention proved helpful. For diabetic on oral hypoglycemic agents (*n* = 8), poor glucose control was seen in 87.5%. Reinforcement for compliance with drug therapy and lifestyle modifications was one of the components of educational intervention. In a previous study conducted among the bank employees on hypertension, the prevalence of hypertension was found to be 69.5%,[7] while in the present study among subjects with unknown hypertension status is 37% were in pre-hypertensive stage and 3% in hypertensive stage. The subjects who are already diagnosed hypertensive (*n* = 21) were getting anti-hypertensive drugs. With use of anti-hypertensive drugs 42.9% subjects had blood pressure

in normal range but nearly half of the patients were not able to maintain optimal blood pressure values, that is, 47.6% subjects were in a pre-hypertensive stage while 9.5% subjects were in Stage 1 hypertension. This reflects the need for educating the study subjects regarding monitoring of blood pressure at home and simultaneously informing them that high B.P. is the main risk factor for stroke so that they can seek timely intervention if needed.

The discussion of the personal practices is must as unhealthy personal practices can make the respondents more prone to have stroke. Most of the subjects were well aware of the negative effects of smoking and tobacco use as only 9% and 3% subjects were smoking and using tobacco, respectively. Inadequacy of sleep was also seen in current study subjects (31%) that can enhance the mental stress levels of the respondents and can act as a risk factor for stroke. According to AHA, an individual should have 2 h and 30 min moderate activity per week or 1 h and 15 min of vigorous activity in a week but the findings related to physical activity of the respondents revealed that almost half of the subjects (48%) had no physical activity as a part of their daily routine. The reasons cited by the respondents for the lack of physical activity were exhaustion from the daily stressful routine work and their job profile (sedentary work). This lack of physical activity might be contributing for obesity; hence, the study subjects were made aware through educational intervention and even the bank administration can also take initiative for making it feasible for the employees to practice yoga and have facilities for carrying out physical activities at workplace only. In context to food preferences, high fat diet, that is, fried and oily food was preferred by 21% of the respondents. This again reflects the probability of having high cholesterol values and obesity in the respondents which are regarded as risks for the development of stroke. Hence, educational activities on dietary counseling related to healthy eating practices were emphasized.

The overall knowledge in all aspects of stroke improved significantly post-educational intervention; hence, it is evident that the teaching content of the educational intervention was efficient and the way of imparting information to the subjects was good enough to sensitize the study subjects regarding stroke. The similar findings were reported in the literature.[8]

After educational intervention, all the subjects were found to be aware of FAST. It is very important in context of early identification of stroke which directly or indirectly will help in early diagnosis of stroke. Majority of the subjects (98%) became aware after the educational intervention that stroke is "brain attack" and organ involved is brain while in the findings of a survey conducted by Madae'n *et al.* (2013)[6] revealed that 75% of the subjects were aware of "brain" as an organ involved in stroke. In a study conducted by Pandian *et al.* (2005),[9] 43.9% of the study subjects were aware of the treatment for stroke, while in the present study 98% of the subjects after the educational intervention were aware of

the fact that there is a treatment for stroke and 97% of the subjects became aware of golden period and its importance after educational intervention. Both of these findings will definitely help in seeking prompt treatment for stroke and thus reducing stroke disability rate.

Majority of the participants were already aware about hypertension, diabetes, high cholesterol, and heart disease as risk factors for stroke. This is justified by the fact that these are the commonly prevalent health conditions in present scenario. Myths related to risk factors were cleared post-intervention as reflected by study findings as the subjects reporting distractors (thyroid disorder and kidney disease) as risk factors of stroke reduced significantly post-intervention. Significant improvement was also seen in awareness status of health habits which are regarded as risk factor for stroke such as alcohol consumption, smoking, sedentary lifestyle, physical inactivity, unhealthy diet, obesity, and taking oral contraceptive pills. The results were similar with the study in literature where risk factors identified by subjects included hypertension (100%), diabetes (96%), high cholesterol (100%), smoking (100%), and only (91%) recognize obesity as a risk factor after educational intervention.[8]

In the current study, loss of consciousness, slurred speech, arm drift, facial drooping, and double vision were identified as warning signs by 78%, 46%, 26%, 30%, and 40% subjects, respectively. Majority, that is, 71% of subjects could identify headache as a warning sign. After educational intervention, arm drift, slurred speech, facial drooping, and headache were identified by 89%, 86%, 82%, and 81% subjects, respectively, which justifies the fact of increased awareness regarding FAST, that is, 100%, an important part of early stroke detection. Similarly in literature, headache, loss of consciousness, and difficulty in speech were reported as warning signs for stroke.[7,8]

Conclusion

In the present study, knowledge about stroke, risk factors, warning signs, and treatment of bank employees improved after educational intervention which further enhanced their ability to self-identify risk factors present in them. Hence, such educational programs can improve awareness about risk factors among general public and can contribute toward decreasing the incidence of stroke. On the other hand, if there is stroke then early identification and treatment seeking behaviors will definitely improve the quality of life post-stroke.

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