International Journal of Nursing & Midwifery Research
Volume 6, Issue 4 - 2019, Pg. No. 44-51
Peer Reviewed & Open Access Journal

Research Article

Effect of Comprehensive Nursing Care Strategies in Patient's with Stroke on Physiological Parameters

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DOI: https://doi.org/10.24321/2455.9318.201932

I N F O

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How to cite this article:
Regu M, Koul P. Effect of Comprehensive Nursing Care Strategies in Patient's with Stroke on Physiological Parameters. *Int J Nurs Midwif Res* 2019; 6(4): 44-51.

Date of Submission: 2019-11-30
Date of Acceptance: 2019-12-26

A B S T R A C T

A Study was conducted to assess the effectiveness of comprehensive Nursing care Strategies for stroke patients, at Sher-I-Kashmir Institute of Medical Science, Kashmir, J&K State of India, during 2010 to 2014, on 220 stroke patients (110 in experimental and 110 in control group) fulfilling the inclusion criteria by using simple random sampling technique. The first post test was conducted on 7th day after implementation of Comprehensive Nursing Care Strategies to Stroke Patients (CNCSSP) for five days; second post test was conducted in neurology outpatient department on the 10th day after discharge on first follow up visit. Results of the study revealed that majority comprised, males, Muslims, non-vegetarians and 65-74 years of age. Majority of the subjects both in experimental and control group had severe symptoms during acute stage at the time of admission in neurology ward as measured by National Institute of Health Stroke Scale (NIHSS). Mean±S.D of Activity level measured by Barthel Index was 26.65±9.43 in both experimental and control group before intervention. There was significant difference in National Institute of Health Stroke Scale score (P-value <0.05) in experimental group after implementation of comprehensive Nursing Care Strategies to stroke patients. There was significant difference in systolic and diastolic blood pressure, in cholesterol, triglycerol levels and activity level as measured by Barthel Index, in experimental group. To conclude, the findings of the study revealed significant difference in stroke severity, physiological parameters, biochemical parameters, activity level and prevention of complications in experimental group as, compared to control group which shows the effectiveness of comprehensive Nursing Care Strategies for stroke patients.

Keywords: Physiological Parameters, Significant Difference, Stroke Patients, Stroke Severity, Trigylcerol

Introduction

Stroke is a major health problem in the world ranking among the top three causes of death, after heart disease and cancer in developed world. More than two thirds of the global burden of stroke is borne by developing countries, where the average age of the patients with stroke is 15 years

younger than in developing countries. It has been estimated that about 1,800 people die of stroke every day in India and stroke represented 1.2% of the total deaths in the country, when all age groups were included. Stroke is more common after the age of 50 years but is not uncommon below it. It affects the males 1.5 times more often than females. In average population, the annual incidence of new strokes is 2 per 1000 population. Stroke is one of the most common neurological disorders in clinical practice. It is the leading cause of adult disability. According to WHO, it is the second commonest cause of death worldwide. It is projected that deaths due to stroke will rise to 6.5 million by 2015 and by 2020; stroke varies in different regions of India and ranges from 40 to 270 per 100,000 population. Stroke is classified by the type of Pathology (Infraction or hemorrhage) although overlap does occur with the hemorrhage and infraction. Intracranial hemorrhage is subdivided into either Intracerebral or subarachnoid depending upon site of bleed. Ischemic infraction is classified by the mechanism of ischemia into hemodynamic or thromboembolic. It is also classified on the basis of Pathology of Vascular lesion into, atherosclerotic, lacunar, cardioembolic.[1]

Stroke has been found to be major cause of mortality and morbidity throughout the world. Stroke is a lay term for a vascular accident causing disability. WHO (World Health Organization) has defined stroke as "acute neurological dysfunction of vascular origin with sudden (within seconds) or at least rapid (within hours) occurrence of symptoms and signs, corresponding to the involvement of focal areas in the brain lasting more than 24 hours or leading to death with no apparent cause other than vascular origin". In average population, the annual incidence of new strokes is 2 per 1,000 population though the overall prevalence of stroke is 794 per 1, 00,000 population. Stroke is a worldwide health problem. It makes an important contribution to morbidity, mortality and disability. More than two-thirds of the global burden of stroke is borne by developing countries, where the average age of patients with stroke is 15 years younger than in developed countries.[2]

A community based cross sectional study showed that heart disease, hypertension, and smoking are significantly associated with stroke. The risk factors of stroke are family history of stroke, transient ischemic attack, heavy alcohol consumption, high fat/high sodium diet consumption and obesity. The population in India is now surviving beyond the peak years (age 55-65 years) for the risk of stroke.[3]

Kasner Scott E et al.[4] selected 39 patient records for which National Institute of Health Stroke Scale scores were formally measured. Handwritten notes from medical records were abstracted and National Institute of Health Stroke Scale item scores were estimated by 5 raters blinded scores to actual scores. Estimated scores were compared among raters and with actual measured scores. Inter-rater reliability for total National Institute of Health Stroke Scale NIHSS scores on admission and discharge was excellent, with Intraclass Correlation Coefficients (ICCs) of 0.85 and 0.79, respectively. However, ICCs for 2 items (Facial Palsy and Dysarthria) were poor (<0.40). Inter-rater reliability for total was slightly greater, with ICCs of 0.87 and 0.89 on admission and discharge, respectively. None of the 11 National Institute of Health Stroke Scale items had poor reliability, 4 were moderate (ICC - 0.40 to 0.75) and 7 were excellent (ICC>0.75). Sixty-two percent of estimated total National Institute of Health Stroke Scale NIHSS scores were within 2 points of actual scores and 91% were within 5 points, whereas 70% of estimated total scores were within 2 points and 95% were within 5 points. The National Institute of Health Stroke Scale can be estimated from medical records with a high degree of reliability and validity. In retrospective assessment of stroke severity, the National Institute of Health Stroke Scale NIHSS performs better than the standard National Institute of Health Stroke Scale NIHSS and may be easier to use because it has fewer and simpler items.

Haan RD et al.[5] studied 87 stroke patients. Impairments were scored on five stroke scales: the Orgogozo Scale, the National Institute of Health Scale, the Canadian Neurological Scale, the Mathew scale and the Scandinavian Scale. Disability was assessed with the Barthel Index, handicap with the Rankin Scale and the quality of life with the sickness impact profile. The linear relationship between stroke scales and functional scales was assessed with correlation coefficients. We used regression analyses to explain functional health. The stroke scales were highly related to one another (range, r=-0.85 to 0.92). The correlation between stroke scales and functional scales was <0.70 and decreased from Barthel Index (mean r^2=47.5%) to Rankin (mean r^2=36.5%) to Sickness Impact Profile (mean r^2=33%). Stroke scales were rather poorly correlated with patients' psychological conditions mean r^2=11.5%). Functional health status was mainly related to leg power and orientation. The standardized stroke scale weights of the explanatory items were lower than their standardized regression weights.

Objectives of the Study

The objectives of the study were:

- To identify pre-interventional health problems in patients with stroke in both experimental and control group.
- To determine effectiveness of Comprehensive Nursing Care Strategies for Stroke Patients (CNCSSP).
- To compare outcome, in terms of physiological parameters in patients with stroke subjected to CNCSSP (experimental group) with that of control group.

ISSN: 2455-9318
DOI: https://doi.org/10.24321/2455.9318.201932

Hypothesis

There is significant difference in outcome, in terms of physiological parameters in patients with stroke, after implementation of CNCSSP, in experimental group, at 0.05 level of significance.

Materials and Methods

In this study quasi, experimental, pre-test, post-test, control group design was adopted and quantitative research approach was followed. In both experimental and control group pretest was conducted on first day after admission to neurology ward. Intervention, Comprehensive Nursing Care Strategies for Stroke Patients (CNCSSP) was given to experimental group and Routine Nursing Care (RNC) to control group, for five days each, (2^{nd}, 3^{rd}, 4^{th}, 5^{th}, 6^{th} day) in neurology ward. Post-test 1, was conducted after five days of intervention i.e. CNCSSP to experimental and RNC to control group. Post-test 2, was conducted 10 days after discharge, during first follow up visit in OPD neurology, SKIMS, to both experimental and control group. To avoid contamination, data collection in control group was conducted before the data collection in experimental group.

Independent variable is Comprehensive Nursing Care Strategy for Stroke Patients (CNCSSP), which included: dietary advice, back massage, deep breathing exercises, physical exercises and dependent variable included change in physiological parameters (Blood Pressure, Hemoglobin, Albumin) and biochemical parameters (Cholesterol, triglyceride, HDL, LDL, Calcium), in this part of the study. Demographic variables under study were age, gender, marital status, religion, education, residence, occupation, family income, type of family dietary habits, measured by interview schedule.

Neurology ward and OPD of SKIMS, Srinagar was selected as setting for the study. Target population was all hemorrhagic stroke patients attending OPD, Emergency department of Sher-1 - Kashmir Institute of Medical Sciences (SKIMS). Accessible population was all hemorrhagic stroke patients who attended neurology OPD and ED of SKIMS, during the study period. Sample size was 220 subjects, fulfilling the sampling criteria, 110 in experimental and 110 in control group. Simple random sampling was used to select the sample using lottery method. Power analysis was conducted to estimate sample size, which was 200, 100 in each group. However, the investigator studied 10% more i.e. 110 in each group to compensate the drop out and sample attrition. 9 subjects in control group and 7 subjects in experimental group have not reported for post-test 2 assessments. Hence, the investigator instead of 101 and 103 in experimental and control group respectively analyzed the findings on 100 subjects in each group as per the estimated sample size.

Simple random sampling technique was used to select the subjects, fulfilling the sampling criteria. Out of 3-4 patients with stroke fulfilling the sampling criteria, one subject was randomly selected by lottery system (unit system). The process continued till the selected sample size was completed, i.e. 110 in control and 110 in experimental group. Simple random sampling technique was used to select the subjects fulfilling sampling criteria. The stroke patients admitted in the neurology ward were selected for the study.

Data Collection Period

Study was conducted by the scholar during the Ph.D programme January 2010 to November 2014 and Data collection was done from March 2012 to August 2013, at neurology ward and O.P.D S.K.M.S, Srinagar Kashmir.

Inclusion Criteria

- The subjects who were willing to participate after informed consent
- Diagnosed as brain hemorrhage ICD - 10: 10:161
- Adults above 45 years
- Bothe gender
- With history of hypertension
- Glasgow coma scale score above 8 assessed on admission
- Admitted in neurology ward of SKIMS

Exclusion Criteria

- Not willing to participate in the study
- Unconscious patient
- Patient eith mental retardation
- Medicolegal cases
- Patient with severe aphasia
- Glasgow coma score less than 8 assessed on admission

Result

The results of the present study are presented under the following sections:

Section I

Presents the data related to Socio-demographic characteristics of subjects. These include age, gender, marital status, religion, educational status, residence, occupation, type of family, number of family members, family income, dietary habits (Table 1).

Findings in Table 1, revealed that characteristics of patients in both groups are same with respect to age of the patients, here the P-value (0.0865) depicts that the difference in age of patients in two groups i.e. experimental group and control group is not statistically significant. Likewise the two groups of interest i.e. experimental group and control group have not statistically significant difference in terms of other demographic variables like sex, marital status, religion, educational status, residence, occupation, type of

ISSN: 2455-9318
DOI: https://doi.org/10.24321/2455.9318.201932

family, number of family members and family income which indicates that two groups are perfectly matched, and which carries out suitable for the entire study.

The P-values calculated by the statistical analysis depicts no significant difference at 0.05 level between experimental and control group in terms of demographic variables. Hence, the subjects in experimental and control group are identical in terms of sample characteristics.

Table 1.Socio-demographic characteristics in experimental and control group

(N=200)

Variable	Experimental group (N=100)	Control group (N=100)	p-value	Remarks
Age in years				
45-54	16 (16%)	10 (10%)	0.865	*NS
55-64	23 (23%)	28 (28%)		
65-74	35 (35%)	40 (40%)		
75-84	25 (25%)	19 (19%)		
>85	02 (025)	03 (03%)		
Gender				
Male	57 (57%)	58 (58%)	0.886	*NS
Female	43 (43%)	42 (42%)		
Marital status				
Married	95 (95%)	96 (96%)	0.929	*NS
Unmarried	4 (4%)	3 (3%)		
Widow/ Widower	1 (1%)	1 (1%)		
Religion				
Muslim	98 (98%)	98 (98%)	1.00	*NS
Hindu	1 (1%)	1 (1%)		
Sikh	1(1%)	1(1%)		
Educational status				
Illiterate	75 (75%)	72 (72%)	0.527	*NS
Primary-higher secondary	9 (9%)	14 (14%)		
Degree and above	16 (16%)	14 (14%)		
Residence				
Urban	24 (24%)	22 (22%)	0.867	*NS
Rural	76 (76%)	78 (78%)		
Occupation				
Farmer/ Laborer	40 (40%)	41 (41%)	0.988	*NS
Govt. employee	40 (40%)	39 (39%)		
Skilled worker	20 (20%)	20 (20%)		
Type of family				
Nuclear	32 (32%)	34 (34%)	0.881	*NS
Joint	68 (68%)	66 (66%)		
Number of family members				
3-5	23 (23%)	31 (31%)	0.1	*NS
6-8	47 (47%)	49 (49%)		
≥9	30 (30%)	20 (20%)		

ISSN: 2455-9318
DOI: https://doi.org/10.24321/2455.9318.201932

Family income				
<10000	43 (43%)	50 (50%)	0.559	*NS
10000-30000	42 (42%)	35 (35%)		
30000-50000	15 (15%)	15 (15%)		
Dietary habits				
Both vegetarian and non-vegetarian	96 (96%)	97 (97%)	1.000	*NS
Vegetarian	4 (4%)	3 (3%)		

*Ns: not significant, *S: significant

Table 2.Physiological parameters in experimental and control group

(N=200)

Variable		Experimental group mean±SD	Control group mean±SD	Mean difference	95% confidence interval of the difference		p-value	Remarks
					Upper	Lower		
Systolic BP	Pre-test	171.83±22.2	170.24±22.51	1.59	-4.646	7.828	0.616	*NS
	Post-test 1	124.20±4.96	152.10±13.43	27.9	-30.723	-25.077	<0.001	*S
	Post-test 2	124.20±4.96	142.20±9.16	18	-20.055	-15.945	<0.001	*S
Diastolic BP	Pre-test	107.20±12.3	106.10±11.44	1.1	-2.214	4.414	0.513	*NS
	Post-test 1	83±4.60	97.59±10.79	14.59	-16.897	-12.283	<0.001	*S
	Post-test 2	82±8.799	92.94±10.11	10.66	-13.303	-8.017	<0.001	*S
Albumin	Pre-test	5.20±10.72	5.20±10.72	0	-2.990	2.990	1.00	*NS
	Post-test 1	4.98±7.79	4.49±7.74	0.490	-1.677	2.657	0.006	*S
	Post-test 2	4.49±7.74	4.06±1.03	0.430	-1.110	1.970	0.008	*S
Hemoglobin	Pre-test	12.52±2.04	12.52±2.04	0	-0.571	0.571	1.00	*NS
	Post-test 1	14.31±1.79	12.97±1.29	1.34	-0.803	3.483	0.072	*NS
	Post-test 2	14.37±10.77	14.29±10.79	0.80	-2.927	3.087	0.825	*NS

*NS: not significant, *S: significant, level of significance 0.05.

Section 2

This section is related to findings of objective three, to compare the outcome in terms of physiological parameters in patients with stroke subjected to CNCSSP (experimental group) with that of control group. The physiological parameters viz systolic and diastolic blood pressure, albumin level and hemoglobin level were assessed and analyzed during pre-test. Post-test1 and post-test 2 and presented in Table 2.

Table 2, shows findings of pre-test, post-test 1, post-test 2 of selected physiological parameters under study (blood pressure, albumin and hemoglobin). Systolic BP during pre-test assessment was 171.83±22.2 in experimental and 170.24±22.51 in control group, with mean difference of 1.59 (P-value=0.616), which revealed no significant difference between experimental and control group. Findings of post-test 1, after implementation of CNCSSP for five days showed that mean±S.D in experimental group was 124.20±4.96 and 152.10±13.43 in control group, with mean difference of 27.9 (P-value=<0.001), which depicts significant difference in systolic BP of experimental group after implementation of CNCSSP. Findings of post-test 2, ten days after discharge revealed mean±S.D of systolic BP in experimental group was 124.20±4.96 and control group 142.20±9.16, mean difference 18 (P-value=<0.001). There is significant difference in systolic BP of experimental and control group, which revealed better outcome in terms of systolic BP in experimental group after implementation of CNCSSP. In experimental group diastolic BP during pre-test mean±S.D was 107.20±12.3 and in control group 106.10±11.44, with mean difference of 1.1 (P-value=0.513) which showed no significant difference in experimental and control group before intervention. Findings of diastolic BP during post-test 1, in experimental group mean±S.D was 83±4.60 and control group 97.59±10.79, with mean difference of 14.59 (P- value=<0.001) which indicates significant difference between experimental and control group. Findings of post-test 2 revealed that in experimental group mean±S.D of diastolic BP was 82±8.799 and in control group 92.94±10.11,

ISSN: 2455-9318
DOI: https://doi.org/10.24321/2455.9318.201932

with mean difference of 10.66 (P-value=<0.001), which indicates significant difference in experimental and control group.

The findings related to albumin level during pre-test revealed that mean±S.D in experimental and control group was 5.20±10.72, with 0.000 mean differences (P-value=1.00). There was no significant difference between experimental and control group before intervention. Findings of post-test 1, after implementation of CNCSSP for five days, revealed that mean±S.D in experimental group was 4.98±7.79 and in control group 4.49±7.74, with mean difference of 0.490 (P-value=0.006). Findings of post-test 2, 10 days after discharge in Neurology OPD, revealed that mean±S.D was 4.49±7.74 in experimental group and 4.06±1.03 in control group, with mean difference of 0.430 (P-value=0.008) which reveals no significant difference in albumin level at <0.05 level.

The findings related to hemoglobin level during pre-test, on admission to Neurology ward, depicted that mean±S.D was 12.52±2.04 in both experimental and control group, with 0 mean difference (P-value=1.00). There was no significant difference in hemoglobin level of two groups during pre-test before intervention. Findings of post-test 1 after implementation of CNCSSP for five days to experimental group was 14.31±10.79 and in control group 12.97±1.29, with mean difference of 1.34 (P-value=0.072). Findings of post-test 2, 10 days after discharge in first follow up visit in Neurology OPD, revealed that mean±S.D in experimental group was 14.37±10.77 and in control group 14.29±10.79, with mean difference of 0.80 (P-value >0.825) showed no significant difference between experimental and control group, as both groups were taking prescribed medical treatment and routine nursing care.

Table 3 depicts Mean ± S.D, mean difference, 95% CI difference and P-value of biochemical parameters under study like cholesterol, triglycerides, HDL, LDL, Calcium.

The pre-test findings of cholesterol revealed Mean±S.D in experimental group was 224.06±28.91 and in control group 220.08±33.02, mean difference 3.98 (P-value=0.366), which shows no significant difference in cholesterol level before intervention. In post-test 1, the mean±S.D of cholesterol level in experimental group was 207.03±23.61 and in control group 269.53±31.56, mean difference 62.49 (P-value<0.001) which shows significant difference in cholesterol level of experimental and control group after intervention. In post-test 2, the mean±S.D of cholesterol in experimental group was 202.94±23.16 and in control group 222.15±26.08, mean difference of 19.21 (P-value<0.001), which shows significant difference in cholesterol level in two groups 10 days after discharge.

Table 3.Biochemical parameters in experimental and control group

(N=200)

Variable		Experimental group mean±SD	Control group mean±SD	Mean difference	95% confidence interval of the difference		p-value	Remarks
					Upper	Lower		
Cholesterol	Pre-test	224.06±28.91	220.08±33.02	3.98	-4.677	12.637	0.366	*NS
	Post-test 1	207.03±23.61	269.53±31.56	62.49	-70.264	-54.716	<0.001	*S
	Post-test 2	202.94±23.16	222.15±26.08	19.21	-26.089	-12.331	<0.001	*S
Triglycerides	Pre-test	163.07±23.10	159.94±25.35	3.13	-3.636	9.896	.363	*NS
	Post-test 1	121.76±27.77	171.99±14.78	50.23	-56.435	-44.025	<0.001	*S
	Post-test 2	121.79±27.77	161.11±23.14	-39.35	-46.479	-32.21	<0.001	*S
HDL	Pre-test	70.05±7.0	68.52±8.80	1.53	-.691	3.751	0.176	*NS
	Post-test 1	60.20±7.87	70.46±4.54	10.26	-12.053	8.467	<0.001	*S
	Post-test 2	60.20±7.87	68.25±6.64	-8.05	-10.081	-6.019	<0.001	*S
LDL	Pre-test	131.93±27.59	126.77±27.57	5.16	-2.533	12.853	.187	*NS
	Post-test 1	114.76±25.68	130.87±27.02	16.11	-23.461	-8.759	<0.001	*S
	Post-test 2	114.76±25.68	129.90±26.59	-15.14	-22.430	-7.850	<0.001	*S
Calcium	Pre-test	7.63±1.07	7.63±1.07	.000	-0.298	298	1.00	*NS
	Post-test 1	7.74±1.04	8.74±1.44	1.00	-1.351	-.649	<0.001	*S
	Post-test 2	8.74±1.44	7.88±1.5	0.860	0.440	1.280	<0.001	*S

*NS: not significant, *S: significant.

ISSN: 2455-9318
DOI: https://doi.org/10.24321/2455.9318.201932

The pre-test findings of triglycerides level revealed that mean±S.D of experimental group 163.07±23.10 and control group 159.94±25.35, mean difference 3.13 (P-value=0.363), which showed no significant difference in experimental and control group before intervention. In post-test 1, the triglycerides mean±S.D in experimental group was 121.76±27.77 and in control group 171.99±14.78, mean difference 50.23 (P-value=<0.001), which showed significant difference in experimental and control group after five days of intervention of CNCSSP. In post-test 2, triglycerides level mean±S.D in experimental group was 121.79±27.77 and in control group 161.11±23.14, mean difference -39.35 (P-value<0.001), which reveals significant difference in experimental and control group after discharge.

The pre-test findings of HDL mean±S.D in experimental group was 70.05±7.0 and in control group 68.52±8.80, mean difference 1.53 (P-value=0.176) which shows no significant difference in experimental and control group before intervention. In post-test 1, the HDL mean±S.D in experimental group was 60.20±7.87 and in control group 70.46±4.54, with mean difference 10.26 (P-value=<0.001) which shows significant difference in HDL after implementation of CNCSSP for five days in experimental group. In post-test 2, the HDL mean±S.D in experimental group was 60.20±7.87 and in control group 68.25±6.64, mean difference -8.05 (P-value=<0.001), which shows significant difference between the two groups, 10 days after discharge.

The pre-test findings of LDL mean±S.D in experimental group was 131.93±27.59 and in control group 26.77±27.57, mean difference 5.16 (P-value=0.187), which shows no significantdifference in LDL level in experimental and control group before intervention of CNCSSP. In post-test 1, the LDL mean±S.D in experimental group 114.76±25.68 and in control group 13.87±27.02, mean difference of 16.11 (P-value=<0.001), which shows significant difference in experimental and control group after implementation of CNCSSP to experimental group for five days. In post-test 2, the LDL mean±S.D in experimental group was 114.76±25.68 and in control group 129.90±26.59, mean difference -15.14 (P-value=<0.001), which shows significant difference in experimental and control group 10 days after discharge.

The pre-test findings of calcium mean±S.D in experimental group was 7.63±1.07 and in control group 7.63±1.07, mean difference 0.000 (P-value=1.00), which shows no significant difference in experimental and control group before intervention of CNCSSP. In post-test 1, the calcium mean±S.D in experimental group 7.74±1.04 and in control group 8.74±1.44, mean difference of 1.00 (P-value=<0.001), which shows significant difference in experimental and control group after implementation of CNCSSP. In post-test 2, the calcium mean±S.D in experimental group was 8.74±44 and in control group 7.88±1.5, mean difference 0.860 (P-value=<0.001), which shows significant difference in experimental and control group. Hence, it is concluded that there is difference in physiological parameters of stroke patients after implementation of comprehensive nursing care strategies at 0.056 level of significance in experimental group. Therefore, the research hypothesis is accepted.

Discussion

The findings of the present study revealed a significant difference in the outcome in terms of physiological parameters in stroke patients subjected to CNCSSP. The study findings are similar to the study conducted by Harris M, Richards KC[6] reviewed Cochrane data bases, Pub Med, EBSCO, CINAHL, Health Resource, Pych INFO and EMB Reviews 1991-June 2009 by Research Appraisal Checklist. Results revealed that all studies using dietary management, exercises, slow- stroke back massage and hand massage showed statistically significant improvements in physiological indicators of relaxation.

Studies of Castillo-Guerra L et al.[7] revealed good outcome in the stroke subjects with spontaneous B.P falls with treatment strategies support the findings of the present study.

Similar results were shown by the studies conducted by Geeganage CM, Bath PM,[8] Elis G et al.,[9] Feroz A[10] and Rashid P et al.[11] who while studying also found 123 patients with acute stroke and found significant difference in physiological parameters of patients in both experimental and control group.

Conclusion

On the basis of findings of the study, the results revealed that the majority of the stroke patients comprised males, Muslims, non-vegetarian, illiterates, living in rural areas and in low socio- economic status. Majority of the subjects both in experimental and controlled group belong to 65- 74 years age group. Majority of the subjects in both experimental and control group had severe symptoms during acute stage at the time of admission in neurology ward. Majority had high blood pressure, hyperlipidemia during pretest assessment. There was significant difference in systolic and diastolic blood pressure, cholesterol and tri glycerol levels of experimental group p value<0.001, after implementation of CNCSSP, in experimental group. A similar study can be replicated on a large population. A study can be conducted to evaluate the effectiveness of existing nursing care standards for stroke patients. A study can be conducted to develop comprehensive Nursing Care Strategies for stroke patients based on nursing process approach.

Conflict of Interest: None

ISSN: 2455-9318
DOI: https://doi.org/10.24321/2455.9318.201932

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ISSN: 2455-9318
DOI: https://doi.org/10.24321/2455.9318.201932