Effect of Comprehensive Nursing Care Strategies, on the Outcome of Stroke Patients

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Abstract

A quantitative study with quasi-experimental pre-test – post-test, control group design, was conducted on 200 stroke patients, 100 in experimental and 100 in control group, to assess the effectiveness of comprehensive Nursing Care Strategies for stroke patients on the outcome in patients with stroke in a selected hospital of Kashmir during June 2012 to June 2013. Baseline assessment was determined by pre-test on first day of admission in neurology ward of Sher-i-Kashmir Institute of Medical Sciences (SKIMS). The first post-test was conducted on 7th day after implementation of comprehensive Nursing Care Strategies to stroke patients for five days. Second post-test was conducted on 10th day after discharge, in neurology OPD during first follow-up visit. Findings revealed significant difference in stroke severity, activity level, physiological parameters, biochemical parameters and prevention of complications in experimental group which shows the effectiveness of the intervention.

Stroke is a major health problem in the world ranking among the top three causes of death, after heart disease and cancer. It has been estimated that about 1,800 people die of stroke every day in India and it accounts for 1.2 percent of the total deaths in the country when all age groups were included. It is projected that deaths due to stroke will rise to 6.5 million by 2020. Stroke and coronary artery disease together are expected to be the leading cause of lost health life years. Surveys in different parts of India have shown that the prevalence of stroke varies in different regions, from 40 to 270 per 1,00,000 population. Stroke is classified by the type of pathology (infarction or haemorrhage) although overlap does occur with the haemorrhage and infarction. Intracranial haemorrhage is subdivided into either intracerebral or subarachnoid depending upon the site of bleed. Ischaemic infarction is classified by the mechanism of ischaemia into haemodynamic or thromboembolic. It is also classified on the basis of pathology of vascular lesion into atherosclerotic, lacunar, and cardio embolic.

Research has documented that stroke leads to extensive changes, symptoms vary from mild functional deficits to loss of consciousness and death. The classical symptoms are hemi paresis, incontinence, visual field defect, aphasia, dysphasia, and cognitive problems like neglect, memory loss, and changed bodily and spatial perception are among the serious consequences of stroke.

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Objectives

This study aimed to:

1. Identify pre-interventional health problems in patients with stroke in both experimental and control group.
2. Determine the effectiveness of comprehensive nursing care strategies for stroke patients (CNCSSP).
3. Compare the outcome in terms of (a) physiological parameters (b) activity level (c) complications in patients with stroke subjected to CNCSSP (experimental group) with that of control group.
4. Analyse the relationship between physiological parameters and activity level.
5. Associate the socio-demographic characteristics with physiological parameters, activity level and complications (outcome).

Hypotheses

H1: There is significant difference in outcome of stroke patients after implementation of Nursing Care Strategies for Stroke Patients at 0.05 level of significance.

H2: There is significant difference in physiological parameters of stroke patients after implementation of comprehensive nursing care strategies at

0.05 level of significance.

H3: There is significant difference in activity level of stroke patients after implementation of comprehensive nursing care strategies at 0.05 level of significance.

H4: There is significant difference in complications of stroke patients after implementation of comprehensive nursing care strategies at 0.05 level of significance.

H5: There is significant relationship between physiological parameters and activity at 0.05 of significant level.

H6: There is significant association between sociodemographic characteristics and outcome of stroke patients at 0.05 level of significance.

Based on Langhorne and Pollock's review of stroke unit trials (2002), six steps that need to be taken for managing stroke patients are:

- Comprehensive assessment of medical problems, impairments and disabilities,
- Active physiological management,
- Early mobilisation and the avoidance of bed-rest,
- Early setting of rehabilitation plans involving carers,
- Early assessment and planning of discharge needs,
- Skilled nursing care.

Non-drug methods can reduce BP 10 to 15 mmHg:

- Regular exercise
- Salt intake of not more than 4 gm per day
- Consuming fresh fruits and leafy vegetables
- Avoidance of alcohol or drinking in moderation
- Losing weight.

Review of Literature

Sharma (2005) conducted a study on 30 cases and 20 controls selected randomly. In the study group, 56.66 percent of patients were haemorrhagic stroke and 43.33 percent were with ischaemic stroke. Majority of patients presented with sudden onset of weakness (93.3%) followed by sudden loss of consciousness (50%), dysarthria (33.3%), vomiting (26.7%), headache/giddiness (16.7%) each and incontinence (10%). History of smoking and hypertension was present in 53.33 percent; 40 percent had dyslipidaemia, 13.33 percent were diabetic. The study demonstrated significant relationship of dyslipidaemia in stroke patients. The researcher observed significant relationship between anticihlaymida pneumonia IgGsero-positive and ischaemic stroke as compared to haemorrhagic stroke.

Kwan et al (2004) studied effects of introducing an integrated care pathway in an acute stroke unit. The introduction of integrated care pathway (ICP) was associated with fewer urinary tract infections. This might be related to fewer catheterisations in the intervention group (adjusted OR 0.58, not statistically significant), but other factors such as better nursing care or earlier removal of catheters. The baseline characteristics of the two groups (control and experimental) were similar, although there were more total anterior circulation strokes (29% vs 18%, p=0.005) and fewer partial anterior circulation strokes (30% versus 42%, p=0.04) in the intervention group. In the intervention group, urinary tract infections were significantly less frequent (OR 0.37, Cl 0.15-0.91) and the quality of several aspects of care. However, there were no significant differences in deaths, discharge destination, or length of stay between the two groups. This study has provided further evidence that introducing an integrated care pathway for stroke may improve the quality of documentation and process of care and reduce the risk of certain post-stroke complications.

Zubin et al (2008) studied 88 stroke patients (53, 60% men with average age 76 years). A history of hypertension before ICH was documented in 50 (57%) patients. Analysis using the Spearman co-relation indicated that there was no statistically significant correlation (p> 0.05) between expansions of ICH or perihaematomal oedema and initial GCS. Multivariate linear regression analysis adjusting for the listed covariates indicated that initial systolic BP was the only significant predictor for ICH expansion (p=0.04) but did not have any association with expansion of oedema. At multivariate analysis, only Glasgow Coma Score and ICH volume remained significantly associated with functional outcome measured at hospital discharge and at the last follow-up visit.

Joubert et al (2009) studied 186 stroke patients randomised to either the treatment (integrated care) or control (usual care) who were followed up over 12 months. Systolic BP decreased in the treatment group but increased in controls. The group difference was significant and remained so when age, sex, disability and systolic BP at discharge were accounted for (p=0.007) and number of walks taken (p<0.001) than controls. Rankin scores indicated significantly reduced disability in treatment group to control in the year post-stroke (p=0.003). Through an integrated system of education, advice and support to both patient and

general practitioner, this was effective in modifying a variety of vascular risk factors and therefore should decrease the likelihood or recurrent stroke or vascular event.

Methodology

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. Pre-test 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) for stroke patients was given to control group for five days each (day 2, 3, 4, 5, 6 day in neurology ward). Post-test 1 was conducted after five days of intervention (CNCSSP) in experimental group and RNC in control group. Post-test 2, was conducted 10 days after discharge, during first follow-up visit in neurology OPD of SKIMS, to both experimental and control group. To avoid contamination, data collection in control group was conducted before the data collection in experimental group.

Variables under study

Independent variable was comprehensive Nursing Care Strategies for stroke patients (CNCSSP), which included: (1) Dietary advice, (2) Back massage, (3) Deep breathing exercise, (4) Physical exercises including range of motion exercise both active and passive, progressive muscle relaxation techniques, quadriceps setting and gluteal setting exercises.

Dependent variable included (1) Stroke severity measured by NIHSS, (2) Health problems viz headache, weakness, pneumonia, cough/gag reflex, swallowing reflex, joint contractures, foot drop, wrist drop, bladder and bowel incontinence.

Activity of Daily Living was measured by Barthel Index, physiological parameters (blood pressure, haemoglobin, and albumin) and biochemical parameters (cholesterol, triglycerides, HDL, LDL, and calcium).

Demographic variables under study were age, gender, marital status, religion, education, residence, occupation, family income, type of family, dietary habits.

Sample and Sampling

Sample consisted of 100 subjects in control group and 100 in experimental group. Simple random sampling was used to select the sample using lottery method. Power analysis was conducted to estimate sample size. To achieve a power of 0.08, the required sample size was 100 for experimental group and 100 for control group. However, the investigator studied 10 percent more i.e. 110 in each group to exclude the drop outs and sample attrition; 9 subjects in control group and 7 subjects in experimental group did not report for post-test 2 assessments. Hence, the investigator instead of 101 in control group and 103 in experimental group analysed the findings on 100 subjects in each group as per the estimated sample size.

Table 1: Description of tools

Tools	Technique	Items
Socio-demographic characteristics	Interview schedule	12
National Institute of Health Stroke scale	Observation checklist	16
Assessment of health problems	Interview and observation	15
Physiological parameters	Observation	12
Biochemical parameters	Record analysis	09
Barthel index	Observation	10

Table 2: Outline description of intervention

Area	Schedule / Time
Dietary advise	Morning (5 minutes)
Back massage	Morning (3-5 minutes)
Deep breathing exercise	Morning / Evening (3 minutes)
Exercises: • ROM (Range of motion) • PMRE (Progressive muscle relaxation technique) • Quadriceps setting • Gluteal setting	 Morning/Evening (7 minutes) Morning/Evening (3-5 minutes) Morning/Evening (2-3 minutes) Morning/Evening (2-3 minutes)
Intervention and assessment by data collection.	50-60 minutes total for intervention and assessment by data collection.

Inclusion Criteria: (a) Subjects who were willing to participate in the study after informed consent. (b) Diagnosed as brain haemorrhage ICD-10:10:161. (c) Adults above 45 years. (d) Both genders. (e) With history of hypertension. (f) GCS (Glasgow coma scale) score above 8 (assessed on admission). (g) Admitted in Neurology Ward of SKIMS.

Exclusion Criteria: (a) Not willing to participate in the study. (b) Unconscious patients. (c) Patients with mental retardation. (d) Medico legal cases. (e) Patients with severe aphasia. (f) GCS (Glasgow Coma Scale) score less than 8 (assessed on admission).

Tools developed and used for data collection are given in Table 1.

Results

Comprehensive Nursing Care Strategies for Stroke Patients was developed and implemented, as given in Table 2.

Data related to socio-demographic charac-

Table 3: Stroke severity measured by NIHSS in experimental and control group (N=100 in each group)

Variable	Experimental group Mean±SD	Control group Mean±SD	Mean difference	95% Confidence interval of the difference		p-value	Remarks
				Lower	Upper		
NIHSS score pre-test	19.49±3.6	19.83±3.8	0.340	-1.379	0.699	0.520	*NS
Post-test 1	12.65±2.1	16.47±5.07	3.820	-4.904	-2.736	<0.001	*S
Post-test 2	11.09±1.20	14.76±5.26	3.67	-4.734	-2.606	<0.001	*S

*NS: Not significant, *S: Significant, Level of significance 0.05

Table 4: Physiological parameters in experimental and control group (N=100 in each group)

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
Haemoglobin	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

teristics in experimental and control group comprised of variables related to age in years, genders, marital status, religion, education status, residence, occupation, type of family, number of family members, family income and dietary habits revealed no significant difference in experimental and control group, which shows the homogeneity of subjects in experimental and control group before intervention.

Data related to identify pre-interventional health problems in patients with stroke both in experimental and control group, measured by National Institute of Health Stroke Scale and check list for Health Problem revealed no significant difference in pre-interventional stroke severity and health problems in experimental and control group, and showed homogeneity of the sample in pre-test of two groups (Table 3). Findings related to determining the effectiveness of CNCSSP, by change in stroke severity and change in health problems observed during pre-test, post-test 1 and post-test 2 are depicted in Tables 3 and 4.

Table 5 shows significant difference in biochemical parameters in experimental group after implementation of CNCSSP. To compare the outcome in terms of activity level in patients with stroke subjected to CNCSSP, the subjects were observed for activity level by Barthel index during pre-test, post-test 1 and post-test 2 (Table 6).

Significant difference in activity level was measured by Barthel index, after implementation of CNCSSP, in experimental group.

Table 7 reveals the relationship between physiological parameters and activity level calculated by ANOVA, regression co-efficient, co-relation co-efficient, p-value reveals no significant relationship of activity level measured by Barthel index with physiological parameters.

The findings revealed that there was no significant relationship between activity level and physiological parameters analysed by ANOVA (p=0.063).

Discussion

Association of socio-demographic characteristics with physiological parameters, activity level and complications (outcome)

The association was analysed by three ways ANOVA, which showed that age in years has significant association to mean in Barthel Index Score. Younger stroke patients responded better to intervention. The findings were analysed by post HOC analysis between residence and activity level. Mean of urban 30.769

Table 5: Biochemical parameters in experimental and control group (N=100 in each group)

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	0.187	*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,

and rural 27.230, standard error urban 1.487 and rural 0.956, 95% CI urban from 27.835 to 33.702 and 25.344 to 29.116 in rural (p<0.025), which revealed significant association of residence to activity level, significant at 0.05 level.

Findings showed more bowel incontinence in elderly (>65 years) is 103 (58.9%) p-value=0.042. The p-value is significant at 0.05 levels. More bowel incontinence among elderly than young stroke patients.

As for association of wrist drop with occupation, 53 (43.4%) farmers among stroke patients had wrist drop whereas only 29 (23.8%) of skilled workers had wrist drop; p-value was <0.04, which revealed association of wrist drop to occupation, significant at <0.05 level. There was association of wrist drop to occupation. Subjects who had hard job like farmers were more prone to wrist drop on affected side during the stroke.

Stroke is a life changing event that affects not only the person who may be disabled, but their family and caregivers. Utility analysis shows that a major stroke is viewed by more than half of those at risk being worse than death. In many high income countries, stroke management has changed substantially in the past two decades. Impressive developments through structured clinical pathways for thrombolysis and secondary prevention have been made. Provision of care in a stroke unit have been found to increase the number of patients who survive, return home and regain functional independence in their everyday activities. However, implementation of such organised care for stroke is limited and inadequate in low and middle income countries, especially in a country like India where resource for rehabilitation are scarce.

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 ischaemic 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.

The burden of intracerebral haemorrhage (ICH) in the community is growing because of (1) the more common use of anti-platelet therapy for the primary and secondary prevention of atherosclerosis (2) the increasing use of anticoagulation, particularly in the elderly population and (3) the more frequent use of thrombolysis for both myocardial infarction and ischaemic stroke. It has been estimated that between 1 to 2 percent of the population is now undergoing warfarin therapy.

Nursing Implications

Implication for nursing practice: Stroke has become a public health issue worldwide. Nurses play a pivotal role in prevention of morbidity, mortality and

Table 6: Activity level measured by Barthel Index in experimental and control group (N=100 in each group)

Variable	Experimental Group Mean±SD	Control Group Mean±SD	Mean Difference	95% Confidence Interval Of The Difference		P - Value	Remarks
Barthel Index				Upper	Lower		
Pre-Test	26.65 ±9.43	26.65 ±9.43	0	-2.630	2.630	1.00	*NS
Post-Test1	42.55 ±13.07	31.50 ±12.40	11.05	7.496	14.604	<0.001	*S
Post-Test 2	51.59 ±13.58	34.25 ±13.09	17.05	13.329	20.771	<0.001	*S

*NS: Not significant, *S: Significant,

Table 7: Relationship between physiological parameters and activity level (N=100 in each group)

Variable	Physiological parameter	Regression co-efficient	Co-relation co-efficient	p-value	p-Value ANOVA	Remarks
Activity level	Haemoglobin	-0.082	-0.018	0.799	0.063	*NS
	Albumin	-0.154	-0.175	0.054		
	Blood pressure	-0.057	-0.072	0.308		

*NS: Not significant, *S: Significant, Level of significance 0.05

disability in stroke patients by providing them need based individualised care at hospital. There is need of early identification of risk factors and adoption of appropriate nursing care measures for prevention of stroke. Nurse practitioners may be appointed in outpatient departments for awareness about modifiable risk factors and lifestyle change measures.

Implication for nursing education: Graduate Nursing curriculum should contain the content specific to stroke prevention, management and home care to make patients independent.

Implication for nursing administration: Nurse administrators can prepare the stroke nursing protocols for implementation among different types of stroke patients for management of physiological, biochemical, psycho-social parameters, activity level and prevention of complications in stroke patients.

Implication for nursing research: The study has great implication on the need of nursing research in stroke nursing for different types of stroke in order to discover appropriate methods and media for effective teaching and counselling and to develop positive attitude towards stroke patients and their management.

Implication for nursing theory: New theory can be derived to support the findings of the study with concept of practice-based information.

Conclusion

There was significant difference in stroke severity, physiological parameters, biochemical parameters, activity level and prevention of complications in experimental group and control group, after implementation of comprehensive Nursing Care Strategy for Stroke Patients, as assessed by pre-test, post-test 1 and post-test 2.

References

1. Sharma Ajay. Serological Evidence of Chlamydia Pneumonia Infection in Acute Stroke in Kashmir. SKIMS, MD Thesis 2005
2. Kwan Joseph, Peter Hand, Martin Dennis, Peter Sander Cock. Effects of introducing an integrated care pathway in an acute stroke unit. *Age and Aging* 2004; 33: 362-67
3. Zubin Alexander Y, Jayawant N Mandrekar, Edward M Manno, et al. Predictors of outcome in warfarin-related intracerebral haemorrhage. *Arch Neurol*; 65(10): 1320-25
4. Jouber J, Reid C, Barton D, Cumming T, et al. Integrated care improves risk factor modification after stroke: Initial results of the Integrated care for the Reduction of Secondary Stroke. *Journal Neurol Neurosurgery Psychiatry* 2009; 80: 279-84
5. Perry IJ, Beevers DG. Salt intake and stroke: A possible direct effect. *J Human Hypertension* 1992; 6: 23-25
6. Eisler R, Loye D, Norgaard K. Women, Men and the Global Quality of Life. Beijing: The Centre for Partnership Studies; 1995 [cited 2012 Jan] Available from: http://www.partnershipway.org/learn-more/partnership-books/books/women-men-and-thglobal-quality-of-life
7. Ekstam L, Uppgard BM, Von Koch L, Tham K. Functioning in everyday life after stroke: A longitudinal study of elderly people receiving rehabilitation at home. *Scandinavian Journal of Caring Sciences* 2007; 21: 434-46

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