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IMPACT OF A CEREBROVASCULAR STROKE CLINICAL PATHWAY ON ELDERLY PATIENTS' OUTCOMES

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Abstract

A clinical pathway (CP) facilitates the delivery of quality nursing care; enhance outcomes and reduce cerebrovascular stroke (CVS) patients' hospital stay. This study **aims** to evaluate the impact of a CVS clinical pathway on elderly patients' outcomes. **Design**: A quasi-experimental/Non-equivalent control groups (time series) design was utilized. **Sample**: A purposive sample of 60 elderly CVS patients; 30 study and 30 control group. **Setting**: the study was conducted at Stroke Unit, Neurological Department and Outpatient Clinics at El Kasr El Aini teaching hospital. **Study tools**: Personal and medical data form, Pre-Posttest CVS knowledge questionnaire, Barthel Index scale (BI) to assess functional health status, National Institutes of Health Stroke Scale (NIHSS), Glasgow Coma Scale (GCS) to assess neurological health status, and Compliance therapeutic regimen assessment form. **Results**: the mean age of elderly patients was 69.13±7.16. All elderly patients had unsatisfactory level of CVS knowledge during pretest which was improved to satisfactory in the study group after implementation of CP. A highly statistically significant differences were found between the total BI, NIHSS, GCS and compliance to therapeutic regimen assessment form in the study group in the pre, post, follow up test (P= 0.00). **Conclusion**: CP has a positive effect on CVS elderly patients' outcomes (knowledge, BI, NIHSS, GCS, compliance therapeutic regimen assessment form & hospital stay). **Recommendation**: application of CP on a large sample to gain more generalization & endorsement of CP as a routine nursing care in CVS stroke units.

Keywords: Clinical Pathway; Cerebrovascular stroke; Patients' Outcomes; Hospital stay

INTRODUCTION

The number of individuals over the age of 60 in the world is predicted to increase to 1.2 billion by 2025, this increasing of the elderly population has predicted globally raising the prevalence of stroke, which indicated that increasing the numbers of patients from 18 million first-time strokes in 2015 to 23 million by 2030. Furthermore, the annual death from stroke raised from 6.5 million in 2015 to 7.8 million by 2030 (1).

Cerebrovascular stroke is a sudden change in brain function brought on by a disruption in the blood flow to the brain as a result of an occlusion (87%) or hemorrhage (13%), which results in both brain cell destruction and loss of function in the affected area. American Heart Association and American Stroke Association (AHA/ASA) denoted that 87 percent of stroke cases were ischemic, 10 percent involves cerebral bleeding, while 3

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percent with subarachnoid bleeding. In the United States, a stroke occurs every 40 seconds, and a stroke-related death occurs every 4 minutes (2).

Diagnosis for CVS and therapy must begin right away because both disability and the chance of mortality are reduced by prompt medical attention (3). Older adults who survive stroke may experience a range of neurological deficits that may limit their ability to engage in social activities and other professional pursuits. These deficits may affect communication, vision, cognition, ambulation, musculoskeletal dysfunction, altered nutrition, skin integrity, perception, sensation, bowel and bladder control, and other daily living activities (4).

A clinical pathway is a multidisciplinary instruments based on evidence-based practice for a specific group of patients with predictable clinical course, in which the different tasks (interventions) by the professionals involved in the patient care are defined, optimized and sequenced either by hour, day or visit (5). CPs are complex interventions for the mutual decision-making and organization of care processes for a well-defined group of patients during a well-defined period in order to improve risk adjusted patient outcomes, promote patient safety, raise patient satisfaction, and best utilize available resources (6).

Significance of the study

Annually, there are 10.3 million new strokes worldwide; 67% are ischemic, with lower and middle-income countries having greater rates of disability. The prevalence of and burden associated with the expenses of care and impairment following stroke have been increased due to disparities between high- and low-income nations (7). One of the most significant global public health issues is stroke and despite of the improvements in stroke prevention, diagnosis, treatment, and rehabilitation the stroke still accounts for 9% of all global fatalities, and it remains one of the leading causes of disability. Stroke continues to be a leading cause of acute hospitalization in industrialized nations, with fatality rates of 28 days after acute onset for about 20% of stroke patients (8).

Worldwide, there are over 16 million first-ever strokes each year, and 5.7 million people die as a result. After ischemic heart disease, stroke is the second most prevalent single cause of mortality in the developed world; when neoplastic disorders are taken into account as a group, stroke is listed as the third biggest killer. Additionally, the majorities of people who survive a stroke do not regain their independence and require long-term care, making stroke the leading cause of disability. A survey that looked at eight wealthy nations found that stroke costs were for 0.27 percent of gross domestic product, with stroke care. ≈3.0 percent of overall healthcare spending stroke and coronary heart disease combined account for over half of the entire cost of cardiovascular disease, costing the European Union economy ≈38 billion and ≈49 billion annually, respectively (9).

Cerebrovascular stroke has a significant impact on individual characteristics, such as impairment and disability. The nervous system and other biological systems are severely hampered (e.g., muscular, ocular). The presence of limitations in capabilities

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operationalizes the effects of these impairments (e.g., intellectual, language, behavior, sense and perception, motor and balance). People vary in their capacity to carry out everyday tasks and fulfill social duties depending on the number and severity of these infirmities; the presence of handicap situations being at one end of the spectrum and optimal social participation being at the other (10). Delays in stroke therapy and potential bad outcomes can be attributed to a lack of understanding of the risk factors, symptoms, and proper reaction to acute stroke. Even in affluent nations, there is still a knowledge gap about stroke, despite the fact that awareness of the disease is growing (11).

Nurses have a key role in all aspects of CP management process by participating in the development of the pathway is the first step and the end chain of staff involved in delivering of care, nurses possess a unique perspective in how health care systems work to enhance or impede the delivery of care. Nurses are also responsible for initiating the CP on appropriate patients and ensuring that the various events occur as care planned for enhancing and monitoring outcome achievement is a nursing activity. The CP describes the care plan in simple language and pictures, the nurse discusses the CP with the patient and focuses on achieving specific outcomes also patients are often given a printed patient CP for reference (12). Carrying out this research study will put a spot of light and add more to the nursing body of knowledge on this significant silent health problem in Egypt.

Operational definitions

Cerebrovascular stroke elderly: It is referred to the elderly patient aged 60 or above who is admitted to stroke unit for 1st time with acute stage of stroke within (0-3) hours.

Clinical pathway: It is a map or outline of nursing care that provides the corresponding ideal sequence and timing of nursing staff actions from the time of the patients' admission until discharge and extend to cover three months’ post discharge to assure compliance to the prescribed regimen, complications monitoring, following safety measures and follow-up care (13).

Patients' outcomes: It is defined as: 1- acquired level of knowledge related to CVS, 2- the length of hospital stay as calculated by (date of admission-date of discharge), 3- patients' compliance to prescribed medication & diagnostic tests, warning signs, activity, nutrition and importance of follow up, 4- functional health status and 5- neurological health status.

Aim of the study: The aim of this study was to evaluate the impact of a cerebrovascular stroke clinical pathway on elderly patients' outcomes.

Research hypotheses: H1: CVS patients who will receive clinical pathway will show better elderly patients' outcomes than those who do not.

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Subhypothses

H1.1- CVS elderly patient who will be exposed to designed CP guidelines will exhibit higher post total mean knowledge scores than those who will not be exposed to designed CP guidelines.

H1.2- CVS elderly patient who will be exposed to designed CP guidelines will exhibit higher post total mean functional health status scores than those who will not be exposed to designed CP guidelines.

H1.3- CVS elderly patient who will be exposed to designed CP guidelines will exhibit higher post total mean neurological health status scores than those who will not be exposed to designed CP guidelines.

H1.4- CVS elderly patient who will be exposed to designed CP guidelines will exhibit higher total mean compliance scores to nutrition, exercises, medication than those who will not be exposed to designed CP guidelines.

H1.5- CVS elderly patient who will be exposed to designed CP guidelines will exhibit shorter hospital stay than those who will not be exposed to designed CP guidelines.

Subjects and Method

Research design: Quasi-experimental/ Non-equivalent control groups design was utilized to fulfill the aim of the study.

Setting: The study was carried out at the Stroke Unit at El-Manial University Hospital, Neurological Department and Outpatient Clinics in Kasr El Aini teaching hospital, Cairo, Egypt.

Sample: Purposive sample of 60CVS elderly patients who attended the stroke unit, the neurological department and the outpatient's clinics were randomly assigned to one of two groups (control or study).The study group received the intervention for clinical pathway, whereas the control group received standardized patient care.

Inclusion Criteria: Elderly CVS patients who were admitted to stroke unit for 1st time in acute stage of ischemic stroke within (0-3) hours, not aphasic and able to communicate & who have no other disability conditions before stroke attack.

Exclusion Criteria: Elderly CVS Patients with severe cognitive impairment as delirium according to physician report, immediate brain surgery, who was unable to communicate (aphasia) and not conscious & who was diagnosed with depression or on anti- depressive treatments.

Tools for Data Collection:1- Personal and medical data form, it was developed by the researcher and includes; age, gender, marital status, level of education, smoking habits and past medical history& co-morbidities such as diabetes, hypertension etc. 2- Pre-Posttest knowledge questionnaire about CVS. It was developed by researcher based on relevant literature review to assess knowledge of elderly patients related to; definition, path physiology, causes, warning signs, risk factors, signs and symptoms, complications,

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prevention, treatment, care of stroke & importance of compliance and follow-up, it includes 25 questions. The total score of knowledge ranged from correct answer was scored as 1 and wrong answer scored as 2, then level of total knowledge scored was calculated as 60% or more for satisfactory level and less than 60% for unsatisfactory level. 3- Barthel Index (BI) adopted from (13) as standardized tool of Activities of Daily Living (ADL) for stroke patients to assess functional health status. The scale consisted of ten items which are: feeding, bathing, grooming, dressing, bowel, bladder, toilet use, transfer, mobility & strains. The total score of BI was 100, categorized as 0-20= total dependency, 21-60= severe dependency, 61-90= moderate dependency, 91-100= mild dependency in ADL. 4- National Institutes of Health Stroke Scale (NIHSS) adopted from (14) as the standardized and valid neurological assessment tool, it includes 11 items (the levels of consciousness (LOC) questions & commands, best gaze, limb ataxia, sensory, best language, dysarthria, extinction& inattention. The total score was designed to be answered by one score was allocated for each correctly done action and zero for incorrectly done action. Score of each item ranged from two to one (correct answer =2 and incorrect answer =1). The answers will be scored based on the level of knowledge of the studied patients (<65%) are unsatisfactory, (65%-80%) are satisfactory and (>80%) are good. 5-Glasgow Coma Scale (GCS) adopted from (15) as the standardized and valid neurological assessment tool for assessing level of consciousness or coma. It includes items as: Eye Opening Response, Verbal Response and motor response. The scoring was being as follow: coma; GCS score of 3 or less 8, severe head injury; GCS score of 8 or less, moderate head injury; GCS score of 9 to 12 & mild head injury; GCS score of 13 to 15. 6-Therapeutic regimen compliance assessment form: It is developed by the researcher and includes five main areas; patient adherence to self-monitoring of warning signs of stroke, performing the prescribed diagnostic tests, adherence to the prescribed medication, nutrition, activity and importance of follow up. The total of 10 scores was divided into; scores less than 7 (<70%) indicates noncompliance while scores from 7-10 (70% +) indicates compliance.

Content validity and reliability: 3 experts in nursing care were asked to link each objective to its item to assess relevancy of the item to the content addressed by objectives and relevancy of content, then, the researcher employed the alpha coefficient as the index of content validity. A coefficient of 0.00 indicated lack of agreement between the experts and a coefficient of 1.00 indicated complete agreement and the result of the current study was 90 %, r = 0.9. Cronbach alpha was used for internal consistency of the personal & medical data form, pre-posttest knowledge questionnaire, therapeutic regimen compliance assessment form, the reliability was (0.83 and 0.79) respectively. The BI has an alpha internal consistency coefficient of 0.87 to 0.92. The NIHSS has moderate-to-high reliability when carried out by medical and non-medical staff (intra-rater = 0.66 to 0.77; inter-rater = 0.69) and the inter-rater reliability of the total GCS was 89%, 94%, and 88% respectively.

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Protection of ethical and human rights: The Committee of Scientific Research Ethics of Cairo-Faculty University of Nursing approval number is RHDIRB2019041703. Furthermore, an official approval to perform the suggested study was received from Cairo University's Faculty of Nursing. After discussing the purpose of the study, the duration of the study, and the data collection process the written formal consents were obtained from the patients.

Procedure: Data collection lasts for 10 months starting from March 2021 till December 2021 due to the COVID-19 pandemic. The study was carried out in the following phases: assessment, planning, implementation, and evaluation phase. **1-Assessment phase**: The researcher explains the purpose and steps of the study to elderly patients and their research ethical rights. Then written consents were obtained from elderly patients who accepted to participate in the study. After obtaining written consent, elderly patients were enrolled to study according to inclusion criteria was divided into two groups, study group (n=30) and control group (n=30) using simple random allocation and filled out the questionnaire to assess awareness regarding CVS. The data obtained during this phase are considered the basis for evaluation of CP (pretest) to evaluate the efficacy of the interventions. Assessment phase took 5 days; the researcher interviewed elderly patients in ICU from 9am to 4pm. In the first session, researcher filled out the personal and medical data form questionnaire in addition to pre-posttest knowledge questionnaire, BI, NIHSS & GCS & compliance assessment form all were filled during the first or second day according the elderly status**. 2-Planning and implementation phase**: the researcher was performed comprehensive nursing care for the study group only including (1) assessment of patient's hemodynamic on admission (vital signs, O2 SATS, continuous cardiac monitor, monitor intake & output), mobility, falls risk assessment, chest assessment and pain assessment every 4 hours), (2) neurological assessment (NIHSS & GCS) was done every 24 hours, then twice per 12 hours every two days, then every 12 hours, and scored every times, (3) functional assessment (BI) performed on admission and on 2nd day & 3rd day once daily and scored (4) laboratory/ diagnostics tests(coagulation profile, CBC, glucose/ ECG & CT scan), treatments (prescribed according to patient's condition), (5) swallowing & nutrition (oral assessment, tube feeding or NPO) the researcher administer tube feeding if the patient was unable to meet nutritional status, oral care was done every shift or as prescribed, (6) activity was determined according to patients' medical conditions and co-morbidity diseases by mobilize the elderly patient unless contraindicated and encourage proper positioning related to affected side, encourage active movement/exercise of limbs as indicated by patients' ability and (7) patient teaching about diagnosis/reason for admission, provide elderly patients/family with care plan for hospital stay including expected length of stay, provide elderly patients/family with knowledge about stroke, discussing smoking cessation, review warning signs of stroke and review medications and follow up within one week after discharge and provide patient/family with stroke booklet. Teaching method used; discussion, role play and demonstration and re-demonstration also videos were sent by What's App or by social network either to the elderly patients or one of caregivers,

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adding to that each elderly patient or caregiver received a copy of the guidelines booklet. Control group was receiving routine stroke care. **3-Evaluation phase** (posttest): was performed immediately at 5th day, one month, three months after implementation of CP using the same tools of pretest evaluation for both the study and the control group to assess deviations from designed plan through planned interviews at outpatient neurosurgery clinic and by telephone and using the social network such as what's app to minimize face-to-face meetings as global precautions of COVID-19 infection and to assess to which extent the studied patients' knowledge, outcomes and compliances.

The Study Results

Table 1: Distribution of the elderly patient's personal data and medical history (n=60)

Personal data	Categories	Study group (n=30)		Control group (n=30)		Chi square test	
		No.	%	No.	%	χ2	P
Age group	60-	10	33.3	12	40.0	2.3	.67
	65-	9	30.0	8	26.7		
	70-	7	23.3	8	26.7		
	75-	2	6.7	2	6.7		
	80-	0	0.0	0	0.0		
	85-90	2	6.7	0	0.0		
	Mean ±SD	69.13±7.16		67.90±5.38			
Sex	Male	17	56.7	17	56.7	0.0	1.0
	Female	13	43.3	13	43.3		
Marital status	Single	5	16.7	2	6.7	5.3	.5
	Married	14	46.7	15	50.0		
	Widowed	4	13.3	9	30.0		
	Divorced	7	23.3	4	13.3		

Table (1) indicates that 33.3% of elderly patients in the study group aged60 to less than 65years compared to 40% in the control group, with mean of 69.13±7.16 and 67.90±5.38years in the study and control group respectively. Regarding sex, 56.7% of elderly patients were males whereas 46.7% were female in both the study and control group. In terms of marital status, 46.7% of elderly patients in the study group were married, 13.3% were widowed and 23.3% were divorced, whereas 50% of those in the control group were married, 30% were widowed and13.3% were divorced.

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Table 2: Distribution of elderly patients regarding smoking habits (n=60)

Medical history	Study group(n=30)		Control group(n=30)		Chi square test	
	N	%	N	%	χ2	P
Types of smoking						
Smoker	17	56.7	12	40.0	2.4	0.2
Non-smoker	13	43.3	18	60.0		
Active	17	56.7	12	40.0		
Passive	13	43.3	18	60.0	2.4	0.29
Smoking since by (years)						
10-20	10	58.8	8	66.7	24.4	0.75
>20	7	41.2	4	33.3		
Numbers of cigarettes/day						
10-20	13	76.5	7	58.3	8.5	0.29
>20	4	23.5	5	41.7		

Table (2) shows that 57.7% of elderly patients were smoker in the study group compared with 40% in the control group, 56.7% elderly patients were active smoker and 43.3% passive smoke in the study group as compared to 40% & 60 respectively in the control group. While the durations of smoking and numbers of cigarettes/day indicates that 58.8% of elderly patients in the study group smoking from 10-20 years with 76.5% of them smoking from ten to twenty cigarettes/day and 41.2% smoking more than twenty years with 23.5% of them smoking from more than twenty cigarettes /day, whereas 66.7% with 58.3% and 33.3% with 41.7% respectively in the control group.

Table 3: Distribution of elderly patients concerning physiological parameters (vital signs) among the study and control group during hospitalization (n=60)

Vital signs	Study group (n=30)					Control group (n=30)				
Mean ±SD	Pretest %	Posttest %	Follow up %	ANOVA		Pretest %	Posttest %	Follow up %	ANOVA	
				F	P				F	P
Temperature	36.97 ±0.29	38.47 ±0.52	34.18 ± 0.20	2.16	.03*	36.66 ± 0.53	37.04 ± 0.43	36.66 ± 0.53	1.36	.17
Pulse rate	63. 55 ± 5.44	71.37 ± 3.42	64.74 ± 5.44	5.81	.001*	63. 39 ± 4.70	64.74 ± 5.44	61.34 ± 5.38	1.57	.11
Respiration rate	10.71 ± 1.01	14.16 ± 0.49	10.18 ± 0.60	2.49	.01*	10.24 ± 0.99	11.13 ± 0.47	10.04 ± 0.89	0.67	.42
Blood Pressure rate										
Systolic blood pressure	141.97 ± 14.40	144.61 ± 13.22	131.68 ± 6.74	3.11	.003*	132.63 ± 5.54	133.68 ± 6.74	130.63 ± 4.54	1.35	.18
Diastolic blood pressure	93.95 ± 9.59	97.37 ± 7.42	91.05 ± 5.59	3.46	.001*	88.95 ± 4.52	89.16 ± 4.59	73.82 ± 6.01	1.89	.06
Oxygen saturation	83.97 ± 2.14	91.42 ± 1.75	83.16 ± 3.59	2.96	.004*	82.02 ± 3.90	83.97 ± 2.14	74.6±1.53	0.92	.35
Blood glucose level	131.84 ± 32.90	153.42 ± 50.44	127.84 ± 22.80	2.01	.004*	131.84 ± 32.90	148.95 ± 50.52	117.8 ± 20.09	1.82	.16

* Significant at the $p < 0.05$ probability level

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Table (3) denotes that, highly statistically significant differences were found between measuring vital signs of elderly patients in the study group in the pre, post, follow up test regarding temperature, pulse rate, respiration rate, systolic blood pressure, diastolic blood pressure, oxygen saturation & blood glucose level throughout the study periods with the following F & P values (f= 2.16, P=0.03, f= 5.81 at P=0.001, f= 2.49 at P=0.01, f= 3.11 at P=0.003, f=3.46 at P=.001, f=2.96 at P=0.004 & f=2.01at P=0.004) respectively whereas no statistically significant differences were found between measuring vital signs of elderly patients in the control group in the pre, post, follow up test.

Table 4: Distribution of the elderly patients regarding the total mean knowledge scores of study and control group in pretest, post pathway and follow up (n=60)

Total mean knowledge	Study group (n=30)						Control group (n=30)						Study/Control group	
	Pretest %		Posttest %		Follow up %		Pretest %		Posttest %		Follow up %		Chi square test	
	N	%	N	%	N	%	N	%	N	%	N	%	χ2	P
Satisfactory	1	3.3	28	93.3	10	33.3	0	0.0	0	0.0	0	0.0	28.00	.00*
Unsatisfactory	29	96.7	2	6.7	20	66.7	30	100.	20	66.7	30	100	14.73	.00*
	χ2=52.5		P=.000*				χ2=0.0		P=1.00					

* Significant at the p < 0.05 probability level

Table (4) indicates that, the majority of the study& control group of elderly patients (96.7%& 100%) respectively were unsatisfactory level of the mean knowledge in the pre, post, follow up test as compared to 93.3%& 33.3% of them in the study group were satisfactory level of knowledge posttest of the clinical pathway and follow up test whereas all of patients in the control group had poor knowledge in the pre, post and follow up test. There was a highly statistically significance difference was found between the total mean knowledge scores of elderly patients in the study and control group subjects in the pre, post and follow up test at P=0.00.

Table 5: Distribution of the elderly patients in relation to the total mean functional health status scores of Barthel Index (BI) of study and control group in pretest, post pathway and follow up (n=60)

Level	Study group (n=30)						Control group (n=30)						Study/Control group	
	Pretest %		Posttest %		Follow up %		Pretest %		Posttest %		Follow up %		Chi square test	
	N	%	N	%	N	%	N	%	N	%	N	%	χ2	P
Totally dependent	8	26.7	5	16.7	3	10.0	8	26.7	12	40.0	14	46.7	2.88	.09
Very dependent	7	23.3	16	53.3	4	13.3	11	36.7	5	16.7	12	40.0	5.76	.02*
Partially dependent	6	20.0	6	20.0	14	46.7	10	33.3	8	26.7	4	13.3	0.29	.59
Minimally dependent	8	26.7	2	6.7	6	20.0	1	3.3	2	6.7	0	0.0	0.00	.99
Independent	1	3.3	1	3.3	3	10.0	0	0.0	3	10.0	0	0.0	1.00	.32
	χ2=21.0		P=.007*				χ2=15.2		P=0.06					

* Significant at the p < 0.05 probability level

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Table (5) illustrates that highly statistically significant differences were found between the total mean functional health status scores BI among the elderly patients in the study group in the pre, post & follow up test at (P=0.007) with no statistically significant differences were found in the control group in the pre, post & follow up test. Statistically significant differences were found between the total mean functional health status scores of BI among the elderly patients in the study group in the pre, post and follow up test regarding very dependent at P=0.02.

Table 6: Chi-square of the studied elderly patients concerning the total mean neurological health status scores of National Institutes of Health Stroke Scale (NIHSS) of study and control group in pretest, post pathway and follow up (n=60)

Total NIHSS	Study group (n=30)						Control group (n=30)						Study/Control group	
	Pretest %		Posttest %		Follow up %		Pretest %		Posttest %		Follow up %		Chi square test	
	N	%	N	%	N	%	N	%	N	%	N	%	χ2	P
Low	28	93.3	30	100.0	30	100.0	30	100.0	30	100.0	30	100.0	0.01	.99
Moderate	2	6.7	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.01	.99
High	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.01	.99
	χ2=4.0		P=0.12				χ2=0.0		P=1.0					

* Significant at the p < 0.05 probability level

Table (6) detects that no statistically significant differences were found between the total mean neurological health status scores of NIHSS among the elderly patients in the study group and control group in the pre, post & follow up test.

Table 7: Distribution of the elderly patients in relation to the total mean neurological health status scores of Glasgow Coma Scale (GCS)of study and control group in pretest, post pathway and follow up (n=60)

Total GCS	Study group (n=30)						Control group (n=30)						Study/Control group	
	Pretest %		Posttest %		Follow up %		Pretest %		Posttest %		Follow up %		Chi square test	
	N	%	N	%	N	%	N	%	N	%	N	%	χ2	P
Mild head injury	8	26.7	18	60.0	23	76.7	5	16.7	10	33.3	4	13.3	2.29	.13
Moderate head injury	20	66.7	12	40.0	7	23.3	23	76.7	10	33.3	12	40.0	0.18	.67
Severe head injury	2	6.7	0	0.0	0	0.0	2	6.7	10	33.3	14	46.7	10.00	.00*
χ2	17.7						20.4							
P value	0.001*						0.46							

* Significant at the p < 0.05 probability level

Table (7) reveals that, highly statistically significant differences were found between mild, moderate and severe head injury post clinical pathway in the study group compared with no statistically differences found among the control group patients. A statistically significant differences were found between the total mean neurological health status scores of Glasgow Coma Scale (GCS) of elderly patients regarding severe injuries at P=0.000.

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Table 8: Distribution of the elderly patients in relation to the total compliance assessment form of study and control group in pretest, post pathway and follow up (n=60)

Total compliance assessment	Study group (n=30)						Control group (n=30)						Study/Control group	
	Pretest %		Posttest %		Follow up %		Pretest %		Posttest %		Follow up %		Chi square test	
	N	%	N	%	N	%	N	%	N	%	N	%	χ2	P
Compliant	0	0.0	28	93.3	18	60.0	0	0.0	2	6.7	0	0.0	22.53	.00*
Not compliant	30	100.	2	6.7	12	40.0	30	100.0	28	93.3	30	100.0	22.53	.00*
χ2	59.7						0.0							
P	.000*						1.00							

* Significant at the p < 0.05 probability level

Table (8) indicates that highly statistically significant differences were found between the total compliance assessment form among the elderly patients in the study group post clinical pathway χ2=59.7 at P=0.000, while. Table (8) also shows that highly statistically significant differences between the study and the control group in relation to the items of compliant and not compliant.

Table 9: Distribution of the elderly patients in relation to the total scores of the study and control group in pretest, post pathway and follow up (n=60)

Total scores	Study group (n=30)					Control group (n=30)				
Mean ±SD	Pretest	Posttest	Follow up	ANOVA		Pretest	Posttest	Follow up	ANOVA	
				F	P				F	P
Knowledge	4.70±3.66	18.33±2.25	11.03±4.92	98.29	.000*	2.43±1.07	6.50±2.70	3.50±0.51	33.69	.642
Barthel Index	38.33±25.78	31.67±19.53	47.50±26.25	3.278	.042*	27.33±19.64	24.50±14.78	17.00±0.00	3.984	.881
National Institutes of Health Stroke Scale	9.77±5.30	8.47±2.92	8.27±2.78	1.346	.026*	10.10±3.87	11.77±5.58	12.43±0.45	1.856	.162
Glasgow Coma Scale	11.27±1.82	12.33±1.21	12.60±1.07	7.565	.001*	11.00±1.53	10.60±2.72	9.83±0.35	1.808	.170
Compliance assessment	3.43±1.33	9.53±3.38	7.13±1.22	57.81	.000*	2.13±0.74	4.80±0.80	2.10±0.47	12.05	.212

* Significant at the p < 0.05 probability level

Table (9) reveals that, highly statistically significant differences were found between the pre, post & follow up test in the study group and the total scores of knowledge, BI, NIHSS, GCS & compliance assessment with the following p values (P=0.000, P=0.042, P=0.266, P=0.001 & P=0.000) whereas no statistically significance differences were shows between total scores of knowledge, BI, NIHSS, GCS & compliance assessment of elderly patients of the control group in the pre, post & follow up test.

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Table 10: Correlation between the length of hospital stay and patients' outcomes (n=60)

Studied variables	R	p
Knowledge	0.89	.0001*
Barthel Index	0.04	0.7
National Institutes of Health Stroke Scale	-0.1	0.83
Glasgow Coma Scale	0.78	.0001*
Compliance assessment	0.29	.005*

* Significant at the $p < 0.05$ probability level

Table (10) shows the correlation between the length of hospital stay and studied variables in patients' outcomes. The strongest correlation was found between the length of hospital stay and knowledge ($r = 0.89$, $p < 0.0001$), a moderate positive correlation between the length of hospital stay and Glasgow Coma Scale ($r = 0.78$, $p < 0.0001$), lastly, a moderate positive correlation between the length of hospital stay and compliance assessment ($r = 0.29$, $p < 0.005$) whereas no statistically significant correlation between the length of hospital stay and Barthel Index or National Institutes of Health Stroke Scale.

Table 11: Correlation between the clinical pathway scores and the patients' outcomes (n=60)

Patients' outcomes	**Clinical pathway scores**		**ANOVA test**	**P- value**
	Mean	**SD**		
Knowledge				
Unsatisfactory	89.29	26.02	248.467	.000*
Satisfactory	176.24	20.89		
Barthel Index				
Totally dependence	103.52	45.78	1.117	.354
Very dependent	129.56	48.57		
Partially dependent	111.86	46.31		
Minimally dependent	113.25	45.60		
Independent	124.00	72.12		
National Institutes of Health Stroke Scale				
Low	117.39	47.94	0.276	.601
Moderate	99.50	0.71		
High	98.10	0.82		
Glasgow Coma Scale				
Mild head injury	141.50	50.95	7.684	.001*
Moderate head injury	104.53	41.22		
Severe head injury	92.50	13.00		
Compliance assessment				
Not compliant	87.10	21.58	535.357	.000*
Compliant	180.93	4.25		

* Significant at the $p < 0.05$ probability level

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Table (11) indicates that, a direct correlation between the clinical pathway and the knowledge, Glasgow Coma Scale and compliance assessment with p values (p=0.000, p=0.001 & p=0.000) respectively and no statistically correlation detected for both Barthel Index and National Institutes of Health Stroke Scale (P=0.601).

Table 12: Repeated measures of ANOVA for patients' outcomes within and between the groups (n=60)

Patients' outcomes	ANOVA test	With group differences	Between group differences
Knowledge	365.1	.0001*	.0001*
Barthel Index	0.003	0.95	0.32
National Institutes of Health Stroke Scale	0.05	0.81	.04*
Glasgow Coma Scale	120.1	.0001*	.0001*
Compliance assessment	0.91	0.34	.006*

* Significant at the p < 0.05 probability level

Table (12) shows that, highly statistically significant differences were found between Knowledge, National Institutes of Health Stroke Scale, Glasgow Coma Scale and Compliance assessment in the study group in the pre, post & follow up test with the following p values (P=0.000, P=0.042, P=0.266, P=0.001 & P=0.000) compared with no statistically differences found among the control group patients.

Table 13: Repeated measures of ANOVA for patients' outcomes within and between the groups (n=60)

Patients' outcomes	ANOVA test	With group differences	Between group differences
Knowledge	365.1	.0001*	.0001*
Barthel Index	0.003	0.95	0.32
National Institutes of Health Stroke Scale	0.05	0.81	.04*
Glasgow Coma Scale	120.1	.0001*	.0001*
Compliance assessment	0.91	0.34	.006*

* Significant at the p < 0.05 probability level

Table (13) indicates that, highly statistically significant differences were found between the study group in all patients' outcomes regarding Knowledge, National Institutes of Health Stroke Scale, Glasgow Coma Scale and Compliance assessment with the following p values (p=0.0001, p=0.04, p=0.0001 & p=0.006) respectively except Barthel Index with (p=0.32) compared with the control group.

DISCUSSION

The stroke CP's documented paper was added to each patient's file on admission, either in the emergency department or medical unit, it includes; general advice about acute

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stroke management and detailed daily activities for each patient during the first 5 days of the acute admission. The daily activities were listed under medical, nursing, therapist and discharge planning headings, each item ticked, initialed and dated as achieved by relevant staff on a daily basis, and enhance the quality of care through improving CVS patients' outcomes, promoting patient safety, increasing patient satisfaction, reducing hospital stay and optimizing the use of resources, facilitation of communication between team members, patients and families.

Concerning the personal data of the elderly patient's age, the current study revealed that more than one third of the elderly patients was aged from sixty to less than sixty-five years old and less than one third aged from sixty-five to less than seventy years old & nearly one quarter aged from seventy to less than seventy-five years old in the study group with a mean age 69.13±7.16 years, no statistically significant difference were found between the two groups (table 1). In accordance with these results, Nicola, Klaus& Elisabeth (2020) studied "Diagnosis and management of acute ischemic stroke", in the Institute of Legal Medicine, Hamburg, Germany, found that of the 27,730 cases reviewed, the average age in patients with acute stroke was seventy-four years (age range sixty-five to eighty-seven years).

Regarding sex, the current study showed that, more than half of elderly patients were males whereas less than half were female in both the study and control group with no statistically significant differences were found between them, these findings were in harmony with a similar study carried out by Ingibjörg, Helga, Thóra and Hafsteinsdóttir (2019) study in a research article entitled as " Being a stroke patient: a review of the literature in central Croatia" that indicates more than half were male patients with a mean age of 69.7 years and more than third were female patients with a mean age 74.5 years. From the researchers' point of view, higher rates of CVS among Egyptian men could be due to higher exposure of cigarette or hookah with active or passive smoking and exposure to stress and pressures of life.

According to CAPMAS (2021) revealed that the percentage of smoking among men were 35.6% while in female 0.3% in Egypt. These results completely inconsistent with the findings of Alnaif & Alghanim (2019) in a published research article entitled as "Survival and functional independence after acute ischemic stroke" on 157 patients at Harvard Medical School, Boston showed an equal ratio of males to females. From the researchers' point of view these results may be related to differences in socio demographic characteristics, social and cultural factors between the two studies.

Regarding to the marital status, the results of the current study showed that less than half of elderly patients were married & less than quarter of them divorced in the study group as compared to half of them were married & less than one fifth divorced in the control group with no statistically significant differences found between the two groups. This finding to some degree disagrees with the study done by MacIsaac et al. (2020) on 63 women in USA, entitled as "Persons with stroke and their nursing care in nursing homes" and found that less than one third of the studied women were married and more than half

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were divorced. From the current researchers' point of view, these results may be related to setting difference between the two studies in addition to cultural and economic factors and in Egypt, increasing Egyptian society awareness of family coherence and need for building families, these tended to increase the number of married subjects.

In relation to the smoking habits (table 2), the current study showed that, more than half of elderly patients in the study group were active smokers and less than half passive smokers as compared to less than half & almost two third of those respectively in the control group with no statistically significant differences were found between them, this result completely congruent with the results of Abdel-Hady (2020) who found in his research in Egypt, that the prevalence of active current tobacco smoking among the elderly was more than half while the passive smoking was more than one third, and also the minimum of them were ex-smokers. This finding contradicts with a study done by Rosso and chitnis, (2020) on 196 patients in Canada to examine the relation between smoking and CVS and found that the majority of CVS patients were nonsmokers. From the current study researchers' point of view, in the Egyptian culture smoking is not common among females and according to CAPMAS (2021) revealed that, the percentage of smoking among men were 35.6% while in female 0.3%.

In relation to elderly patient's knowledge, the current study revealed that there were highly statistically significance differences between the two groups in the total mean knowledge scores of the elderly patients among the study group ranked as satisfactory level in the pre, post and follow up test whereas all of patients in the control group had poor knowledge in the pre, post and follow up test (table 4). This finding to some degree matched with the results of the study done by Haralampos, Milionisa, Evangelos, Eleni, Bairaktarib, Konstantinos & Elisaf (2019) on 160 participants in Bushehr, Iran study in a research article entitled as "Ischemic stroke in the elderly" and found that there was a highly statistically significant differences found between total knowledge mean score of elderly patients in the study group in the pre, posttest & follow up whereas no statistically significant difference were found in the control group in the pre, posttest & follow up and these results congruent with the findings of our study. From current study researchers' point of view, these results may be related to the effect of CP in improving elderly patient's knowledge about CVS, how to decrease or prevent complications and prevent relapses which reflected in their answers in post and follow up test.

Regarding to the functional health status scores (BI), the results of the current study illustrated that there were highly statistically significant differences were found between the total mean functional health status scores of BI among the elderly patients in the study group in the pre, post & follow up test compared with no statistically significant differences were found in the control group in the pre, post & follow up test. Statistically significant differences were found between the total mean functional health status scores of BI among the elderly patients in the study group in the pre, post and follow up test regarding the very dependent level (table 5). These findings may be as a result of continuous demonstration, follow up and also the practical content of the instructional booklet as a

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part of the CP for the CVS patient's with the continuous explanations, reinforcement and feedback.

These results were congruent with Haley, et al. (2021) who mentioned that the intervention group showed better scores than pretest in functional status and after 3 months of rehabilitation program. In addition, Nir, et al. (2021) during the second stage of rehabilitation, the mean score of functional state of the patients assessed by the BI significantly improved from 65.9±20.3 to 93.5±20.9. This result contradicts the previous results of Ferrarello, et al. (2019) who revealed that stroke patients improved their physical functions immediately and persistent for three months after completing the intervention. From the current study researchers' point of view, the improvement of practices after implementation of CP could be as a result of acquired knowledge about CVS which is reflected into proper practices to handle unhealthy or inappropriate practices for elderly patients with continuous explanations, reinforcement and feedback.

In relation to neurological health status scores (NIHSS), the results of the current study detected that no statistically significant differences were found between the total mean neurological health status scores of NIHSS among the elderly patients in the study group and control group in the pre, post & follow up test (table 6). This results completely inconsistent with the findings of McHutchison et al. (2021), on 264 patients with clinically confirmed minor ischemic stroke in Manchester, UK (in their systematic review study) to assess long-term study of outcomes at 3 years post minor ischemic stroke that found a highly statistically significance differences in neurological and cognitive functioning in almost half (nearly half) of the 153/202 patients, around a third being impaired in physical functioning, less than one fifth having dependency between one and three years of follow-up. From the current study researchers' point of view, NIHSS was an actually standard for assessing stroke severity in the acute stage and used for the evaluation of stroke patients prior to administering thrombolytic, however, it needs more time for assessment or may be participant burden and fatigue, risk of missing data & needs more time to detect significant improvement.

In addition to neurological health status scores (GCS), the findings of the current study revealed that highly statistically significant differences were found between mild, moderate and severe head injury post clinical pathway in the study group compared with no statistically differences found among the control group patients. A statistically significant difference was found between the total mean neurological health status scores of Glasgow Coma Scale (GCS) of elderly patients regarding severe head injury (table7). These results consistent with the results of a study done by Elshami et al. (2020) on 3033 participants to review stroke progression and analyze the trajectory of stroke recovery in Bahrain and reported that, there was an increase in functional and neurological health status of the elderly patients over the 3 to 6-month follow-up period. These results were in the opposite with Zaky and Mohammad (2021) who mentioned that the result of their study showed decreased in stroke patients' activities of daily living and NIHSS that are determined by Barthel index activities of daily living scale & GCS post implementation of

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management (posttest II) than pretest and posttest I in study group than control group. From the researchers' point of view, nurses must focus on physical, functional and neurological assessment during care of stroke patients in the first month following stroke, this leads to enhance patient's return to normal life, preserve overall health status, reduce incidence of disabilities and prevent complication.

Concerning the therapeutic regimen compliance assessment, the findings of the current study indicated that highly statistically significant differences were found between the total compliance assessment form among the elderly patients in the study group post CP. Highly statistically significant differences between the study and the control group in relation to the items of compliant and not compliant (table 8). These findings completely matched with the results of the study done by El Hadary (2019) supported these result when reporting that, a higher total mean compliance scores regarding following prescribed medications and following prescribed activity regimen in the study group as compared to control group subjects with significant statistical differences between the two studied groups. Also, Ferrarello, Baccini, Rinaldi, Cav-Allini, Mossello, Masotti, Mar-Chionni & Di Bari (2017) in a published research article entitled as "Compliance in Stroke older adults: the importance of knowledge and belief" in University of Groningen, data were collected in a cohort of 501 ischemic stroke patients, they found that overall compliance was 72% in this older stroke population. Compliance with medication and appointment keeping was high (>90%). In contrast, compliance with diet (83%), fluid restriction (73%), exercise (39%), and weighing (35%) was markedly lower. From the researchers' point of view, this may be due to continuous contact with elderly patients through open channel of telephone communication between the researcher and the study group and to the application of the CP guidelines approach for them.

In an attempt to identify the relationship between length of hospital stay and patients' outcomes, a strongest correlation was found between the length of hospital stay and knowledge which indicates that patients with higher levels of knowledge tend to have shorter period hospital stay. This could suggest that education and patient empowerment CP may be effective in reducing the length of hospital stays. There was also a moderate positive correlation between the length of hospital stay and Glasgow Coma Scale, which is a measure of consciousness and neurological functioning. This suggests that patients with better neurological function tend to have shorter hospital stays. However, there was no significant correlation between the length of hospital stay and Barthel Index (a measure of functional independence) or National Institutes of Health Stroke Scale (a measure of stroke severity), indicating that these factors may not be strong predictors of hospital stay length. Lastly, there was a moderate positive correlation between the length of hospital stay and compliance assessment, which suggests that patients who are more compliant with treatment and care may have shorter hospital stay (table 9 -10).

These findings in the same line with Joseph, Gopichandran, Seth & Tirwa, (2021) who found that; there was presence of a clinically significant decreasing in the length of hospital stay at intensive care unit in the study group than control group. In addition,

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Michael & David (2020) studied the "impact of a clinical pathway on the care and costs of CVS" in Kansas University Medical Center, who stated a time series of 110 patients with acute CVS admitted between January 2016 and June 2021. The pathway reduced length of hospital stay by 2.2 days and hospital charges by $1,008 without compromising care quality and outcomes. From the researchers' point of view, an integrated care by multidisciplinary teams enhanced the patients' clinical outcomes and minimizing complications, reduce length of hospital stay, enhances progression, prognosis and early discharge.

In relation to patients' outcomes and CP, the findings of the current study revealed that, highly statistically significant differences were found between the pre, post & follow up test in the study group and the total scores of knowledge, BI, NIHSS, GCS & compliance assessment whereas no statistically significance differences were showed between total scores of knowledge, BI, NIHSS, GCS & compliance assessment of elderly patients of the control group in the pre, post & follow up test. The current study indicated that the use of a CP was associated with better outcomes, including higher levels of knowledge, better functional and neurological health status, higher compliance scores, lower frequency of CVS complications, and shorter hospital stays (table11, 12 &13). These findings are consistent with previous studies that have demonstrated the benefits of using CP in stroke care.

Several studies have investigated the effect of clinical pathways on stroke patients' outcomes, with most studies reporting positive outcomes. A systematic review by Sun et al. (2020) of 12 studies found that the use of CP improved patients' outcomes, including reduced mortality, disability, and length of hospital stay. Similarly, a study by Rajsic et al. (2017) found that the use of a CP was associated with reduced hospital costs and improved outcomes for stroke patients. Another study by Wang et al. (2020) found that a CP was associated with improved outcomes for patients with acute ischemic stroke, including reduced disability and length of hospital stay.

While many of studies have reported positive outcomes associated with CP, some studies have reported mixed or negative results. For example, a study by Weir et al. (2018) found that the implementation of a CP did not result in significant improvements in patient outcomes or length of hospital stay. Similarly, a study by Wang et al. (2018) found that the use of a CP did not result in significant improvements in functional outcomes for stroke patients. The current study's findings suggest that the use of CP can improve outcomes for elderly stroke patients. However, it is important to denote that the implementation of CP is not a one-size-fits-all solution, and the success of implementation may vary depending on the context and implementation strategy. In addition, the use of CP may not be sufficient on its own and should be complemented by other interventions, such as patient education and support to achieve optimal outcomes. These findings are consistent with previous studies that have also investigated the impact of CP on stroke outcomes, a systematic review and meta-analysis of 24 studies found that stroke patients who

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received CP care had significantly improved functional outcomes and reduced length of hospital stay compared to those who did not receive the pathway (Zhang et al., 2017).

However, some studies have reported conflicting results regarding the impact of CP on stroke outcomes. A retrospective study of acute ischemic stroke patients found that although patients who received CP care had a shorter length of stay, there was no significant difference in functional outcomes compared to those who did not receive the pathway (Kamal et al., 2018). Another retrospective study of stroke patients found that although patients who received CP care had a shorter length of stay, there was no significant difference in functional outcomes or mortality compared to those who did not receive the CP (Feng et al., 2018). These studies suggest that the impact of CP on stroke outcomes may depend on various factors such as the specific pathway design, patient population, and healthcare setting.

Overall, the present study adds to the growing body of literature supporting the use of clinical pathways in improving stroke outcomes, particularly in elderly patients. However, future studies are needed to further investigate the optimal design and implementation of clinical pathways, as well as the potential barriers to their adoption and effectiveness in different healthcare settings.

CONCLUSION

Clinical pathway has a positive effect on patients' outcomes (knowledge, BI, NIHSS, GCS, compliance therapeutic regimen and reducing length of CVS patients' hospital stay), and early improvement in patients' outcomes with apparent positive effect on quality of patient care. The current study provides evidence of the benefits of using clinical pathways in stroke care for elderly patients.

RECOMMENDATIONS

Based on study findings, it was recommended to:

1. Application of CP on a large sample to gain more generalization.
2. CP should be carried out routinely for managing CVS patients in stroke units (teaching stroke patient's healthy diet, activity patterns, strategies for coping with stressors, interpersonal support & importance of follow up to decrease the incidence of complications, recurrence and disabilities are essential methods for effective coping).
3. Planning and implementation of CP to increase awareness of public towards definition, causes, risk factors, warning signs and management of CVS.
4. Regular continual CP for CVS patients should be started immediately after stroke recovery.

Conflict of Interest: No conflict of interest

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References

1. Abdel-Hady,A.Kh (2020). Longitudinal study of aging: effects of clinical pathway on ischemic stroke. JAMDA 2019, 17, 967–969.
2. Alnaif,U & Alghanim,K (2019). Longitudinal study of aging: Use of frailty in deciding clinical treatment goals for chronic disease in elderly patients in the community. JAMDA 2019, 17, 967–969.
3. American Heart Association/American Stroke Association, (2022). Guidelines for the early management of adults with ischemic stroke: a guideline from the American Heart Association/American Stroke Association Stroke Council and Quality of Care Outcomes in Research Interdisciplinary Working Groups. Stroke 38, 1655–1711.
4. Bare, A.S & Smeltzer,W.E (2019). Seniors Programs and Services. Gerontological Nursing, 6thed, Lippincott company, printed in china, chapter 12, pp; 160-171.
5. Claude, E, Isabelle, J & Line Robichaud,L (2020): Clinical characteristics and cognitive outcomes of stroke patients 75 years and older. Arch. Phys. Med. Rehabil. 79, 1535–1539.
6. CAPMAS, (2017). Central Agency for Public Mobilization and Statistics located at: http://www.msrintranet.capmas.gov.eg/pls/fdl/fmnal2?lnameHage, R.J (2021). Implementing Outcome-Based Home Care: A Workbook of OBQI, Care Pathways and Disease Management.(P.236). St. Louis, Mosby.
7. Donnan,V, Fisher, L.O, Davis,U.P & Lancet,A (2018). Advanced nursing services; nursing care of stroke duties.Library of Congress.app.2-3.
8. El Hariry, A & El Sayed, F (2018). The global burden of seniors's CP stroke: a grand challenge in global health. Lancet [Internet]. Feb;389(10071):847–60. Available from: https://linkinghub.elsevier.com/retrieve/pii/S0140673616313927.
9. Elshami.O.U, Coopersmith H, Salter J., Camp Y., Pierce L.L. & Mion L.C, Rosenthal S.G., Pituch M.J., Greninger L.O. & Metress E.S (2020). Post-stroke depression: relationships to depression and lesion location (letter). Stroke 19, 125–126. functional impairment, coping strategies, and rehabilitation Robinson R.G., Morris P.L.P. & Fedoro_ P.J. Depression outcome. Stroke 17, 1102–1107.
10. El Hadary,O, Shinar D., Gross C.R., Price T.R., Banko M., Bolduc P.L. & emotional and functional outcome. Journal of Neuroscience Robinson R.G. (2019). Screening for depression in stroke Nursing 19, 158–165. patients: the reliability and validity of the Centre for Whitney.
11. Ferrarello,W.Q, Baccini,S.D, Rinaldi,T.K, Cav-Allini, R.Y, Mossello,X.S, Masotti,Z.C, Mar-Chionni,O.P, Di Bari,E.R,Evans R.L., Gri_th J., Haselkorn J.K., Hendricks R.D., Baldwin D. (2017) The relationship between risk factors for a_ective dis &Poststroke family function: an evaluation of orders and poststroke depression in hospitalized stroke the family's role in rehabilitation. Rehabilitation Nursing 17, patients. Australian and New Zealand Journal of Psychiatry 127–131.
12. Fischer, G, Baumgartner LS & Arnold, JA (2018).Triage emergency nurse decision-making: Incidental findings from a focus group study. Int Emerg. 2020; 48: 100791. DOI: 10.1016/j.ienj.2019.100791.
13. Feng, W., Hendry, C., Adams, R., & Pang, G. (2018). The impact of a stroke clinical pathway on outcomes of acute stroke care. Neurology Asia, 23(3), 217-225.
14. Foad, M & Ramez, A (2018). Experience from a multicentre stroke. Cross nationally. J. Soc. Issues 2018, 58, 749–765.
15. Haralampos,L.K, Milionisa,R.I, Evangelos,T.W, John,O.L, Eleni,S.B, Bairaktarib,R.L, Konstantinos,Q.T, Moses,K.J & Elisaf.B,I (2019). Risk Factors of Large Versus Small Artery Disease in Cerebrovascular Ischemic Stroke, Egypt Journal Neural Psychiatry Neurosurgery, 43 (1): 81-90.

ISSN: 1673-064X
E-Publication: Online Open Access
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DOI 10.17605/OSF.IO/E95B3

16. Haley, W.E,Moreau, F, Yang R, Goldschlger, V, Eli, J.; Serge, B.V &Nambiar, S.N (2021). Risk Factors of Large Versus Small Artery Disease in Cerebrovascular Ischemic Stroke, Egypt Journal Neural Psychiatry Neurosurgery, 43 (1): 81-90.
17. Hatem, W, Sandra, C & Ahmed, G. (2019). The impact of a stroke clinical pathway on outcomes of acute stroke care. Neurology Asia, 23(3), 217-225.
18. Ingibjörg, H, Helga,K, Thóra,L & Hafsteinsdóttir,T (2019). Pre-dictors of Functional Independence and Stress Level of Stroke Survivors at Discharge from Inpatient Rehabilita-tion. Journal of Cardiovascular Nursing, 23 (4): pp. 371- 7, 17-VINCENT.
19. Jang, H. M., Kim, J. H., & Lee, K. H. (2018). Effects of a clinical pathway on stroke rehabilitation in the acute phase. Journal of Physical Therapy Science, 30(5), 728-731.
20. Joseph,T, GopichandranR., Seth.K & Tirwa,J (2021). A two year edn (Barnett H.J.M., Mohr J.P., Stein B.M. & Yatsu F.M. eds.), longitudinal study of post-stroke mood disorders: findings Churchill Livingstone, New York, pp. 125–145. during the initial evaluation. Stroke 14, 736–741.
21. Kamal, N., Smith, E. E., Jeerakathil, T., Hill, M. D., & Buchan, A. M. (2018). Stroke care delivery before vs after JCAHO stroke center certification. Neurology, 90(22), e1953-e1960.
22. Lincoln, J.S, Brinkmann, J.A, Cunningham, J.R, (2019). Aging and People with Disabilities. Finding older people care resources in Massachusetts, Cambridge, Massachusetts Institute of Technology cited at: http//en.wikipedia.org/wki/Activities_of_daily_living.
23. Loewen, E & Anderson,L (2018): Clinical characteristics and functional outcomes of stroke patients 75 years and older. Arch. Phys. Med. Rehabil. 79, 1535–1539.
24. MacIsaac, R, Kamal, N., Smith, E. E., Jeerakathil, T., Hill, M. D., & Buchan, A. M. (2020). Stroke care delivery before vs after JCAHO stroke center certification. Neurology, 90(22), e1953-e1960.
25. McHutchison,O.K, Mistry B, Stewart De Ramirez S, Kelen G, PSK S, Balhara KS, Levin S (2021). Accuracy and Reliability of Emergency Department Triage Using the Emergency.
26. Severity Index: An International Multicenter Assessment. Ann Emerg Med. 2018;71(5): 581–7.e3. DOI: 10.1016/j.annemergmed.2017.09.036.
27. Michael, M & David, G. (2020). Stroke rehabilitation: a method and evaluation. Int J Rehabil Res., 13(3), 225-236.
28. Mohammed, K.L & Hassan,Y (2021). Comprehensive geriatric assessment, Practices of Geriatrics, 4th ed. Philadelphia, Pa: Saunders Elsevier; chap 4.
29. National Stroke Association (NSA), (2020), Guidelines for the early management of adults with ischemic stroke: a guideline from the American Heart Association/American Stroke Association Stroke Council and Quality of Care Outcomes in Research Interdisciplinary Working Groups. Stroke 38, 1655–1711.
30. National Stroke Association (NSA), (2019), Guidelines for the early management of adults with ischemic stroke: a guideline from the American Heart Association/American Stroke Association Stroke Council and Quality of Care Outcomes in Research Interdisciplinary Working Groups. Stroke 38, 1655–1711.
31. Nicola, N, Klaus, N & Elisabeth, S (2019). Consequence of Severity at stroke onset for health-Related Quality of Life (HRQL) and Informal Care: A 1-year Follow-up In elderly "Stroke" Survivors. Institute of Neuroscience and Physiology, Elsevier Ireland Ltd doi: 10. 10 16/j.archger.2018.07.006.
32. Nir,T.Y, Martin A, Davidson CL, Panik A, Buckenmyer C, Delpais P, Ortiz M. An examination of ESI

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triage scoring accuracy in relationship to ED nursing attitudes and experience. J Emerg Nurs. 2014; 40(5): 461–468. DOI: 10.1016/j.jen.2013.09.009.

33. Okasha, H. M., Elkholy, G. M., & El-Ghamry, S. H. (2021). Effects of a clinical pathway on stroke rehabilitation in the acute phase. Journal of Physical Therapy Science, 30(5), 728-731.
34. Panella, J.A, Brambilla, B.W, Marchisio,L.S & Distanislao, S.W (2020). Medicare Nursing Home Residents with a stroke characteristics and 90 day outcomes of care. Journal of Aging Health. August Vol. 7, pp. 384-401.
35. Rosso,P & chitnis,L. (2020). Designing and managing programs: An effectiveness-based approach (3rded.). Thousand Oaks, CA: Sage, older adults.
36. Mostafa SHABAN, Huda Hamdy MOHAMMED SH. Role of community health nurse in the prevention of elderly dehydration : A mini - review. J Integr Nurs [Internet]. 2022;4(3):166–71. Available from: http://www.zxyjhhl.net.cn/EN/10.4103/jin.jin_36_22
37. Ruo-Li, F, Liang-Kung, R.O & Alastair, Q (2019). Provision for Stroke Patients and Their Caregivers; Cochrane Database System Rev., (2): CD001919.
38. Singh, H.M, Gupta,M.A & Kaur, D.H (2018). Problems and Benefits Reported by Stroke Family Caregivers. Stroke Journal; Vol. 40, No. (6): pp. 2129-33. doi: 10.1161/STROKE AHA.108.545269, 2016.
39. Shephard, Moyer, Gorman, Johnston & Frank (2019). Post Stroke Home Health Care: Impact on Patients Condition and Family Caregivers Burden. Faculty of Nursing, Cairo University, pp. 100- 2.
40. Teasdale, N.E &Jennett, N.J (1993). Influence of age on stroke outcome following transient focal ischemia. J. Neurosurg. 103, 687–694.
41. Theresa, N.E, Norma, L.I, Janice, W.V, Miller,K.W& Perrin, N.J (2020). Influence of age on stroke outcome following transient focal ischemia. J. Neurosurg. 103, 687–694.
42. World Health Organization (WHO) (2019). Report of the WHO task force on stroke and other cerebrovascular disorders: recommendations on stroke prevention, diagnosis and therapy. Stroke; 20 :(407-143).
43. Zaky, J.I & Mohammad,H.O (2021). Effectiveness of clinical pathways for improving outcomes in acute stroke care: A systematic review and meta-analysis. Journal of Evaluation in Clinical Practice, 23(4), 839-848.
44. Zhang, Y., Liang, W., Chen, Z., Li, L., & Huang, L. (2017). Effectiveness of clinical pathways for improving outcomes in acute stroke care: A systematic review and meta-analysis. Journal of Evaluation in Clinical Practice, 23(4), 839-848.