Effect of Nursing Practice Scheme on Knowledge and Remedial Compliance among Patients with Stroke

Asmaa Hassan Albadry[1], Shalabia Elsayed Abozead[2], Ghona Abd El-Naser Ali[3], and Alaaeldin Sedky Bekhit[4]
[1]Instructor of Medical Surgical Nursing Department- Faculty of Nursing- Sohag Unevirsity
[2]Professor of Medical Surgical Nursing, Faculty of Nursing, Assiut University, Egypt
[3]Professor of Medical Surgical Nursing, Faculty of Nursing, Sohag University, Egypt
[4]Assistant professor of Neurology, Faculty of medicine, Sohag University, Egypt
Corresponding author email Email: ***dr.Asmaahassan293@GMAIL.COM***
Phone number: ***002-01000412957***

Abstract

Background: Effective nursing practice scheme for stroke patients is a proactive procedure that starts with hospitalization care and ends with the patient returning to the community. Its goal is to help the patients regain their functional independence and resume an active and productive lifestyle. **Aim:** to investigate the effect of nursing practice scheme on knowledge and remedial compliance among patients with stroke. **Research design**: A quasi- Experimental (pre and posttest) was utilized in this study. **Setting:** It was conducted in the Neurology department at Sohag University Hospital, **Sample:** A sample of 84 patients who confirmed diagnosis of stroke, with age 35-65 years old. **Tools:** Two tools were used: Tool (I): Structured Interviewing questionnaire for patients, Tool (II): Compliance assessment questionnaire: (pre/ post).**Results:** less than three quarters of the studied patients had low knowledge level at pre-nursing practice scheme that decreased to be 8.3% at post nursing scheme phase. While, 10.7% of them had good knowledge level that increased to be 65.5% at post nursing scheme phase. 19% of them had medium compliance with medication level at preprogram that increased to be 61.9% of them at post nursing scheme phase. **Conclusion:** There was statistical significant positive correlation between the studied patient's knowledge, compliance with medication and compliance with exercise at pre and post nursing scheme at ($P < 0.05$). **Recommendation:** replication of this study on a larger probability sample and evaluating its effect on health outcomes among stroke patients.

Keywords: Knowledge, Nursing practice scheme, Remedial compliance, Stroke

Introduction

A stroke is defined as an immediate interruption of the blood flow to the brain. tissues caused on by stenosis, blockage, or rupture of the cerebral blood arteries. This condition results in brain damage that impairs brain function. Its start and development are rapid. **(Jang & Lee., 2022).** Stroke's enormous occurrence over the world has made it the leading cause of epidemiological death in humans. About 80% of all stroke types are ischemic strokes, which have a high recurrence rate. **(Jang et al., 2022).**

According to WHO estimates, between 150,000 and 210,000 new strokes occur in Egypt annually, and low- and middle-income nations like Egypt account for 85% of stroke deaths**. (Farraga et al., 2018).**

The following are risk factors for stroke: being overweight, being 55 years of age or older, having a history of stroke, leading a sedentary lifestyle, having a tendency to smoke and consume alcohol. **(Moreau et al., 2018).**

Stroke is the most prevalent cause of long-term functional impairment. With 15% to 30% living with lifelong disability and 50% to 70% functionally independent. Furthermore, 26% need long-term care, and 32% will use home healthcare services. **(Summers et al., 2018).**

In stroke patients, remedial compliance is essential for subsequent prevention. In stroke survivors, noncompliance might result in recurrence, disability, or even death. **(Weijing and Li-hong., 2021).**

The effective management of chronic illnesses depends on patient cooperation. Disease control is aided by patient adherence to prescription regimens and medical advice. **(Ekinci et al., 2023)** and Improved clinical outcomes for chronic diseases. **(Aremu et al., 2022).** Unfortunately, the literature reports low levels of patient compliance. **(Sen et al., 2023).** Health problems and deterioration are caused by low patient compliance. Readmission is a common occurrence for hospitalized patients suffering from chronic illnesses in the past due to factors such therapeutic non-compliance and lifestyle modifications. **(Tun, 2021).** Noncompliance can lead to inefficient treatment outcomes, greater hospitalization rates, decreased discharge rates, complications, increased healthcare expenses, and mortality. **(Desai et al., 2023)**.

The effectiveness of a medical therapy is determined by remedial compliance regimens, which enhance health and help control illnesses. **(Nassar et al., 2022).** However, despite compliance is usefulness for better health and preventing recurring strokes, compliance among stroke patients is known to be poor. **(Chapman and Bogle., 2022) .**

The degree to which patients obey medical professionals' orders and follow their medications is known as remedial compliance. Moreover, It is the extent to which the patient's activities (such as taking their medications, adhering to a diet, getting regular exercise, and/or making lifestyle adjustments) are in line with the recommendations that have been made. In addition to adhering to a diet, supporting relaxation, encouraging exercise, and getting regular health assessments, the patient might need to precisely take their medications. **(Krot and Sousa., 2019),** the nurse plays a crucial role in guiding and instructing patients toward adherence.

Nursing practice for stroke patients must focus on assisting with functional rehabilitation. Supporting self-care and everyday life activities, lowering the chance of subsequent complications, and, in the end, encouraging comprehensive adjustment to stroke-related impairment. **(Abd El-Hay et al , 2018)**.

The nursing practice scheme for stroke patients attempted to increase knowledge and practice about appropriate action, limit the serious consequences of stroke, and prepare patients for the rehabilitation phase. **(White et al., 2020).**

Nursing practice schemes are crucial for improving patient compliance because they serve as the foundation for most patient-core interventions. They also enable patients to make decisions about their care and can help them become more motivated to follow the recommended therapy plan **(Marcus, 2017).**

Nurses play an essential role in assuming responsibility for each stroke patient. In general, nurses may help stroke patients better manage their condition by providing nutritional knowledge, helping with meal plans, encouraging behavior changes, and building flexibility and confidence. This duty entails putting patients with stroke, their families, and relatives in contact with various patient care settings, including acute care, rehabilitation centers and primary care. **(Maslakpak & Shams, 2020).**

Operational definition

Compliance remediation: is the process of creating a plan to following a medical regimen or schedule correctly and consistently, including taking medicines or following a diet to correct and prevent problems from occurring. **(National cancer institute, 2020)**

Significance of the study

According to **the World Stroke Organization, (2019),** 15 million individuals worldwide suffer from strokes every year. **(Lindsay et al., 2019).** According to statistic, around 795,000 people have a stroke in the United States every year. **(Mozaffarian et al., 2021).** In Egypt, it was predicted that between 150,000 and 210,000 strokes occurred each year. **(Farrag et al., 2021).** According to Sohag University Hospital's data records, 1000 patients with stroke were admitted in 2022. **(Sohag Statistical Record., 2022)**

Stroke is linked to profoundly negative effects on the social, psychological, and physical functioning of patients. Among the most significant effects are loss of independence, restrictions on activities, functions, and physical mobility, and challenges for stroke patients to engage in Social roles before a stroke, employment, or leisure activities. Studies have also shown that stroke survivors are more likely to experience post-stroke depression in addition to Anxiety and psychological stress, or low self-esteem. **(White et al., 2020).**

From clinical experience of researcher, it was found that stroke patients are ignorant about the condition, its consequences, and its treatment. So, they need health education to increase their knowledge and remedial compliance

Aim of the study

The aim of the current study was to investigate the effect of nursing practice scheme on knowledge and Remedial Compliance among Patients with Stroke.

Study variables

Dependent variables: Knowledge and remedial compliance

Independent variables: nursing practice scheme

Research hypotheses

1. Patients who receive nursing practice scheme exhibit higher knowledge mean score than those who do not receive it.
2. Level of remedial compliance of patients with stroke will improve after applying nursing practice scheme

Method

Research design

The research design used in this study was quasi-experimental (pre - posttest).

Research Setting

The proposed study was conducted in the Neurology department on the third floor at Sohag University Hospital. Which consists of 5 rooms (3 female and 2 male) and each room has 8 beds. **Sample:** A convenient sample consisting of 84 patients was included in the study.

Sample size: The size is computed using the following equation:

n = N Z 2 σ 2 Z 2 σ2 + N e 2 n = 1000× (1.96) 2 ×(0.244) 2 (1.96)2× (0.244)2+1000× (0.05)2 = 83.817 ≅ 84 Where: Z = 1.96 [standard scores], e = 0.05 [error], σ = 0.244 [SD],
N = 1000 [population]
n = 84 [sample]

Inclusion criteria for the patients

- Adult conscious male and female patient from 35 to 65 yrs.
- A verified stroke diagnosis
- Able to communicate.

Exclusion criteria for the patients

- Patients, who have substantial cognitive impairment, as reported by their physician, may have delirium.
- Patients undergoing brain surgery right now.
- Diagnosed with depression, or an anti-depressive treatments.
- Have any educational program

Tools for data collection: Two tools are used to collect data:

Tool (I): A structured interviewing schedule: was developed by the researcher using a clear, basic Arabic language after a review of the literature**. (Ostwald, 2015).**

It consists of three parts:

Part 1. Demographic Data: by asking patients about age, sex, level of education, occupation, residence and marital status.

Part 2. Medical data. it consists of questions on the patient's past hospital admissions, the beginning of the stroke, any prior neurological conditions, the causes of the stroke, the type of clot the patient had, and the patient's handicap as a result of the stroke.

Part 3. Patients' Knowledge Assessment: (pre / post): developed by the researchers after reviewing of the related literature **(Ostwald., 2015).** It was used to assess patient knowledge about stroke. It consisted of 15 closed ended questions such as (definition, causes, types, signs, symptoms, diagnosis, complications, prevention, and therapies). The purpose of the questions was to extract information from the patient regarding stroke.

Scoring system:

Questions on the patient knowledge assessment sheet were closed-ended. The researcher's model key answer was used to evaluate the responses. Three responses from 0:2 were divided as:

¬ 0→ incorrect or I don't know.
¬ 1→ incomplete correct.
¬ 2→ complete correct.

There were three levels based on the total knowledge score (30 degree):

¬ Low knowledge scale level < 50% (<15 degree).
¬ Fair knowledge scale level 50% - < 70 % (15- < 21 degree).
¬ Good knowledge scale level ≥ 70% (≥ 21 degree)

Tool II: Compliance assessment questionnaire: (pre/ post)

Part I: Compliance of medications: This portion was analyzed with the Morisky Medication Adherence Scale. (MMAS – 8). The MMAS-8 is a self-reported measure developed by **(Morisky et al., 2008).** It is employed to evaluate the degree of medication adherence among patients. 8 questions were used to assess the patients' forgetfulness, their comprehension of the necessity of continuing their medication, and whether or not they felt that following their daily treatment plan was difficult: a score of zero indicated a positive response and a score of one indicated a negative response for questions 1, 2,3,4,6 and 7 (Yes= 0; No= 1). Contrariwise, for item 5, a score of zero was given for a negative response while a score of one was given for a positive response (Yes= 1; No= 0). For item 8, if a patient selects response ''0", the score is ''1" and if they selects response ''4", the score is ''0". Responses ''1, 2, 3" are respectively rated as ''0.25, 0.75, 0.75". The total score was eight. Patients who had a score below 6 were considered having low adherence. Patients who had a score between 6 < 8 were considered having medium adherence. While patients who had a score equal 8 were considered having high adherence.

The sum of total compliance to medication was 28 scores developed by the researchers after reviewing of the related literature **(Morisky et al., 2008).** and then categorized into

¬ Low compliance < 50%.
¬ Medium compliance 50% - < 70 %.
¬ High compliance ≥ 70%

Part II: Compliance of patient's with Exercises (Slujis et al., 1993): It is used to evaluate patients' adherence to exercise. Twelve statements. The patient is asked to circle a number from 1 to 4 based

on how well they believe the statement applies to them. The items are assessed on a four-point scale that ranges from 1 (agree) to 4 (disagree). The maximum score that a person can obtain in this scale is 48 and a minimum score is 12.

Score Interpretation: Total score: 48

Low compliance (12 – 23), Medium compliance (24 - 35) and High compliance (36 -48).

Validity & Reliability:

Face validity of the data collection tools was reviewed by a panel of five experts in the field of Medical Surgical Nursing and Neurology Medicine. Also its reliability was statistically examined. According to reliability, the instruments were tested and demonstrated good internal reliability as Cronbach′s alpha for stroke knowledge scale was 0.88, compliance with medication scale was 0.76 and compliance with exercises scale was 0.92.

Pilot study

A pilot study was done with 10% of the study participants to test the tool's clarity, objectivity, feasibility, and application. The pilot study participants were included in the actual research participants when the final format was modified to reflect the necessary changes.

Ethical Consideration

The Ethics and Research Committee of the Faculty of Nursing at Sohag University provided written approval. Similarly, hospital administrators approved the research study. The objective and nature of the study, as well as its significance, were conveyed to all participants who met the inclusion criteria. Patients and family who agreed to participate in the study provided signed consent. Furthermore, the data were coded to ensure anonymity and confidentiality. Patients were advised that their participation was voluntary and that they could withdraw from the study at any moment and there is no risks for participants.

Procedure

Data were collected over a period of 9 months from august 2023 to April 2024. The research was carried out in 4 phases; (assessment, planning, implementation and evaluation):

Assessment phase: Patients were tested prior to the start of the nursing practice scheme using Tool (I) to collect baseline data, and Tool II to evaluate patients' compliance of stroke patients. The knowledge questionnaire sheet was completed within thirty minutes.

Planning phase: The researcher created a nursing practice scheme in accordance with the literature review, and the study's objectives were established in accordance with the needs of the study subjects. A simple Arabic-language instructional booklet with structured illustrations was created to serve as a guide for the patients. A variety of teaching techniques were employed, including group discussions, videos, and presentations for the theoretical portion and for the practical component, there will be a demonstration and a redemonstration. During sessions, each patient received a booklet to review their knowledge and practice.

Determine the best time to gather data through an exploratory visit to settings. The nursing practice scheme was conducted in 4 sessions to all patients. Each session lasted from 20 to 30 minutes.

Implementation phase: During the first week, patient assessments were completed. After that, they were split up into groups, and the research settings were used to apply the nursing practice scheme. The researchers implemented a nursing practice scheme that was split into four sessions, which were as follows:

The first session covered an overview for the nursing practice scheme, its goals, its schedule, its advantages, and the first section of theoretical knowledge about strokes, including the definition of a stroke, its causes, its types, its symptoms, complications and risks.

The second session. Covered the significance of taking medication, the consequences of not taking it, and methods to improve medication adherence through group discussions, which served as a teaching method. The use of visual aids like photos and movies to demonstrate and re-demonstrate knowledge.

Whereas, **the third session** offered information about movement, elimination, eating and drinking, bathing, clothing, and assistive devices and healthy life style.).

Finally, **the fourth session** for practical part of nursing scheme about few exercises the patient can perform to improve his physical condition.

Each session started by summarizing the previous one's topics and outlining the goals of the current one in simple Arabic. It also ended with a summary of its contents and patient feedback to ensure the patient was getting the most benefit possible.

Lecturers and discussions were utilized as teaching tools, each patient was given an illustrated booklet as a hand out, the researcher and patients maintained an open line of communication to ensure understanding, answer any question and to confirm information. At the conclusion of the session, the patients were notified of the time of the following one.

Evaluation phase: after implementing nursing practice scheme, evaluation of the effect of applying the nursing practice scheme was done immediately after implementation of nursing practice scheme and then after two months later, Using Tool (I) part 3, Tool II, the researchers reevaluated knowledge and compliance for the patients to see if there had been any improvements over time among the participants. The researcher observed each patient both immediately and after two months after the applied the planned nursing practice scheme to determine the patients' physical improvement.

Data analysis

Data entry and analysis were done using Statistical Package for Social Science (SPSS) software version 20 because it incorporates the significance test found in a standard statistical book. Collected data will be summarized, tabulated and analyzed. Descriptive and inferential statistics was be tested to examine the differences and similarities. Statistics was be considered at P value (≤ 0.05).

Results

Table (1): Illustrates that less than half of the patients (45.2%) their age ranged from 60 years to 65 years old and more than half (56%) of them were female and were illiterate. Also, less than half 47.6% of them didn't have work, more than two thirds of them (69%) were from rural area and less than two thirds of them (61.9%) were married.

Table (2): Demonstrates that more than three quarters of the patients (79.8%) had Previous admission to hospital and most of them (92.9%) had less than 5 years of onset of stroke occurrence and hadn't any history of previous neurological disease. In addition, less than two thirds of them (61.9%) had history of smoking, more than half of them (53.6%) the causes of stroke was presence of hypertension, more than half of them suffered from ischemic clot and impaired movement (54.8% , 52.4% respectively)

Figure (1): Distribution the total studied patient according to their knowledge through program phases (n=84)

Figure (1): illustrates that, less than three quarters of the studied patients had low knowledge level at pre-program phase that decreased to be 8.3% at post program phase. While, 10.7% of them had good knowledge level that increased to be 65.5% at post program phase.

Figure (2): Shows that 76.2% of the patients had low compliance level with medication at pre nursing scheme phase that decreased to be 15.5% at post nursing scheme, Furthermore, 19% of them had medium compliance with medication level at pre nursing scheme that increased to be 61.9% of them at post nursing scheme phase.

Figure (3): Reveals that 17.9% of the patient had high compliance level with exercise at pre nursing scheme that increased to be 82.1% of them at post nursing scheme. While, 29.8% of them had low compliance level at pre nursing scheme that decreased to be 1.2% of them at post nursing scheme phase.

Table (3): Illustrates that there was significant relation between the patient educational level and their knowledge and occupation at pre-nursing scheme and their age, educational level, occupation and residence at post nursing scheme at ($p < 0.05$).

Table (4): Reveals that there was statistical significant positive correlation between the patients knowledge, compliance with medication and compliance with exercise at pre and post nursing scheme phase at ($P < 0.05$).

.

Results

Table (1): Frequency distribution demographic data among studied patients (n=84)

Variables	No	%
Age 18< 30	5	6.0
30<40	4	4.8
40<50	20	23.8
50<60	17	20.2
60 - 65	38	45.2
Sex		
Male	37	44.0
Female	47	56.0
Level of education		
Illiterate	47	56.0
Read and write	26	31.0
Preparatory school	1	1.2
Secondary school	10	11.9
Occupation		
Employer	34	40.5
House wife	10	11.9
Not work	40	47.6
Retired	**0**	0.0
Residence		
Urban	26	31.0
Rural	58	69.0
Marital status		
Single	2	2.4
Married	52	61.9
Widow	30	35.7

Table (2): Frequency distribution of medical history among studied patients (n=84)

Medical History	No	%
Previous admission to hospital		
yes	17	20.2
No	67	79.8
Onset of stroke occurrence		
Less than 5 years	78	92.9
5- 10 years	6	7.1
Mora than 10 years		
History of any previous neurological disease		
yes	6	7.1
No	78	92.9
History of smoking		
yes	32	38.1
No	52	61.9
Causes of stroke		
Smoking	10	11.9
Hypertension	45	53.6
Diabetes	15	17.8
heart disease	29	34.5
Obesity	12	14.3
Gene	34	40.5
Type of stroke		
Hemorrhage	38	45.2
Ischemic	46	54.8
Disability resulting from stroke:		
Impaired sensation	15	17.8
Loss of sensation	20	23.8
Impaired movement	44	52.4
Paralysis and loss of movement	16	19.1
Mental disorder	6	7.1
Speech disorder	11	13.1
- Cognitive disorder	15	17.8
Psychological disorder	20	23.8

Figure (1): Distribution the total studied patient according to their knowledge through program phases (n=84)

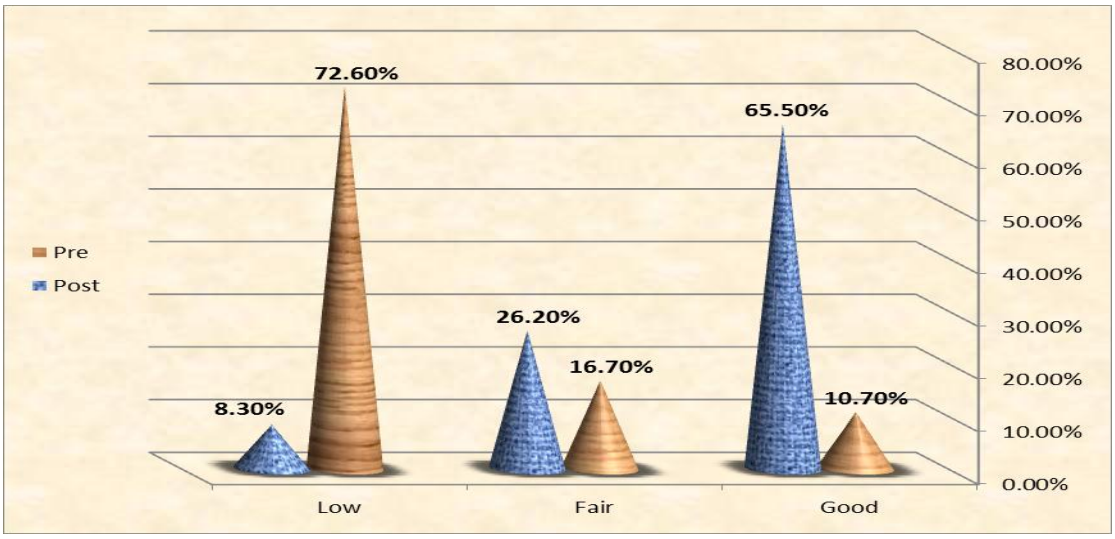

Figure (2): Distribution the total studied patient compliance with medication through nursing scheme phases (n=84)

Figure (3): Distribution the total studied patient compliance with exercise through program phases (n=84)

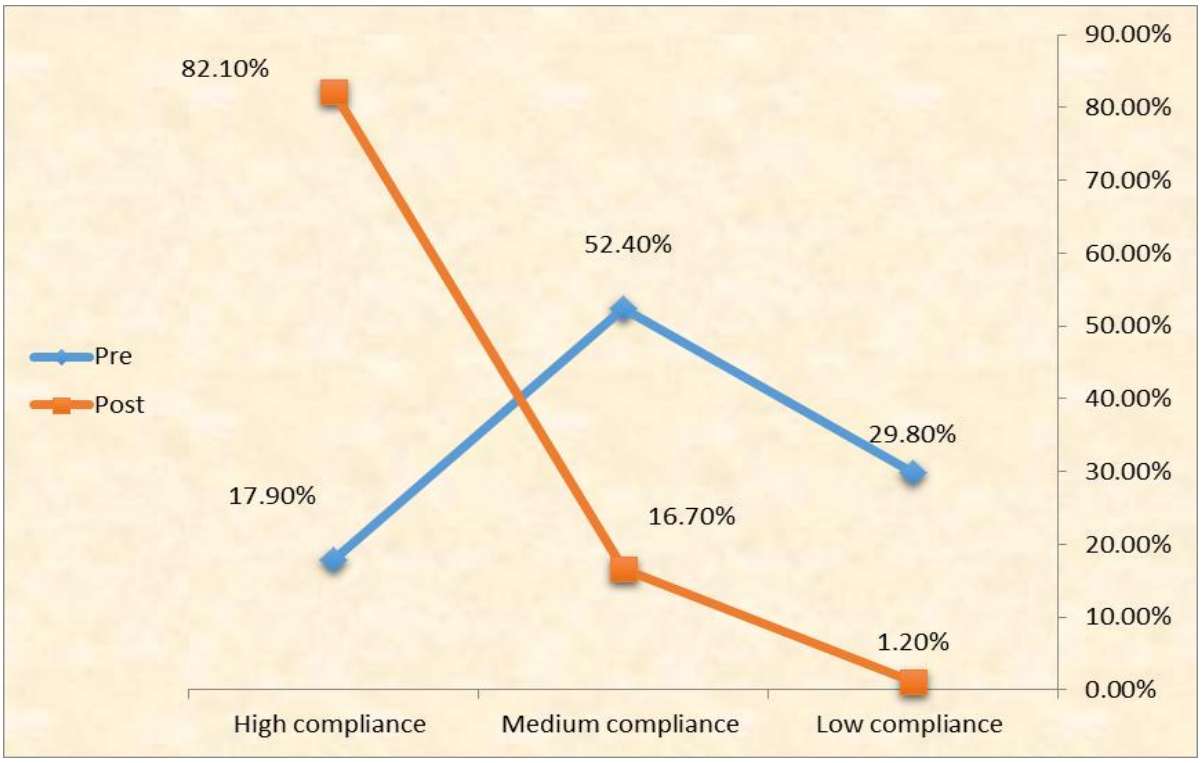

Table (3): Relation between the study variables and Scio demographic data among studied patients through program phase (n=84)

Scio-demographic characteristics	Study variables					
	Pre program			Post program		
	Patients' Knowledge	Compliance of patients with medications	Compliance of patients with exercises	Patients' Knowledge	Compliance of patients with medications	Compliance of patient's with Exercises
	M ± SD	M ± SD	M ± SD	M ± SD	M ± SD	M ± SD
Age						
18< 30	14.400 ±1.516	4.8000 ±1.7888	41.00 ±5.244	25.80 ±7.529	3.9500±1.462	26.20±5.01
30<40	12.750 ±.957	5.2500 ±2.217	42.50 ±3.696	22.50±3.316	3.7500±.500	26.00±6.92
40<50	13.500±1.504	5.6500 ±1.663	39.300 ±7.284	21.65 ±2.30	4.8375±3.225	26.650±4.97
50<60	13.058±1.477	5.6471 ±1.1147	42.11 ±5.532	21.35 ±1.22	3.5000±1.283	25.58±3.77
60 - 65	13.715±1.799	6.0263 ±1.218	39.78 ±5.733	20.50 ±2.61	4.0987±1.613	27.526±4.42
F (P)	1.09(.382)	1.121(.353)	.742(.566)	4.13(.004*)	1.051(.387)	.590(.671)
Sex						
Male	13.596±1.7710	5.4865±1.32543	41.05±5.4870	21.48±2.008	4.1689±2.6829	26.89±4.68
Female	13.481±1.530	5.9574±1.44399	39.78±6.3517	21.25±3.685	4.0957±1.382	26.68±4.48
t (P)	.351(.727)	1.538(.128)	.963(.339)	.34(.732)	.162(.872)	.210(.834)
Level of education						
Illiterate	13.266±1.61113	5.9787±1.11295	40.531±5.800	20.80 ± 2.601	4.0053±1.472	26.787±4.31

Read and write	13.846±1.47856	5.4231±1.70113	39.50±6.883	21.26±2.12	4.573±2.969	26.846±5.10
Preparatory school	11.000±1.47856	5.0000	45.0000	22.0000	3.000±2.969	29.00±5.104
Secondary school	14.000±1.88562	5.6000±1.776	41.20±4.6139	24.10±5.342	3.6750±1.414	26.300±4.73
F (P)	1.928(.032*)	1.019(.389)	.449(.719)	3.52(.019*)	.714(.547)	.115(.951)
Occupation						
Employer	13.267±1.543	5.5294±1.542	40.882±5.601	21.11±2.156	4.1985±2.709	27.323±5.13
House wife	13.500±2.013	5.3000±1.418	38.20±9.818	25.00±4.966	4.1000±1.355	24.50±4.76
Not work	13.500±1.613	6.0500±1.239	40.425±5.098	20.65±2.486	4.0750±1.502	26.875±3.85
F (P)	.810(.048*)	1.884(.159)	.779(.462)	10.15(.000**)	.034(.967)	1.527(.223)
Residence						
Urban	13.842±1.405	5.5000±1.65529	40.423±5.72834	20.153±2.781	4.5673±2.907	26.76±5.12
Rural	13.379±1.7150	5.8621±1.27662	40.310±6.14505	21.89±3.0302	3.9310±1.5020	26.775±4.31
t (P)	1.216(.228)	1.093(.277)	.079(.937)	2.497(.015*)	1.324(.189)	.006(.995)
Marital status						
Single	15.00±.000	5.5000±.707	38.00±9.899	20.00±.0000	5.6250 ± .530	21.0000±.00
Married	13.192±1.540	5.7500±1.506	40.55±5.902	21.86±3.447	4.0962±2.323	26.8462±4.56
Widow	13.333±+1.813	5.7667±1.278	40.133±6.112	20.56±2.112	4.0833±1.519	27.0333±4.49
F (P)	.862(.426)	.033(.968)	.201(.818)	1.975(.145)	.543(.583)	1.695(.190)

* Statistically significant at p<0.05. ** Highly statistically significant at p<0.001.

Table (4): Correlation matrix between the studied Patients' knowledge, Compliance of patients with medications and Compliance of patients with Exercise through nursing practice scheme phases (n=84)

Study variables / Phases of study		Patients' Knowledge		Compliance of medications		Compliance of exercises	
		r	P	r	P	R	P
Pre	**Patients' Knowledge**	--	---	0.602	0.043*	0.103	0.025*
	Compliance of medications					0.982	0.001**
	Compliance of exercises					---	---
Post	**Patients' Knowledge**			0.542	0.003*	0.362	0.026*
	Compliance of medications					0.418	0.033*
	Compliance of exercises						

* Statistically significant at p<0.05. ** Highly statistically significant at p<0.001.

Discussion

Nursing practice scheme for stroke patients is extremely important in improving their quality of life. Some patients have limited compliance with the advice for suitable food, regular exercise, and regular medication due to reasons such as insufficient knowledge of the condition and rehabilitation training, lack awareness of self-discipline. etc. **(Forster et al., 2023)** Hence, The current study aimed to investigate the effect of nursing practice scheme on knowledge and remedial compliance among patients with stroke. In order to support the current research hypotheses; the following discussion presented in the subsequent manner: the first section discussed patient knowledge

which verify the first hypothesis, while second part focused on remedial compliance among patient with stroke which support the second hypothesis of the study.

The present study showed that a less than three quarters of the patients had low knowledge level at pre-program phase. While, two third of them had good knowledge level at the post program phase. From my point of view, these results are due to providing information in a simplified manner according to the patient's level of understanding, using videos and pictures, and giving the patient a booklet containing information about stroke in simple language.

This result supported by **(Ibrahim & Taha., 2020)** who was studying about "Effect of a Design Discharge Planning Program for Stroke Patients on Their Quality of Life and Activity of Daily Living" he mentioned that the majority of the studied patients had an unsatisfactory knowledge level pre design discharge planning program implementation. However, only one-fifth of the studied patients had an unsatisfactory knowledge level immediately after implementing the design discharge planning program. The knowledge level increased to three-quarters immediately following the implementation of the planning program, with a minor decline to two-fifths and one-third during the follow-up periods (1st and third month).

furthermore, this result similar with **(Elsehry et al. 2019)** who was studying about" Effect of an Educational Program on the Elderly with Stroke and their Family Caregivers Based on Transitional Care Model" found that the whole sample had no knowledge about stroke in the pre-program, but in the post-test, the majority of them had a high knowledge score about stroke

The same result was supported with **(Beider et al. 2022)** who conducted a study on the" Effect of Nursing Educational Program on knowledge Among Patients at Risk for Stroke" concluded that there was a statistically significant improvement in knowledge scores among participants during the pre-test and post-test.

According to the current study, during the pre-program phase, three-quarters of the studied patients had low medication compliance. that decreased to be around one fifth at post nursing scheme, Furthermore, one fifth of them had medium compliance with medication level at pre nursing scheme that increased to be around two third of them at post nursing scheme phase. In my point of view, I founded that Medication adherence is influenced by a variety of factors, including level of knowledge and belief in treatment. The most influential element on the quality of life of stroke patients is belief in treatment, and perceptual beliefs influence adherence. Moreover, good social support and quality family help can increase medication adherence in stroke patients. This result agree with **(Wang et al., 2021)** who conducted a study titled" Independent predictors of medication adherence among Singaporean patients following an ischemic stroke or transient ischemic attack" and reported that half of patients had a high degree of medication adherence. Approximately less than half of patients were at a medium level. Approximately more than half of them were at a low level.

Likewise **(Fang et al., 2022)** who conducted a study titled" Effects of continuous nursing on rehabilitation compliance, living quality and daily living ability of patients with acute ischemic stroke " and pointed that the compliance rate of the continuous nursing group majority of patients was significantly higher than that of the conventional nursing group.

Also the previous finding was supported by **(Emmanouela and Evangelos__., 2019)** who conducted study titled " Adherence to Treatment in Stroke Patients" and reported that two third of patients were categorized as optimally compliant while the one fifth of them as partially compliant after nursing intervention.

The same findings was consistent with **(Zhang et al., 2019)** who was studying about" Psychological distress, social support and medication adherence in patients with ischemic stroke" and reported that one third of patients obtained high medication adherence, more than half of patients medium medication adherence, and one fifth of patients low medication adherence.

In accordance with our results **(Khettar et al., 2022)** who was studying about" multi professional intervention to improve adherence to medication in stroke patients" and confirm this conclusion, as they said that there was significantly improve medication adherence in stroke patients following an educational program.

The present study revealed that around one fifth of the patient had high compliance level with exercise at preprogram that increased to be majority of them at post program. While, around one third of them had low compliance level at preprogram. From my point of view, I think that this result due to some factors as: Good exercise self-efficacy can help patients take the initiative, raise motivation and self-confidence in exercise rehabilitation, and so improve home exercise adherence. This result similar to **(Hussain et al., 2022)** who conducted study titled" Exercise Compliance in Patients with Stroke Following Physical Therapy Treatment" and found that The results showed that individuals with stroke had limited to moderate activity compliance following physiotherapy intervention However this conclusion contradicted by **(Tanveer et al., 2022)** who conducted study titled" Compliance in Patients with Stroke Following Physical Therapy Treatment" and reported

that there was low to moderate level of compliance to exercise in patients with stroke following physiotherapy intervention.

Conclusion

The post mean remedial compliance and knowledge scores of patients with stroke who were exposed to nursing practice scheme were higher than their pretest mean scores. There were statistical significant positive correlation between the studied patients knowledge, compliance with medication and compliance with exercise.

Recommendations

1. There is a need for continuous assessment and monitoring knowledge, remedial compliance of stroke patients for early detection and solving any problems.
2. Further studies using random sample are needed to validate the existing findings for broader applicability to evaluate physical problems affecting on compliance for patients with stroke.

References

1. **Abd El-Hay, S., Abed Allah, A., & Tag El Din, E. (2018).** Effect of implementing designed educational training program for neurological nurses on clinical outcomes of stroke patients. Clinical Nursing Studies, 6(4), 121-137.
2. **Aremu, T, Oluwole, O, Adeyinka, K & Schommer, J., (2022).** Medication adherence and compliance: Recipe for improving patient outcomes. Pharmacy, 10(5), 106. 10.3390/pharmacy10050106.
3. **Bedir, N., Sheir, M., Shahin, E., & Abd El-Reheem, H. (2022).** Effect of nursing educational program on knowledge among patients at risk for stroke. Port Said Scientific Journal of Nursing, 5(1), 188-211.)
4. **Chapman B, Bogle V. (2022)** Adherence to medication and self-management in stroke patients. Br J Nurs. 23(3):158-166. https://doi.org/10.12968/bjon.2014.23.3.158.
5. **Desai, R., Thakkar, S., Fong, H.., Varma, Y., Khan, M.., Itare, V., Raina, J., Savani, S., Damarlapally, N., & Doshi, R. (2023).** Rising trends in medication non-compliance and associated worsening cardiovascular and cerebrovascular outcomes among hospitalized adults across the United States. Cureus, 11(8), e5389. 10.7759/cureus.5389.
6. **Ekinci, F., Tuncel, B., Coşkun, D., Akman, M., & Uzuner, A. (2023).** Effects on blood pressure control and compliance for medical treatment in hypertensive patients by sending daily sms as a reminder. Konuralp Medical Journal, 9(2), 136-141. 10.18521/ktd.288633.
7. **Elsehry N., Fouda L., Elsiedy E., El-Zeftawy A &Mohamed N. (2019)**: The Effect of an Educational Program on the Elderly with Stroke and their Family Caregivers Based on Transitional Care Model،International Journal of Novel Research in Healthcare and Nursing Vol. 6, Issue 1, pp: (765- 785)
8. **Emmanouela C and Evangelos C. (2019),** Adherence to Treatment in Stroke Patients, Int J Environ Res Public Health. Jan; 16(2): 196. Published online Jan 11. doi: 10.3390/ijerph16020196.
9. **Fang L, Qingmei G, and Ying L., (2022),** Effects of continuous nursing on rehabilitation compliance, living quality and daily living ability of patients with acute ischemic stroke, Am J Transl Res.; 14(1): 381–388.
10. **Farrag, M., Oraby, M., Ghali, A., Ragab, O., Nasreldein, A., Shehata, G., & Abd-Allah, F. (2021).** Public Stroke Knowledge, Awareness, and Response to Acute Stroke: Study from 4 Egyptian Governorates. Journal of the Neurological Sciences, P. 384, 46-49.
11. **Farraga M, Orabyb M, Ghalic A. (2018).** Public stroke knowledge, awareness, and response to acute stroke: Multicenter study from 4 Egyptian governorates. Journal of the Neurological Sciences. 384: 46-49. PMid: 29249376. https://doi.org/10.1016/j.jn s.2017.11.003.
12. **Forster A, Murff H, Peterson J, Gandhi T, Bates D.(2023)**: The incidence and severity of adverse events affecting patients after discharge from the hospital. Ann Intern Med.;138:161–167.
13. **Hussain S, Raza M, Tanveer F, Arslan S, Wajeeha Z, Suhail M, Waris S., (2022)**, Exercise Compliance in Patients with Stroke Following Physical Therapy Treatment., P J M H S Vol. 16, No.01, JAN 2022 523., DOI: https://doi.org/10.53350/pjmhs22161523.
14. **Ibrahim R & Taha A., (2020),** Effect of a Design Discharge Planning Program for Stroke Patients on Their Quality of Life and Activity of Daily Living, International Journal of Studies in Nursing; Vol. 5, No. 1; ISSN 2424-9653 E-ISSN 2529-7317, URL: https://doi.org/10.20849/ijsn.v5i1.724.
15. **Jang S, Lee H. (2022),** Recovery of an injured ascending reticular activating system with recovery from a minimally conscious state to normal consciousness in a stroke patient: a diffusion tensor tractography study. Neural Regen Res. 15:1767–1768.
16. **Jang S, Seo Y, Lee S.(2020).** Increased thalamocortical connectivity from the affected

thalamus to the unaffected hemisphere in a stroke patient. Neural Regen Res. 2020;15:1568.

17. **Khettar S , Courtois S , Luaute J , Decullier E , Bin S , Dupuis M , Derex L , Mechtouff L , Nighoghossian M, Dussart C, Rode G,(2022)** , multiprofessional intervention to improve adherenc to medication in stroke patients: a study protocol for a randomised controlled trial (ADMED AVC study), Eur J Hosp Pharm;29:169–175. doi:10.1136/ejhpharm-2020-00242.
18. **Krot, K and Sousa, J. (2019**): Factors impacting on patient compliance with medical advice: empirical study. Engineering Management in Production and Services, 9(2), 73-81.
19. **Lindsay, M. P., Norrving, B., Sacco, R. L., Brainin, M., Hacke, W., Martins, S & Feigin, V. (2019).** World Stroke Organization (WSO): Global Stroke Fact Sheet.
20. **Marcus, C. (2017):** Strategies for improving the quality of verbal patient and family education: a review of the literature and creation of the Educate model. Health Psychology and Behavioral Medicine, vol (2), issue (1), Pp.482–495.
21. **Maslakpak, M., & Shams, S. (2020**). A comparison of face to face and video-based self-care education on quality of life of hemodialysis patients. International Journal of Community Based Nursing and Midwifery, 3(3), 234–243.
22. **Moreau F, Yang R, Nambiar V. (2018)** Near-infrared measurements of brain oxygenation in stroke. Neurophotonics,; 3(3): 031403- 031403. PMid: 26958577. https://doi.org/10.1117/1.NPh. 3.3.031403.
23. **Morisky D, Ang A, Krousel-Wood M, Ward H (2008)** Predictive validity of a medication adherence measure in an outpatient setting. J Clin Hypertens (Greenwich) 10: 348–354.
24. **Mozaffarian, D., Benjamin, E., Go, A., Arnett, D., Blaha, M., Cushman, M., & Turner, M. (2021).** Executive Summary: Heart Disease and Stroke Statistics 2015 Update. Circulation, 131(4): 434-41.
25. **Nassar R, Basheti I, Saini B. (2022).** Exploring Validated Self-Reported Instruments to Assess Adherence to Medications Used:A Review Comparing Existing Instruments. Patient Prefer Adherence. ;16(1):503-513. https://doi.org/10.2147/PPA.S352161.
26. **National cancer institute, (2020).** Retrived from https://www.cancer.gov/publications/dictionaries/cancer-terms/def/compliance
27. **Ostwald, S. (2015**). Predictors of life satisfaction among stroke survivors and spousal caregivers: a narrative review. Journal of Aging Health, 4(3), 241-252.
28. **Sen, H.., Linh, T.., & Trang, D. (2023).** Factors related to treatment compliance among patients with heart failure. Ramathibodi Medical Journal, 43(2), 30-40. 10.33165/rmj.2020.43.2.239889.
29. **Sluijs E, Kok G, van der Zee J (1993).** Correlates of exercise compliance in physical therapy. Phys Ther. 73: 771-782. https://doi.org/10.1093/ptj/73.11.771.
30. **Sohag Statistical Record of Sohag University Hospital. (2022).** Consensus of adult patients with stroke. Retrieved officially from administrators.
31. **Summers D, Leonard A, Wentworth D., (2018).** Comprehensive overview of nursing and interdisciplinary care of to the acute ischemic stroke patient. Stroke; 40(8): 2911-44. PMid: 19478222. https://doi.org/10.1161/STROKEAHA.109.192362
32. **Tanveer F, Arslan S , Zahra W and Waris S., (2022),** Exercise Compliance in Patients with Stroke Following Physical Therapy,Treatment, Pakistan Journal of Medical & Health Sciences · January, DOI: 10.53350/pjmhs2216152, at: https://www.researchgate.net/publication/359520250.
33. **Tun, H. (2021).** Importance of medication compliance and lifestyle modification in heart failure readmission: Single centre cohort study. European Journal of Preventive Cardiology, 28(Supplement_1), zwab061-030. 10.1093/eurjpc/zwab061.030.
34. **Wang W, Chia G, Tan I, Tye S, Wang X, Zhu B. (2021).** Independent predictors of medication adherence among Singaporean patients following an ischaemic stroke or transient ischaemic attack. J Clin Nurs. 26:5016–24. 10.1111/jocn.14001.
35. **Weijing and Li-hong. (2021),** Association Between Patient Activation and Medication Adherence in Patients With Stroke: A Cross-Sectional Study, Front Neurol. 10.3389/fneur.2021.722711.
36. **White, C., Barrientos, R & Dunn, K. (2020).** Dimensions of uncertainty after stroke: Perspectives of the stroke survivor and family caregiver. The Journal of Neuroscience Nursing, 46(4), 233–240.
37. **WHO. (2019).**, Global Stroke Fact Sheet, Int J Stroke. Apr;17(4):478. doi: 10.1177/17474930221080343.
38. **Zhang H., Qian H., Meng S., Shu M., Gao Y., Xu Y., Zhang S., Hong M., Xiong R.(2019).** Psychological distress, social support and medication adherence in patients with ischemic stroke in the mainland of China. J. Huazhong Univ. Sci. Technol.; 35:405–410. doi: 10.1007/s11596-015-1445-y.