The Effect of the Educational Program based on Roy's Adaptation Model on the Quality of Life for Patients with Hemiplegia

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ABSTRACT

Background: Hemiplegia is a condition characterized by paralysis or weakness on one side of the body, often resulting from a stroke, traumatic brain injury, or cerebral palsy. This physical disability can significantly impact an individual's daily life, leading to difficulties with mobility, balance, and coordination. **Aim of the study:** To evaluate the effect of the Educational Program based on Roy's adaptation model on the quality of life for patients with hemiplegia**. Research design:** A quasi experimental design. **Setting:** Neurology outpatient clinic at El-Fayoum university hospital. **Methods:** A purposive sample of 100 adult patients from previously mentioned setting, allocated randomly into two equal groups (50 patients in each). **Tools**: Four tools were utilized, included: Structured Interview questionnaire, patients need assessment questionnaire, Stroke Specific Quality of Life Scale (SS-QOL) questionnaire, assessment questionnaire based on Roy's adaptation model. **Results:** There was a significant statistical difference between the study and control groups in terms of needs, adaptation levels, and quality of life. Following the implementation of the nursing educational program, over half of the participants in the study group achieved good levels of adaptation and quality of life, while more than 70% of the control group continued to exhibit poor outcomes in both aspects. **Conclusion:** Application of the educational program had a positive effect on the outcomes of patients with hemiplegia. **Recommendations:** Healthcare institutions should adopt and scale up Roy Adaptation Model-based educational programs as part of standard rehabilitation care to sustainably improve the quality of life for patients with hemiplegia.

Key words: Educational program based Roy adaptation model, Hemiplegia, Quality of life.

Introduction

According to ***Oscar, et al., (2023),*** hemiplegia is a neurological condition characterized by weakness or paralysis on one side of the body, which leads to significant limitations in physical function, mobility, and overall quality of life. Individuals affected by hemiplegia often struggle with activities of daily living, social engagement, and emotional well-being, resulting in a noticeable decline in their life satisfaction. Therefore, it is essential to develop and implement targeted interventions that support adaptation and aim to enhance the quality of life for individuals living with this condition.

Based on ***Abdel-Wahed et al. (2022),*** hemiplegia is a significant public health issue in Egypt, primarily due to the high prevalence of stroke, its leading cause. The Egyptian Ministry of Health estimates that the stroke prevalence in Egypt is approximately 714 cases per 100,000 populations,

with higher incidence rates among males and older adults. This burden is further intensified by Egypt's aging population, increasing obesity and diabetes rates, and inadequate healthcare infrastructure, especially in rural areas. Addressing this challenge requires improving healthcare services, promoting healthy lifestyles, and enhancing access to rehabilitation programs to reduce the impact of hemiplegia nationwide.

As indicated by ***Mohammad (2024),*** hemiplegia can arise from multiple causes, including stroke, traumatic brain injury, cerebral palsy, brain tumors, and central nervous system infections such as meningitis or encephalitis. Stroke remains the most prevalent cause, accounting for approximately 80% of hemiplegia cases. Traumatic brain injury, often resulting from motor vehicle accidents or falls, is also a significant contributor. Beyond the initial motor impairment, hemiplegia is often associated with a range of complications, including muscle spasticity, contractures, and joint deformities, which typically result from prolonged immobility and muscular imbalance. Affected individuals may also experience neuropathic symptoms such as pain, numbness, or tingling, along with cognitive and emotional disturbances including depression, anxiety, and memory deficits.

Fan, et al., (2023) recommends that, Hemiplegia profoundly impacts patients' daily lives, affecting their physical activities, social relationships, and community interactions. Mobility limitations can hinder socialization, leading to feelings of isolation and decreased confidence. This, in turn, affects their overall quality of life and ability to adapt to their condition. Effective support and adaptation strategies are crucial to enhance their functional abilities, promote social reintegration, and improve their well-being.

As regards ***Fong and Ho (2023),*** living with permanent hemiplegia has a profound impact on an individual's quality of life, occupational performance, self-confidence, and self-esteem. Quality of life serves as a comprehensive indicator that reflects multiple dimensions, including physical, psychological, and social well-being. The extent to which patients can perform daily living activities, engage with their communities, and manage stress significantly influences their overall adaptation and psychological

resilience. These factors are critical in determining not only the patient's functional outcomes but also their ability to reintegrate into society and lead a meaningful life despite the limitations of their condition.

Regarding ***Roussia et al. (2023),*** the Roy Adaptation Model (RAM) is a theoretical framework in nursing that emphasizes the individual's capacity to adapt to changes in their internal and external environment. The model conceptualizes the person as a holistic being, integrating biological, psychological, and social systems, and highlights adaptation as a key mechanism for achieving and maintaining health and well-being. The RAM has been extensively applied in nursing practice, education, and research, and has demonstrated effectiveness in enhancing adaptive responses and improving health outcomes across diverse patient populations.

Based on ***Zrelak et al. (2024),*** nurses play a critical role in alleviating both physical and psychosocial distress in patients through comprehensive nursing assessment, management, and the implementation of psychosocial interventions. By offering targeted support to both the patient and their family, nurses contribute significantly to the rehabilitation process and to enhancing the patient's quality of life. Accordingly, the implementation of a nursing program grounded in the Roy Adaptation Model can effectively address patient needs, promote higher levels of adaptation, and lead to improved quality of care and better clinical outcomes.

Significance of Study:

Hemiplegia is often caused by stroke, traumatic brain injury, or cerebral palsy. **According to the World Health Organization (WHO),** stroke is the second leading cause of death worldwide, accounting for approximately 6.2 million deaths annually and considered third cause of death in Egypt. Approximately 150,000 to 210,000 new stroke cases each year in Egypt.

Based on ***Mohamed et al. (2022)***, stated that patients with hemiplegia often experience unmet needs that hinder their overall well-being and require effective adaptation to improve quality of life. Their evidence-based findings highlight the presence of maladaptive responses in the physical, psychological, and social domains, indicating the need for targeted interventions to manage these

challenges and support patients in achieving more positive health outcomes. ***Saeedi & Parvizy, (2019),*** demonstrated that the positive impact of implementing a Roy Adaptation Model-based care plan on the physiological dimension of patients recovering from stroke. This finding aligns with several studies that emphasize the critical role of adaptation in improving the overall quality of life for individuals with hemiplegia. These studies collectively support the use of structured, theory-based nursing interventions to facilitate more effective physical and psychosocial adjustment among patients.

Regarding ***Dharma (2021),*** stated that the development of a family empowerment intervention framework aimed at enhancing the adaptive behavior of stroke survivors. Similarly, studies addressing chronic diseases have underscored the significance of adaptation in managing long-term health conditions. For instance, ***Abdolahi et al.*** **(2020),** found that implementing an educational program based on the Roy Adaptation Model served as a low-cost, effective, and non-invasive nursing intervention, capable of reducing fatigue and improving daily functioning in patients with heart failure. **In light of** this evidence, the current study aims to evaluate the effect of an educational program based on Roy's Adaptation Model on the quality of life of patients with hemiplegia.

Aim of the Study

The present study aimed to evaluate the effect of the Educational Program based on Roy's adaptation model on the quality of life for patients with hemiplegia through the following objectives:

1- Assess level of quality of life for adult patients suffering from hemiplegia.
2- Design the education program based on Roy's adaption model for patients with hemiplegia based on their basic assessment needs.
3- Implement the designed education program based on Roy's adaptation model for patients with hemiplegia.
4- Evaluate the effect of provided educational program based on Roy's adaption model on quality of life for patients with hemiplegia.

Research hypothesis:

H0: Patients who will receive educational program based on Roy's adaptation model will not exhibit better physical, psychological and

social well-being more than those who will not receive the program.

H1: Patients who will receive nursing program based on Roy's adaptation model will be exhibit better physical, psychological and social well-being more than those who will not receive the program.

Theoretical Framework

Based on ***Kumar (2022),*** the theoretical framework for this study is grounded in the Roy Adaptation Model (RAM), which offers a comprehensive structure for understanding the process of adaptation and guiding the development of interventions that support adaptive responses. The RAM is a widely recognized nursing model that emphasizes the individual's capacity to adapt to environmental changes. It conceptualizes the person as a holistic being, integrating physical, psychological, and social dimensions, and highlights adaptation as a fundamental mechanism for promoting health, well-being, and optimal functioning.

Majeed et al. (2020), present a conceptual framework that illustrates the cyclical nature of the Roy Adaptation Model (RAM), wherein the nurse continuously assesses, diagnoses, plans, implements, and evaluates the patient's adaptation in order to promote optimal health outcomes. The RAM can be effectively integrated into the nursing process, offering a comprehensive and holistic approach to patient care. The model underscores the importance of assessing the individual's adaptive responses, identifying areas of maladaptation, and designing targeted interventions to enhance adaptive functioning. This RAM-based nursing process supports the improvement of physiological, emotional, and social well-being, thereby facilitating better overall health outcomes.

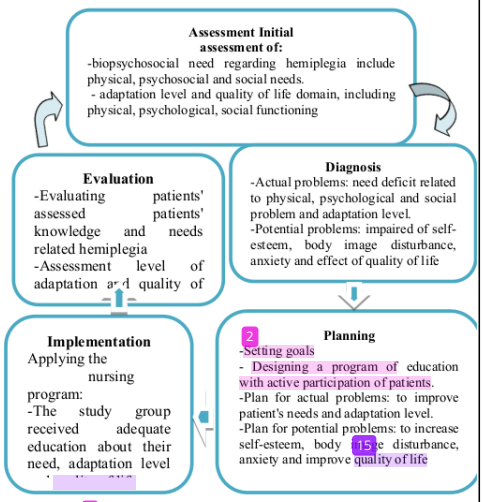

Figure (1): Nursing process according to Roy theoretical model for patients with hemiplegia designated by the researcher based on literature

Subject and Methods

Research Design:

A Quasi-experimental design was utilized to conduct the study.

Setting:

This study was conducted in Neurology Outpatient Clinic in Fayoum University Hospital.

Sample size:

A purposive sample of 100 adult patients from both genders. They were recruited from the previously mentioned setting and divided randomly into two equal groups study and control (50 patients for each group).

Study group: patients who received the nursing program based on Roy adaptation model in addition to routine nursing care.

Control group: patients who received hospital routine nursing care only.

Subjects criteria:

Inclusion criteria:

- Adult patients confirmed diagnosis with permanent hemiplegia.
- From both genders (male and female)
- Free from psychiatric disorders

Exclusion criteria:

- Patients who have temporary hemiplegia or still under diagnosis.
- Patients who have mental illness.
- Patients who are unconscious.

Tools of data collection:

Four tools were used to collect the data according to the following:

Tool (1): Structured Interview assessment questionnaire: This tool developed and filled in by the researcher based on current national and international literatures. It includes the following:

Part 1: patient Socio-demographic data for studied patients: This part concerned with assesses patients' socio-demographic characteristics which include patients' age, gender, place of residence, occupation, educational level marital status and family member.

Tool (II): Assessment patient regarding their needs: It includes three categories of patients' needs including:

Part 1: Assess patient by using Barthel Index Scale; this scale was adapted from **(Liu, et al., 2015).** It is a standardized tool to assess functional status as a measurement of the patient's ability to perform activities of daily living independently. Each item is rated using a **graded 15-point Likert-style scale**, with score ranges such as **0, 5, 10, and 15** depending on the degree of independence. A **score of 0**

reflects total dependence, while **15 indicates full independence**. Intermediate scores (e.g., 5 or 10) reflect varying levels of partial assistance or supervision needed. A total score ranging from: **0 to 20** indicates **total dependency**, while scores from **21 to 60** reflect **severe dependency**. Scores between **61 and 90** suggest **moderate dependency**, and those from **91 to 99** indicate **slight dependency**. A score of **100** typically reflects full independence.

Part 2: Assess patient by using DASS Scale; this scale was adapted from **(Oei, et al., 2013).** It is standardized scale includes assessment of anxiety, depression and stress scale (DASS) among patients with hemiplegia.

DASS scoring system:

The scale to which each item belongs is indicated by the letter D (Depression), A (Anxiety), S (Stress). For each scale (D & A and S) sum the scores for identified items. It consists of 21 items, divided into three subscales with 7 items each. Each item is rated on a 4-point Likert scale ranging from 0 (Did not apply to me at all) to 3 (Applied to me very much or most of the time). To calculate final scores, each subscale score is summed and then multiplied by 2 to match the scoring of the original 42-item DASS. Higher scores indicate more severe symptoms.

DASS 21 scoring system:

The total score of each item was categorized as following:

	Depression	**Anxiety**	**stress**
Normal	0-9	0-6	0-10
Mild	10-12	7-9	11-18
Moderate	13-20	10-14	19-26
Severe	21-42	15-42	26-42

Part III: Assess patient by using social dysfunction rating scale; this scale was adapted from **(Kaur, et al., 2019).** It is standardized scale was used to assess social needs among patients under study. It is a 21-item scale which measures the negative aspect of an individual's social adjustment. It is a tool used to assess a person's difficulties in social functioning, including communication, relationships, and social participation. It uses a Likert-type scale from 0 to 3, where 0 = severe,

1 = moderate, 2 = mild, and **3** = normal.

The total score out of 100 is classified as follows:

- **0 <40:** high level of social dysfunction.
- **40- <60:** moderate level of social dysfunction.
- **60- <80:** mild level of social dysfunction.
- **80- <100:** no social dysfunction.

Tool (III): Stroke Specific Quality of Life Scale (SS-QOL) questionnaire:

The Stroke Specific Quality Of Life scale (SS-QOL) is a patient-centered outcome measure intended to provide an assessment of health-related quality of life specific to patients with hemiplegia. Patients must respond to each question of the SS-QOL. It is a self-report scale containing 49 items in 12 domains, such as mobility, energy, mood, social roles, self-care, communication, and thinking. Each item is rated on a 5-point Likert scale, where 1 indicates extreme difficulty or poor quality and 5 indicates no difficulty or excellent quality. Higher scores reflect better quality of life. The SS-QOL is widely used in stroke rehabilitation and research to evaluate patient outcomes and recovery progress. The total score ranges from 49 to 245, with higher scores indicating a better QOL, this scale was adapted from (**Safdar, et al., 2023 and Williams, et al., 1999).**

The score was categorized in to:

- Good quality of life: ≥ 70%
- Poor quality of life: <70%

The total score (245) is categorized as following:

49-≤122 = Poor quality of life

123-≤163 = Fair quality of life.

164-≤ 204= Very good quality of life.

205-≤ 245 = Excellent quality of life.

Tool (IV): Roy's Adaptation Model: It was adapted from (***DeSanto& Fawcett, 2009).*** It is consisted of four modes physiological, self-concept, role function, and interdependence 10 items for each mode. Each mode composed of questions which are used for assessment level of adaptation among studied patients. The answers were measured and given a score based on a five point Likert scale as the following: Strongly Disagree (1), Disagree (2), Neither Agree or Disagree (3), Agree (4), and Strongly Agree (5). The total score ranged from 40- 200 with the higher score indicated more adaptive behaviors. The studied patient's adaptation can be classified as high adaptation if ≥80%, moderate adaptation if 60 – < 80% and mal adaptation if <60.

The total score (200) is categorized as following:

40-80 = Mal-adaptation.

81-120 = Fair of adaptation.

121-160 = Good adaptation.

161-200 = Excellent adaptation.

Ethical consideration:

An ethical approval to conduct the proposed study was obtained from the Scientific Research, Ethical Committee of the faculty of Nursing, Helwan University **(Approval Code: 36).** Additionally, an official permission was obtained from the administrative authority of the selected setting for the current study.

The researcher obtained consent from the studied patients, explaining the purpose and nature of the study, stating the possibility to withdraw at any time, confidentiality of data assured by the researcher by using codes to identify participants instead of names or any other personal identifiers.

Pilot study:

A Pilot study was carried out with 10% (not less than 10 patients) of the sample under study. Patients who shared in pilot study excluded from the study sample.

Field Work:

Study was conducted within nine months from July 2024 to the end of march 2025.and carried out through four phases: assessment, designing, implementing and evaluation.

I- Assessment Phase:

- The researcher collect data regarding to participants' sociodemographic and health history. Data collection was held through structured interviews and medical record chart.
- Each patient of both control and study group was interviewed individually in clinical outpatient during follow up in order to collect the baseline patient's data using tool I, II, III, IV. Time needed to complete each tool was around 15-30 minute.

II- Second phase (diagnosis phase)

According to Roy theory diagnosis provides the basis for selection of nursing interventions to achieve outcomes for which the nurse is accountable, actual problems includes: need deficit related to physical, psychological and social problem, body image disturbance and adaptation level. Potential problem: risk for complications as impaired of self-esteem, anxiety and negative effect of quality of life.

III- Planning and design phase:

-The researcher plan intervention, design the educational section's content according to the patient's needs. Detected needs, requirements and deficiencies were translated into the aim and objectives of the educational program sections in the form of educational booklet in order to

improve patient's need, adaptation level and quality of life.

- The educational training program was written in simple Arabic language easy to be understood from patients.

III- Implementation phase:

- Adaptation program was developed and implemented by the researcher.
- immediately after the pre-test. No intervention was performed for the control group during the study.
- Implementing the designated nursing guidelines for the study group (50) patient, in term of educational sessions, instructions and follow up. the program was divided into 5 sessions (2 theoretical, and 3 practical sessions) The researcher started teaching lectures from 9 am to 1 pm 3 days/ week.
- Each session usually started by a summary of what had been taught during the previous session and the objectives of the new session. After every session, there has been five minutes for discussion and gave feedback.
- Each participant within the study group obtains a copy of the nursing guidelines booklet. The researcher used pictures for illustration, and video to educate the patient.

IV- Evaluation phase:

Evaluation phase aimed to reassess patients after implementation of nursing program to identify progress in term of differences in patients' level of response from baseline. The study patients were evaluated 3 times by study tools as following:

- The first evaluation (pretest) was done in outpatient clinical during follow up the researcher using tool I, II, III & IV.
- The second evaluation (posttest) was done after 2weaks from implementation of the intervention using tool II, III & IV.
- Follow up was done three months after implementation of the intervention using tool II, III & IV.

Results:

Table (1): Frequency and percentage distribution of patient Socio-demographic data for the study and control group (N=100).

Variable	Control group		Study group		χ2	P-value
	N	%	N	%		

Age group:						
• 20 to less than 35	0	0	2	4	4.44	0.108
• From 35 to less than 55	21	42	13	26		
• Equal to or more than 55	29	58	35	70		
Mean ± SD	60.44±10.69		59.22±11.66		t-test=0.546	0.800
Gender:						
• Male	29	58	28	56	0.041	0.840
• Female	21	42	22	44		
Place of residence:						
• Urban	19	38	21	42	0.167	0.683
• Rural	31	62	29	58		
Occupation:						
• Don't work	32	64	42	84	4.210	0.061
• Official Job	18	36	8	16		
Educational Level:						
• Not read and write	16	32	12	24		
• Basic education	6	12	13	26	3.44	0.329
• Intermediate education	17	34	14	28		
• Highly education	11	22	11	22		
Marital Status:						
• Married	26	52	17	34		
• Divorce	0	0	7	14	3.98	0.072
• Single	7	14	12	24		
• Widow	17	34	14	28		

: Significant at P ≤ 0.05

Table (1) Illustrates that there was no statistically significant difference between the study and control group p-value >0.05, as regarding age, gender, place of residence, educational level, marital status which indicated proper matching between groups in these variables.

Table (2): Frequency and percentage distribution of total patient's activity of daily living (N=100)

Total patient's activity of daily living	**Studied patients (n = 100)**				**χ2**	**P-Value**
	Control group (n=50)		**Study group (n=50)**			
	N	**%**	**N**	**%**		
Pre-program.						
Total dependency	13	26	15	30		
Severe dependency	35	70	35	70	2.143	0.409
Moderate dependency	2	4	0	0		
Slight dependency	0	0	0	0		
Pre-program Mean&SD	8.46±2.936		8.84±2.103		t=0.744	0.459

Post-program.						
Total dependency	6	12	0	0	6.751	0.133
Severe dependency	41	82	48	96		
Moderate dependency	3	6	2	4		
Slight dependency	0	0	0	0		
Post-program Mean&SD	8.320±3.261		9.78±2.677		t=3.587	0.01*
3 monthes-Follow up program.						
Total dependency	5	10	0	0	38.629	0.000 *
Severe dependency	42	84	18	36		
Moderate dependency	3	6	32	64		
Slight dependency	0	0	0	0		
Follow up Mean&SD	8.58±2.914		12.76±2.519		t=7.672	0.000 *

: Significant at P ≤ 0.05

Table (2) Show that, there was a highly statistically significant difference between the study and control group regarding their total activity of daily living in post, and follow up scores with p- value = (0.01, to 0.000), while there was no statistically significant difference between the study and control group regarding their total activity of daily living in pre scores with p- value = (0.459).

Table (3): Frequency and percentage distribution of total patient's regarding psychological need (n=100): -

Total patient's psychological needs	**Studied patients (n = 100)**		**T-Test**	**P-Value**
	Control group (n=50)	**Study group (n=50)**		
Pre-program Mean±SD	41.80±11.897	47.320±10.119	2.499	0.100
Post-program Mean±SD	40.120±9.511	30.480±1.384	4.994	0.000*
3 monthes-Follow up program Mean±SD	40.280±9.39	13.56±8.96	14.55	0.000*

: Significant at P ≤ 0.05

Table (3) Illustrated that there was a highly statistically significant difference between the study and control group regarding their total psychological needs in post, follow up scores with p- value ≤ *0.00*, while there was no statistically significant difference between the study and control group regarding their total psychological needs in pretest with p- value = (0.100).

Table (4): Frequency and percentage distribution of total patient's social needs (N=100)

Variable	Studied patients (n = 100)				χ2	P-Value
	Control group (n=50)		Study group (n=50)			
	N	%	N	%		
Total patient's social needs within pre-program.						
High social dysfunction	47	94	48	96	0.211	0.637
Moderate social dysfunction	3	6	2	4		
Mild social dysfunction.	0	0	0	0		
No social dysfunction	0	0	0	0		
Mean&SD	101.02±11.65		108.24±10.89		t=3.201	0.134
Total patient's social needs within post-program.						
High social dysfunction	47	94	36	72	2.674	0.000*
Moderate social dysfunction	3	6	12	24		
Mild social dysfunction.	0	0	2	4		
No social dysfunction	0	0	0	0		
Mean&SD	100.24±12.27		85.00±14.52		t=5.668	0.000*
Total patient's social needs within follow up -program.						
High social dysfunction	46	92	0	0	58.921	0.000*
Moderate social dysfunction	4	8	19	38		
Mild social dysfunction.	0	0	19	38		
No social dysfunction	0	0	12	24		
Mean&SD	100.14±12.11		54.36±15.70		t=16.324	0.000*

*: *Significant at P ≤ 0.05*

Table (4) Demonstrates that, there was a highly statistically significant difference between the study and control group regarding their total social needs in post, follow up scores with p- value = (<0.000), while there was no statistically significant difference between the study and control group regarding pretest with p-value = (0.637).

Table (5): Frequency and percentage distribution of total patient's Quality of Life (N=100)

Total patient's Stroke Specific Quality of Life	Studied patients (n = 100)				χ2	P-Value
	Control group (n=50)		Study group (n=50)			
	N	%	N	%		
Pre-program.						
Poor quality of life	43	86	48	96	3.053	0.160
Fair quality of life	7	14	2	4		
Very good quality of life	0	0	0	0		
Excellent quality of life	0	0	0	0		
Mean&SD	11.30±3.73		10.50±4.73		t=0.939	0.350
Post-program.						
Poor quality of life	43	86	29	58	9.722	0.003*
Fair quality of life	7	14	21	42		
Very good quality of life	0	0	0	0		
Excellent quality of life	0	0	0	0		
Mean&SD	11.38±3.768		12.62±4.09		t=1.577	0.01*
3Months-Follow up program.						
Poor quality of life	42	84	3	6	65.943	0.000*
Fair quality of life	8	16	20	40		
Very good quality of life	0	0	27	54		
Excellent quality of life	0	0	0	0		
Mean&SD	11.44±3.709		15.32±4.152		t=4.927	0.000*

*: *Significant at P ≤ 0.05*

Table (5) illustrates that there was a highly statistically significant difference between the study and control group regarding their total Stroke Specific Quality of Life in post, and follow up scores with p- value = (≤0.000), while there was no statistically significant difference between the study and control group regarding pretest with p- value = (0.160).

Figure (2): Percentage distribution of total patient's Quality of Life of the control group.

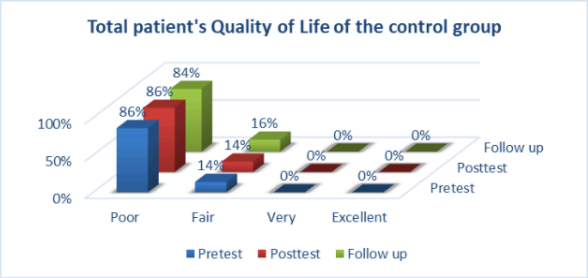

Figure (2) Illustrates that, there was no statistically significant difference between the control group regarding their total Stroke Specific Quality of Life in pre, post and follow up with p- value = (0.160).

Figure (3): Percentage distribution of total patient's Quality of Life of the study group.

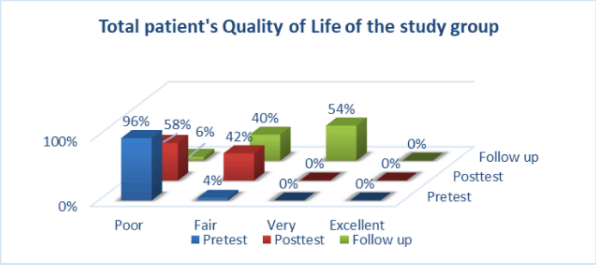

Figure (3) Illustrates that, there was a highly statistically significant difference between the study regarding their total Stroke Specific Quality of Life in pre, post and follow up scores with p- value = (≤0.001).

Table (6): Frequency and percentage distribution of total patient's Roy Adaptation Modes (N=100)

Total patient's Roy Adaptation Modes	Studied patients (n = 100)				χ2	P-Value
	Control group (n=50)		Study group (n=50)			
	N	%	N	%		
Pre-program						
Mal-adaptation.	1	2	5	10		
Fair of adaptation.	37	74	43	86	10.260	0.642
Good adaptation.	12	24	2	4		
Excellent adaptation	0	0	0	0		
Mean±SD	112.74±19.59		100.16±13.48		t=3.739	0.120
Post-program						
Mal-adaptation.	1	2	0	0		
Fair of adaptation.	37	74	25	50	7.890	0.005*
Good adaptation.	12	24	25	50		

Excellent adaptation	0	0	0	0		
Mean±SD	112.50±19.81		123.32±10.53		t=3.409	0.001*
3 Months Follow up-program						
Mal-adaptation.	1	2	0	0		
Fair of adaptation.	37	74	0	0		
Good adaptation.	12	24	26	52	67.158	0.000*
Excellent adaptation	0	0	24	48		
Mean±SD	111.66±19.78		157.76±14.89		t=13.16	0.000*

*: *Significant at P ≤ 0.05*

Table (6) shows that, there was a highly statistically significant difference between the study and control group regarding their total patient's Roy Adaptation Modes in post, and follow up scores with p- value = (≤0.001), while there was no statistically significant difference between the study and control group regarding pretest with p- value = (0.642).

Figure (4): Percentage distribution of total patient's Roy Adaptation Modes of the control group.

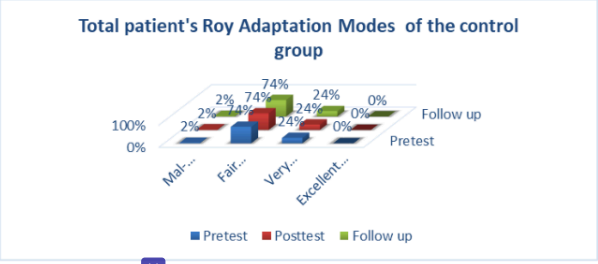

Figure (4) Illustrates that, there was no statistically significant difference between the control group regarding their adaptation level in pre, post and follow up with p-value = (0.642).

Figure (5): Percentage distribution of total patient's Roy Adaptation Modes of the study

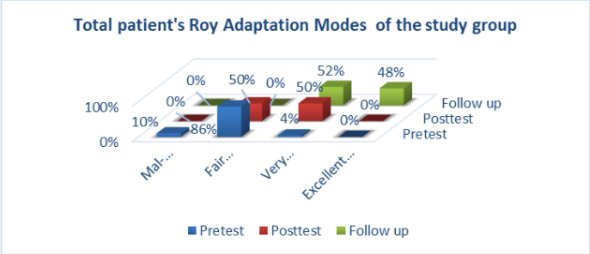

Figure (3) Illustrates that, there was a highly statistically significant difference between the study regarding their adaptation level in pre, post and follow up scores with p- value = (≤0.001).

Table (7): Correlation between patients' of Total Roy Adaptation Modes, Total patient's assessment regarding activity of daily living, psychological needs, social needs and total patient's Stroke Specific Quality of Life

Items	Total patient's Roy Adaptation Modes					
	Pre		Post		Follow Up	
	r	p	r	p	r	P
Total patient's physical needs	-0.644	0.000*	0.473	0.000*	0.790	0.000*
Total patient's psychological needs	-0.653	0.000*	-0.623	0.000*	-0.874	0.000*
Total patient's social needs	-0.380	0.000*	-0.446	0.000*	-0.835	0.000*
Total patient's Stroke Specific Quality of Life	0.708	0.000*	0.715	0.000*	0.901	0.000*

Table (7) reveals that; there was a highly statistically significant correlation between patients' Total Roy Adaptation Modes, total physical needs, total psychological needs, total social needs, and total patient's Stroke Specific Quality of Life, with p-value= (0.000) within pre, post, and follow up test through the study**.**

Discussion

In the present study, and according to the socio-demographic characteristics of the participants, the mean age of the patients in the study group was 59.22 ± 11.6 years, while in the control group, it was 60.44 ± 10.6 years. The majority of patients in both groups were male, married, and residing in rural areas. From researcher point of view, there was no statistically significant difference between the study and control group regarding age, gender, place of residence because Egyptian patients aged 60 and above living in rural areas face unique challenges in dealing with hemiplegia. Hemiplegia often results from stroke or other brain injuries and can significantly impact their quality of life. In rural areas of Egypt, specialized healthcare may be limited, making it harder for patients to access the care they need.

This finding supported with **Edzie, et al. (2021)**, in a study titled *" Incidence rate and age of onset of first stroke from CT scan examinations in Cape Coast metropolis"* and reported that more than half of the study their sampled male with aged ≥ 60 years old and live in rural area. This

finding also agree with **Tu, et al. (2022)** who conducted a study about " *Prevalence of stroke in China, 2013–2019: a population-based study"* reported the weighted prevalence of stroke was higher for male sex, older age, and residence in rural and northeast areas.

Regarding occupation and educational level, the result of this study revealed that more than one third of the patient under study in control and study groups had moderate educational level and more than two third of patients had no work or house wife. From the researcher point of view, this result may be due to that most patient suffer from motor impairments that obstructing the completion of tasks or their participating in some work although higher educational levels may experience better health outcomes and improved ability to manage their condition.

In the same context **Rutkowski, et al., (2021),** reported in a study titled" *Post-stroke fatigue: a factor associated with inability to return to work in patients< 60 years—a 1-year follow-up"* found that two third of their subjects were not return to work after stroke. Also, this finding was in consistent with **Drake, et al., (2022)** in their study entitled " *The relationship of socio-demographic factors and patient attitudes to connected health technologies: a survey of stroke survivors"* revealed that one quarter of patient unemployed because patients who have experienced a stroke often face significant challenges in their physical environment that can hinder their ability to work effectively.

Regarding total score of daily living activities according to barthal scale, findings of the present study revealed that there was no significant difference in psychological needs of the study and control groups before the educational intervention, instead, there was a highly significant difference between both groups after the intervention. From researcher point of view, this confirm the effectiveness of implementing an educational program for patients with hemiplegia can significantly improve their physical needs by enhancing their understanding of the condition, promoting adherence to rehabilitation protocols, and fostering self-management skills. Studies have shown that targeted education can lead to improved functional outcomes,

increased mobility, and better overall physical recovery in stroke patients.

This finding agree with **Shahid, et al., (2023),** who stated in a study about " *A comprehensive review of physical therapy interventions for stroke rehabilitation: impairment-based approaches and functional goals"* that the findings showed that after intervention a statistically significant difference was seen between the two groups and highly significant difference in experimental group, whereas, the same test showed no statistically significant difference in control groups.

Regarding psychological needs assessment using DASS scale, findings of the present study revealed that there was no significant difference in psychological needs of the study and control groups before the educational intervention, instead, there was a highly significant difference between both groups after the intervention. From researcher point of view, this confirm the effectiveness of implementing a designated educational program for patients with hemiplegia can effectively improve their psychological needs by providing them with essential knowledge, coping strategies, and support. Such programs can enhance patients' understanding of their condition, promote adherence to treatment plans, and foster a sense of control and empowerment.

This finding agree with **Srisodsaluk, et al., (2023),** who stated in a study about *" An application of Organismic Integration Theory to enhance basic psychological needs satisfaction and motivation for rehabilitation in older stroke survivors: A randomized controlled trial study"* that the findings showed that after intervention a statistically significant difference was seen between the two groups and significant difference in experimental group, whereas, the same test showed no statistically significant difference in control groups.

Regarding the social needs assessment according to social dysfunction scale, findings of the present study revealed that there was no statistical significant difference in social needs of the study and control groups before the educational intervention, instead, there was a highly significant difference between both groups after the intervention. From researcher point of view, this

confirm the effectiveness of implementing an educational program for patients with hemiplegia can effectively address their social needs by providing them with essential knowledge, skills, and support networks. This can enhance their ability to reintegrate into daily life, connect with others, and access community resources, ultimately improving their social interactions and overall quality of life.

This finding agree with **Obembe & Eng, (2016),** who stated in a study about *"Rehabilitation interventions for improving social participation after stroke: a systematic review and meta-analysis"* that the findings showed that after intervention a statistically significant difference was seen between the two groups and significant difference in experimental group, whereas, the same test showed no statistically significant difference in control groups.

As regarding specific stroke quality of life, the findings of the present study revealed that there was no statistical significant difference between study and control groups before program but found highly statistical significant between both group after educational program. From researcher point of view, Educational programs for patients with hemiplegia can significantly enhance health-related quality of life by improving their understanding of the condition, promoting self-management skills, and fostering adherence to treatment plans. Studies have shown that structured educational interventions can lead to improved physical function, reduced disability, and enhanced overall well-being in patient with hemiplegia, ultimately elevating their quality of life.

The present study demonstrated a significant improvement in quality of life among patients in the intervention group, who received the educational program, compared to the control group that received routine care only. While the control group patients mostly reported poor quality of life, the intervention group patients showed a notable shift from fair to very good quality of life after the program. This highlights the effectiveness of targeted educational interventions in enhancing patient outcomes.

This finding in line with **Sakr, et al., (2022),** who conducted *"Construction and validation of the 17-item stroke-specific quality of life scale (SS-QOL-17): a comprehensive short*

scale to assess the functional, psychosocial, and therapeutic factors of QOL among stroke survivors" there was highly statistically significant difference between the two groups post intervention, which indicated the effectiveness of the provided educational intervention.

Similarly, this finding in the same line with **Devi, (2022)**, who demonstrated that, there are no statistical significant difference between two groups pre implementation. While, there are highly statistically significant improvement of quality of life in study group at the immediately and follow-up tests after implementation of program compared by control group with routine care.

As regarding Roy adaptation model, the findings of the present study revealed that there was no statistical significant difference between study and control groups before program but found highly statistical significant between both group after educational program. From researcher point of view, the educational program, based on the Roy Adaptation Model, significantly improved adaptation and quality of life in patients. By enhancing their ability to cope with challenges, the program fostered better physiological, psychological, and social adaptation. The effectiveness of the educational program was evident in the improved quality of life outcomes, highlighting its potential as a valuable tool for patient care.

The present study demonstrated the effectiveness of the educational program based on the Roy Adaptation Model in improving adaptation levels in patients. The study group shows a significant shift from fair to excellent adaptation after receiving the program, while most patient in the control group had mal adapted. This finding in line with **Hasanah, et al., (2022),** who conducted *" A Critical Analysis of Using Roy's Adaptation Model in Nursing Research as an Empirical for Clinical Practice: a Systematic Review."* reported that RAM-based interventions effectively overcome the problems experienced by patients and reduce the perceived symptoms and improve the patient's quality of life.

Similarly, this finding in the same line with **El Gawab, et al., (2022)**, who demonstrated that, there was a statistically significant difference for the mean scores of physiological, self-concept, work role

function, and independence and interdependence mode of patients on pre and post-application of RAM. There was observed improvement in adaptation level among patients after application of RAM.

The present study findings indicated that, there was a statistical significant positive correlation between Roy adaptation model with physical need and quality of life before and after implementation of nursing education, which indicated that the effective fulfillment of physical needs and engagement in meaningful activities fosters adaptive responses in patients, leading to enhanced quality of life despite disease. Conversely, a negative correlation exists between RAM and psychological distress and social dysfunction, increased adaptation according to the Roy Adaptation Model (RAM) is associated with decreased psychological distress and social dysfunction, ultimately leading to enhanced quality of life.

This finding in line with, **Dharma, et al., (2023).** who conduct a study of "The factors that influence the adaptation process 6 months after a stroke: A path analysis" the study revealed that effective adaptation according to the Roy Adaptation Model (RAM) is linked to enhanced quality of life in patients with stroke. By meeting physiological and psychological needs through targeted interventions, healthcare providers can promote adaptive responses and improve patient outcomes, ultimately leading to better quality of life for individuals affected by stroke.

Conclusion

Based on the findings of the study, it can be concluded that, the nursing program based on Roy adaptation model had a positive effect on the patient's outcomes among study group as regarding the incidence of their needs, quality of life and adaptation level of patient compared to control group, as well as there was statistically positive correlation with high statistical significance between their needs and quality of life.

Recommendation.

- Healthcare institutions should adopt and scale up Roy Adaptation Model-based educational programs as part of standard rehabilitation care to sustainably improve the quality of life for patients with hemiplegia.
- Designing a systematic program and investigating the Patients' before leaving the hospitals to ensure that such a basic need is

fulfilled and patients have received the needed adaptation programs.

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