Journal Homepage: -www.journalijar.com

INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)

Article DOI:10.21474/IJAR01/21440
DOI URL: http://dx.doi.org/10.21474/IJAR01/21440

RESEARCH ARTICLE

THE EFFECT OF THE EDUCATIONAL PROGRAM BASED ON ROY'S ADAPTATION MODEL ON THE QUALITY OF LIFE FOR PATIENTS WITH THALASSEMIA

Nora Ramadan Korany[1], Baghdad Hussein Mahmoud[2] and Zeinabhussien Ali[3]

1. Assistant Lecturer of Medical Surgical Nursing, Faculty of Nursing Fayoum University.
2. Assist Professor of Adult HealthNursing, Faculty of Nursing Helwan University.
3. Professor of Adult Health Nursing, Faculty of Nursing Helwan University.

Manuscript Info

Manuscript History
Received: 21 May 2025
Final Accepted: 23 June 2025
Published: July 2025

Key words:-
Adaptation,Quality of life,
Thalassemia.

Abstract

Thalassemia is an autosomal recessive blood disorder.The chronic natur e of the disease,along with its complications and treatment,causes multi ple physical,psychological,and social problems that affect the quality of life in these patients.

Aim of the study: Evaluate the effect of provided educational program based on Roy's adaption model on quality of life for patients with thalassemia. Research design: A quasi experimental design. Setting: General medicine department and the blood transfusion unit in Fayoum university hospital.

Methods:A purposive sample of 80 adult patients from previously men tioned setting, allocated randomly into two equal groups (40 patients in each).

Tools:four tools were utilized,included:Interview patient's assessment questionnaire,patients knowledge assessment questionnaire, World Hea lth Organization Quality of Life BREF(WHOQOL BREF) questionnai re and Roy's Adaptation Model questionnaire.

Results: There was a statistical significant difference between both grou ps as regarding knowledge,quality of life and adaptation level.

Conclusion: Application of the educational program based on Roy's ada ptation model had a positive effect on the outcomes of patients with thalassemia.

Recommendations: Nurses should apply the educational instrument that would help patients improve their adaptation to reach positive outcomes.

Introduction:-

Thalassemia is an autosomal recessive blood disorder and is characterized by abnormal hemoglobin production. Owing to genetic abnormalities, the production of one or more types of globin peptide chains is diminished or

Corresponding Author:-Nora Ramadan Korany
Address:-Assistant Lecturer of Medical Surgical Nursing, Faculty of Nursing Fayoum University.

entirely lacking, which results in hemolytic anemia, fatigue, and a range of complications related to poor oxygen delivery to tissues **(Thein& Rees, 2025).**

Thalassemia is one of the most common genetic diseases in the world. Worldwide, it is estimated that 7 % of the population carries the thalassemia gene. The World Health Organization (WHO) has listed thalassemia as a major public health problem. Thalassemia has clear regional characteristics and group specificity, mainly occurring in the Mediterranean region, Southeast Asia, India, the Middle East, Africa, and southern China. With the flow of migrants, thalassemia has spread from the Mediterranean region, Africa, Asia to Europe, America, and Australia, becoming a serious global public health problem **(Su, et al., 2025).**

Individuals with mild forms of thalassemia might not exhibit any symptoms, whereas those with severe cases require frequent blood transfusions and iron chelation therapy to sustain life or potentially a hematopoietic stem cell transplant for a cure. The thalassemia treatment and monitoring process is cumbersome, expensive, seriously affects the quality of life of patients, and has a heavy disease burden. These impose substantial financial and social burdens on patients, families and society. Therefore, early, timely, and accurate screening is crucial **(Setiawan, et al., 2025).**

Patients with thalassemia often experience various physical, psychological, and social challenges that can significantly impact their overall quality of life quality of life. Improving the quality of life for these patients requires comprehensive and multidimensional care that extends beyond pharmacological treatment **(Wangi, et al., 2025).**

The Roy Adaptation Model Roy's adaption model developed by Sister Callista Roy, offers a holistic nursing framework that focuses on promoting adaptation in four key domains: physiological, self-concept, role function, and interdependence. This model views individuals as adaptive systems responding to internal and external stimuli and it emphasizes the role of nursing interventions in facilitating effective coping mechanisms and enhancing adaptive responses **(El Arab, et al., 2025).**

Educational programs based on the Roy's adaption model have shown promise in promoting patient-centered care by empowering individuals with knowledge, skills, physical, psychosocial and environmental support. For patients with thalassemia, such programs may help improve physical practices, psychological resilience, social integration, environmental adaptation and ultimately, quality of life. So, this study aims to evaluate the effect of provided educational program based on Roy's adaption model on quality of life for patients with thalassemia. By addressing the multidimensional needs of these patients through a structured and theory-based educational approach, the program seeks to foster improved adaptation and well-being of patients with thalassemia **(Hassan, et al., 2025).**

Significance of Study:
Thalassemia is a lifelong hereditary disorder that imposes considerable physical, emotional, and social burdens on patients, often leading to a diminished quality of life quality of life. Despite advances in medical management, many patients continue to struggle with complications arising from their condition, including frequent hospital visits, dependency on transfusions, and psychological stress. Therefore, addressing the holistic needs of patients is essential **(Al_Hamadiny, 2024**)

From the researcher point of view and experience.This study is significant as it applies the Roy Adaptation Model, a well-established nursing framework that emphasizes adaptive responses in four domains: physiological, self-concept, role function, and interdependence.

By integrating Roy Adaptation Model into an educational program tailored for thalassemia patients. The findings can provide evidence-based support for implementing theory-driven nursing interventions that empower patients to adapt to their chronic condition. Moreover, the outcomes may inform healthcare professionals and policymakers about the value of structured educational programs in improving quality of life, especially in resource-limited settings such as Egypt where thalassemia remains a public health challenge.

Aim Of Study:-

The present study aimed toevaluate the effect of an education program based on Roy's adaptation model on the quality of life for patients with thalassemia through:

1. Assess level of quality of life for patients with thalassemia.

1

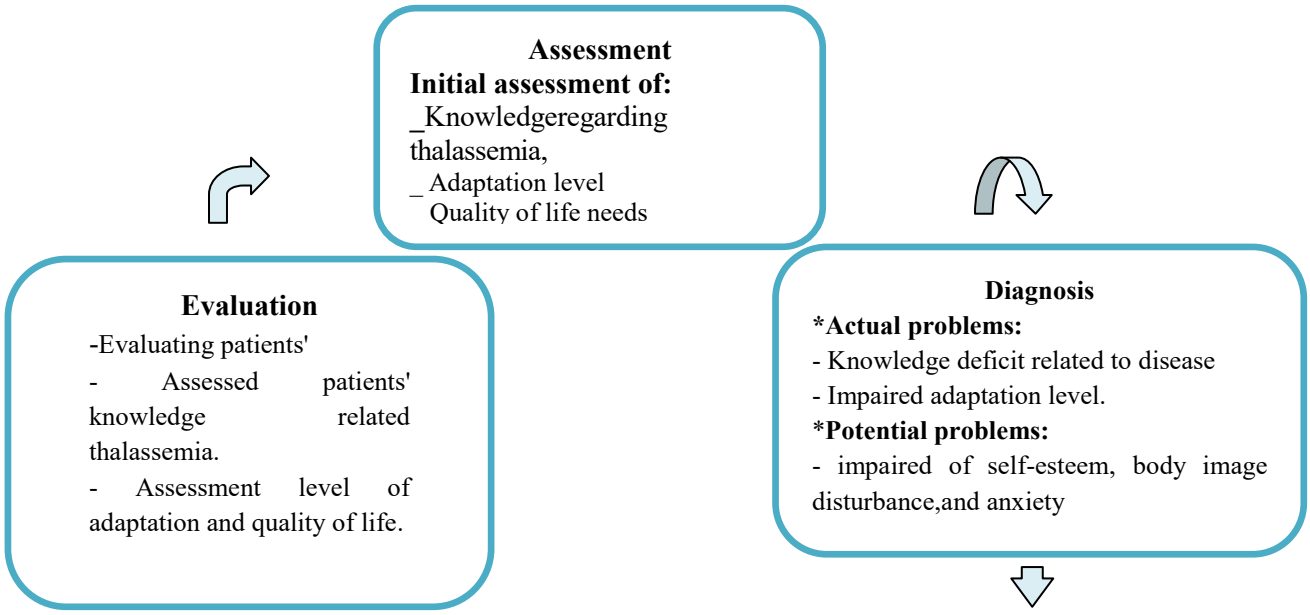
2. Designeducational program based on Roy's adaption model and patients' basic quality of life assessment needs for patients with thalassemia.
3. Implement the educational program based on Roy's adaption model and patients' basic quality of life assessment needs for patients with thalassemia.
4. Evaluatethe effect of provided educational program based on Roy's adaption model on quality of life for patients with thalassemia.

Research Hypothesis:
H0: Patients who will receive educational program based on Roy's adaption modelwill not exhibit better physical, psychological, social and environmental well-being more than those who will not receive the program.

H1: Patients who will receive educational program based on Roy's adaption model will be exhibit better physical, psychological, social and environmental well-being more than those who will not receive the program as measure by tool (III).

Theoretical Framework;
This study is grounded in Roy's Adaptation Model (RAM), which views the individual as a biopsychosocial being in constant interaction with a changing environment. According to RAM, health is defined as a state and process of being and becoming integrated and whole. The goal of nursing is to promote adaptation in four adaptive modes: physiological, self-concept, role function, and interdependence**.(Kumar, 2022).**

This conceptual framework illustrates the cyclical process of Roy's Adaptation Model, where the nurse continuously assesses, diagnoses, plans, implements, and evaluates the patient's adaptation to promote optimal health outcomes. The Roy Adaptation Model (RAM) can be seamlessly integrated with the nursing process to provide a comprehensive and holistic approach for patient care. The model emphasizes the importance of assessing the individual's adaptation levels, identifying adaptation problems, and developing interventions to enhance adaptation. This nursing process based on the RAM model focuses on promoting adaptation and improving health outcomes by addressing the patient's physiological, emotional, and social needs**(Majeed, et al., 2020)**.



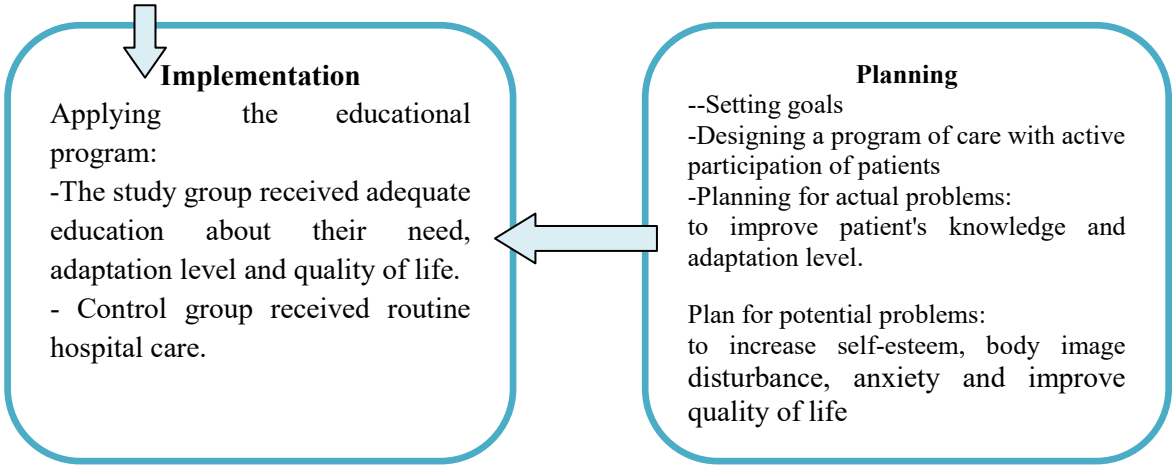


Figure (1): Nursing process according to Roy's theoretical model forpatientswiththalassemiadesignated by the researcher.

Subject and Methods:-

Research Design:

A Quasi-experimental design identifies a comparison group that is as similar as possible to the treatment group in terms of baseline (pre-intervention) characteristics. The comparison group captures what would have been the outcomes if the program/policy had not been implemented. Hence, the program or policy can be said to have caused any difference in outcomes between the treatment and comparison groups.

Setting:

This study was conducted in the General Medicine Department and the Blood Transfusion Unit at Fayoum University Hospital. The General Medicine Department is located on the 3rd floor and consists of twenty rooms—ten for male patients and ten for female patients—with each room containing two beds. The total capacity of the department is forty beds. The Blood Transfusion Unit is located on the ground floor of the hospital. It consists of a large room that includes a healthcare provider's desk and eight beds for patients

Subject:

A purposive sample of 80 adult patients from both genders. They were recruited from the previously mentioned setting and divided randomly into two equal groups study and control (40 patients for each group).

Inclusion criteria:

- Patients from both genders agree to participate in the study.
- Patients diagnosed with thalassemia.
- Patient able to communicate verbally..

Exclusion criteria:

- Psychiatric patients.
- Patients suffering from other types of anemia..

Sample size:

Based on sample size equation, the sample size was calculated by adjusting the power of the test to 80% and the confidence interval to 95% with margin of error accepted adjusted to 5% and a known total population of 80 patients using the following equation:**(Chow & Wang, 2007).**

$$n = \frac{N \times p(1-p)}{\left[\left[N-1 \times \left(d^2 \div z^2\right)\right] + p(1-p)\right]}$$

1

Nxp(1-p)	=(180*(0.20*(1-0.20)))/
N-1	=(180-1)*
d^2/z^2	=0.0025 / 3.8416+
p(1-p)	=0.20*(1-0.20)
N	=80

- P= 0.5
- N= Total population
- Z= Z value "1.96"
- D= Standard Error
- n= sample size

Tools of Data Collection:

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

Tool I: Interview Patient's assessment Questionnaire:

This tool was developed by the researcherin English and Arabic language afterreviewing relevant recent literatures**(Haq, et al., 2017)**to collect baseline data pertinentto the current study. It was consisting of twoparts as follow:

Part I: Patients' Socio-demographic data: This part concerned with assesses patients' socio-demographic characteristics which include patients' age, sex, marital status, educational level and occupation, residence and income. It contains seven questions in form of multiple-choice questions.

Part II: Patients' present, past and family history: This part aimed to assess patients' medical history that includes information about the present history, duration of the disease, past history, previous hospitalization and family history of thalassemia. It contains 12 questions in form of closed, open ended and multiple-choice questions.

Tool II: patients' knowledge assessment questionnaire.

It was developed by the researcher in the light of related literatures (Haq, et al., 2017;Olwi, et al., 2018; Man, et al., 2019) to assess knowledge of patient regarding thalassemia. It includes questions about definition, causes, signs and symptoms, diagnostic test, prognosis, complications, treatment, iron therapy, diet and activity. It consisted of 40 questions in form of multiple-choice questions.

Scoring system: Patient's knowledge assessment questionnaire consisted of 40 questions, the correct answers were predetermined according to literature review, a correct answer was scored 1 point and incorrect answer was scored 0 point, and satisfactory level was detected based on statistical analysis as following:

- **Satisfactory knowledge level ≥75%**
- **Unsatisfactory knowledge level < 75 %**

Tool (III): World Health Organization Quality of Life-BREF (WHOQOL-BREF) questionnaire:

The WHOQOL-BREF was developed by**GENEVA, 1996.** It was used to assess quality of life for patient with thalassemia. It was translated into an Arabic language and back translated into English. The tool included (26) questions. The items of the WHOQOL-BREF questionnaire are divided into 4 domains (Physical health domain, psychological domain, social relationships domain and environmental domain).

Scoring system:

WHOQoL-BREF composed of 26 items, which assess the following broad domains: physical health (7 items), psychological health (6 items), social relationships (3 items), and environmental factors (8 items), as well as the overall quality of life and general health (2 items). Each item is rated on a five-point likert scale that ranged from 1 to 5 where 1 is the lowest score and 5 are the highest score.

The score were categorized according Skevington et al., (2004)into:

- Good quality of life: ≥75%
- Average quality of life: 50<75%
- Poor quality of life: <50%

Tool (IV): Roy's Adaptation Modelquestionnaire:
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 10 questions which are used for assessment level of adaptation among studied patients. The answers was measured and given a score based on 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 grade for this questionnaire is 200 grades that represent 100%. The total score ranged from 40- 200 with the higher score indicated more adaptive behavior for thalassemia patients.

The studied patients'adaptation can be classified accordingAbdelrahman et al.. (2023) as:
- High adaption: ≥75%
- Moderate adaption: 50<75%
- Low adaptation: <50%

Validity:
The validity of the developed tools was testedby a panel of five experts from adult health nursing department, faculty of nursing, HelwanUniversity. The panel of experts was from different academic categories (four assist professors and one lecture). The experts reviewed the tools for clarity, relevance, comprehensiveness, understanding, applicability and easiness for administration. Suggestions were given and modifications were done.

Reliability:
Reliability of the tool was tested to determine the extent to which the questionnaire items are related to each other. The Cronbach's alpha model, which is a model of internal consistency, was used in the analysis. Statistical equation of Cronbach's alpha reliability coefficient normally ranges between 0 and 1. Higher values of Cronbach's alpha (more than 0.7) denote acceptable reliability.

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. 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 to test the applicability, clarity and efficiency of the tools, then the tools modified according to the results of the pilot study. Modifications included: rephrasing and rearrangement of some questions. After modification, the final form of the tools was developed. Patients who shared in pilot study excluded from the study sample.

Field Work:
Study was conducted within nine months from beginning of July 2024 to theend of March 2025.and carried out through four phases according to nursing process: assessment,planning, implementing and evaluation.

I-Assessment phase:
During this phase, the researcher visited the selected setting regularly, four days per week, selected patient according to inclusion criteria, and then assigned them randomly to either a study or control group. Initial assessment was done by the researcher for all study subjects in study and control groups regarding to participants' age, gender, educational level, occupation, and health history. Determine whether the deficit is due to lack of needs, lack of skills, or limited ability. Data collection was held through structured interviews and medical record chart. During this phase each patient was assessed individually during follow up period, and data collection was filled by the researcher, by using tools (I), tool (II), tool (III) and tool (IV) for study and control groups as follows:
Tool I: Was utilized to assess patients' socio-demographic characteristics and medical history data that filled for the study and control groups, it took around 10 minutes.

Tool II: To assess patient about knowledge regarding patients with thalassemia; it took around 15-20 minutes.

Tool III: To assess quality of life specific to patient with thalassemia, it took around 15-20 minutes.

Tool III: To assess level of adaptation among patient with thalassemia it took around 15-20 minutes.

II- Planning and Design phase:
This phase included analysis of the pre-test findings; where goals and outcomes are formulated that directly impact patient care. 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 guidelines booklet.

III- Implementation phase:
Based on the results obtained from the interviewing and observational sheets, as well as literature review, the educational program was developed by the researcher. It was implemented immediately after the pre-test**.** This includes implementing the designated nursing guidelines for the study group (40) patient, in term of educational sessions, instructions and follow up. The program was divided into 5 sessions (2 theoretical and 3 practical sessions)each session was implemented in one day. The duration of each session varied, according to its contents as well as the clients' response.

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. Evaluation was done by using the posttest questionnaire which was the same format of pre-test in order to compare the changes in patients' need, and practices, using assessment tools (II, III, IV) post 2 weeks and follow up 3month from program.

Results:

Table (1): Frequency and percentage distribution of Socio-demographic data for the studied patients. (n=80).

Socio-demographic data	Control group (n=40)		Study group (n=40)		x2	P-value
	N	%	N	%		
Age group						
18-24 Years	**21**	**52.5**	**22**	**55**	**0.753**	**0.686**
25-34 Years	**9**	**22.5**	**11**	**27.5**		
35-45 Years	**10**	**25**	**7**	**17.5**		
Mean±SD	**27.8±8.83**		**27.3±7.07**			
Gender						
Male	**24**	**60**	**21**	**52.5**	**0.457**	**0.499**
Female	**16**	**40**	**19**	**47.5**		
Social Status						
Single	**29**	**72.5**	**29**	**72.5**	**2.39**	**0.495**
Married	**9**	**22.5**	**8**	**20**		

Widowed	**2**	**5**	**1**	**2.5**		
Divorced	**0**	**0**	**2**	**5**		
Level of Education						
Can't read and write	**20**	**50**	**21**	**52.5**	**1.66**	**0.312**
Primary education	**10**	**25**	**8**	**20**		
Secondary education	**7**	**17.5**	**8**	**20**		
University education	**3**	**7.5**	**3**	**7.5**		
Occupation						
Work	**15**	**25**	**13**	**27.5**	**1.16**	**0.2799**
Doesn't work	**25**	**75**	**27**	**72.5**		
Place of residence						
Urban	**10**	**25**	**11**	**27.5**	**0.065**	**0.799**
Rural	**30**	**75**	**29**	**72.5**		
Income						
Sufficient	**11**	**27.5**	**13**	**32.5**	**0.238**	**0.626**
Insufficient	**29**	**72.5**	**27**	**67.5**		

***Significant at P ≤ 0.05.**

Table (1) illustrates that there was no statistical significant difference between study and control groups with p-value >0.05, as regarding socio-demographic characteristics like; age, gender, social status, education level, occupation, place of residence, and incomewhich indicated proper matching between groups in these variables.

Table (2): Frequency and percentage distribution of past health and family history for the studied patients. (n=80).

Past health history and family history	**Control group (n=40)**		**Study group (n=40)**		**Test**	**P-value**
	N	**%**	**N**	**%**		
Suffering from Chronic Disease:						
No	1	4.3	2	8.6	3.85	0.696
Diabetes	9	23.07	8	21.05		
High blood pressure	10	25.6	11	28.9		
Heart problems	15	38.4	17	44.7		

1

Chest sensitivity	0	0	1	2.6		
Diabetes, High blood pressure and Heart problems	2	5.1	2	5.2		
Diabetes and Heart problems	3	7.6	2	5.2		
Family history for thalassemia:						
Yes	30	75	29	72.5	0.065	0.799
No	10	25	11	27.5		
Degree of relationship:						
First	20	66.6	19	65.5	0.037	0. 901
Second	10	33.3	10	34.4		

***Significant at P ≤ 0.05.**

Table (2) illustrated that there was no statistical significant difference between study and control groups as regarding past health history and family historychronic disease, previous surgery and family history.

Table (3): Frequency and Percentage Distribution of the patient's total knowledge for the two groups within pre, post, and follow up test.

Variable	Total Patients' Knowledge												x^2	P-Value
	Pre				Post				Follow Up					
	Control group (n=40)		Study group (n=40)		Control group (n=40)		Study group (n=40)		Control group (n=40)		Study group (n=40)			
	N	%	N	%	N	%	N	%	N	%	N	%		
Unsatisfactory	25	62.5	23	57.5	22	55	0	0	20	50	1	2.5	32.72	**0.00***
Satisfactory	15	37.5	17	42.5	18	45	40	100	20	50	39	97.5		
Test &P-Value	x2= 0.208 (0.648)				x^2=30.34 **(0.00*)**				x^2=23.30 **(0.00*)**					

***Significant at P ≤ 0.05.**

Table (3) showed that; there was no statistically significant difference in knowledge between the control and study groups at the pre-test, while there was a statistically significant difference in knowledge between the control and study groups at the post and follow up test.

Table (4): Frequency and Percentage Distribution of the patient's total quality of life for the two groups within pre, post, and follow up test.

Variable	Total Patient'sQuality of Life												x^2	P-Value
	Pre				Post				Follow Up					
	Control group (n=40)		Study group (n=40)		Control group (n=40)		Study group (n=40)		Control group (n=40)		Study group (n=40)			
	N	%	N	%	N	%	N	%	N	%	N	%		
Poor QoL	6	15	5	12.5	6	15	2	5	6	15	1	2.5	10.68	**0.00***
Average QoL	32	80	30	75	33	82.5	32	80	32	80	34	85		
Good QoL	2	5	5	12.5	1	2.5	6	15	2	5	5	12.5		
Test &P-Value	x^2= 1.82 (0.799)				x2= 6.212 **(0.02*)**				x^2= 8.21 **(0.01*)**					

*** Significant at P ≤ 0.05.**

Table (4): illustrated that there was a statistically significant difference between the two groups within post and follow up test. The control group remained unchanged across all phases.

Table (5): Frequency and percentage distribution of total patient's Roy Adaptation for two groups Modesduring pre, post, and follow up phase (n=80).

Total patient'sRoy Adaptation Modes	Studied patients (n = 80)				$\chi 2$	P-Value
	Control group (n=40)		Study group (n=40)			
	N	%	N	%		
Pretest:					0.057	0.972
Low adaptation.	14	35	13	32.5		
Moderate adaptation.	24	60	25	62.5		
High adaptation.	2	5	2	5		
Posttest:					23.69	**0.00***
Low adaptation.	14	35	3	7.5		
Moderate adaptation.	24	60	21	52.5		
High adaptation.	2	5	16	40		
Follow up test:					45.35	**0.00***
Low adaptation.	13	32.5	2	5		
Moderate adaptation.	25	62.5	3	7.5		
High adaptation.	2	5	35	87.5		

***Significant at P ≤ 0.05.**

Table (5) 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 (p- value 0.00*), while there was no statistically significant difference between the study and control group regarding pretest with p-value (p- value 0.972).

Table (6): Correlation between patients' total knowledge, total quality of life and total Roy adaptation mode.

Items	Total Patients' Knowledge					
	Pre		Post		Follow Up	
	R	P	R	p	R	p
Total Quality of Life	0.279	**0.01***	0.108	0.342	0.298	**0.007***
Total Roy Adaptation Modes	0.338	**0.00***	0.517	**0.00***	0.581	**0.000***

***Significant at P ≤ 0.05:**

Table (9)illustrates that; There was a significant positive correlation between total patients' knowledge and total Roy adaptation within three tests, while there was a significant positive correlation between total patients' knowledge and total quality of life within pretest and follow up test. There was a significant positive correlation between total patients' knowledge and total Roy adaptation mode within pretest, posttest and follow up test.

Discussion:-

In the present study, findings regarding to the patient's characteristics revealed that, the socio-demographic and medical characteristics of subjects in both study and control groups, were not significantly dissimilar; this means that the participants were selected from identical population of thalassemia patients with good random allocation obtained, The mean age of the studied patients in both study and control groups werebetween (18-24) years with mean age (27.8±8.83, 27.3±7.07) and more than half of them were males. From researcher point of view,the short life span is associated with iron overload, which may eventually affect the organs and lead to their failure.

This result is similar toHossainet al., (2023)who reported that the mean age of the studied patients was (19.75 ± 8.02) their age group was between (14-24) years, in a study titled"Health-related quality of life among thalassemia patients in Bangladesh using the SF-36 questionnaire.

Regarding to social status,the study results showed more than two thirdsof the studied patientsin both study and control groups were single. These results may be due to most patients are fear of passing the disease to their children by heredity. These results is in the same line with Khodashenaset al., (2021)who revealed thatmajority ofthe participants were single in their study that entitled "Quality of life and related paraclinical factors in Iranian patients with transfusion-dependent thalassemia".

Concerning education level, occupation, residence and income of the studied subjects, half of studied patients in study and control groups, can't read and write and more than two thirdsof patients doesn't work, live in rural areas and had insufficient income. This result may be due to that the thalassemia is a chronic disease which affect the patient's, physical, psychological and social status of patients and cause severe level of fatigue which interfere with the patient's ability to study is go through their education in addition to frequent hospitalization of patients due to the chronic nature of the disease and frequent receiving of treatment such as blood transfusion, which make patients in ability to work.Therefore, patients' income is insufficient.

This result is similar toHossainet al., (2023)who reported that the majority of the studied patients were unemployment and low income. This result also agree withBadur et al., (2021)who revealed that more than half of patients were illiterate in their study that titled "Evaluation of the relationship between sociodemographic characteristics, quality of life, depression, drug compliance and biochemical parameters in patients with thalassemia major in Isparta".

In relation to past health history, chronic diseases in this study showed that about more than one quarter of patients in study and control group suffer from diabetes mellitus and hypertension and more than one third of patients had heart problem. These results may be due to pancreatitis which leads to diabetes mellitus and iron accumulation on

the heart can cause cardiomyopathy. These results is agree with Hamdy et al., (2021)who revealed that more than one third of patients haddiabetes mellitus and cardiomyopathyin their study that titled "Assessment of quality of life among beta-thalassemia major patients attending the hematology outpatient clinics at Cairo university hospital"

In relation to family history, the current results found that the more than two thirdsof the studied patients in both study and control groups had family history for thalassemia from first degree relation. This result may be due to that thalassemia is genetic disease that can be transferred through heredity. This result go in the same contextwithAbd Al-Abbass et al,, (2024)who reported that two thirds of patients had family history of thalassemia in a study that titled "Epidemiological characteristics and disease complications in thalassemia syndrome patients in Babylon, Iraq"

Pertaining to patients' knowledge regarding definition, causes, signs and symptoms, diagnostic test, complications, treatment, iron therapy, diet and activity of thalassemia, the findings of the present study illustrated that, there was no statistical significant difference between study and control groups as regarding knowledge scores before the nursing program implementation, as the studied patients allocated randomly from the same population.

These findings are in line with Hassani et al., (2024) who conducted that no statistically significant difference between the mean scores of knowledge in the two groups before the educational intervention in their study that titled "Effectiveness of educational intervention on quality of life in adults with thalassemia major ".

The result of the present study demonstrated that, there is an improvement in patients' knowledge in the study group after the implementation of educational program and follow up, from the researcher point of view, this result may be due to training program affect patients' knowledge positively that appeared in the highest scores in the post intervention phase. The studied patients were prone to the educational program covered all the knowledge, and skills needed by the patient based on the assessment done during the pilot study and included all items related to the knowledge about the disease. Which support research hypothesis (1).

These findings are in line with Hassani et al., (2024) who conducted that a statistically significant difference between the mean scores of knowledge in the two groups after the educational intervention, study group demonstrated that increase knowledge and level of awareness in one week after the educational intervention and four months after follow up phase.

As regarding quality of life for patients with thalassemia,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 thalassemia 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 improve physical practices, psychological resilience, social integration, environmental adaptation and ultimately, 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 poor to average quality of life after the program. This highlights the effectiveness of targeted educational interventions in enhancing patient outcomes.

This finding in line with Dehnoalian, et al., (2017), who reported that comparison of the dimensions of quality of life in patients with thalassemia before and after the intervention indicated improvement in scores in all aspects of quality of life ($P > 0.05$). in their study that titled" The impact of educational counseling program on quality of life of thalassemia patients: a comprehensive short scale to assess the functional, psychosocial, and therapeutic factors of QOL among stroke survivors"

Similarly, this finding in the same line withEtemad et al, (2021), who demonstrated that, a significant increase in the QoL score was observed in all dimensions after the implementation of the intervention in one month and three month, compared to the QoL before the interventionin their study that titled" Quality of life and related factors in β-thalassemia patients "

At the same direction, Imanian et al. (2024`)who conducted that, there was no significant difference between the control and intervention groups in the mean pre-test scores of quality of life, the mean post-test scores of quality of life in the intervention group were significantly increase than the control group in their study that titled"An investigation of group-based mobile learning on stress, anxiety, depression, and pain among Beta-thalassemia major patients".

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, social and environmental 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 low to high adaptation after receiving the program, while most patients in the control group had mal adapted. This finding in line withHasanah, et al., (2022), who 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 in their study that titled"A Critical analysis of using Roy's Adaptation Model in nursing research as an empirical for clinical practice: a systematic review".

In the same context Imani, et al., (2024), who reported that,the application of Roy model was determined in improving adaptation level in different modes and in various diseases and situations, including in hemodialysis patients, thalassemia, heart failure, breast cancer, mental disorders, burns, asthma, multiple sclerosis, diabetes, blood pressure and covid- 19 In their study that titled"The application of Roy adaptation model in iranian nursing care: a narrative review study ".

Similarly, this finding in the same line withYaghoubinia, et al., (2017), who demonstrated that, there was a statistically significant difference for the mean scores of physiological adaptation of patients on pre and post-application of RAM. There was observed improvement in adaptation level among patients after application of RAM. In their study that titled"Effect of care plan based on Roy adaptation model on physiological adaptation in patients with thalassemia major ".
Regarding the current study correlations, the findings indicated a statistically significant positive relationship between the Roy Adaptation Model (RAM), patient knowledge, and quality of life (QoL) before and after the implementation of the educational program.

The researcher believes that patients with greater knowledge about their condition are more likely to manage their symptoms effectively and adopt healthier lifestyle choices. This enhanced understanding helps to reduce stress and promotes better psychological and physical well-being. According to Roy's model, adaptation occurs through four modes: physiological, self-concept, role function, and interdependence. As patients gain a deeper understanding of thalassemia, they are better equipped toadapt within each of these domains, resulting in an overall improvement in their quality of life. Therefore, increasing disease-specific awareness and education plays a critical role in supporting patient adaptation and enhancing daily living.

This finding supported withHasanah, et al., (2022), who 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. Also this result support with Hosseini&Soltanian, (2022),who reported that application of care program based on the Roy's adaptation model increased physical and psychological adaptive (healthy) behaviors in patients with chronic diseases, which might improve the patients' psychological adaptation to the disease, proper disease control, reduction of complications, and quality of nursing care. In their study that titled"Application of Roy's adaptation model in clinical nursing ".
In the same context Hassani, et al., (2024), who demonstrated that a structured educational intervention significantly improved knowledge and quality of life among patients with thalassemia major, highlighting the importance of educational support in chronic disease management. In their study that titled"Effectiveness of educational intervention on quality of life in adults with thalassemia major: A quasi-experimental study based on PRECEDE model

1

CONCLUSION:-

Based on the findings of the study, it can be concluded that, the educational program based on Roy adaptation model had a positive effect onthe patient's outcomes among study group as regarding knowledge, quality of life and adaptation level of patient compared tocontrol group, as well as there was statistically positive correlation withhigh significance between knowledge, adaptation and quality of life.

Recommendation:-

- Educational programs based on the Roy Adaptation Model should be regularly implemented to improve patients' adaptation and enhance their quality of life.
- Future studies are recommended to assess the long-term impact of adaptation-based educational program on large sample of patients with thalassemia for generalization.

Reference-:

1. Abd Al-Abbass, H., Obaid, A., Makki, H., Abdulrasol.,&Jasim, A. (2024).Epidemiological Characteristics and Disease Complications in Thalassemia Syndrome Patients in Babylon, Iraq. Journal of Babol University of Medical Sciences, 26(1).
2. Abdelrahman, B., Mohey El-Deen, H, &Sabry, S..(2023). Effect of Applying Roy's Adaptation Model on Quality of Life for Patients with Vitiligo. Egyptian Journal of Nursing and Health Sciences, 4(4), 215-242. Al_Hamadiny, S., Alqaisi, A., Al-Sarray, R., Ali, S., Trad, H. &Abood, A. 2024 Psychological Factors Associated with Major Thalassemia.Journal of Medical Genetics and Clinical BiologyVolume: 1, Issue: 9, ISSN: 3032- 1085
3. Badur, A., Ozbalci, D. &Alanoglu, E. (2021). Evaluation of The Relationship between Sociodemographic Characteristics, Quality of Life, Depression, Drug Compliance and Biochemical Parameters in Patients with Thalassemia Major in Isparta. Annals of Medical Research, 28(8), 1500-1507.
4. Chow, C., Shao, J. & Wang, H. (2007).Sample Size Calculation in Clinical Research, Second edition. Chapman and Hall/ CRC Biostatistics Series, P: 389-405.
5. Dehnoalian, A., Dehkordi, S., Alaviani, M., Motamedi, Z., Ahmadpour, S. &Banan-Sharifi, M. (2017).The Impact of Educational Counseling Program on Quality of Life of Thalassemia Patients.Jundishapur Journal of Chronic Disease Care, 6(4).
6. DeSanto, S. & Fawcett, J. (2009).Toward Understanding and Measuring Adaptation Level in The Context of The Roy Adaptation Model. Nursing Science Quarterly, 22(4), 355-359.
7. El Arab, R., Alzghoul, H., Abu-Mahfouz, M., Aldarwish, Z., Abbadi, M., Ghashi, E. &Seweid, M. (2025).Nurses' Perspectives on the Sleep Quality of Hospitalized Patients in Al Ahsa, Saudi Arabia. Nursing Reports, 15(2), 54.
8. Etemad, K., Mohseni, P., Aghighi, M., Bahadorimonfared, A., Hantooshzadeh, R., Taherpour, N. &Hajipour, M. (2021).Quality of Life and Related Factors in β-thalassemia Patients.international journal for hemoglobin research, 45(4), 245-249.
9. Hamdy, M., Draz, I., El Sayed, I., Ayyad, A. &Salemd, M. (2021).Assessment of Quality of Life among Beta-Thalassemia Major Patients Attending the Hematology Outpatient Clinics at Cairo University Hospital. Open Access Macedonian Journal of Medical Sciences, 9(E), 156-160.
10. Haq, N., Masood, N., Nasim, A., Riaz, S., Saood, M. &Yasmin, R. (2017). Assessment of Disease State Knowledge and Awareness Among the Guardians of Thalassemia Patients Attending Different Health Facilitiesin Quetta, Pakistan. In Value In Health, 20(5), 236-236.
11. Hasanah, I., Nursalam, N., Pandin, M., Ikhwani, D. &Rohita, T. (2022). A Critical Analysis of Using Roy's Adaptation Model in Nursing Research as an Empirical for Clinical Practice: a Systematic Review.doi:10.20944/(www.preprints.org).0276.v1
12. Hassan, W., Soliman, H., Mohamed, M. &Fawzi, A. (2025).The Prevalence of Blood Transfusion Episodes among Thalassemia Patients at Sporting Hospital Alexandria.European Journal of Theoretical and Applied Sciences (ISSN 2786-7447) Volume 3, Number 2.
13. Hassani, L., Seyrafi, N., Mohammadi, S., Aghamolaei, T., Ghanbarnejad, A. & Reza, M. (2024). Effectiveness of Educational Intervention on Quality of Life in Adults with Thalassemia Major: A quasi-Experimental Study Based on PRECEDE Model. Health Science Reports, 7(9), e70075.
14. Hossain, M., Islam, M., Munni, U. R., Gulshan, R., Mukta, S., Miah, M. & Islam, M. (2023).Health-Related Quality of Life among Thalassemia Patients in Bangladesh Using the SF-36 Questionnaire. Scientific Reports, 13(1), 7734.

1

15. Hosseini, M., &Soltanian, M. (2022). Application of Roy's Adaptation Model in Clinical Nursing: A Systematic Review. Journal of Iranian Medical Council.5(4).
16. Imani, A., Jaghouri, E., Molavynejad, S. &Asadizaker, M. (2024). The Application of Roy Adaptation Model in Iranian Nursing Care: A Narrative Review Study. Community Health Journal, 17(4), 27-37.
17. Khodashenas, M., Mardi, P., Ghahfarokhi, N., Tavakoli, B., Jamee, M. &Ghodrati, N. (2021).Quality of Life and Related Paraclinical Factors in Iranian Patients with Transfusion-Dependent Thalassemia. Journal of Environmental and Public Health, (2849163), 6.
18. Kumar, S., Jan, R., Rattani, S., &Yaqoob, A. (2022). Theory GuidedPractices: An Approach to Better Nursing Care through the RoyAdaptation Model. International Journal of Current Research andReview, 14(14), 58-63.
19. Majeed, I., Sehar, S., Afzal, M., Gilani, S. A., Parveen, K., & Ahmed, R. (2020). 34. Effect of Roy's Adaptation Model Based Interventions on Quality of Life in Patients with Type II Diabetes. Pure and Applied Biology (PAB), 9(1), 332-339.
20. Man, C. D., Maideen, S. F. K., & Rashid, A. (2019).Knowledge, Attitude and Practice towards Dietary Iron among Patients with Thalassemia and their Caregivers in Peninsular Malaysia.Med J Malaysia, 74(5), 365.
21. Olwi, D., Merdad, L. & Ramadan, E. (2018). Thalassemia: A Prevalent Disease yet Unknown Term among College Students in Saudi Arabia. Journal of Community Genetics, 9(3), 277-282.
22. Setiawan, H., Xu, W., Wang, C., Li, C., Ariyanto, H., Firdaus, F. & Hu, R. (2025). The Effect of Mobile Application Based Genetic Counseling on the Psychosocial Well-Being of Thalassemia Patients and Caregivers: A randomized Controlled Trial. Patient Education and Counseling, 130, 108457.
23. Skevington, S., Lotfy, M. & O'Connell, K. (2004). The World Health Organization's WHOQOL-BREF Quality of Life Assessment: Psychometric Properties and Results of the International Field Trial. Quality of Life Research, 13(2), 299–310.
24. Su, Y., Xie, J., He, J., Shen, Y., Li, T., Huang, W. &Bian, Q. (2025).Screening and Treatment of Thalassemia.ClinicaChimicaActa, 120211.
25. Thein, S. & Rees, D. (2025).Haemoglobin and the Inherited Disorders of Globin Synthesis.Hoffbrand's Postgraduate Haematology, 222-248.
26. Wangi, K., Shaleha, R., Wijaya, E., &Birriel, B. (2025). Psychosocial Problems in People Living with Thalassemia: A Systematic Review. SAGE Open Nursing, 11, 23779608251323811.
27. Yaghoubinia, F., Navidian, A. &Yousefian, N. (2017).Effect of Care Plan Based on Roy Adaptation Model on Physiological Adaptation in Patients with Thalassemia Major. Medical-Surgical Nursing Journal, 6(2 &3).