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Self-Care Nursing Educational Intervention for Post Renal Transplant Recipients among Adolescents

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Abstract: **Self-care is a concept frequently referred to in both the theory and the clinical practice of nursing. Renal transplantation represented an alternative to dialysis for many patients with end stage renal disease. An important function of the nurse is to prepare the patient for a lifetime of self-care management and monitoring care. The aim of this study was to assess the effect of self-care nursing educational intervention for Post Renal Transplant Recipients among Adolescents. Subject and Method: Design: A quasi experimental design (Study/ Control) was used. Setting: This study was carried out in Mansoura Urology and Nephrology center. Sample: convenience sample of forty renal transplant recipients were enrolled in this study (Study/Control). Tools for data collections were 1) an interviewing questionnaire for assessing socio-demographic characteristics, health history and patient's knowledge,2). Post renal transplant recipients Observational checklist for self-care for practical skills for measuring:- vital signs, recording fluid balance, assessing edema, taking medications and measuring the weight, post renal sign of complications, infection, rejection, and drug side effects, 3) the Rosenberg Self-Esteem Scale for Post Renal transplant recipients for assessing of self-esteem. The findings revealed that; there was significant significance difference between study and control group regarding mean total knowledge and total self-care (P<0.001). Also, about two third of patients (65%) in the study group had a positive self-esteem compared to 54% in the control group post renal transplant. Conclusion: Self-care nursing educational intervention had an effect on increasing renal transplant recipient's knowledge and self-care practices, decreased the post renal transplant complications and had a positive self-esteem of the study group. Recommendation: encouraging the implementation of self-care nursing educational intervention for all renal transplants to adapt functioning and prolongation of normal life.**

Keywords: **Self-Care, Nursing Educational Intervention, Renal Transplantation.**

1. INTRODUCTION

Chronic kidney disease (CKD) is recognized as a growing global public health problem characterized by raising rates of diabetes mellitus, obesity, hypertension and ageing populations [1]. Kidney transplantation (KT) is the treatment of choice for pediatric patients with end-stage renal disease (ESRD) [2,3]. Kidney transplantation is the surgical placement and vascular integration of a human kidney that is considered the only treatment that restores reasonably normal kidney function and health [4,5].

Worldwide, the number of patients with chronic kidney disease "CKD" is raising markedly, especially in adults, and chronic kidney disease (CKD) is now being recognized as a threatening to reach epidemic proportions over the next decade [6]. In North America, up to 11% of the population (19 million) may have CKD [7] and survey in Australia, Europe, and Japan describe the prevalence of CKD to be 6–16% of their respective populations [8,9].

In contrast, a study demonstrated an increasing prevalence of childhood kidney diseases that represents prevalence of 8.9% for kidney disease among hospital admissions as reported by **[10].** Pediatric ESRD patients <20 years of age constitute a very small proportion of the total ESRD population. A total of 1,462 children aged 0-19 years in the United States began ESRD care in 2013 **[11].** Also marked variations were reported in the incidence and prevalence of ESRD in the pediatric population across countries. Approximately 80% of Renal Replacement Therapy (RRT) patients worldwide live in Europe, Japan or North America, where all children with ESRD have access to RRT. By contrast, limited health care resources and lack of trained personnel in developing countries result in rationale of or even not offering RRT **[12].**

Pediatric kidney transplant recipients are medically fragile and present with complex care issues requiring high-level management **[13].** Although renal transplantation brings many benefits to patients, it is potentially associated with a number of drawbacks, which include constant risk of rejection, the need to comply with a complex medication regimen capable of producing pronounced side effects, and the need for ongoing medical and nursing supervision. These drawbacks are also stressors for patients, with some of the most important being fear of kidney transplant rejection, worries about the risk of infection, compliance with the medication regimen, repeated hospitalizations, and changes in body appearance**.** Renal transplant patients experience stress and uncertainty, which influence their health-related quality of life **[14].** The hope of a transplant is an important factor in patient's ability to cope with end stage renal disease and dialysis treatment **[15].**

As the number of kidney transplants continues to increase, survival rates of grafts and patients have also increased dramatically **[16].** However, successful transplantation brings new challenges in patients' life in terms of life-long medication, care of the graft. In order to reduce rejection episodes, and the negative consequences of immunosuppressive medication, renal recipients need to acquire knowledge in relation to medication regime, graft surveillance, and the benefit specific lifestyle behavior. The consequences of lacking knowledge can be fatal. The factors making the outcome complex, knowledge regarding important aspects of life post-transplant is an essential first step toward enhanced coping and quality of life **[17,18].**

The early post-operative phase observations focus on graft function, blood pressure, pain, and fluid replacement. Kidney transplantation is a surgical procedure associated with postoperative pain, nausea, vomiting and tiredness. Both surgery and anesthesia can cause reduced cognitive functions. The loss and lack of concentration are symptoms that frequently occur in patients who have undergone a surgical procedure **[19,20].** In addition, emotional reactions are a well-known phenomenon after surgery in general. For renal recipients, emotional postoperative reactions seem to be associated with insecurity and anxiety during the waiting time prior to the transplantation **[21,22].**

Shorter stays in the hospital and efficient, time-saving follow-up might have imposed increased demands on the patient, particularly regarding the acquirement of necessary post-transplant knowledge. Noncompliance with post-transplant health advice appears to be unacceptably high among renal recipients **[23,21]** and that learning difficulties might occur due to physical and mental stress in the post-transplant situation **[21].** Hence, patient education is of vital importance for transplant patients.

Nursing education for patients with renal diseases has been studied, they concluded that descriptions of effective interventions to improve adherence to medication are lacking for organ recipients **[24].** It has also been claimed a more holistic approach to organ recipient patient education is required **[25].** Increasing national and international interest in patient education has emerged, and individuals are increasingly expected to exert more self-care **[26,27].** However, teachings to ensure those patients and their families are competent and confident have not been supplied **[28].**

In transplantation, the importance of knowledge concerning medication, signs of rejection and how to prevent negative consequences require a patient education program that, to the highest possible degree, prepares patients for life when returning home with a new kidney. An important function of the transplant nurse is to prepare the patient for discharge and for a lifetime of self- monitoring and care. Improving physical strength is an important part of self-care. Thus, Patients can play a vital role in reducing complications by engaging in self-care activities **[27].**

Self-care refers to "the range of behaviors undertaken by individuals to promote or restore their health". Self-care encompasses more than just adherence to medications, and includes how patients follow dietary recommendations, monitor symptoms, maintain physical function, execute medical regimens, and make decisions about seeking care. Self-

care behaviors associated with proper management of the kidney transplant include: taking immunosuppressive medications; staying well-hydrated; following a low salt, low fat, and low cholesterol diet; vigilant monitoring of vital signs and symptoms of infection or rejection; exercising; wearing sun protection; personal care, and follow-up appointments and avoiding contact with people who are ill **[29].**

Significance of the Study

Most epidemiological information on chronic kidney disease (CKD) originates from data available on end-stage renal disease (ESRD), the terminal stage of CKD when treatment with renal replacement therapy (dialysis or transplant) becomes necessary to sustain life. Little information is available on the prevalence of earlier stages of CKD, as patients are often asymptomatic [11].

There is still a lack of statistics pertaining chronic kidney disease (CKD) in Egypt to help the researchers in this field. Insufficient data were obstacles to guide the researchers in the fields of pediatric nephrology practice to allocate and focus on diseases increase in children with kidney disease settings.

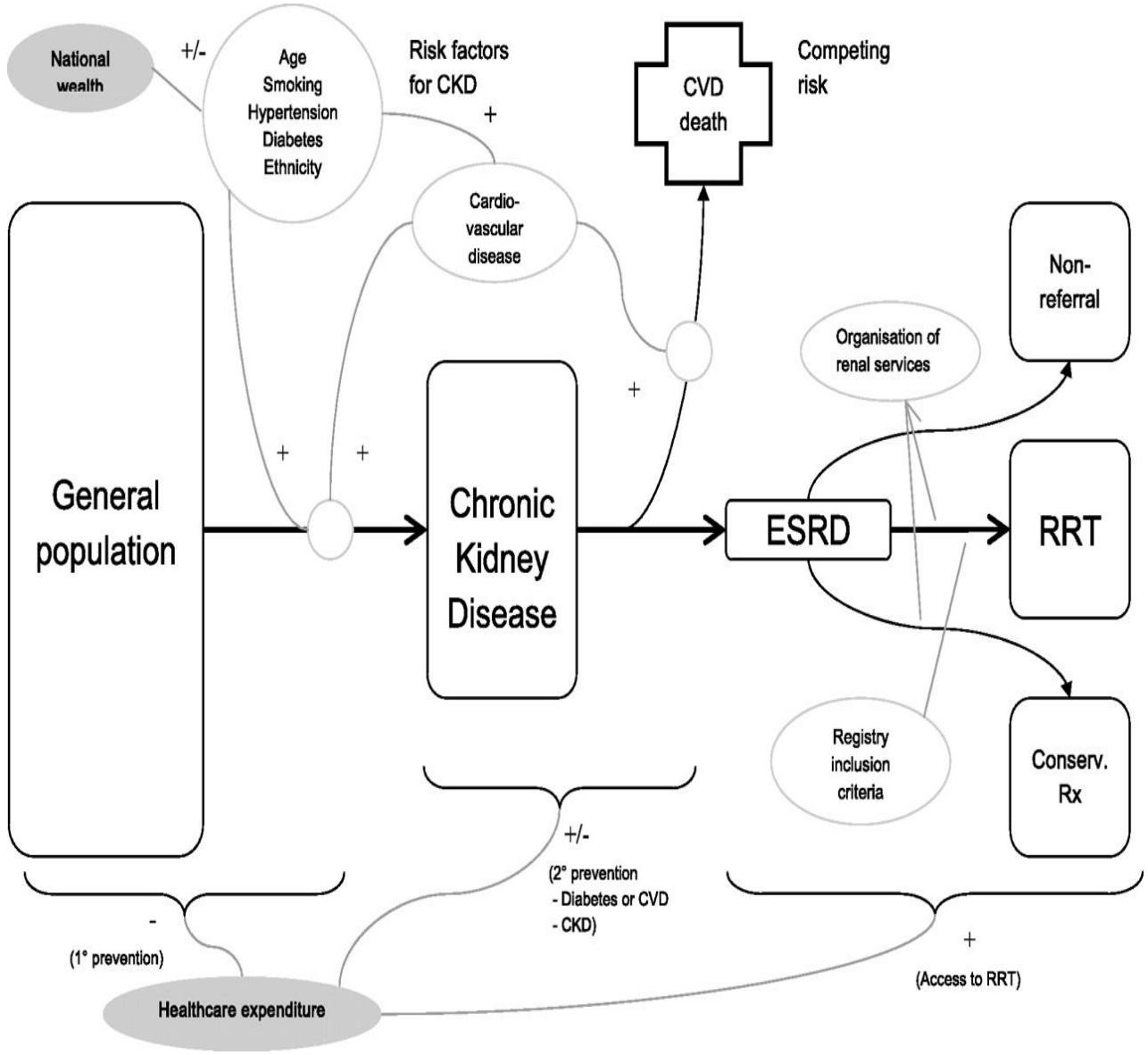

Fig.1. Summary of conceptual framework for Renal Replacement Therapy (RRT) incidence. CVD = cardiovascular disease; 1° = primary; 2° = secondary; Rx = therapy. Adopted from [30]

2. AIM OF THE STUDY

The aim of the study was to assess the effect of Self-Care intervention of Pediatric post renal transplant recipients. **Theoretical Definition of** Adolescents**:** The World Health Organization (WHO) defines adolescents as the period in human growth and development that occurs after childhood and before adulthood, from ages 10 to19 **[29].**

Operational Definition:

Self Care Nursing Educational intervention: refers to education related to self-care behaviors associated with:-

- Proper management of the kidney transplant include: more than just adherence to medications, and includes monitor symptoms, maintain physical function, execute medical regimens, and staying well-hydrated.
- Following a dietary education, how patients follow dietary recommendations; low salt, low fat, and low cholesterol diet.
- Monitoring of vital signs and symptoms of infection or rejection, exercising; wearing sun protection; personal care, and follow-up appointments and avoiding contact with people who are ill**.**

Research Hypothesis:

1. Study patient who will receive self-care intervention is more likely to have better knowledge about self-care post kidney transplant recipients than control group.

2. Study patient who will receive self-care intervention is more likely to improve the self-care practice of post kidney transplant recipients than control group.

3. Study patient who will receive self-care intervention is more likely to decreases the post kidney transplant recipient's complications than control group.

4. Study patient who will receive self-care intervention is more likely to increases patient's self-esteem post kidney transplant recipient's than control group.

3. SUBJECTS AND METHOD

Design:

This study was quasi-experimental study **(study /control study)**. A nursing intervention study designed to be carried out on a group of patients who are undergoing renal transplantation. The patients were divided into study and control group. The self care was devoted to the study group while the control group was under the usual care of the health care setting.

Setting:

This study was implemented at Mansoura Urology and Nephrology center, Mansoura University. It is considered as one of the major centers in Egypt that serve renal failure patients and it has an active program of pediatric renal transplantation among other services in Cairo-Egypt.

Sample:

A convenience sample of a total number of forty (40) adolescent post kidney transplant recipients was included in this study. They were selected according to the following criteria:-

Inclusion Criteria: The criteria includes:-

- All gender; male and female.
- Age 10-18 years.
- Patients who repaired for renal transplantation.

Exclusion criteria:-

- All adolescent patients who are not medically stable were not included.

They were equally divided in two groups (the first 20 for the study group and the second twenty for the control group. The intervention of each patient in the study group started before the operation and followed post kidney transplant.

Tools for Data collection:

I. An structured interviewing questionnaire: It was developed by the researcher after review of related literature for assessing the following:

a. Socio-demographic characteristics as regard age, sex, education level.

b. Health history of kidney transplant recipient as type, duration of dialysis, and donor types.

c. Patient's knowledge by using close and open-ended questions based on the relevant literature review. It covered the following items: Signs of infection and rejection, Diet regimen, Medications schedule (name, duration dose, frequency, side-effects), Complications related to post renal transplant and Daily living activities related to post renal transplanted.

II. Pediatric Patient's Post kidney transplant recipients checklist. It was developed by the researcher after review of related literature for assessing the following: Practical skills for measuring:- vital signs, recording fluid balance, assessing edema, taking medications and measuring the weight, post renal sign of complications, infection, rejection, and drug side effects.

III. Rosenberg Self-Esteem Scale for Post kidney transplant recipients:- It was adopted from **Rosenberg, (1965) [31].** It is a tool for assessing global self-esteem. Also, the instrument is a vital part of self-esteem measure in social science research and is mainly used adolescents. It consisted of ten statements that included in the self-report to measure pertinent to self-worth (negative) and self-acceptance (positive). It is four-point scale ranging from "strongly agree" to "strongly disagree." The Rosenberg Self-Esteem Scale presented high ratings in reliability areas as reported by them; internal consistency was 0.77, minimum Coefficient of Reproducibility was at least 0.90. Test-retest reliability for the 2-week interval was calculated at 0.85.

Scoring system for:-

1. **Patient's knowledge** was assessed by using close and open-ended questions. Analysis was done as follows.

- A score of 2 was given for complete correct answer.
- A score of 1 was given for incomplete correct answer.
- A score zero was given for wrong answer.

2. Pediatric Patient's Post Renal transplant recipients checklist of patient's performance skills was filled by the researcher. Analysis of the checklist result was performed as follows.

- A score of 2 was given for satisfactory action.
- A score of 1 was given for need improvement action.
- A score zero was given for unsatisfactory action.

3. The Rosenberg Self-Esteem Scale for Post Renal Transplant Recipients is a tool for assessing global self-esteem. It was assessed according to the following:

- 4 points = "strongly agree"
- 3 points = agree
- 2 points = disagree
- 1 points = "strongly disagree."

Sum scores for all ten items. Keep scores on a continuous scale. Higher scores indicate higher self-esteem → Positive. Lower scores indicate lower self-esteem → Negative.

METHOD:

Approval; The official permission for conducting the study was obtained from the hospital directors. An exploratory phase was conducted before starting the study to determine the feasibility of accomplishing this study according the available resources.

Study Period: Data were collected from March 2016, to the end of November, 2016.

Ethical Consideration: During the initial interview, the purpose of the study and the procedures were explained to the patient and the oral consent was obtained from the participants. The patients were assured that all information would be confidential to assure the confidentiality of the participants. Patient were assured that their participation in the study was voluntary and that they could withdraw from the study at any time and can refusing to participate in the study.

Tools Developments:

A. Validity of the tools: - Tools were checked by a panel of five experts in pediatric surgery and pediatric nursing, Faculty of nursing, Menoufia University. The corrections were done accordingly based on their response.

B. Reliability of the tool: - Reliability of the tools was done by test-retest for measuring internal consistency for four patients with a period of two-week interval. The Cronbach's alpha for the "Pediatric Patient's Post kidney transplant recipient's checklist" was 0.92 indicate good reliability. The test and retest reliability of tool three "The Rosenberg Self-Esteem Scale" was 0.89 indicate good reliability.

C. Pilot: study was performed to test the practicality and applicability of the three tools to detect the obstacles and problems that may be encountered during data collection. It also helped to estimate the time needed to fill in the tools. It was conducted on 4 pediatric patients. The pilot sample was not included in the total sample.

Procedures and Data Collection:-

- Individuals who met the study inclusion criteria were interviewed by the researchers using a prepared questionnaire.
- Each renal transplant patient was interviewed individually after a simple conversation started by introducing my-self to them, followed by a description of the objectives intervention, which were established in a simple Arabic statements according to their age and understanding.
- Patients were interviewed through using the structured questionnaires to collect data about: 1) Socio demographic data, medical history and medications use and so on. The interview period was 25- 30 minutes in length.
- The interviewing questionnaire was filled in about 30 minutes; medical record was investigated in about 10 minutes.
- The intervention was done individually. The equipment's as weighting scale, tape measure, thermometer, sphygmomanometer, and stethoscope used to teach the patient skills were available in the department.
- Time allocated for the intervention was three hours theory and seven hours practice,) sequenced through 5 sessions. Three sessions started before renal transplant at hospital and two sessions after renal transplantation "two sessions / week". The implementation of the intervention was carried out in the patient room in hospital, Mansoura Nephrology and Urology center.
- Evaluation of the intervention was accomplished by using oral questions to assess patient's knowledge and by observing three demonstrations of patients each procedure for assessing practical skills and assessing Self-esteem by the Rosenberg Self-Esteem Scale post-renal transplantation.

The intervention Sessions:

Session I: Information about renal transplantation

Session II: Health education about diet, daily living activity, how to record fluid balance and measure temperature.

Session III: Health education about signs and symptoms of rejection and infection and how to assess edema and measure blood pressure.

Session IV: Health education about infection control and how to measure the body weight and measure pulse.

Session V: Health education about the medications (name, dose, duration, frequency, methods, color, time fixed) and how to deal with schedule of medications.

During implementation of the intervention the discussion and demonstration methods guided by using education media in the forms of; pictures, kidney model, real objects, and booklet to provide visual back-up for teaching and discussion sessions.

- Sessions were presented in small information with teaching point categorized into lists and before going on to new topic the investigator used questions to check the patient recall and understanding of the material already covered.
- The Contents of Performance: Medications plan, Fluid balance, teach the patient how to report signs and symptoms of infection or transplant rejection, Self-monitoring skills, the dietary regimen, how to avoid infections and how to manage them when they occur? The importance of an exercise program.

Limitation of study:

- During data collection, there were a limited number of medically stable adolescent patients at Mansoura Urology and Nephrology center, Mansoura University.
- Some parents of patient refuse to allow the researchers to conduct the study on their siblings.

Statistical Analysis:

Data were tabulated, analyzed and percentage distribution was determined. A computerized statistical analysis was done. Test of significance were applied (Chi square and t- test) to test significance of differences.

P-value less than 0.05 were considered as statistically significant.

4. RESULTS

Table (1) shows the biosocial characteristics of children at study and control group. It revealed that most children in the two groups were in the age group 10-18 years. Male children constituted 55% of the study group compared to 70% of the control group. A large percentage of both groups had completed their secondary education (55% and 60%).

Table (2) clarified that most children of both study and control group (95% and 90%) were treated by hemodialysis. The majority of children (45%) in the study group and (60%) in the control group had duration of dialysis between 2-<3 years.

Figure (2) illustrated that more than half of the children (60% in study and 55% in control group) received their grafts from non-relative living donors.

Table (3) showed level of knowledge post renal transplant was generally improved in study group regarding diet, medication, signs of infection, signs of rejection and complications. The statistical difference was highly significant between both groups.

Table (4) represents the distribution of renal transplant recipients as regard self care practice. There was highly significant statistical difference between study and control group in relation to measurement of vital signs, weight measurement, fluid balance measurement, medication, edema adjust, daily exercise and exposure to sunshine

(P <0.001).

Table (5) revealed that there was highly significant difference between study and control group regarding mean total knowledge and total self care (P<0.001).

Figure (3) clarified that about two third of patients (65%) in the study group had a positive self-esteem. Compared to (54%) in the control group post renal transplant.

Table (6) emphasized that there was only statistical significant difference between study and control group regarding urinary tract infections (P< 0.05). In relation to chest, skin and oral infections they were 20%, 15% and 25% in study

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group compared to 35%, 30% and 45% in the control group. Regarding rejection and side effect from drugs, there was no significant statistical difference between study and control group.

Table (1): Distribution of Socio-Demographic Characteristics of the Studied Sample

Socio-Demographic Characteristics	Study Group N=20 No	%	Control Group N=20 No	%	X^2	P
Age in years						
10- <14	2	10	3	15	0.22	0.64 ns
14 - 18	18	90	17	85		
Sex						
Male	11	55	14	70	0.94	0.33ns
Female	9	45	6	30		
Education						
Preparatory	5	25	6	30	0.31	0 .58 ns
Secondary	11	55	12	60		
University	4	20	2	10		

ns = P > 0.05

Table (2): Distribution of the types and duration of dialysis of the Studied Sample

Types & Duration of Dialysis	Study Group N=20 No	%	Control Group N=20 No	%	X^2	P
Types of dialysis						
Hemodialysis	19	95	18	90	0.35	0.55 ns
Peritoneal	1	5	2	10		
Duration of dialysis						
< one year	1	5	0	0.0	0.09	0.77 ns
2 - <3 years	9	45	12	60		
3 - <4 years	6	30	4	20		
4 or more	4	20	4	20		

ns = P > 0.05

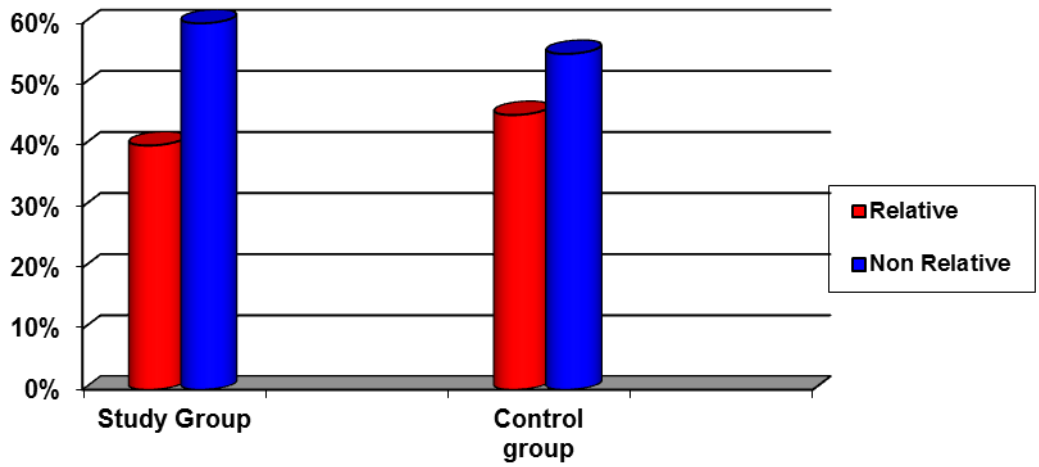

Figure (2): Distribution of the renal transplant recipients according to the donor type

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Table (3): Distribution of the renal transplant recipients regarding their level of knowledge post renal transplant after intervention

Patients' Level of Knowledge	Study Group N=20 No	%	Control Group N=20 No	%	X^2	P
Diet						
Correct answer	12	75	3	15	13.3	< 0.001**
Incomplete answer	3	15	8	40		
Wrong answer	2	10	9	45		
Medication						
Correct answer	13	65	4	20	8.7	0.003**
Incomplete answer	5	25	8	40		
Wrong answer	2	10	8	40		
Signs of infection						
Correct answer	16	80	3	15	15.8	<0.001**
Incomplete answer	3	15	10	50		
Wrong answer	1	5	7	35		
Signs of rejection						
Correct answer	12	60	0	0.0	21.7	<0.001**
Incomplete answer	5	25	3	15		
Wrong answer	3	15	17	85		
Complications						
Correct answer	13	65	1	5	21.01	<0.001**
Incomplete answer	5	25	3	15		
Wrong answer	2	10	16	80		

**** P ≤ 0.01**

Study group = was pediatric Pt who receive self-care Intervention

Control group = was pediatric Pt who did not receive self-care Intervention and under the usual care of the health care setting.

Table (4): Pt Self-Care Performance level of Post renal transplant recipients after intervention

Self-Care Performance Level	Study Group N=20 No	%	Control Group N=20 No	%	X^2	P
Blood Pressure Measurement						
Satisfactory	12	60	0	0.0	20.3	< 0.001**
Need improvement	5	25	4	20		
Unsatisfactory	3	15	16	80		
Pulse measurement						
Satisfactory	13	65	0	0.0	17.6	< 0.001**
Need improvement	4	20	7	35		
Unsatisfactory	3	15	13	65		
Temperature measurement						
Satisfactory	14	70	2	10	12.7	< 0.001**
Need improvement	4	20	11	55		
Unsatisfactory	2	10	7	35		
Weight measurement						
Satisfactory	18	90	13	65		
Need improvement	2	10	4	20	3.87	0.05*
Unsatisfactory	0	0.0	3	15		

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Fluid balance measurement						
Satisfactory	14	70	2	10	14.7	< 0.001**
Need improvement	3	15	5	25		
Unsatisfactory	3	15	13	65		
Medications						
Satisfactory	13	65	7	35	5.1	0.02*
Need improvement	5	25	9	45		
Unsatisfactory	2	10	4	20		
Edema adjust						
Satisfactory	12	60	5	25	4.9	0.03*
Need improvement	5	25	11	55		
Unsatisfactory	3	15	4	20		
Do daily exercise						
Yes	15	75	9	45	3.7	0.06*
No	5	25	11	55		
Exposure to sunshine 9:10 Am-4:5 Pm						
Yes	16	80	8	40	6.5	0.01*
No	4	20	12	60		

*** P ≤ 0.05** ****P ≤0.01**

Study group = was pediatric Pt who receive self-care management Intervention

Control group = was pediatric Pt who did not receive self-care management Intervention and under the usual care of the health care setting.

Table (5) Mean total Knowledge and total Self-Care management practice of both study and control group after intervention

Total	Study group Mean+ SD	Control group Mean+ SD	T	P
Total knowledge	**7.95+1.7**	**2.70+1.3**	**10.84**	**P < 0.001****
Total Self-Care management practice	**13.45 +3.3**	**8.50 +1.8**	**5.94**	**P < 0.001****

** P ≤ 0.01

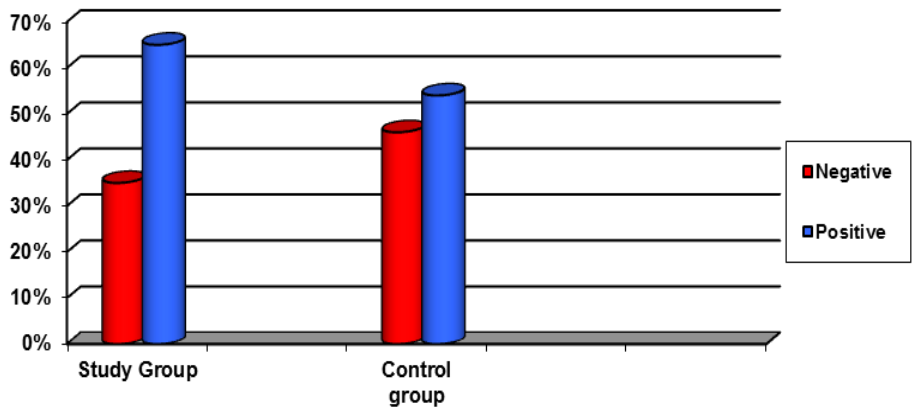

Figure (3): Distribution of renal transplant recipients according to their self-esteem post renal transplant after intervention

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Table (6): The Effect of Self-Care Management for renal transplant recipients according to post-renal transplantation complications after intervention

Post-renal Transplantation Complications	The Effect of Self-Care Intervention					
	Study N=20		Control N=20		X^2	P
	No	%	No	%		
Urinary tract infection						
Yes	6	30	13	65	4.79	0.03 *
No	14	70	7	35		
Chest infection						
Yes	4	20	7	35	1.10	0.29 ns
No	16	80	13	65		
Skin Infection						
Yes	3	15	6	30	1.26	0.26 ns
No	17	85	14	70		
Oral Infection						
Yes	5	25	9	45	1.71	0.19 ns
No	15	75	11	55		
Rejection						
Non	14	70	12	60	0.38	0.54 ns
Acute	5	25	7	35		
Chronic	1	5	1	5		
Side effect due to drugs						
Yes	6	30	11	55		
No	14	70	9	45	2.49	0.11 ns

ns = P > 0.05 * P≤ 0.05

5. DISCUSSION

The kidney transplant recipients (KTR) continue to live with a chronic condition because they run the risk of chronic rejection, infection or graft function failure **[32].** Thus, these patients need to take responsibility for their own care after KT. Self-management has been recognized on a worldwide basis as an important aspect of successful health care **[33].** Nursing care of the renal transplant recipient is challenging and rewarding. Acute assessment skills and effective teaching techniques are necessary to help the patient's progress from the immediately post operative period through discharge and toward outpatient management and active participation in care **[34].** The current study aimed to assess the effect of self-care educational intervention for post kidney transplant recipients among adolescents.

Medication Adherence:-

The findings of this study revealed that there was significant statistical difference between the study and control groups regarding medications taken. This result was similar to According to **[35]** who studied: "Nursing management of patients for greater renal transplant success". They reported that, there is now a greater choice of immunosuppressive agents that can be used in the care of kidney transplants recipients". Concordance with treatment regimens is of prime important and nurses working with this patient group have a key role in encouraging adherence to medication and helping patients to achieve a good quality of life.

Whereas, **[36]** reported that actually, only half of patients who suffer from chronic diseases adhere to treatment recommendations, the biggest stumbling block to taking medicines is the complexity of treatment. However, poor adherence is frequent even in patients who have to take only 1 pill per day. In a survey, about half of patients who were prescribed a single antihypertensive drug had stopped taking it within 1 year **[37].** Also, the collaboration between

caretakers and patient is of paramount importance. The transplant staff should provide clear instructions about prescriptions and check that the patient has fully understood the prescriptions, taking into account that about 60% of patients cannot correctly report what their physicians told them about medication use 10 to 80 minutes after receiving the information **[38].** Regular contact with the patient should be established, and the adherence to prescriptions should be verified during follow-up visits. Moreover, **[37]** stated that some measures should be suggested to the patients to facilitate their adherence, including the following: Patients should be aware of the importance of prescriptions and should ask for further explanations if they have any doubts; and a daily checklist of drugs should be used.

Hygienic measures and infection control:

Concerning knowledge related to dangerous signs of infection and rejection, the present study found highly significant statistical difference between both study **and** control groups. This result was in-line with **[39]** who studied "CDC/NHSN surveillance definition of health care-associated infection and criteria for specific types of infections in the acute care setting". They pointed out that patients who have had organ transplants are at risk for infection and organ rejection, nurses can improve patient outcome by recognizing and treating infection by familiarizing themselves with the immunosuppressant medications used in transplantation.

Whereas **[40,41]** stated that hygienic measures can prevent infections and other complications. Accurate handwashing during hospitalization can reduce the risk of nosocomial infections, and gown and glove isolation have an additional protective effect in children and patients should be advised to wash with antiseptic soap. Also **Randleet al., (2006) [40]** added that frequent nystatin swish and swallow are recommended in the first post-transplant period to prevent oral and esophageal fungal infections. Dental and medical care should be closely integrated for kidney transplant recipients, since there is evidence that dental infection and periodontal disease are associated with an increased risk of cardiac infarct. Also **[42,43]** emphasized on the other general measures are also important. Patients should ventilate their rooms, wear clean clothes and change them frequently and avoid crowded meetings and passive smoking. Whereas, **[44,45]** recommended the Influenza vaccination in renal transplant recipients. Concerns that vaccination can trigger rejection episodes are not confirmed by recent studies.

Nutrition in Renal Transplantation:

The findings of the present study, showed a statistical significant differences between the studied sample in experimental and control groups concerning their compliance to self-care regarding vital signs, weight, fluid balance. This result was in line with **[46]** who studied "Education and counseling of renal transplant Recipients". They pointed out that weight gain is common in renal allograft recipients and may be associated with hypertension, hyperlipidemia and/or glucose intolerance or overt diabetes. To prevent these complications, patients should follow diet regimens based on low fat and normal/low caloric intake "diet a well-balanced meal plan that includes the basic food groups to maintain the weight with normal range. This was followed and consistent with the present whose study patient's knowledge related to diet regimen, found highly significant statistical difference between experimental and control groups and this was in response to information given through the intervention.

Self esteem:

As regards the renal transplant recipients self-esteem, this study revealed that about two third of patient (65%) in the experimental group and 45% of control group had a positive self-esteem. This results could be due to allow the greatest opportunity for life, including eliminating the need for expensive, time consuming, dialysis treatment, decreased dietary restrictions, more complete resolution of urinary symptoms and the patient has the potential to return to nearly normal functioning. Most patients who have successful transplants believe that it was worth all the risks to feel so good. This findings justified by **[47]** who found in a study on psychological functioning and quality of life in renal transplant candidates and recipients, that pre transplant group and post-transplant group mean scores were significantly lower than published norms on the self-esteem scale.

Self-care Intervention:

The findings of the present study, showed a statistical significant differences between the studied sample in experimental and control groups concerning their compliance to self-care regarding vital signs, weight, fluid balance, medications,

edema adjust, daily exercise and exposure to sunshine therefore this results proved the effectiveness of the intervention**.** These results were similar to **[34]** who studied **"**Self-management in patients with end-stage renal disease: exploring domains and dimensions. They stated that patients are taught the essentials of self-monitoring while; they are in the hospital for their transplant. Patients who perform routine self-assessment would be able to be detected and provide information about problems early in the course of events. Some experts have stated that KT recipients need to participate more in their care and self-management than do those with other chronic conditions**.** Also the result was consistent with **[48]** who studied; "Self-efficacy, self-care behaviors and quality of life of kidney transplant recipients". They reported that interventions to maintain and improve patients' self-care behavior should continue to be emphasized and facilitated. Support to enhance patients' problem-solving skills and the partnership of patients with health professionals is needed. According to **[34]** they added that the gold standard of postsurgical care for kidney transplantation recipients is to empower them to work with healthcare providers and to report any symptoms and signs correctly and immediately.

Also, similar to **[49]** who studied; **"**Patient Education for Renal Transplant Recipients", they found that investigating the effect of the patient education intervention, higher levels of knowledge and compliance were found in the experimental group at second measure point (p= 0.002 and p = 0.000). At the third measure point, the experimental group reported significantly higher levels of knowledge (0.004), self-efficacy (p = 0.036) and mental score of quality of life (p = 0.001). Also the result was consistent with **[13]** who studied "Pediatric Solid Organ Transplant Recipients: Transition to Home and Chronic Illness Care". They stated that the results underscore the important aspect of education and care coordination in preparing patients and families to successfully self-manage after hospital discharge.

Moreover, **[50]** studied; "Utilizing electronic health records to predict acute kidney injury risk and outcomes". They concluded that the Electronic Health Record (HER) dataset is a massive collection of clinically relevant data elements generated through the routine provision of patient care. Its size and complexity lend themselves to "big data" techniques; these in turn offer the potential to use the entire EHR dataset to predict acute kidney injury (AKI) and AKI related outcomes. Variable selection should employ high-content, unsupervised analytic techniques. Developing predictive models should focus on EHR integration and optimize the output for clinical utility.

6. CONCLUSION

- The self-care nursing educational intervention had an effect on increasing renal transplant recipient's knowledge and self-care practices. This was proved by the significant difference between study and control group regarding mean total knowledge and total self-care and also by the positive self-esteem of the study group.
- There was a significant decrease in post renal transplant complications especially urinary tract infection compared to control group.

7. RECOMMENDATIONS

- Nurses who working in out-patients clinic of nephrology must be prepared by periodically in-service training to be competent in implementing such intervention and to deal effectively with patients who are undergoing renal transplantation.
- There is a need for specialized center within the outpatient clinics for rehabilitation of renal transplant recipients equipped with the necessary educational media for proper training and guidance.
- Encouraging the implementation of self-care nursing educational intervention for all renal transplants to adapt functioning and prolongation of normal life.

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