

## Effect of Nursing Intervention Program on Self-Esteem, Body Image and Quality of Life of Children undergoing Hemodialysis

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### Abstract

**Background:** Chronic Renal Failure (CRF) is a public health problem that tends to take dimensions of epidemic and has serious impact on self-esteem, body image and quality of children's life. Hemodialysis is the most common treatment modality for end-stage renal disease. **This study aimed to evaluate the effect of a nursing intervention program on self-esteem, body image and quality of life of Children undergoing Hemodialysis. A quasi-experimental design** was used to conduct the study at the Children Renal Dialysis Unit at Benha University Hospital which affiliated to the University of Qalubia Governorate. **Subjects:** A convenience sample of 30 children undergoing Hemodialysis was included in the study. **Tool of Data Collection:** The tool was divided into four tools: **tool one:** - A structured interviewing questionnaire **Tool two:** Rosenberg self-esteem Scale **Tool three:** Body Image Questionnaire **Tool four:** Quality of life (QOL) Scale for children with hemodialysis **The main findings** of the study: there were highly statistically significant difference of the studied subjects mean score regarding total self-esteem, total body image and total quality of life pre and post- program ( $P < 0.001$ ). Also, a positive correlation was found among the studied subjects self-esteem, body image and quality of life pre and post-program. **Conclusion:** The result showed the effectiveness of a nursing intervention program on improving self-esteem, body image and quality of life of children undergoing Hemodialysis. **Recommendation:** Ongoing in-service nursing program about self-esteem, body image and quality of children should be designed and implemented at all pediatric hemodialysis units to improve it. **Keywords:** Self Esteem, Body Image, Quality of Life, Children, Hemodialysis

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### I. Introduction

Chronic renal failure like many chronic diseases disrupts cognitive and emotional functions. Children undergoing hemodialysis experience many problems including sleep disorders, peripheral neuropathy, infection, psychological stress, anxiety and depression, cognitive changes, body image disturbances, reduction of viscosity and so on. Hemodialysis affects children's quality of life and self-esteem it can disrupt the amount of physical and social activity as well as life satisfaction. Quality of life is a state of complete physical, mental and social well-being felt by an individual. It refers to children's ability to enjoy normal life activities. It consists of physical, psychological and social aspects (Kargar et al., 2016).

Self-esteem as individuals' confidence in their ability to think and to face the challenges of human life and success. Self-confidence, the ability to achieve the objectives set, the reaction to failures are related attitudes that can influence self-esteem and the quality of life. Self-esteem is a complex concept which has attached variable definitions. Indicates that self-esteem refers to how we evaluate ourselves and how good we think we are by comparison with our expectations or others. The emphasis on the subjective side of oneself enables us to consider self-esteem as an indicator of the subjective side of the quality of life (Băban, 2018).

In addition to self-esteem is a social construction and self-assessment is conducted by social and linguistic interactions that we have with others since childhood. So others are a "social mirror" in which the person gets an idea about the opinion of others about him. Coley's assumption shows us that self-esteem is influenced by the opinion that others have about us, the more they feel better about a person, his/ hers self-esteem may be higher and vice versa: if others have a bad opinion about a person, it can lead to a low self-esteem (Grossbard, 2019).

Over time, changes occur in the body of children's undergoing hemodialysis due to chronic renal failure. Uremia-related skin changes, changes in skin color due to anemia (resulting from bone marrow suppression due to uremia), having a continuous shunt or fistula in the arm, and physical changes (e.g., weight gain due to fluid overload) can negatively affect the patients' body image. Changes in body image may cause the patient to feel alienated, lose his/her confidence and social relations, and experience fear of rejection by others. Also, negative body image, sexual functioning problems, deterioration of self-care behaviors, and

feelings of despair are associated with these changes. Children who had changes in their physical appearance were found to have lower self-esteem and body image (**Oyekcin et al., 2017**)

Chronic kidney diseases had a negative impact on children lifestyle and this indicates that children and their family need for more support to achieve adjustment (**Tong et al., 2016**). Early detection and treatment of chronic kidney disease-related complications are very important that help the patient to have better growth and development and better quality of life (**Mark, 2017**). Based on the World Health Organization (WHO) statement, "quality of life (QOL) includes individuals' perceptions from their life situation with regard to their culture, value system, goals, expectations, standards, and concerns. Therefore, one of the most important aspects in the management of chronic kidney disease is the promotion of patients' QOL, in addition to control of disease signs (**Lai, 2019**).

Basically, nurses are the main people who provide care for these children, and their most important responsibility is to identify the essential care of these children's. Hemodialysis children's need mental support to adapt to their current status and nurses can help them become accustomed to their problems and fears of the disease by reducing anxiety, enhancing adaptability, supporting decision making, and providing emotional support and education. Therefore, nurses' awareness of the high quality of care can affect the care of these children and increase children's satisfaction; notably, the quality of the provided nursing care is an important indicator of nurses' involvement in the care program (**Nobahar, 2017**).

Promotion of self-care activities for children undergoing hemodialysis is crucial in enhancing their ability to perform their daily living activities. Self-care and adaptation to the disease can lessen children's physical problems, enhance the quality of their life and reduce dependency (**Wang et al., 2015**).

**Zohreh et al., (2014)** who found that results of their study administration of intervention and educational program can increase the quality of life of children of age 8-12 years with chronic renal diseases. Also their results as well as many others clearly confirmed the effectiveness of educational intervention in children with chronic kidney disease management. Moreover, well designed educational programs, which were correctly applied for children, should be considered a part of good clinical and emotional care in children with chronic kidney disease.

### **Significance of the study**

Chronic renal failure is considering major health problems for children less than 18 years. It is a gradual loss of renal function that gradually which ultimately leads to end-stage renal disease (**National Kidney Foundation, 2017**). Worldwide, there is an increase in the number of children's with chronic renal failure and consequent end-stage renal failure. The annual rate of children who develop kidney failure was 1 or 2 new cases in every 100.000 children. In the USA, each year three to five children per million develop Chronic renal failure (**United States Renal Data Systems (USRDS), 2017**).

In Egypt, Chronic renal failure in hospitalized children between births to 15 years of age has been reported to be approximately 1.36% of all hospitalized patients (**Gad, 2016**). Moreover, morbidity and mortality are highly worldwide more than 67,000 deaths occur each year as a result of renal failure. Its incidence is still increasing due to poor and low socio-economic standard. Complications related to chronic renal failure not develop to end-stage renal diseases only. It can increase the risk for heart disease, failure of growth and development and alteration of lifestyle for children and their parents (**Behrman et al., 2018**) So, the present study aimed to evaluate the effect of a nursing intervention program on self-esteem, body image and quality of life of Children undergoing Hemodialysis

### **Aim of the study**

This study aimed to evaluate the effect of a nursing intervention program on self-esteem, body image and quality of life of children undergoing hemodialysis. It was achieved through:

- 1-Assessing the level of self-esteem, body image and quality of life of children undergoing hemodialysis.
- 2- Designing, implementing and evaluating the effectiveness of a nursing intervention program on self-esteem, body image and quality of life of children undergoing hemodialysis.

### **Research hypothesis:**

To fulfil the aim of this study the following research hypothesis were formulated:

H1: Mean score of self-esteem, body image and quality of life post nursing intervention program will be improved than before the program

H2: There will be a positive correlation between self-esteem, body image and quality of life of children undergoing hemodialysis.

## **Subject and Methods:**

### **Research design**

A quasi-experimental design was used to conduct the study.

### **Setting:**

The study was conducted at the Children Renal Dialysis Unit at Benha University Hospital which affiliated to the University of Qalubia Governorate. The Hospital is divided into three building: One building for medical diseases. One building for surgical diseases. One separate building for emergency and operations. In these hospitals, there are separate specialized units that are prepared to perform renal dialysis for children. The hemodialysis unit contains two rooms, one free from hepatitis contain of 6 beds and other room have hepatitis contain of 18 beds for hemodialysis children's in two- shift morning and afternoon.

### **Subjects**

A convenience sample of 30 children undergoing Hemodialysis was included in the study. Inclusion criteria for the patients were as follows: performing regular hemodialysis for at least 2 months, at least three times a week, and for 3–4 h in each session; having no history of kidney transplantation, and having a family caregiver to do home care. Age range from 10 to less than 18 years old, both sexes, who able to talk and express themselves verbally and willing to participate in this study. Subject's decision to withdraw from the study, the absence of even a training session, and booking the patient on the kidney transplantation list were selected as exclusion criteria.

### **Tools of Data Collection:**

The following four tools were used for data collection. Arabic translation of all the tools by the researcher and retranslation into English and tested for their translation.

**Tool One: - A structured Interviewing Questionnaire:** It was designed by the researchers after reviewing the related literature, it was written in the Arabic language. Based on **Mohamed, (2017); Farzad et al., (2016)**. It comprised of three parts:

**Part I:** Personal characteristics of the studied children's: It includes age, sex, education level, residence and occupation. (4 MCQs and 1 open-end question). This tool used pre-implementation of the nursing intervention program.

**Part II:** Clinical data of the studied children's: such as start of the renal dialysis, number of dialysis sessions; complain of other diseases, family history and complications of hemodialysis. (4 MCQs and 3 close ended-questions). This tool used pre-implementation of the nursing intervention program.

**Part III:** Children's information about of their illness: It includes information about the disease such as definitions, importance of dialysis, causes and symptoms of renal failure. (4 MCQs). This tool used pre-and post- implementation of the nursing intervention program.

**Tool Two: Rosenberg Self-esteem Scale. This scale was developed by Rosenberg (1965)** to assess adolescent self-esteem. It consists of 10 items. Of this total, 5 items evaluate the individual's positive feelings about themselves (In general, I am satisfied with myself; I feel I have some good qualities; I am able to do things as well as most other people, provided they are taught to me; I feel that I am a person of worth, at least on a level equal to other people; I take a positive view of myself) and 5 assess negative feelings (At times I think am no good at all; I don't feel satisfaction in the things that I have done; I feel that I have not much to be proud of; some-times I really feel myself useless, incapable of doing things; I wish I could have more respect for myself; Almost always I'm inclined to think I'm a loser). Each item is answered from 1-4 scores in positive sentences (1 mean strongly disagree, 2 means disagree, 3 means agree, 4 means strongly agree) but negative sentences ( 1 means strongly agree, 2 means agree, 3 means disagree, 4 means strongly disagree). This tool used pre-and post-implementation of the nursing intervention program.

Total scoring system of self-esteem scale was categorized as follows:

10-20: indicate low self-esteem.

21-30: indicate moderate self-esteem.

31-40: indicate high self-esteem.

**Tool Three: Body Image Questionnaire was adopted by Gamal (2016).** This questionnaire aims to examine a patient's perception of their body image. It consists of 21 items such as (I feel that my body parts are different from others; I am sad when I look at my shape in a mirror; Most of my friends seem to look better than me; I see that my form is ugly and disgusting; I accept my body as it is; I see that I enjoy people's acceptance). Scoring system from 0-3, Never=0, scarcely= 1, sometimes=2, Much=3. A Higher score indicates a greater degree of negative body image. This tool used pre-and post-implementation of the nursing intervention program.

Scoring system of body image scale was categorized as follows

- 1- Less than 21 = Positive body image.
- 2- From 21 to less than 42 = Mild negative body image.
- 3- From 42 to less than 63 = Moderate negative body image.
- 4- From 63 to less than 84 = Sever negative body image.

**Tool four: - Quality of life (QOL) Scale for children with hemodialysis: Was adopted by Abusalem et al., (2013)** to assess children's feelings and responses about the quality of life (QOL) by ratings on a five- point Likert scale (1= very little, 2 = a little amount, 3 = a moderate amount, 4 = very much, 5 = an extreme amount). This tool used pre-and post-implementation of the nursing intervention program. It consists of 30 items divided into 5 dimensions as:

**Physical Health (5 items)** such as (I participate in daily life activities and I play frequently in my neighbourhood and school; I feel physical pain that prevents me from playing and doing homework).

**Psychological health (7 items)** such as (I am satisfied with my myself; I feel happiness and pleasure)

**Social relationship (6 items)** such as (I prefer to stay in my home; I can easily make friendly relationships).

**Environment (7 items)** such as (All resources for comfort and playing are provided at home and school; my surrounding environment are clean).

**Personal safety (5 items)** such as (I feel safe in my home; I am frightened from loud voice).

**Content validity:**

The tools were revised for the validity of the content by a panel of six experts, in the field of Psychiatric Mental Health Nursing and Pediatric Nursing to ascertain relevance and comprehensiveness.

**Reliability of the tools**

Reliability was applied by the researcher for testing the internal consistency of the tool, by administration of the same tools to the same subjects under similar conditions on one occasion. Answers from repeated testing were compared (Test-re-test reliability). The result reveals that all tools were reliable. The tools revealed (Cronbach's alpha = 0.87) for Rosenberg self-esteem Scale, (Cronbach's alpha = 0.90) for Body Image Questionnaire and (Cronbach's alpha=0.79) for quality of life scale.

**Administrative approval:**

Official letters were issued from the Dean of Faculty of Nursing, Benha University to the administrator of University Hospital in Benha City, explaining the aim of the study and requesting their permission for data collection and participation of children's in the research process.

**Ethical considerations:**

Permission to carry out the study was obtained from the hospital manager and the supervisor of the renal dialysis unit in the previously mentioned study setting. All participants were assured that participation in the study was voluntary; each child was informed about the purpose, benefits and nature of the study and each child had the right to withdraw from the study at any time without any rationale, then oral consent obtained from them. Children's were informed that obtained data not be included in any further researches. Confidentiality and anonymity of each subject was assured through coding of all data and all information has taken was protected.

**Pilot study:**

A pilot study was conducted on 10% of the sample to test by the designed assessment tool and its applicability on the sample and in order to estimate the time needed to fill in the sheets and to identify obstacles or problems in data collection and accordingly necessary modifications were done. Subjects who shared in the pilot study were excluded from the main study sample.

**Fieldwork:**

-The aim and the nature of the study were explained to hemodialysis patients and assured that their personal data will be treated confidentiality and will be used only for research purpose and then it was possible to carry out the study with minimum resistance.

-The researchers met each patient individually after introducing their selves and explained to them the purpose of the study to seek participants' cooperation and emphasizing that all collected information is strictly confidential to obtain oral consent from them.

- The study was carried out from the beginning of April 2019 to the end of June 2019 for two days/week.

-The study was carried out at Children Renal Dialysis Unit of Benha University Hospital; a convenience sample of 30 children who fulfilled the inclusion criteria were included in the study.

**Procedures:**

The nursing intervention program comprised the following phases:

**A- Assessment Phase:**

- A comfortable, private place was chosen for the interviewers. Orientation was done about the researcher's name, purpose, significance, content of the study. Subject was interviewed to collect the baseline children data using all study tools.

-The researchers completed the questionnaire (pre-program) from children's in two-shift morning and afternoon. This process took one month (April 2019). This interview took about 15 to 20 minutes.

**B-Implementation phase:**

The general objective of the study was to evaluate the effect of a nursing intervention program on self-esteem, body image and quality of life of Children undergoing Hemodialysis

**The specific objectives of the nursing intervention program include the following:**

- Define renal failure and its causes, stages, symptoms and diagnosis of it.
- Identify renal dialysis and its complications.
- Teaching the methods about ways to improve self-esteem.
- Teaching the methods about ways to improve body image
- Identify the Concept of quality of life, Improve sleep disturbance, Identify nutritional regimen for renal failure children's and training the proper way for eating.
- Apply skills to improve positive feeling and reduce negative feeling.
- Training to carry out the activities of daily life.
- Training to do personal cleanliness.
- Apply social relation skills with others.
- Practice recreational activities.
- Training on how to maintain a clean and healthy environment.
- Apply methods to strengthen the spiritual side of the patient to maintain personal safety.

Content of the nursing intervention program was designed by the researchers according to the previously mentioned objectives. The theoretical content of the program included the definition of renal failure, causes, stages, symptoms and diagnosis of it; renal dialysis and its complications; teaching ways to improve self-esteem, body image; Concept of quality of life; sleep disturbance; nutritional regimen for renal failure.

The practical content of the nursing intervention program was included: Training the proper way for eating; Apply skills of positive feeling, Training to carry out the activities of daily life; personal cleanliness; Apply Social relation skills with others; Practice recreational activities; maintain a clean and healthy environment; Methods to strengthen the spiritual side of the patient

The nursing intervention program /theoretical and practical training included eight sessions three for theory and five for practices. Patients were classified into 6 groups; each group consists of 5 children's. The contents were repeated for each group by the researchers. Each session takes from 15-25 minutes for theory and 30-40minutes for practical. The teaching methods used were lectures and discussions as teaching methods for theory, however, role play, demonstration and re-demonstration were used as practical skills. As regards the teaching media used, they were booklet and real objects. At the end of every session, patients were discussed to correct any misunderstanding, which has happened this through making conclusion and taking feedback from patients about the content of the session and orienting them about the content of the next session.

**C- Evaluation Phase:**

Immediately after implementation of the nursing intervention program, each Patient in the study was asked to evaluate self-esteem, body image and quality of life (post-test). The results were compared to the pre-test results

**Statistical analysis:**

The calculated data for this study were analyzed and the collected data was organized, coded, computerized and tabulated and analyzed by using (SSPS) programs version 20. Data analysis was accomplished by the use of the number, percentage distribution, mean and standard division, Paired t-test, was used to compare mean between groups pre and post-program and correlation coefficient was used determine statistically significance relations significant  $p < 0.05$

II. Results

Table (1): Frequency distribution of the studied subjects regarding their personal characteristics (N=30).

Personal characteristics	No	%
<b>Age</b>		
<16 years	16	53.3
From 16 ≤ 18	14	46.7
Mean ±SD	14.73±3.05	
<b>Gender</b>		
Male	14	46.7
Female	16	53.3
<b>Education level</b>		
Illiterate	2	6.6
Primary	12	40.0
Preparatory	8	26.7
Secondary	8	26.7
<b>Residence</b>		
Rural	20	66.7
Urban	10	33.3
<b>Occupation</b>		
Not working	30	100.0

Table (2): Frequency distribution of the studied subjects regarding their clinical data (N=30).

Clinical data	No	%
<b>Start of renal dialysis</b>		
Less than one year	10	33.3
From 1 to 3years	6	20.0
More than 3 years	14	46.7
<b>Number of dialysis sessions</b>		
Three times a week	30	100.0
<b>Complain of other disease</b>		
Yes	20	66.7
No	10	33.3
<b>Mention it (n=20).</b>		
Hypertension	2	10.0
Hepatitis	18	90.0
<b>Family history of renal failure</b>		
Yes	16	53.3
No	14	46.7
<b>Degree of consanguinity</b>		
Father	5	31.3
Mother	5	31.3
Grandfather/Grandmother	6	37.4
<b>Complications</b>		
Yes	22	73.3
No	8	26.7
<b>Complications of hemodialysis (n=22).</b>		
Coma	12	54.5
Muscle strain	4	18.2
All of the above	6	27.3

Table (3): Comparison of the studied subjects regarding their information about renal failure pre and post nursing intervention program (N=30).

	Pre		Post		X <sup>2</sup>	p-value
Knowledge about renal failure	No	%	No	%		
<b>Definition of renal failure.</b>						
A complete correct answer	2	6.6	12	40.0	7.77	0.05*
Incomplete correct answer	14	46.7	10	33.3		
Incorrect answer	8	26.7	6	20.0		
don't know	6	20.0	2	6.7		
<b>Importance of dialysis</b>						
don't know	18	60.0	7	23.3	11.96	0.003*
know some knowledge	10	33.3	23	76.7		

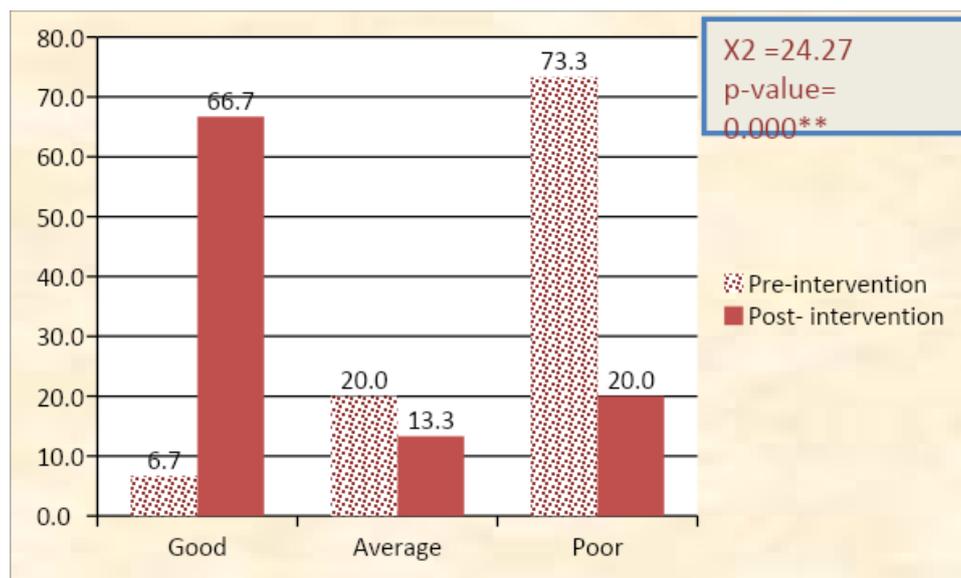
know incorrect knowledge	2	6.7	0	0.0		
<b>Causes of renal failure</b>						
Genetic	2	6.6	2	6.7	9.52	0.049*
High blood pressure	2	6.7	1	3.3		
Chronic inflammation of the kidney pelvis	2	6.7	1	3.3		
All of the above	12	40.0	23	76.7		
Don't know	12	40.0	3	10.0		
<b>Symptoms of renal failure</b>						
Fatigue and Color Paleness	2	6.7	1	3.3	4.62	0.099
All of the above (headache, insomnia, loss of appetite, fatigue and color paleness).	22	73.3	28	93.4		
Don't know	6	20.0	1	3.3		

(\* ) Statistically Significant at  $\leq 0.05$

**Table (4): Comparison of the studied subjects mean score regarding total self-esteem pre and post nursing intervention program (N=30).**

Total self esteem	Pre		Post		Paired t - test	P-value
	Mean	±SD	Mean	±SD		
	21.2000	±2.00688	20.0667	±1.91065		

(\*\*) Highly Statistically Significant at  $\leq 0.001$



**Figure (1): Comparison of the studied subjects regarding total body image pre and post nursing intervention program.**

**Table (5): Comparison of the studied subjects mean score regarding quality of life domains pre and post nursing intervention program (N=30).**

QOL domains	Pre		Post		Paired t-test	P-value
	Mean	±SD	Mean	±SD		
Total physical	15.2000	±2.13993	12.5333	±1.88887	10.638	<.001**
Total psychological	18.2000	±2.49689	19.3333	±1.98847	3.495	.002*
Total social	17.4000	±2.37225	18.4667	±1.56983	3.002	.005*
Total environmental	19.3333	±3.65148	22.3333	±2.50975	6.454	<.001**
Total personal	16.8667	±3.10432	17.5333	±2.19299	2.408	.023*

(\* ) Statistically Significant at  $\leq 0.05$

(\*\*) Highly Statistically Significant at  $\leq 0.001$

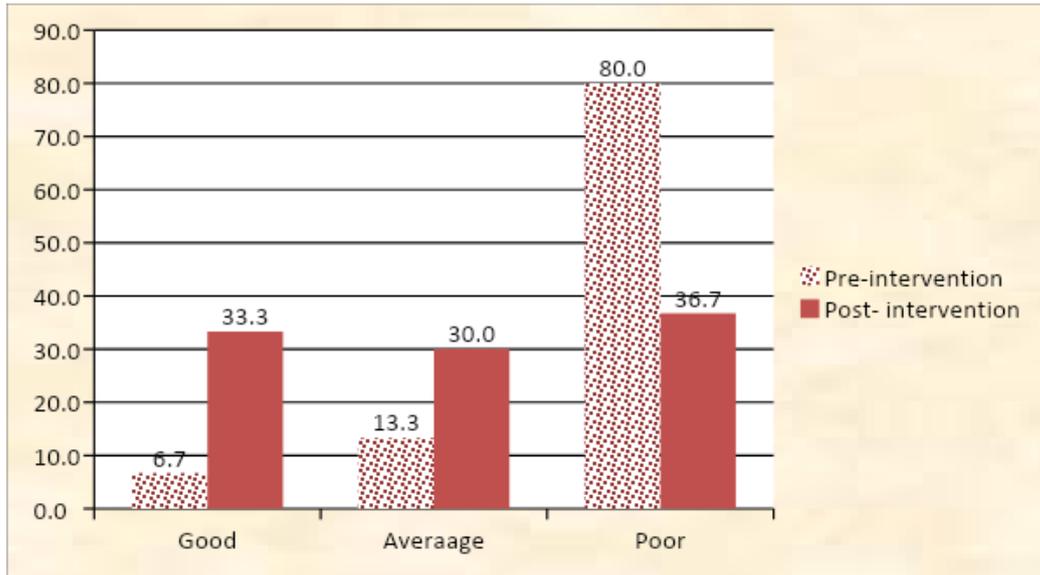


Figure (2): Comparison of the studied subjects regarding Total quality of life pre and post nursing intervention program

Table (6): Correlation matrix between the total quality of life, self-esteem and body image pre and post nursing intervention program (N=30).

	Pre			Post		
	Total quality of life	Total self esteem	Total body image	Total quality of life	Total self esteem	Total body image
Total quality of life	r	1	.370	1	.374*	.127
	p-value		.044*		.042*	.503
Total self esteem	r	.370	1	.374	1	.019
	p-value	.044*		.042*		.921
Total body image	r	.314	.084	1	.127	1
	p-value	.091*	.658		.503	.921

**Table (1):** Illustrates that, personal characteristics of the studied subjects. More than half (53.3%) were <16 years old and their mean age was  $14.73 \pm 3.05$  years and were female, less than half (40.0%) of studied subjects had primary education level, more than two-thirds of them (66.7%) were living in rural areas and 100% of children had not worked.

**Table (2):** Reveals that, clinical characteristics of studied subjects. It was found that nearly half (46.7%) start renal dialysis for more than 3 years. And all of the subjects (100.0%) taken number of dialysis sessions three times a week. More than two thirds (66.7%) of them complain of other diseases and the majority of them (90.0%) have hepatitis. More than half (53.3%) of them reported that there is a positive family history of renal failure. One third (37.4%) of them having a degree of consanguinity of Grandfather/Grandmother. And three-quarters of them (73.3%) had complications. and finally more than half of them (54.5%) have coma as a complication of hemodialysis.

**Table (3):** Demonstrates that, a statistically significant difference of studied subjects knowledge about renal failure pre and post nursing intervention program.

**Table (4):** Shows that, there was a highly statistically significant difference of studied subjects mean score regarding total self-esteem pre and post nursing intervention program ( $P < 0.001^{**}$ ).

**Figure (1):** Portrays that, more than two thirds (66.7%) of the studied subjects have good body image post nursing intervention program compared to (6.7%) only pre- program.

**Table (5):** Reveals that, there was a significant and highly statistically significant difference in quality of life domains means score pre and post nursing intervention program.

**Figure (2):** Shows that third (33.3 %) of the studied subjects have a good quality of life post nursing intervention program compared 6.7% only pre-program.

**Table (6):** Indicates that, positive correlation between the total quality of life, self-esteem and body image pre and post nursing intervention program.

### **III. Discussion**

Chronic renal failure for children is a major problem of public health both in poor and developed countries and is an important cause of morbidity and mortality in children worldwide. The disease process is better termed as chronic kidney disease, in order to encompass the entire spectrum and severity of renal disease. The incidence of chronic renal failure (CRF) varies in different parts of the world. (Maalej et al., 2018). Hemodialysis therapy has been one of the most important advancements in medicine in recent years. Hemodialysis is the most commonly employed renal replacement therapy in children's with chronic renal failure. Therefore, requires specialized nursing care, including the establishment of a therapeutic and interpersonal relationship, treatment of physical symptoms, and attention to the functional limitations, mental disorders, and educational needs of these children's (Stavropoulou et al., 2017).

Therefore, the aim of the present study was to evaluate the effect of the nursing program on self-esteem, body image and quality of life of children undergoing hemodialysis. This aim was achieved throughout the study findings and the research hypothesis was accepted.

Regarding personal characteristics of the studied subjects, the findings of the current study revealed that more than half of studied subjects were <16 years old and their mean age was  $14.73 \pm 3.05$  years and were females. This finding disagreed with Daniella et al., (2016) who found that more than two-third were adolescents age over 12 years and mean age was  $13.5 \text{ years} \pm 5.84$  and findings that end-stage renal disease is more common in males.

Also, the present study revealed that the majority of studied subjects had primary education level. This may be due to the effect of the disease on the mental and physical state of children. This finding was agreed with Murray et al., (2019) who reported that the school functioning among dialysis children was significantly lower than in healthy children. Transportation and many hours in hospitals make it difficult or even impossible to integrate with school peers. And more than thirty young adults leave school at 16 years of age

The current study finding revealed that more than two-thirds of them were living in rural areas. This might be due to children living in rural areas in Egypt becoming more exposure to chronic renal failure because of many factors as water pollution. This finding disagreed with Clave et al., (2019) who found that half of the adolescent and thirty of children undergoing hemodialysis were living in the city.

The result of the current study clarified that all of the studied subjects had not worked. This might be due to the effect of the disease on the physical status of child and adolescent he was unable to do any activities as working achievement. This finding was supported by Tong et al., (2016) who stated that children with chronic illnesses are heavily dependent on parental support in many areas of their lives

The present study finding revealed that nearly half of the studied subjects start renal dialysis for more than 3 years and all of the studied subjects taken number of dialysis sessions three times a week. This might be due to hemodialysis is not offered to children less than 5 years old and is usually performed in a hospital setting, with a frequency of three times per week for most children's to expel wastes and poisons from the body. This finding was in agreement with Fischbach et al., (2015) who found that hemodialysis is often preferred for children over the age of five years.

The present study showed that the majority of studied subjects complain of other diseases such as hepatitis. From researchers' points of view, this could be due to the prevalence of hepatitis B and hepatitis C virus infections in dialysis treated children's is commonly higher than the general population. Infections in dialysis children's increase in morbidity and mortality risks due to liver disease and reduced immunity. The most effective measure for preventing this is to isolate seropositive children's to dialysis stations in separate rooms but the strict application of infection control procedures including safe disposal of contaminated medical waste are also important. This finding supported by Simon et al., (2016) who reported that children's undergoing hemodialysis have excess risk for acquiring blood-borne virus infections.

The result of the current study clarified that more than half of the studied subjects reported that there is a positive family history of kidney failure and one-third of them having a degree of consanguinity Grandfather/Grandmother. This is maybe due to family history is a risk factor for developing end-stage renal disease. This is the same line with the results of McClellan et al., (2017) who showed that the first or second degree family members of children's with end-stage renal disease have two to three times as likely to have incident end-stage renal disease. And this finding was disagreement with by Barakat et al., (2017) who found that consanguinity of parents was present in small per cent of children's and family history of renal disease was reported positive in less than one-quarter of children's.

On assessing information of the studied subjects about renal failure pre and post nursing intervention program. The findings of the current study reflected that nearly half of them had a complete correct answer regarding the definition of renal failure post program. From researchers' points of view, this could be due to

program or intervention set in place of dialysis center so, the desire to enhance or at least refresh their knowledge to increased awareness of the renal disease and its importance among the children's is needed.

On the same line, in the present study revealed that more than two-thirds of them post nursing intervention program become aware that genetic, high blood pressure, chronic inflammation of the kidney pelvis were causes of renal failure and the majority of them have renal failure symptoms as headache, insomnia, loss of appetite and fatigue and color paleness. This might be due to hypertension is a leading cause of end-stage renal failure followed by chronic glomerulonephritis among children's and the symptoms and signs include a severe headache, irritability, dizziness, altered mental capacity, seizures, and coma. This finding supported by **Banaga et al., (2015)** who reported that the most common causes of renal failure diabetes and hypertension affecting young-age population followed in order by undetermined causes, glomerulonephritis in chronic pyelonephritis due to drug nephrotoxicity.

The present study revealed that the mean score of total self-esteem pre and post nursing intervention program that, there was highly statistically significant improvement. From researchers' points of view, the results of this study revealed that the information about the nursing program as a positive effect on increasing self-esteem in children's undergoing hemodialysis. This was supported by **Farzad et al., (2016)** who found that mean score of self-esteem in both groups showed a significant difference before and after the program.

However, after implementation of the nursing intervention program, there a good improvement in the body image who achieves a good body image post-program compared to preprogram. The improvement scores indicated that the program was a successful method to improve children's body image undergoing hemodialysis. This finding supported by **Muringai et al., (2018)** who reported that in particular, changes in body image, deterioration of lifestyle, and role changes cause radical changes in the sense of self; at this stage, an individual's sense of self is affected. Considering the nature of dialysis and disease, reductions in social functioning and changes in body image perception may bring about negative consequences. Therefore, adequate training and information are needed to develop appropriate adaptation methods and social relations, provide continuous social support, and design health policies in order to provide the necessary services and support for children's

Apparently, the current study finding indicated that there was a significant and highly statistically significant difference of quality of life domains mean score who achieve a good quality of life post nursing intervention program compared preprogram. From researchers' points of view, this improvement was significantly associated with more familiarity and understanding of the program. This finding was consistent with **Mohammed, (2015)** who revealed that using self-care model had significant effects on all quality of life dimensions including social and physical function, general health. Furthermore, this result was consistent with **Hossein, (2017)** who revealed that children's quality of life improved after administering self-care training program and increased children's quality of life.

The present study illustrated that the total mean scores of quality of life significantly who achieve a good quality of life increased post nursing intervention program compared preprogram which indicated that the provided program was effective. This finding was supported by **Broumand, (2015)** who revealed that the mean of quality of life had increased after education. On the other hand, this finding contradicted with **Abd El-Tawab, (2016)** who mentioned that most of the children undergoing hemodialysis had poor quality of life after intervention where they cannot communicate with others.

Finally, the present finding revealed that, positive correlation between the total quality of life, self-esteem and body image pre and post nursing intervention program. This finding matches with the research hypothesis. From researchers' points of view. This result might be attributed to the education might influence the dimensions of QOL and life satisfaction and self-esteem, body image was increased dramatically after the nursing program. In hemodialysis children and education could help the children to enhance their knowledge to improve their QOL, self-esteem and body image. This finding was consistent with **Farzad et al., (2016)** who reported that this finding indicates that the intervention in the current study has positive effects on the self-esteem, body image and quality of life.

#### **IV. Conclusion**

Based on the results of the present study, it can be concluded that the above-mentioned findings proved and reinforced the research hypothesis. The nursing intervention program had a positive effect on self-esteem, body image and quality of life of Children undergoing Hemodialysis.

#### **V. Recommendation**

In the light of the findings of the current research, the following recommendations are suggested:

1. Ongoing in-service nursing program about self-esteem, body image and quality of children should be designed and implemented at all pediatric hemodialysis units to improve it.

2. Training and awareness-raising of hemodialysis children's should be continuous. About nursing program should be integrated as a part of routine care for children undergoing hemodialysis. Functionality should be monitored periodically. Perceptions self-esteem, body image and quality of life of hemodialysis children's should be regularly assessed in terms of changes and considered in their treatment.
3. Advanced booklets regarding self-esteem, body image and quality of life should be available at each pediatric hemodialysis unit.
4. Application on larger sample should be done to ensure the generalizability of the results.

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