

## Empowerment Program for Mothers to Improve the Quality of Life of Their Children undergoing Hemodialysis on Arteriovenous Fistula Care

Howayda Mohammed Ali <sup>(1)</sup>, Atiat Osman <sup>(2)</sup>, Nagat Farouk Abolwafa <sup>(3)</sup>

(1) Lecturer of Pediatric Nursing, Faculty of Nursing, Minia University, Egypt

(2) Lecturer of Pediatric Nursing, Faculty of Nursing, South Valley University, Egypt

(3) Assistant Professor of Pediatric Nursing, Faculty of Nursing, Minia University, Egypt

### Abstract

**Background:** Children who receive hemodialysis can experience difficulties that might lower their quality of life and that of their mothers. Thus, empowering initiatives based on educational assessment needs will aid in enhancing mothers' knowledge, practice, and the quality of life for their offspring. Because of this, **the aim of actual study is to:** evaluate the effect of empowerment program on mothers to improve quality of life of their children undergoing hemodialysis on arteriovenous fistula care. **Design:** A quasi-experimental research design. **Setting:** this study was conducted in the Pediatric hemodialysis unit at Minia University Hospital for Obstetric and Pediatrics (MUHOP) and Minia General Hospital. **Sample:** A purposeful sample of 60 mothers and their children. **Data collection tools:** **four tools have been used (1)** a structured interview questionnaire sheet **(2)** mothers' knowledge assessment sheet, **(3)** observational checklists and **(4)** the Core Ped QoL questionnaire, version 4. **Results:** These findings showed that the mean score of all mother's knowledge, practices, and children's physical and psychosocial dimensions, as well as the total mean score of children's quality of life in the post-empowerment program were higher than these in the pre-empowerment program, with a highly statistically significant difference. **Conclusion:** There was an improvement in mothers' knowledge and practice. Also, children QOL was improved and increased after implementation of empowerment program than before. **Recommendation:** Providing continuous empowerment program for HD children and their mothers and psychosocial and spiritual support for children and families to improve the children's quality of life.

**Keywords:** Empowerment program, Hemodialysis, Mothers' knowledge and Practice, Quality of Life

### Introduction

Renal failure (RF) and chronic kidney disease (CKD) are important health issues for children under the age of eighteen years. (ESRD)End-stage renal disease is finally brought on by the gradual decrease of renal function. The number of people with end-stage renal failure as a result of chronic kidney disease is rising globally (Vaidya and Aeddula, 2021).

Numerous studies confirm how crucial it is to treat chronic kidney disease-related issues as soon as they arise in order to improve growth, enhancement, and (QOL) quality of life to the patients (Romagnani et al., 2017). According to a statement made by the WHO (World Health Organization), "(QOL) encompasses individuals' impressions from their life expectations with respect to their beliefs, value system, objectives, cultures, standards, and worries" (Ghazy et al., 2022). Promotion of patients' QOL is therefore, together with the control of illness symptoms, among the most crucial factors in the management of CKD.

Hemodialysis (HD) is a procedure that collects extra fluid and waste using a membrane in place of the kidney as a filter; it is not a treatment. A special food and fluid regimen are required for HD, which is a lengthy and expensive treatment that also necessitates lifestyle adjustments. In addition, physical and psychological pressures that children experience include loss of security, social isolation, anemia, hypertension, and anemia, as well as anemia, anemia, and lack of appetite (Liu et al., 2022).

Despite the fact that AVF is the most popular and effective method of vascular access due to the duration of the access, complications such as local coagulation or clotting of the blood in a part of the circulatory system, hand ischemia, swelling, hemorrhage, aneurysm, and palmar-plantar syndrome are frequently experienced with AVF, while infection, thrombosis, and aneurysm are frequently experienced with arteriovenous graft (Aljuaid et al., 2020). Stenosis, aneurysm, infection, and bleeding are AVF-related complications that make it impossible to maintain

the fistula's patency and result in AVF inadequacy. In determining AVF-related problems and ensuring AVF patency, nurses are essential. The risk of consequences from AVFs can be considerably decreased by experienced nurses (Malik et al., 2022).

On the other hand, families are crucial in ensuring the health and wellbeing of the kids and can greatly affect their QOL. That is why the health team members are working so hard to shift away from child-centered care and toward family-centered care today (Kokorelias et al., 2019). In order to make informed decisions about their children's treatment and health care, families need get correct information about diseases (Lin et al., 2021).

A significant strain is placed on patients, family carers, and the healthcare system by long-term HD treatment. The carers of patients undergoing HD bear a tremendous amount of duty for care and risk developing physical and mental health issues (Ebadi et al., 2021).

By their nature, the children are physically, mentally, and developmentally dependent; so, their family members play a great deal of responsibility to take care of them. Children receiving HD have a physical and psychosocial strain on their family caregivers. Such family caregivers are the main cornerstone of care, directly dealing with the health centers, social, and community services, so that their awareness as well as their attitudes and practices toward the ESRD children influence their quality of care and their QOL (Al-agamy et al., 2022).

Bektas et al. (2021) have demonstrated that the majority of families are capable of successfully coping with their children's chronic illnesses. On the other side, some of them might also have trouble adapting to it. The primary causes of that are Lack of access to accurate information for the family's about the illness, their lack of appropriate resources for maintaining their emotions, the high expense of their medical care, their mental health, and the social harms they have suffered.

Family members are empowered when given the chance by professionals to develop their current skills and abilities as well as gain new ones that are necessary to meet their demands (Ashcraft et al., 2019). Empowerment of the

family is a method by which the family gains the information and abilities to better control life's family and, as a result, enhance the lifestyles of the family personnel (Mardhiyah et al., 2022).

Empowerment-based health education programs can help mothers gain self-management skills, and increase their knowledge, compassion, and self-efficacy. They can also help family members become more capable of overcoming current health-related challenges. Therefore, empowerment programs can lower hospitalization expenditures and rates, enhance physical and mental performance, and lower disease symptoms and renal disease-related school absences in children (Vainauskienė and Vaitkienė, 2021).

### Significance of the study

One or two new cases of pediatric renal failure occur annually for every 100.000 children. Also, 3:5 children out of every million in the USA get CRF each year (Centers for Disease Control and Prevention, 2019).

Nearly 1.36% of all hospitalized patients in Egypt are reported to be children between the ages of newborn and 15 who have CRF. Furthermore, renal failure accounts for more than 67,000 annual fatalities, which is a substantial amount of morbidity and death worldwide. Because of the poor and low socio-economic standards, its prevalence is still rising. Chronic kidney disease complications do not just lead to end-stage renal disorders. It can raise the causes of the disease in heart, hinder growth and enhancement, and change the way that both children and their parents live (Hassaballa et al., 2022).

So, the aim of the current study is to assess the impact of empowerment program for mothers to enhance QOL of their children undergoing hemodialysis on arteriovenous fistula care. This empowerment program will help in improving mother's knowledge, practice, as well as improving QOL for their children. Additionally, it offers recommendations and guidance that should be incorporated into the teaching of pediatric nursing as well as the provision of evidence-based data that can advance nursing skills and research in the area of pediatric nephrology nursing.

### Operational Definition

**Empowerment program:** comprises of stages that correlate to the level of confidence and decision-making a mother expresses with healthcare workers. It is an interactive intervention that nurses employ to support mothers (Ashcraft et al., 2019).

**Quality of life:** the degree of pleasure is associated with one's current situation as perceived by the person. It is impacted by both past and upcoming events (López-Ruiz et al., 2021).

**An arteriovenous (AV) fistula:** is the joining of an artery and a vein by a vascular surgeon. An AV fistula is preferred over other methods of access by medical professionals. Allows for enough blood flow during dialysis. is more durable than other access types (Shahverdyan et al., 2021).

### Aim of the research

This study aims to evaluate the effect of empowerment program on mothers to improve QOL of their children undergoing hemodialysis on arteriovenous fistula care

### Subject and Methods

#### **Research hypothesis**

- Mothers who receive empowerment program are expected to have better average knowledge scores in post-program than pre-program.
- Mothers who receive empowerment program are expected to have higher mean scores of reported practices in post-program than pre-program.
- Children whose mothers who receive empowerment program are expected to have better quality of life in post-program than preprogram.

#### **Research design**

A quasi-experimental (pre-test/posttest design) research design is used in this research.

#### **Setting**

The study is conducted in pediatric hemodialysis unit at Minia University Hospital for Obstetric and Pediatrics (MUHOP) which includes 16 beds for pediatric HD., and Minia General Hospital which is affiliated to ministry of health and population. Also, includes 13 beds for pediatric HD.

#### **Sample and sample size**

A purposeful sample of 60 mothers' and their children (21 from Minia General Hospital, and 39 from University Hospital for Obstetric and Pediatrics (MUHOP).

**Inclusion criteria:** children diagnosed with ESRD and treated with HD, children with AVF who come periodically for HD (not hospitalized), Children who had no communication issues, both of sexes were included. Children free of other medical problems such as Juvenile DM, and cancer are also included. Mothers had no cognitive or psychiatric disorders and were willing to participate in the study.

**Exclusion criteria:** mothers' desire to cease taking part in the study Children with special needs, such as those with mental retardation, autism, or hearing or speech impairments, cannot be educated or require special education because they are unable to communicate.

**Sample size:** has been estimated by using the next formula:  $n = (z^2 \times p \times q) / D^2$  at CI 95% and power 80%. The sample size was sixteen mothers' with their children. They had been chosen based on the pervious criteria.

#### **Data collection tool**

Three tools were utilized to collect the data:

**Tool 1:** the structured interview questionnaire was created by the researcher and formulated in Arabic based on pertinent review of literature. It is included the next parts:

**Part 1:** personal items of mothers included age, educational level, and occupation; data related to children included age, gender, education, child ranking, and residence.

**Part 2:** medical history-related renal disease, dialysis, and AVF which included duration of disease, duration of HD, number of sessions every week, duration of AVF, history of previous AVF failure, and history of current AVF.

**Tool 2:** mother's knowledge questionnaire was created by the researcher after observing the literatures (El Awady and Mohamed, 2021) & (Hassan and Mahmoud, 2019). It contains 26 MCQ questions designed to assess mother's knowledge regarding AVF

and its care which were classified into four categories; each category contains related sub-items: first, general knowledge about kidney failure and HD (Included 6 sub-questions related to kidney function, renal failure, Function of dialysis machine, HD process, description AVF, and AVF function); second, how to maintain healthy nutrition (included 5 sub-questions related to identify dietary component, Diet to be restricted, Identify resources of protein, Identify resources diet's rich with potassium as well as phosphorus); third, immediate fistula care (included 2 sub-questions related to preoperative preparation, and postoperative immediate care); fourth, long-term fistula care (included 7 sub-questions related to daily activity life precaution to prevent AVF failure, different methods for assessing AVF function, exercises to strength and maintain AVF, methods of prevention injury to AVF, hygienic measures related to AVF, care before child entering HD session, and care after child ending HD session); fifth, fistula complications and its care (included 6 sub questions related to infection, bleeding, clotting, embolism, deficiency of blood supply to arms, and the care related to complications).

### Scoring system

Total number of questions was 26, each question score ranged from 0 to 2 (zero=do not know or incorrect answer, one=incomplete correct answer, two=complete correct answer). Total score of the questionnaire was 52. It was classified to unsatisfactory less than 50% (<26) and satisfactory more than 50% (26–52).

**Tool 3:** observation checklists to assess practices of the mother included:

**Hand washing checklist:** This is adopted from **Hays et al., (2021)**. It contained 12 steps about hand washing steps about: Wet hands with water, apply a small amount of soap, rub hands palm to palm, rub hands wrist to wrist, rub palm to palm with fingers interlaced, rub hands palm to palm with fingers interlocked, rub hands with backs of fingers to opposing palms, rub hands with thumbs clasped in opposite hands utilizing rotational motion, rub hands with tips of fingers in opposite palm in

circular motion, and then thoroughly dry hands.

**Fistula hand exercises:** This is adopted from **Reanpang et al., (2019)**. It contained 11 steps related to lower arm fistula exercises and upper arm fistula exercises. Lower arm fistula exercises include ball squeeze (exercise 1&2), Clothes peg Grasp, Fingertip Touches. Upper Arm Fistula Exercises include (Bicep Curl). For each of those exercises, the researcher explained to the mothers and their children the technique, duration, and the numbers of repetition during day.

**Measuring child's weight:** is developed by the researcher after reviewing the related literature. It contained 4 steps about weight measuring: using digital scale and place it on firm flooring, remove heavy clothing as well as their shoes, stand with two feet in the middle of the scale, and the nearest the weight in kg and recorded it.

**Measuring blood pressure:** This is adopted from **Fu, (2022)**. It contained 13 steps about digital blood pressure measurement.

### Scoring system

The score of each item was rated as follows: done correctly (1) and (0) if the mother did it incorrectly or not done. Total score checklist was 40. It was classified to unsatisfactory less than 50% (<20 score) and satisfactory more than 50% (20–40 score).

**Tool 4:** Version 4 Questionnaire Sheet for the Core Pediatric QOL Questionnaire (Core Ped QoL, version four) (**Smyth and Jacobson, 2021**), (**Varni et al., (2001)**). There were 23 questions total, and they covered the following two aspects: -

- **Physical dimension:** eight questions.
- **Psychosocial dimension:** fifteen questions (five questions related to emotional function, social function, and function of school).

### Scoring system of this tool

Core Ped QoL, version 4 elements were scored using a linear transformation on a scale from 0 to 100 as follows. The higher scores indicated better health-related QOL, with 0 (Never) equaling 100, 1 (Almost Never) equaling 75, 2 (Occasionally) equaling 50, 3 (Frequently) equaling 25, and 4 (Almost Always) equal to 0.

The sum of all the items over the number of items scored on all scales determined the final score.

### Content validity

Content validity was assessed the degree to which the tools (1, 2, and 3) measure what should have been measured. The translated tools were evaluated by a panel of six experts (three in the field of pediatric renal dialysis medicine and three in the field of pediatric nursing), who agreed that they were valid and relevant to the aim of the study.

### Reliability

Internal consistency was examined to determine how closely related the items are to one another and how closely the items of the instruments assess the same idea. Internal consistency estimates of reliability by Cronbach's  $\alpha$  for tool 2 (mother's knowledge questionnaire), tool 3 (observation checklists), and tool 4 (Core Ped QoL, version 4) were (0.934, 0.714, and 0.89) respectively.

### Pilot study

Six mothers and their kids (10% of the sample) participated in the study to evaluate its viability, application, and to determine how long it would take to complete the instruments. No essential adjustments were made. Consequently, the pilot research was added to the overall sample.

### Data Collection Procedure

Data collection was conducted over a 12-month period extending from the beginning of January 2022 to the end of October 2022. Approval from director of the Minia University Hospital for Obstetric and Pediatrics (MUHOP) and Minia General Hospital was obtained before collection of data. A clear and simple explanation about the aim and nature of the study was discussed by the researcher with each mother who had a child with AVF, and their oral acceptance to participate in the study was taken.

The empowerment program was developed by the researchers after observing the literature review and pertinent researches. The main principles stated in this empowering program intervention were educating, ensuring, guidance, empathy, enhancement, and the chance to share their emotions to promote emotional support from

others. It is prepared in Arabic booklet about guidelines for mothers regarding AVF and its care.

The empowerment program included theoretical and practical parts: the theoretical parts contained introduction about kidney function, renal failure, HD process, function of dialysis machine, description AVF, AVF function, preoperative preparation and post-operative immediate care for AVF, daily activity life precaution to prevent AVF failure, different methods for assessing AVF function, methods of prevention of injury to AVF, hygienic measures related to AVF, daily living and supportive care, care before child entering HD session, and care after child ending HD session; the practical parts contained: hand wash steps, fistula hand exercises, measuring child's weight and finally measuring blood pressure.

The empowerment program was conducted through three phases (assessment, implementation, and evaluation). The total number sessions to conduct an empowerment program was 15 (two sessions for assessment phase, eleven sessions for implementation phase, and finally two sessions for evaluation phase). Sessions of the empowerment program were held in a waiting room, in a pre-mentioned setting. Through in-person interviews, the researcher, the mother, and the child completed questionnaires.

### Phase I, assessment. Assessment phase included four parts:

**Part 1:** assessment of mother and child's personal characteristics and data about medical history of related diseases, dialysis, and AVF using tool 1 structured interview questionnaire.

**Part 2:** mother's knowledge questionnaire was used for assessment of the mother's knowledge regarding AVF and its care which was taken using tool 2.

**Part 3:** assessment of the mother's practice using tool 3 (observation checklists).

**Part 4:** assessment of QOL of children undergoing hemodialysis using tool 4 (Core Ped QoL, version 4).

The total assessment phase was done through two sessions; the duration of each assessment session was 30–40 min.

## Phase II, implementation phase. The Implementation phase included three parts:

- **Part 1 (theoretical content):** the researchers distributed empowerment program booklets for mothers that contain theoretical content and the participants were divided into small groups; each group was composed of 4–6 mothers and their children and it received theoretical contents through five sessions as follows: In the first session, the participant received general knowledge about kidney failure and HD (kidney function, renal failure, Function of dialysis machine, HD process, description AVF, and AVF function). In the second session the researchers provided them with information about maintaining healthy nutrition (identify dietary regimen component, diet to be avoided, identify protein resources, identify potassium rich diet resources, and Identify phosphorus rich diet resources). In third session the researchers provided them with information about immediate fistula care (preoperative preparation and post-operative immediate care). In the fourth session, the researcher explained long-term fistula care (daily activity life precaution to prevent AVF failure, different methods for assessing AVF function, methods of prevention of injury to AVF, hygienic measures related to AVF, care before child entering HD session, and care after child ending HD session). Finally, in the fifth session, the researchers discuss fistula complications and its care (infection, bleeding, clotting, embolism, deficiency of blood supply to the arms, and the care related to complications). Duration of each session was 30–40 min. sufficient information about AVF and its care was provided through lectures using PowerPoint presentations, group discussion and question and answer sessions based on the empowerment program booklet.
- **Part 2 (practical contents):** demonstration and re-demonstration regarding hand washing, fistula hand exercise, measuring child's weight and blood pressure were provided for each mother and his or her child individually through four sessions as follows: the first session demonstration was held regarding hand wash through the mother on herself in front of researchers; the second session demonstration was held regarding hand fistula exercises through the mother on herself in front of

researchers; the third session demonstration was held regarding measuring child's weight; and lastly, the fourth session demonstration was held regarding measuring child's blood pressure. Also, a film was watched and empowerment program booklets that contain the practice content were given to the mother. The duration of each session was 30–40 minutes.

- **Part 3 (improving QOL of children undergoing hemodialysis):** assist children in developing their sense of self via the educational involvement. At this point, the researcher assisted the children in teaching their mothers more about HD with the support of the children. Additionally, to guarantee that mothers comprehend the fundamental concepts and lessons being taught to their children, and to boost and develop self-efficacy among everyone (mothers and their children). It includes two demonstration-filled sessions that were held. This step involved explaining to the researcher the procedures needed to measure body's weight and PB, which were then taught to the children using illustration and re-demonstration techniques. Eleven meetings, each lasting 30 to 40 minutes, comprised the entirety of the implementation phase.

**Phase III: evaluation phase** for the mothers' knowledge and practice regarding AVF and its care, as well as for their children QOL after the empowerment program. The structured interview questionnaires were used as posttest immediately after the eleven sessions of the program. Observation checklists were given to mothers in front of researchers for hand washing, fistula hand exercises, measuring child's weight and child's blood pressure; they were used as posttest immediately after the four sessions of the practical part. The evaluation phase was done through two sessions; the duration of each evaluation session was 30–40 minutes. QOL Questionnaire sheet for children was used as immediately posttest evaluation and after six months (follow up test) as QOL need time for modification

### Ethical consideration

A written approval was taken from the Research Ethics Committee at the Faculty of

Nursing “Minia University”. Additionally, the researcher secured a written approval from the administrators of the aforementioned hospitals as well as the pediatric hemodialysis units. The mothers of the children who participated in this study gave their explicit written consent. The researcher conducted direct personal interviews to explain the study's objectives and methodology, ensuring that the data would be kept confidential and used only for that purpose. The mother had the right to decline involvement from this participation at any time without suffering any detrimental effects, and the study complied with generally accepted ethical guidelines regarding participation in the research, anonymity and privacy were found via the coding of the data.

### Data Analysis

Version 20.0 of the Statistical Package for Social Studies (SPSS) was employed. The gathered information was categorized, tallied, and examined. The mean and SD were used to express numerical data. The paired-sample t-test was used to compare the means. The Pearson correlation coefficient was used to determine the correlation between the variables. For statistical significance, a level of significance of P 0.05 was utilized as the cutoff value.

### Results

**Table 1** shows that near to half of mothers (46.7%) age ranged between 40 > 50 years, with a mean age of (37.85±7.695) years. Regarding the education of mothers more than one-third of them (36.7%) were able to read and write, the majority of mothers (81.7%) were housewives, and regarding the past attendance of educational programs about AVF care, the result mentioned that (100%) of mothers did not attend any AVF care-related programs. In relation to mother's residence, approximately more than one half of them (56.7%) live in urban.

**Table 2** justifies the finding that more than half of children (58.3%) were between 9 to 12 years, with a mean age of (9.48±2.652) years. As respects their level of education (58.3%) have attended primary school. According to their sex (60 %) of the participants were males. More than half of children had one to two

siblings. In relation to their weight (50%) of the children were between 31: 40 Kg with a mean weight (31.71±7.38 Kg).

**Table 3** indicates that the majority of children (88.3%) were diagnosed with chronic renal failure, while the minority of them (10%) had CRF with heart diseases, and one-third of the children (31.7%) had CRF duration between (0>3 & 6>9) years., and the mean duration of CRF was (5.101±3.024) years. Nearly Fifty percent of them (48.3%) duration of hemodialysis between (0>3) years, one-third of the children (33.3%) had hemodialysis duration of between 3 and less than 6 years, with a mean (3.63±2.58) years. Regarding the frequency of sessions per week, all children (100%) received three dialysis sessions per week. In relation to their past history 50% of them had had one kidney since birth.

**Table 4** shows that 73.3% of children did not have a previous history of AVF failure. On the other hand, about one quarter (26.7%) had a previous history of AVF failure. Concerning the numbers and causes of previous AVF failure, 18.4% of children had one previous AVF failure and the cause of failure was unknown, followed by 5% of children who had AVF failure two times before and the cause was clotting, while 3.3% had three previous AVF failure and the cause was infection.

**Table 5** shows that more than two-thirds (66.7%) of children had AVF in the left arm, and about two-thirds (63.3%) of them did not have aneurysm. As respect the age of the present AVF (65%) were between (0 > 2) years, and the mean of age of the present AVF (2.102±1.52) years. Fifty percent of them did not have any complication in the current AVF, followed by (28.4%) of children, who had previous infections in the current AVF.

**Table 6** notes that the mean score of all subtotals, and total mother's knowledge in the post- empowerment program were more than in the pre empowerment program. The subtotals mean score of mother's knowledge regarding (general knowledge about kidney failure and hemodialysis , nutrition status, immediate fistula care, long-term fistula care, and fistula complications and its care), also lastly the total mean score of mother's knowledge were (4.1 ±1.426, 3.5 ± 1.123, 1.1±0.823, 5.9 ±2.1,

3.42±1.72, and finally 17.82 ±3.32 respectively) in the pre empowerment. Compared to (9.50±1.73, 8.51±1.13, 2.97±0.84, 11.90±1.43, 9.30± 1.67, and finally 42.17±3.52 respectively), in the post-empowerment program with highly statistically significant difference  $p=0.000$ .

**Table 7** illustrates that the mean of all mother's practices in the post- empowerment program were more than in the pre empowerment program, the mean score of mother's practices related to hand washing, Fistula exercises, measure child's weight, and blood pressure, and lastly the mean score of total mother's practices were (5.50±1.127, 1.984 ± 0.834, 1.384±0.491, 4.484 ±1.143, and finally 13.35±1.965 respectively), in the pre empowerment program. Compared to (10.50±0.815, 9.11± 1.362, 5.25±1.154, 11.35±1.152, and finally 36.53± 2.228 respectively), in the post- empowerment program with highly statistically significant difference  $p=0.000$ .

**Table 8** clears that the mean scores of children's physical, and psychosocial

dimensions, as well as the total mean of children quality of life in the post-empowerment program and follow up were more than in the pre empowerment program (pre =77.167±7.511, 75.65±8.17, and 152.857±12.989. on the other hand, (post = 88.534±4.851, 88.734±4.839, and 177.267±8.244 respectively), while (follow up = 83.2±6.456, 84.3±7.821, and 169.246±7.56 respectively), with highly statistically significant difference  $p=0.000$ .

**Table 9** suggests that there is a positive significant correlation between the total mother's knowledge pre-empowerment program with post- knowledge empowerment program and with pre-practice empowerment program ( $r=0.757$ ,  $P=0.0001$  and  $r=0.523$ ,  $P=0.0001$ ). There was positive correlation between the total mother's knowledge post-empowerment program with pre-practice empowerment program ( $r=0.538$ ,  $P=0.0001$ ). As well as, present positive correlation between total children QOL pre-empowerment program with total children quality of life post-empowerment program ( $r=0.392$ ,  $p=0.002$ ).

**Table 1:** Distribution of Mothers with Regards to their Personal Characteristics (n=60):

Personnel Characteristics	N	%
<b>Age (years)</b>		
20 >30	9	15
30 >40	23	38.3
40 >50	28	46.7
Mean ± SD	37.85±7.695	
<b>Education</b>		
Not read and write	19	31.7
Read and write	22	36.7
Preparatory	2	3.3
Primary	6	10
Secondary	6	10
University	5	8.3
<b>Mother's occupation</b>		
Not working/housewife	49	81.7
Working	11	18.3
<b>Attended educational programs before about AVF care</b>		
Yes	0	0
No	60	100
<b>Residence</b>		
Rural	26	43.3
Urban	34	56.7



**Table 2:** Distribution of Personnel Characteristics among the studied Children (n=60):

Personnel Characteristics	N	%
<b>Age (years)</b>		
5-8	20	33.3
9-12	35	58.3
13-16	5	8.4
Mean ± SD	9.48±2.652	
<b>Level of Education</b>		
Not read and write	17	28.3
Simply Read and write	3	5
Primary school	35	58.3
Preparatory school	5	8.4
<b>Gender</b>		
Male	36	60
Female	24	40
<b>No. of Siblings</b>		
1-2	32	53.3
3-4	25	41.7
5-6	3	5
<b>Weight</b>		
< 20 kilogram	6	10
21-30 kilogram	19	31.6
31-40 kilogram	30	50
> 40 kilogram	5	8.4
Mean ± SD	31.71± 7.38	

**Table 3:** Distribution of Medical History among Children as (n=60):

Items	NO	%
<b>Diagnosis</b>		
Chronic renal failure (CRF)	53	88.3
CRF and heart diseases	6	10
CRF and liver diseases	1	1.7
<b>Duration of chronic renal failure disease (years)</b>		
0>3	19	31.7
3 to >6	15	25
6 to >9	19	31.7
9 to ≤12	7	11.6
Mean ± SD (years)	5.101±3.024	
<b>Duration of hemodialysis (years)</b>		
0>3	29	48.3
3 to >6	20	33.3
6 to >9	9	15
9 to ≤12	2	3.4
Mean ± SD	3.63±2.58	
<b>Frequency of session every week</b>		
Three session/week	60	100
<b>Past history</b>		
Narrow ureters	6	10
Persistent pus on kidney	6	10
One kidney	30	50
Congenital anomalies	18	30

**Table 4:** Percentage of Medical History of Previous Arteriovenous Fistula Failure among Children (n=60):

Items	NO	%
<b>Previous history for AVF failure</b>		
No	44	73.3
Yes	16	26.7
<b>If yes (number of failures)</b>		
Once	11	18.4
Two	3	5
Three	2	3.3
<b>Causes of AVF failure</b>		
Unknown	11	18.4
Clotting	3	5
Infection	2	3.3

**Table 5:** Percentage of Medical History of Current Arteriovenous Fistula among Children (60):

Items	NO	%
<b>Site of AVF</b>		
Rt. arm	20	33.3
Lt. arm	40	66.7
<b>Presence of aneurysm</b>		
No	38	63.3
Yes	22	36.7
<b>Duration of present fistula (age of present AVF duration in years)</b>		
0>2	39	65
2>4	11	18.3
4≤6	10	16.7
Mean ± SD (years)	2.102±1.52	
<b>Previous complication for the current AVF</b>		
No complication	30	50
Infection	17	28.4
Bleeding	5	8.3
Clotting	8	13.3

**Table 6:** Comparison between the Total Mean Score of Mothers' Knowledge as Regards Care of Arteriovenous Fistula Pre-empowerment and Post- empowerment program (n=60):

mean score of mother's knowledge	Pre-empowerment (Mean±SD)	Post-empowerment (Mean±SD)	t-test	P- Value
General knowledge about kidney failure and hemodialysis	4.1 ±1.426	9.50±1.73	19.053	0.0001**
nutrition status	3.5 ± 1.123	8.51±1.13	31.348	0.0001**
Immediate fistula care	1.1±0.823	2.97±0.84	19.027	0.0001**
Long-term fistula care	5.9 ±2.1	11.90±1.43	19.812	0.0001**
Fistula complications and its care	3.42±1.72	9.30± 1.67	78.844	0.0001**
Total mean score of mother's knowledge in pre empowerment program	17.82 ±3.32	42.17±3.52	19.027	0.0001**

\*\*highly statistical significance differences

**Table 7:** Comparison between the Total Mean Score of Mothers' Practices as Regards Hand Wash, Fistula Exercises, Weight and Blood Pressure Pre-Empowerment and Post- Empowerment Program (n=60):

Mother's practice	Pre-empowerment (Mean±SD)	Post-empowerment (Mean±SD)	t-test	P- Value
hand washing	5.50±1.127	10.50±0.815	5.679	0.0001**
Fistula exercises	1.984 ± 0.834	9.11± 1.362	7.539	0.0001**
measure child's weight	1.384±0.491	5.25±1.154	4.065	0.0001**
measure blood pressure	4.484 ±1.143	11.35±1.152	7.277	0.0001**
Total of mother's practices	13.35±1.965	36.53± 2.228	23.911	0.0001**

\*\*highly statistical significance differences

**Table 8:** Comparison between the Total Mean Score of Children Quality of Life pre-empowerment, post-empowerment Program, and Follow up (n=60):

QOL dimension	Pre-empowerment (Mean±SD)	Post-empowerment (Mean±SD)	Follow up post empowerment (Mean±SD)	F	P- Value
Physical dimension	77.167±7.511	88.534±4.851	83.2±6.456	13.553	0.0001**
Psychosocial dimension	75.65±8.17	88.734±4.839	84.3±7.821	10.745	0.0001**
Total	152.857±12.989	177.267±8.244	169.246±7.56	15.328	0.0001**

\*\*highly statistical significance differences ANOVA test was used

**Table 9:** Correlation between Total Mother's Knowledge, Practices as Regards Care of Arteriovenous Fistula and Total Children QOL Pre-empowerment /Post empowerment Program (n=60):

		Knowledge pre empowerment	Knowledge Post empowerment	Practice pre empowerment	Practice Post empowerment	QOL pre empowerment	QOL post empowerment
Knowledge pre empowerment	R		<b>0.757**</b>	<b>0.523**</b>	0.224	0.126	0.069
	P- Value		<b>0.0001</b>	<b>0.0001</b>	0.085	0.338	0.602
Knowledge Post empowerment	R	<b>0.757**</b>		<b>0.538**</b>	0.179	0.057	0.074
	P- Value	<b>.0001</b>		<b>0.0001</b>	0.172	0.663	0.572
Practice pre empowerment	R	<b>0.523**</b>	<b>0.538**</b>		0.104	0.047	0.021
	P- Value	<b>0.0001</b>	<b>0.0001</b>		0.430	0.721	0.876
Practice Post empowerment	R	0.224	0.179	0.104		0.132	0.191
	P- Value	0.085	0.172	0.430		0.314	0.145
QOL pre empowerment	R	0.126	0.057	0.047	0.132		<b>0.392**</b>
	P- Value	0.338	0.663	0.721	0.314		<b>0.002</b>
QOL post empowerment	R	0.069	0.074	0.021	0.191	<b>0.392**</b>	
	P- Value	0.602	0.572	0.876	0.145	<b>0.002</b>	

\*\*highly statistical significance differences

## Discussion

One of the main health issues affecting youngsters under the age of 18 is chronic renal disease. It is a very difficult illness that might have fatal consequences (**Bombard et al., 2018**). Families of children with chronic renal disorders, such as chronic kidney failure, require ongoing support to help them deal with the illness. These children's mothers frequently give them a lot of time and attention, bearing heavy burdens. The most efficient strategy to improve the QOL for children is to empower the families (**Khorsandi et. al., 2020**).

The engagement of health team members with families of patients that results in a feeling of regulate over their lives and causes beneficial changes in the direction of their abilities, capacity, and skill-building in families is known as family empowerment (**Ahmed, 2018**) & (**Webster et al., 2017**). Hence this research aims to check the impact of the program to improve mothers' empowerment QOL of their children undergoing hemodialysis on arteriovenous fistula care.

Present study results reveal that half of mothers' ages ranged from 40 to less than 50 years old, with a mean age of 37 years (Mean ±

SD =37.85±7.695). Also, more than one-third of them were able to read and write. As well as, the majority of mothers didn't work and didn't attend any training programs about AVF, and more than one half of them (56.7%) live in urban areas. Similarly, **El Awady and Mohamed, (2021)**, who reported that the majority of mothers (70%) were not working (housewives) and none of the mothers attended any AVF care-related programs.

In the present research, more than half of children were between nine to twelve years, with average age nine years (Mean ± SD =9.48±2.652) and over half of the children were males. As well as, their weight between 31:40 Kg with a mean 31weight (Mean ± SD =31.711±7.377 Kg). This result is in agreement for the finding with **Mohamed et al., (2021)** who discovered that more than half of participants were between the ages of 9 and 12 and that the study respondents' weights between 31:40 kg. However, our study contradictory to **El Awady and Mohamed, (2021)**, who evinced that more than fifty-percent of the children studied were females.

Regarding the medical history of the children throughout the current research, nearly half of children duration of hemodialysis between 0 to less than 3 years, and all of them received three dialysis sessions per week. This finding is in accordance with **Saadoon (2017)**, who reported that most of the children received three dialysis sessions per week.

Concerning children's medical history of previous arteriovenous fistula failure, the finding of the current study clarifies that the highest percentage of children did not have previous history for AVF failure; on the other hand, about one quarter had a previous history for AVF failure. This outcome is consistent with **Ozen et al. (2017)**, who justified that the majority of children did not have previous history for AVF failure, while less than one-third of them had a previous history for AVF failure.

As the outcomes of the present study show, more than two thirds of children had AVF in the left arm, and about two thirds of them did not have aneurysm. As well as, Fifty percent of them did not have any complication in the current AVF, followed by (28.4%) of

children, who had previous infection in the current AVF. This outcome is in accordance with **Kamel et al. (2020)** who communicated that, higher two-fifth of children did not have any complication in the current AVF, followed by 29.5 % of children who had previous infection in the current AVF.

Regarding the findings of this study, it is clear from the results that the mean score of all subtotals, and the total mother's knowledge in the post- empowerment program were more than in the pre- empowerment program with highly statistically significant difference between the two programs . The finding of this study is supported by **Sotoudeh et al. (2019)**, who claimed that one of the interventions used to promote problem-nature knowledge and improve communication and problem-solving skills is empowerment workshops. Additionally, adopting a variety of training techniques helps patients and their families learn more about the illness and improve their ability to adapt to it.

Also, this result is consistent with **El Awady and Mohamed, (2021)**, who stated that the total mean knowledge post-empowerment program was higher than the pre- empowerment program and the differences were highly statistically significant.

The present study also find that the total mean score of all mother's practices in the post-empowerment program was higher in the pre-empowerment program, with highly statistically significant difference between the two programs, which is consistent with the results of **Khalil et al. (2017)**, who found that posttest and follow-up time enhanced patients' knowledge and skills in the areas of diet, measuring weight, and blood pressure, with a highly statistically significant difference between pre-intervention and post--intervention patient practices.

The study results show that the total mean score of children's physical, and psychosocial dimensions, as well as the mean score of children's QOL, were higher in the post-empowerment program than in the pre-empowerment program with highly significant difference between pre- empowerment and post- empowerment programs, In the same context, the findings of a study by **Fathalla (2018)**, They claimed that before the family

empowerment model session was implemented, the participant with CKD had low psychosocial QOL. This finding was attributed to a variety of factors, including children's body image in relation to their peers, frequent hospitalizations, disease-related side effects, and fatigue from prolonged treatments that negatively impact patients' mental, emotional, and social well-being. However, after the family empowerment model was implemented, there was an obvious improvement in the patients' physical and psychosocial domains. The study also come to the conclusion that putting the family empowerment approach into practice enhanced and raised the quality of life for kids with chronic renal disease.

Also, this result is consistent with **Minooei et al. (2016)**, which found significantly different in the children's QoL regarding the physical, psychosocial items, as well as the QoL degree before and after the empowerment training program.

Furthermore, the findings exhibited a positive significant correlation between total mean score of mother's knowledge pre-empowerment program with post- knowledge empowerment program and with pre-practice empowerment program. Also, there was positive correlation between total children QOL pre-empowerment program with total children QOL post- empowerment program. Likewise, **Hassan and Mahmoud, (2019)**, who presented positive correlations between total mother's knowledge pre-empowerment program and post- knowledge instruction, also found positive correlations between total mother's practice post- empowerment program and post- knowledge.

Moreover, these results come in agreement with **El-Melegy et al. (2016)**, in their study on 50 patients and their caregivers about the effect of family-centered empowerment model on HD patients and their caregivers, who found a statistically significant difference between the overall mean score pre-empowerment and post- empowerment intervention, while the findings contradict with **Karmalawy et al. (2015)**, which showed that there was no statistically significant correlation between total knowledge and total practice  $r=0.23$  at  $P=0.065$ .

From the researcher's point of view, the empowerment education program in this study enables the mothers to acquire accurate knowledge and practice about AVF care which improve mother's self-confidence and children's QOL by increasing their participation and cooperation in caring, they are able to make decisions for managing their life eventually, prevent AVF fistula complications. So, the current findings support the study hypothesis.

### Conclusion

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On the basis of the study's findings, it can be said that mothers' knowledge and behavior have improved. Also, children QOL was improved and increased after implementation of empowerment program than before.

### Recommendations

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The researcher developed the following suggestions in light of the findings of the current study:

#### For clients

- Provide hemodialysis children and their mothers with empowerment programs which include effective health education that contain knowledge about hemodialysis, healthy nutrition, fistula care , long term plan, and psychosocial and spiritual support for children and families to improve their children's quality of life.
- An ongoing assessment of a mother's skills and procedures when looking after children getting hemodialysis at home.

#### For nurses

- Preparation of professional nurses to enhance awareness toward difficulties that outcome from hemodialysis for newly diagnosed children as well as their families via participation in specific empowerment programs that are concerning QOL approaches and how to deal comprehensively with chronic hemodialysis children, and their families.
- All nurses and parents should have access to educational pamphlets, books, boosters, as well as brochures in hemodialysis wards as a resource.

**For further study:**

- Further studies need to emphasize over a larger sample and a longer period of time, more research needs to highlight the effect of empowerment programs' intervention on knowledge, practice, and children's QOL in other chronic conditions.

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