Assessment of the Nutritional Status for Children Undergoing Hemodialysis

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Abstract

Background: Chronic renal failure is a global health issue, with increasing incidence and adverse effects. The nurse must be knowledgeable with nutritional assessment because children undergoing dialysis are at greater risk to suffer from malnutrition. **Aim:-** To assess nutritional status for children undergoing hemodialysis. **Design**: A descriptive research design was used for this study. **Settings:** The study was coducted at the hemodialysis unit in Sohag University Hospital and Sohag General Hospital. **Sample**: A convenient sample of (100 children) with hemodialysis. **Tools :** Two tools were be used to collect the required data: **Tool (1): Nutritional Assessment Tool:** consists of **part (1):** Biosocial and medical data of children and their family **part (2):** Child's Physical assessment and **part (3):** Child's anthropometric measurements to record and calculate the child's measurements **part (4):** Biochemical investigation **Tool (II): Dietary intake survey. Results:** Males made well over half (56%) of the children, majority (82%) of them were live at rural area. Two third (67%)of children had abnormal body mass index, more than half(55%) of them were had high creatinine level, less than two third (60%) of them had high urea level. **Conclusion:** Nutritional assessment is more detailed systematic process for gathering and analyzing data to determine a person's dietary needs and assess their current state, where, less than three quarters(71%) of children had low intake of protein. **Recommendation**: Developing nutritional counselling for children and their parents. Frequent seminars and classes for nurses on how to care for children with dialysis.

Keywords: nutritional status, assess, children, hemodialysis

Introduction

The kidneys are regarded as one of the body's most vital organs. The ancient Egyptians believed that the brain and kidneys were more valuable than other organs, thus they left them in place before embalming a person. Each kidney is roughly the size of a fist and has a bean-like shape. They are situated immediately beneath the rib cage. The fibrous renal capsule that envelops each kidney and supports the soft tissue within, makes the right kidney typically somewhat lower than the left. Two additional layers of fat provide further protection. The adrenal glands are situated above the kidneys **(Fahy, 2021 & Meera et al., 2024)**
Each kidney is formed of about one million nephrons. Generally, in humans, nephrons start to be formed between 9 to 36 weeks of pregnancy and glomerulogenesis stops after birth. But , in preterm, nephrons remain to grow until 45 postnatal days. Nephrons is made up of a complex system of tubules, arterioles, venules, capillaries and a very small filter, called a glomerulus; the proximal tubules, which reabsorb small sized nutrients (glucose, amino acids and vitamins); the distal tubules and loop of Henle, which regulate fluid and electrolyte and the renal pelvis, which controls the concentration of urine **(Rodríguez et al., 2023).**
The kidneys' primary function is to filter out waste from blood and return the body's cleaned blood. Maintain the proper ratio of water and minerals such as potassium, sodium, magnesium and phosphorus after digestion, muscle contraction and exposure to chemicals or drugs. Also it help in controlling blood pressure by renin. It generates erythropoietin, which stimulates the body to produce red blood cells and the active form of vitamin D that is essential for healthy bones and other physiological processes **(Xiong et al., 2024).**
Renal failure, often occurs when one or both kidneys are no longer able to function normally on their own, The most serious stage of kidney disease is renal failure, which is lethal if left untreated. There is no cure for kidney failure, but it is possible to live a long life with treatment. Children can experience acute kidney failure, which happens quickly, or chronic kidney failure, which develops gradually and lasts for a long time **(feng et al., 2024)** .
When eGFR falls below 60 milliliters per minute per 1.73 square meters and lasts for three months or longer, it is considered as irreversible chronic renal failure. children may experience all or some of these symptoms, edema or swelling of the hands, feet, legs or face, higher or lower urine production are possible symptoms. Urine may be foamy, pink or cola in color. Additional symptoms could be fatigue, reduced appetite, fever, elevated blood pressure,

itchy skin, nausea with or without vomiting, weakness, dyspnea, metabolic acidosis, decreased weight and impaired development problems with bones called osteodystrophy**(de Rooij et al., 2022 & Puri et al., 2024).**

Dialysis or a kidney transplant are required for managing long-term renal failure. There are two ways to perform dialysis: peritoneal dialysis (PD) and hemodialysis (HD), but the most common form is HD. Hemodialysis also called dialyzer or an "artificial kidney, is a technique used in order to flush wastes from blood, including urea and creatinine, as well as excess water when the kidneys arenot able to function normally. Unfortunately, when draining too much fluid , too quickly, some children may have hypotention, tiredness, shortness of breathing, leg-cramps, nausea and sever headaches. These side effects may appear during treatment and may continue after dialysis session (**Bello et al., 2022**&**Masud et al., 2022 & Yan et al., 2022).**

Nutritional problems are the most detectable complication of CRF in children where during evolution of CKD, The requirements and intake of certain nutrients vary greatly. It is estimated that up to 75% of children on hemodialysis are malnourished**.** Nutritional assessment is more detailed systematic process for gathering and analyzing data to determine a person's dietary needs and assess their current state. Clinical indicators of malnutrition, biochemical markers, anthropometry and dietary evaluation can all be used to determine nutritional status. **(Almoraie et al., 2024& Chan et al., 2024).**

The pediatric dialysis nurse requires good communication skills to gather subjective and objective data for the children and other sources such as caretaker and charts. Also, should be flexible and asking easy-going inquiries regarding food intake and eating patterns builds trust and increases the possibility of getting correct information **(Shim et al., 2023).**

Significance of the study

About 18 million children worldwide suffer from chronic renal failure each year, making it a global health issue with rising prevalence and detrimental consequences. According to reports, 225 / one million Egyptian children suffer from chronic renal failure every year (Ibrahim et al., 2019 & Oliveira et al., 2019).

Unfortunately, malnutrition improve the growth of infection. For dialyzed children, septicemia and other infections are responsible for 8% of hospitalization and mortality rates in dialysis receivers (Kiebalo et al., 2020 & Podkowińska et al., 2020)

For children undergoing hemodialysis, malnutrition increase the risk of heart diseases and increase frequency of frailty which results in decreased activity and a poor reaction to stimuli, decline in functioning and an elevated risk of death result from decreased activity, which exacerbates sarcopenia and social isolation and despair can make it worse by reinforcing behaviors that result in increased apathy, neglect and loss of capability. (Yang et al., 2024).

It was observed during the researcher's clinical experience in the dialysis unit that children who receiving hemodialysis and their caregivers are ignorant about chronic kidney disease and its related complications and intercurrences during and after hemodialysis treatment. To assess children nutritional status, For this aim, researcher had done this study (Ali et al., 2023).

Aim of the current study

To assess the nutritional status for children undergoing hemodialysis.

Research Questions

1. What is the nutritional status for children undergoing hemodialysis?

Subjects and Method

The study was done under four main design as follows:

1. Technical design
2. Operational design.
3. Administrative design.
4. Statistical design.

Technical design

Research design

A descriptive research design was used to conduct the study.

Setting

This study was done at the hemodialysis unit in Sohag University Hospitals and Sohag General Hospital in Sohag city.

Sample

A convenient sample of all available children with dialysis (100 children) along 3 months from both sexes and theirs age from 6 to18 years old and who receiving hemodialysis from at least 6 months ago and they did not have any chronic diseases.

Tools for data collection

Two tools were be used to gather the required data:

Tool I: Nutritional Assessment Tool :

It was adopted from **Azad Tehrani et al., (2020):** It's involved characteristics of children with chronic renal failure who receiving dialysis treatment :- It involved 4 parts:

Part I: personal and medical data sheet:-

- It include name of the child, age in years, sex(male

or female), home address and level of education for child and their parents.

- Medical history of the family regarding CRF.
- Uremic symptoms, such changes in food taste, nausea with or without vomiting.
- How long and how often children had HD session.

Part II: The physical examination of the child:
Consists of a clinical examination that examines child's appearance and functionality, including the condition of the child's muscles, eyes, mouth, skin and hair.

Part III : Anthropometric measurements:- are taken in order to record and compute child 's measurements. It includes :- Body weight, height, Triceps Skinfold Thickness (TSFT), Mid-Arm Circumference (MAC) and Body Mass Index (BMI).

Part IV: Biochemical investigation
Each child had these tests performed in the clinical chemistry lab , including urea in mg/dl, creatinine in mg/dl, hemoglobin in g/dl, serum calcium, phosphorus in mg/dl, serum potassium, sodium in mEq/L, serum albumin level in g/L and random blood sugar in mg/dl. The child's records will be used to acquire the laboratory investigation's findings..

Tool II: Dietary intake survey
It adopted from **Azad Tehrani et al., 2020)** and it Included data about the child's nutritional history, including the number of main meals they eat each day, their appetite, their likes and dislikes, the type and amount of snacks they eat, how much water they drink daily and any supplements they take and how much salt they consume.

Operational design

Preparatory phase: it included better understanding of the subject and the tool design process based on review of the current associated literature utilizing books, magazines, journals, publications and online resources.

Pilot study

It was carried out on September, 2023 and was done on (10%) of the studied sample (n=10) to determine any logistical issues with format and accessibility that may arise throughout the study and potentially negatively impact the amount and quality of data and to assess the simplicity and applicability of the tools as well as to determine the time required to fill the structured observational checklist. There was no changes or modification were done in tools after the pilot study, so that the involved numbers of pilot sample (10) children were added to the study Sample. **Validity**

The validity of the study's tools was confirmed prior to data collection. where three pediatric nursing professionals and specialists evaluated the tool's content validity to assess the clarity, feasibility and applicability of the tool.

Reliability

The Cronbach's alpha test was used to statistically evaluate the tools' internal consistency and dependability and it was as the following:-

Tools	Alpha Cronbach
Child 's Physical assessment	.921
Child's anthropometric measurements	.847
Biochemical investigation	.893
Dietary intake survey	.876

Ethical considerations

- The research idea received approval from Sohag University's Faculty of Nursing's ethics committee.
- The director of the hemodialysis units at Sohag University Hospital and Sohag General Hospital in Sohag City issued a letter formally granting approval.
- Written consent was obtained from each child and their caregivers contained within the study.
- The purpose or objective, nature of the study and its expected outcomes was explained to children and their care givers before beginning of the study.
- Researcher informed and reassured children and their caregivers that they could leave at any time without providing a reason.
- Children and their caregivers were assured that their information was confident and researcher did not use it only for the study.

Field work

An official letter from the Faculty of Nursing Dean, Sohag University was submitted to the director of each of the settings listed above in order to get official approval to gather the required data to conduct the study after complete explanation of the aim and nature of study to children and their caregivers. Data were collected through six months from September, 2023 to the end of March, 2024. In order to establish a positive rapport, the researcher introduced herself and gave the kids an explanation of the purpose and design of the study and their caregivers and a written consent was obtained from them. Three days a week, the researcher was available at all times while filling out the questionnaire at the aforementioned locations to collect needed data using the previous tools.

Procedure

•The researcher questioned each mother separately

in the waiting area in the hemodialysis unit.

•At the start of the HD session, each caregiver or child based on age was requested to gather the necessary information regarding personal and medical data from the child's file or by interviewing the caregiver and the child about food habits and anthropometric data.

•All laboratory investigations should have been recorded from each child record, •The researcher assessed the manifestations of anemia and examined overall appearance and functional capacities in order to identify indicators of nutritional deficiencies such as the condition of the skeletal system, muscles, skin and lips for dryness, face and hands for pallor and dryness, eyes for yellowing of conjunctiva.

Anthropometric measurement was measured for each child as follow:

• A beam balance scale from the dialysis unit was used to assess the children's body weight. Using a tape measure that had been fixed to the wall, the standing height was measured and recorded to the closest tenth of a centimeter. Using hemodialysis access free arm, the mid-arm circumference (MAC) was measured. The left hand's thumb and index finger were slightly raised up and the triceps skinfold thickness (TSFT) was securely held.

Dietary data was attained through the following:

Questions about child's appetite, consumption of additional vitamins, salt intake and water intake were asked. A 24-hour recall approach was used to show the kid's food consumption pattern. The child or caregiver was asked to recollect and report all meals and beverages taken during the previous 24 hours in order to calculate the child's real food intake. To determine the amounts of carbohydrates, fats, proteins, vitamins and other nutrients and compare it to the age-appropriate norm**.**

Statistical Analysis

The collected data was coded, arranged and computerized into tables and graphs as needed using the Statistical Package for Social Sciences (SPSS) version 25. Descriptive statistics, such as numbers, frequencies, and percentages, were employed for categorical data; the arithmetic mean (X) and standard deviation (SD) were employed for quantitative data.

Results

Table (1) illustrates that, majority of children (82%) lived at rural area. More than half of children (56%) were boys, less than half of them (45% & 41%) had primary education and their fathers were able to read and write respectively. Also, less than half of them (33%) their fathers were employee, less than two thirds of them (63%) their mother hadn't work and three quarters of them (75%) hadn't enough income.

Table (2) Clarifies that more than half of sampled children (58%) started hemodialysis treatment from 1 to 3 years, the majority of them undergo hemodialysis (85%) had three times hemodialysis in a week and majority of them (95%) had three hours to four hours of hemodialysis treatment every session.

Figure (١): Explains that more than half, of the studied children (58%) started hemodialysis treatment from 1 to 3 years, majority of them (85%) had three times hemodialysis in a week and majority of them (95%) had three hours to four hours of hemodialysis treatment every session.

Figure (2): demonstrates two third of the studied children (67%) had change in the taste of food when eating

Table (3) Demonstrates that, less than three quarters of children had abnormal body weight with mean 21.7± 6.34 and nearly two thirds of them (62%) had abnormal height with mean 116.7 ± 11.5. Also, more than two thirds of them (67%) had abnormal BMI with 15.7 ± 2.15, more than half of them had abnormal arm circumference with mean 15.7 ± 3.21 and more than half of them (61%) had normal Triceps skin fold thickness.

Table (4): Shows that more than half of children (55%) had high creatinine level with mean 7.91 ± 4.74, less than two thirds of them (60%) had high urea level with mean 37.73 ± 42.16, less than half of them (43%) had low hemoglobin level with 7.586 ± 2.68 and more than half of them (55%) had low calcium level with mean 7.437 ± 2.05. In addition, less than two thirds of them (61%) had high level of phosphorus with mean 3.87 ± .833 and less than half of them (42%) had high potassium level with mean 6.3 ± 2. 43. Also, less than two thirds of them (60%) had high sodium level with mean 136.80 ± 11.71, less than half of them (45%) had low serum albumin level with mean 3.42 ± 1.54 and about two thirds of then (67%) had normal level of random blood sugar with mean 121.10 ± 4.38.

Table (5): Illustrates that less than three quarters of the studied children (71%) had low intake of protein level with 32.78 ± 7.84, more than half of them (57%) had low intake of fat with mean 17.77 ± 4.18, half of them (50%) had normal intake of carbohydrates level with 153.43 ± 65.28 and more than half of them (53%) had low intake of energy level with 787.7 ± 370.37.

Results

Table (1): Frequency distribution of the studied children regarding demographic characteristics (n=100)

Demographic data	No	%
Age	**Mean ± SD**	12.61 ± 5.73
Residence		
Urban	18	18.0
Rural	82	82.0
Sex		
Male	56	56.0
Female	44	44.0
The child's education level		
Illiterate	11	11.0
Primary	45	45.0
Preparatory	30	30.0
Secondary	14	14.0
Father's degree of education		
Illiterate	11	11.0
Reads and writes	41	41.0
Primary	10	10.0
Preparatory	5	5.0
Secondary	22	22.0
University	11	11.0
Fathers' Occupation		
Employee	33	33.0
Professional worker	12	12.0
Craftsman	30	30.0
Farmer	25	25.0
Does the mother work?		
Yes	37	37.0
No	63	63.0
Monthly income		
Enough	25	25.0
Not enough	75	75.0

Table (2): Frequency distribution of the studied children regarding their medical history (n=100)

Past medical history	No	%
When did you start hemodialysis treatment?		
Less than one year	22	22.0
From 1-3 years	58	58.0
more than 3 years	20	20.0
Number of hours of hemodialysis treatment		
One to two hours	5	5.0
Three hours to four hours	95	95.0
Five hours and more	0	0.0

Figure (1): distribution of the studied children regarding times of hemodialysis in a week (n=100)

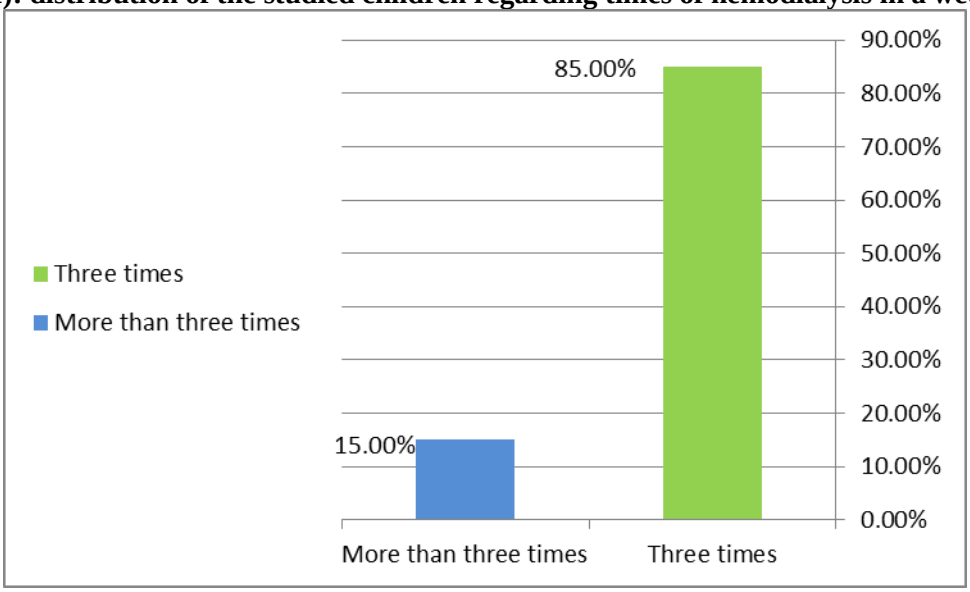

Figure (2): distribution of the studied children according to their changing in the taste of food when eating (n=100):

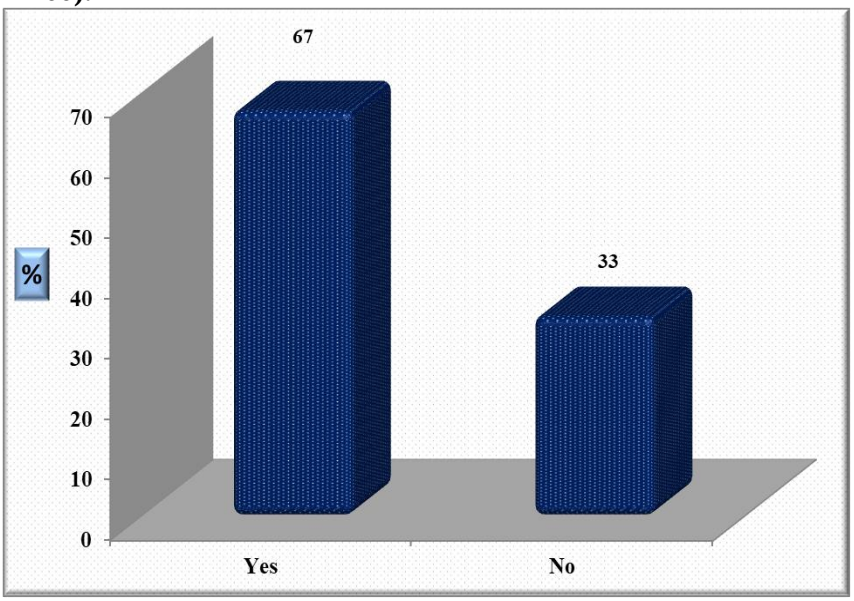

Table (3): Frequency distribution of the studied children regarding anthropometric measurements (n=100)

Anthropometric measurements	No	%	Range	Mean ± SD
Weight: (kg)				
Normal	26	26.0	45.0-15.0	21.7± 6.34
Abnormal	74	74.0		
Height: (cm)				
Normal	38	38.0	140-90.0	116.7 ± 11.5
Abnormal	62	62.0		
BMI (kg/m2)				
Normal	33	33.0	20.0-12.0	15.7 ± 2.15
Abnormal	67	67.0		
Arm circumference: (cm)				
Normal	45	45.0	20.0-10.0	15.7 ± 3.21
Abnormal	55	55.0		
Triceps skin fold thickness (mm)				
Normal	61	61.0	8.0-4.0	5.5 ± 6.18
Abnormal	49	49.0		

Table (4): Frequency distribution of the studied children regarding biochemical investigation (n=100)

Investigation	No	%	Range	Mean ± SD
Creatinine (mg/dL)				
Low	12	12.0	6.7-15.0	7.91 ± 4.74
Normal	33	33.0		
High	55	55.0		
Urea (mg/dL)				
Low	6	6.0	80 -216.0	37.73 ± 42.16
Normal	34	34.0		
High	60	60.0		
Hemoglobin(g/dl)				
Low	43	43.0	5.6-11.7	7.586 ± 2.68
Normal	35	35.0		
High	22	22.0		
Calcium (mg/dl)				
Low	55	55.0	7.30-11.9	7.437 ± 2.051
Normal	20	20.0		
High	25	25.0		
Phosphorus (mg/dl)				
Low	30	30.0	1.60-5.60	3.87 ± .833
Normal	9	9.0		
High	61	61.0		
Potassium (mEq/L)				
Low	34	34.0	3.7-7.7	6.3 ± 2. 43
Normal	24	24.0		
High	42	42.0		
Sodium (mEq/L)				
Low	5	5.0	107.0-192.0	136.80 ± 11.71
Normal	35	35.0		
High	60	60.0		
Serum Albumin (g/L)				
Low	54	45.0	2.70-4.60	3.42 ± 1.54
Normal	30	30.0		
High	25	25.0		
Random blood Sugar (mg/dl)				
Low	23	23.0	83.0-123.0	121.10 ± 4.38
Normal	67	67.0		
High	10	10.0		

Table (5): Frequency distribution the studied children regarding their food consumed within 24 hours (n=100)

Food intake	No	%	Range	Mean ± SD
Protein (gm/d)				
Low	71	71.0	6.0-40.0	32.78 ± 7.84
Normal	22	22.0		
High	7	7.0		
Fat (gm/d)				
Low	57	57.0	8.0 – 23.0	17.77 ± 4.18
Normal	20	20.0		
High	23	23.0		
Carbohydrates (gm/d)				
Low	41	41.0	43.0 – 305	153.43 ± 65.28
Normal	50	50.0		
High	9	9.0		
Energy (kcal/d)				
Low	53	53.0	240 – 1520	787.7 ± 370.37
Normal	33	33.0		
High	14	14.0		

Discussion

Regarding anthropometric measurements, the current findings demonstrates that, nearly two third were had abnormal height. Less than three quarters of them had abnormal body weight, this findings is supported by **Lotfy, ٢٠٢٢** who reported that the height of the children was the most affected anthropometric parameter where, more than two third of studied children were shorter. Also, **Youssef et al., 2022** who reported that more than two thirds of children receiving dialysis were underweight. Also, **Fayed, 2021** who reported that about two thirds of children were had low weight. According to the researchers, this might be because parents haven't attended any prior educational courses on providing their kids with a healthy diet.

This findings is in congruence with **Zaki, 2022** who reported that, majority of children were short. Children's weight was affected than height where less than half of them had underweight.

Also, regarding skin fold sickness and upper mid arm circumference, the present result reported that more than half of children were had abnormal arm circumference and more than half of them had normal Triceps skin fold thickness. This findings was in congruent with **Zaki, 2022** who reported measurement of (Mid upper arm circumference, triceps and subscapular skinfolds thicknesses) were slightly reduced.

According to body mass index (BMI), the present study revealed that, more than two thirds of children had abnormal BMI, this findings is supported with **Fayed, 2021** who reported that nearly two third of children were abnormal BMI (underweight) on pretest.

Regarding biochemical investigation, the present results revealed that two third of children had high creatinine, less than two third of them had high blood urea, more than half of the children, were had low hemoglobin, this findings is supported with **Bhagat et al., (2022)** who described that nearly two third of children had low hemoglobin and high level of urea and creatinine.

This findings is supported by **Mohammad, 2019** who reported that children with chronic renal insufficiency had a markedly lower Hb concentration. Given that the kidneys are hypertrophied, this observation supports the idea that the generation of EPO did not appear to increase significantly. Thus, as expected, a major contributing factor to the pathophysiology of the anemia was the absence of EPO synthesis. He stated in this section that fewer than two-thirds of kids had elevated creatinine and urea levels.

This findings is agreed with **Aljebory et al., 2019** who reported that children with sluggish, persistent and irreversible renal failure, they had increased blood levels of urea and Cr, which result from poor renal excretory function. Thus, children with CRF exhibit a substantial increase in urea and serum creatinine. From the perspective of the researcher, before HD,

children had significantly lower serum Ca++ levels and significantly higher serum urea and creatinine levels because kidney failure appears to diminish the excess calcium concentration caused by intestinal calcium absorption. The relationship between blood urea concentration and calcium fractional absorption is inverse. It seems that people with chronic renal failure eat less calcium than the average person.

The current results revealed that, more than half of children had low level of calcium. In addition, less than two third of them had high level of phosphorus and less than half of them had high potassium level. Also, less than two thirds of them had high sodium level, this findings is braced by **Alati et al., 2024** who reported that children with CKD were had significantly higher levels of potassium and phosphorus and lower levels of calcium.

The present study shows that less than half of them were had low serum albumin level, this result is supported with **Foster, 2022** who reported that more than half of the studied children with ESRD identified through the United States Renal Data System for a study of hypoalbuminemia and mortality risk had serum albumin concentrations <3.5 g/dL.

Regarding food consumed within 24 hours, the present findings, indicated that a lower than three-quarters of the children in the study had low protein consumption, this finding is reinforced with **Azad et al., 2020,** who described that, most children didn't get enough protein.

In this line this findings contradict with **Mak, 2023** who reported that reported that children are growing and have a higher protein daily requirement. Low-protein diets have not been found to be efficacious in children with CKD, in achieving normal growth, or in slowing disease progression.

This findings contradict with **Suárez-González et al., 2023** who reported that all children exceeded recommended protein intakes, more than two third exceeded advice fat intakes, about one third did not meet the minimum requirements for carbs, while nearly two-thirds did not consume enough fiber.

The present study shows that, more than half of them had minimal intake of fat ,one fifth of children had normal intake of fats, this in disagreement with **Maurya et al., 2023,** who reported that, majority of kids consumed oils and fats in a typical amount.

According to the present results of this study concerning the biosocial and medical data of children and their family, it was founded that, greater than half of children were male, majority of them were rural. This finding is in consistent by **Azad Tehrani et al., 2020** who showed that more than half of kids were female and concerning place of residence, it was found that more than half of children resided in rural regions.

Also, **Zaki, 2022** who reported that, more than half of children were males and, **Sharaf et al., 2020** who found that boys had a higher incidence of chronic renal failure than girls, with over half of the cases being in boys. This could be due to the fact that boys are more likely to have congenital kidney and urinary tract abnormalities (CAKUT).

The current findings shown that majority of them were live at rural area and less than two thirds of them their mother hadn't work, this findings is supported by **Abdalla et al., ٢٠٢٢** who reported about three-quarters of the moms in the study were housewives and that over two-thirds of them were rural.

Mohamed et al., 2023 who reported that majority of the mothers sample was housewife. According to the researcher, this could be because some mothers quit their jobs to look after their kids and to satisfy the requirements of medical care, like taking the kid to the hospital for dialysis and follow-up wit doctors or , giving them drug and monitoring their health.

Regarding history of the disease, children, it was founded that, over than half of children started dialysis treatment from 1 to 3 years, majority of them had three times hemodialysis in a week and majority of them had three hours to four hours of hemodialysis treatment every session, this findings is reinforced by **Ali et al., 2023** who stated that over 50% of kids were have CKF from 6 months to 2 years' ago. As well as majority of them receiving dialysis 3 times per week and lasting for four hours. Also, all of them they did not need another extra hemodialysis sessions.

In the same line, this findings is reinforced by **Ghatas et al., 2020** who described that regarding dialysis session, majority of children were three 3 times a week and regarding length of the session, three quarter of children were 3-4 hours.

Conclusion

Based on the results it can be concluded that Nutritional assessment is more detailed systematic process for gathering and analyzing data to determine a children' dietary needs and assess their current state where two third of the studied children (67%) had change in the taste of food when eating and two thirds of them (67%) had abnormal BMI with mean 15.7 ± 2.15, more than half of them (61%) had normal Triceps skin fold thickness. Less than three quarters(71%) of children had low intake of protein.

Recommendations

The following suggestions are based on the results of the current study:

1. At the beginning of dialysis therapy, the dialysis nurse should conduct a routine dietary screening and evaluation for all children receiving

hemodialysis, maintain these records, and provide dietary education.
2. Creating a handbook with the most recent recommendations for managing kids having HD procedures should be accessible in the HD unit.
3. Nutritional counseling ought to be conducted based on a customized evaluation of each child, taking into account their age, developmental stage, kidney disease severity, dialysis and psychological risk

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