

Impact of Health Instructions on Knowledge and Reported Practice of Mothers' having Children Newly Diagnosed with Nephrotic Syndrome

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Abstract

Background: Primary Nephrotic Syndrome is a worldwide epidemic in pediatric nephrology. This study aimed to evaluate the impact of health instructions on knowledge and reported practice of mothers' having children newly diagnosed with nephrotic syndrome. **Subject and method:** A quasi-experimental (pre–post) research design and carried out in the urologic pediatric outpatient clinic at Pediatric Minia university hospital. Also, a purposive sample of eighty-five mothers who had children newly diagnosed with nephrotic syndrome. Two tools were used in this study to collect data: **Tool I:** Children and mothers' demographic characteristics, present the child's medical history, and mothers' knowledge level. **tool II:** mothers' reported practices. **Results:** the studied mothers having children newly diagnosed with nephrotic syndrome had unsatisfactory knowledge level regarding meaning, causes, manifestations, investigations, common treatment, and complications of nephrotic syndrome pre-health instructional program and improved after its implementation by three months with statistically significant differences. Also, more than one-third of the studied mothers had an average reported practice level in the pre-health instructional program increased to nearly two-thirds of them after three months from implementation of the health instructional program with statistically significant differences. **Conclusion:** health instructions program improved effectively knowledge level and reported practice of mothers' having children newly diagnosed with nephrotic syndrome. **Recommendation:** Perform continuous health instructions program about the nephrotic syndrome is effective especially for the newly diagnosed cases.

Keywords: Children; health instructions; mothers' knowledge; nephrotic syndrome; newly diagnosed

Introduction:

Primary Nephrotic Syndrome is a worldwide epidemic among pediatric nephrology (NS). Large proteinuria (more than 40 mg/m² per hour), hyperlipidemia, hypoalbuminemia (less than 30 g/L), edema, and other complications characterize this clinical disorder. Renal glomerular basement membrane injury leads to heighten its permeability (Raina & Krishnappa, 2019).

Primary nephrotic syndrome (primary glomerulonephritis) is caused by a glomerular disorder which confined in the kidneys, while secondary nephrotic syndrome (secondary glomerulonephritis) is caused by a disorder that affects the kidney and other regions of the body (Wang and Greenbaum, 2019).

Protein in the urine, low levels of albumin in the blood, and edema are all hallmarks of nephrotic syndrome. Protein in the urine could be present in varying concentrations and is a symptom of glomerulonephritis. When albumin levels in the blood are low, as protein is lost

through the kidneys and water is absorbed into the soft tissues (Siddique et al., 2018; and Tapia & Bashir, 2022).

Serum hypoalbuminemia most frequently manifests by a generalized increase in body fluid. As the serum oncotic pressure decreases, fluid builds in the interstitial tissues. The body's retention of water and sodium makes the swelling worse. It could be manifest by morning eye puffiness, pitting edema of the legs, or pleural effusion and fluid accumulation in the pleural cavity (Politano et al., 2020; and Bailey & Tosh, 2021).

Mothers are vital person to their childhood health by being avelebole for them emotionally. While the child is in the hospital, mothers should prepared them to be engage in the usual activities (such as eating, bathing, playing, reading stories, and cuddling) as much as possible. In order to overcome the emotional toll of separation on children, especially among the young, mothers should advocate for them to sleep in their beds. Mothers could help their children through

teaching procedures focus on relaxation (Meena & Renuga, 2019; and Du et al., 2022).

Nurses used the nursing process to create a personalized care strategy for the child. The nurse aims to gain insight about the client's health, functional capacity, and top priorities. The first step in nursing care is to examine the child's physical and mental health completely. The nurse used the accumulated data to develop the nursing diagnoses and projections about the child's future health. A child's care plan should be developed in collaboration between the nurse, the mother, and the child's other medical professionals. The natural changing of a child's environment necessitates constant assessment to ensure that nursing services are always delivered promptly and appropriately (Hockenberry et al., 2020).

Child mothers should know and practice several activities as the children needed special diet including: enough protein, avoiding salt, saturated fat, and no salty snacks should be provided for the children. Steroid medications increase appetite; mothers should provide a healthy diet and encourage the children to perform physical activities to minimize weight gain. Nephrotic syndrome treatment requires urine protein monitoring. Mothers must learn to use dipsticks to test urine protein at home to assess steroid response. Mothers should learn how to record urine protein, medicine, blood pressure, urine output, and infection signs in a diary. Immunization prevents infection, which causes recurrence and increase morbidity among the children. Steroid-treated the children with low immunity; hence the live vaccines should not be administered until four weeks after treatment. Mothers should consider handwashing, clean water drinking, and personal hygiene. Mothers' knowledge and good lifestyles could help children's health to be prognosed and preventing behavior relapse.

Significance of the study

The total number of children who attended the maternal and children University Hospital pediatric urology clinic in 2021 was 412. (Pediatric Hospital Statistical office, 2021). Mothers do not have enough data on the recurrence of nephrotic syndrome. Consequently, improving the care levels and helping mothers to have a healthy productive life which could be substantially aided by educating them about the

diseases, their symptoms, and how to avoid difficulties through health instructional programs. In the light of this, the researcher felt obligated to develop a handbook to help mothers to understand nephrotic syndrome disorder among the young children. (Ali & Al-Mosawi, 2021).

Subject and Method

The aim of this study is to evaluate the impact of health instructions on knowledge and reported practice of mothers' having children newly diagnosed with nephrotic syndrome.

Research hypotheses

- H 0: The health instructions will have no impact on knowledge and reported practice of mothers' having children newly diagnosed with nephrotic syndrome.
- H 1: The health instructions will increase the knowledge level of mothers' having children newly diagnosed with nephrotic syndrome.
- H 2: The health instructions will increase the reported practice level of mothers' having children newly diagnosed with nephrotic syndrome.

Research design:

A quasi-experimental (pre-post) research design was utilized in this study to achieve the study's aim.

Setting:

The study was carried out in the urology pediatric outpatient clinic at Pediatric Minia University Hospital, which is a specific place that provides medical services for children with renal health problems for free.

Subjects:

A purposive sample of eighty five mothers who had children newly diagnosed (less than 6 months) with nephrotic syndrome and attending in the previous setting (85 children)

Inclusion Criteria:

The mothers of children with a recent diagnosis of the nephrotic syndrome were considered eligible for participation in this study.

Tools of Data Collection: Two tools were used in this study for collect data:

Tool I: Mothers Interview Questionnaire: This tool covered the following partes.

Part (1): Children and mothers' demographic characteristics,

This part concerned with data about children's characteristics (age, gender, and child ranking) and also the demographic data of the studied mothers (mother age, educational level, occupation, residency, and family income).

Part (2): Present medical history of the child as causes of illness and symptoms that appeared on the child.

Part (3): Mothers' knowledge about nephrotic syndrome. The researchers designed this tool based on the related recent studies and literature review. It's written in Arabic and comprises nine multiple-choice questions related to the nature of the disease, its causes, types, clinical manifestations, investigations, common treatment, and its adverse effects and complications of nephrotic syndrome. All multiple-choice questions contained the right answers; the final choice of the studied mothers was don't know.

Scoring system

Each correct answer took one score, and do not know response took (zero). It contained nine questions (34 correct answers).

- If scores < 50% (< 17 scores) = mean unsatisfactory level of knowledge,
- 50% – < 75 % (17 – 25 scores) means average level of knowledge,
- $\geq 75\%$ (> 25 scores) means satisfactory level of knowledge.

(Husain et al., 2018).

Tool II: Assessment of the Mothers' Reported Practices

This tool assessed the mother's reported practices as edema (10 items), nutrition (3 items), exercise (3 items), committing to therapeutic management (5 items) and prevention of respiratory infection (3 items)

Scoring system

Each done practice took one score, and the not done practice took (zero). It included 24 questions.

- If scores < 60% (< 14.4 scores) mean unsatisfactory reported practices,
- 60% - 80% (12 –< 19.2 scores) mean average,
- if scores $\geq 80\%$ (≥ 19.2 scores) mean satisfactory reported practices.

Validity and Reliability

Five pediatric nurses and pediatrics staff from the nursing faculties at Minia and Assiut University were asked for their opinions on the study tools concerning its overall structure, design and internal consistency, accuracy, and its applicability to the current study.

Researchers assessed the statistical reliability of the tools (tool I, part 3 & tool II). Cronbach's alpha test was 0.802 and 0.845, respectively, to determine the degree to which the tool's items all assessed the same idea and correlate with one another.

Administrative design:

- An official letter was issued from the Faculty of Nursing, Minia University to the director of the the urology pediatric outpatient clinic at Pediatric Minia University Hospital, to facilitate the implementation of the study.
- A meeting was held with the director of the selected facility to obtain their approval after clarifying the purpose of the study, setting, the time for beginning of the study, and gaining their cooperation and support during data collection.

Ethical Consideration:

- The ethical research committee at Minia University, Faculty of Nursing provided the first written permission. For organizational approval, the researcher first met with the hospital's director and the pediatric outpatient clinic's head nurse to explain the study's purpose and methods. Next, the researcher introduced herself to the mothers of the children diagnosed with nephrotic syndrome and explained the study's goals and methods. The anonymity and confidentiality of the mothers were provided. Also, the researcher explains to the mothers that their participation in the study is voluntarily, and they have the right to refuse to participate in the study. The privacy of the mothers of children diagnosed with nephrotic syndrome was guaranteed.

Informed written consents were obtained from the mothers in the previously mentioned setting after brief explanation of the purpose and nature of the study.

Pilot study:

After the tools were developed and before the data collection began, pilot research was conducted with eight participants (10% of the total sample). The pilot study conducted to evaluate the tools' content and time require to fill it in. It also provided a rough estimation of 20 minutes for completing each questionnaire. They were enrolled among the study's participants.

Field of the work

The study was conducted from January 2022 to the end of October 2022. The researcher attended for two days/weeks (Sunday – Tuesday). Each session usually starts with a summary of what has been taught during the previous sessions. During the program's implementation, the mothers who were being examined were provided with encouragement in the form of praise and/or acknowledgment.

The session began by meeting the researcher with the mothers during the morning shift, following by medical examination, than introduce herself and provide an overview about the study and its purpose. Then the pre-test format was distributed to collect the necessary data., the researcher was there to answer any arose questions. The program's content was developed after analyzing the data collected from the mothers in the first assessment of the study to determine the mothers needs regarding health education requirements. As a result, the content has been organized into a logical progression of theoretical and practical sessions.

Methods of teaching involved modified lectures, group discussion demonstrations, and re-demonstration. Suitable teaching aids, such as videos, real equipment, and facilities, were used. Mothers' knowledge and practice were re-evaluated three months later (Post test) after implementation of the educational program.

Health instructions program:

Assessment phase:

The researcher designed the health instructional and training program in an Arabic

language form based on the actual need assessment of the mother. It was supplemented with information from a review of relevant literature (nursing textbooks and online journals) about nephrotic syndrome. Then the health instructional program was reviewed by three experts before it was implemented.

Preparatory phase:

Objectives of the program:

The general objective of the program:

By the end of this program, each mother will be acquired with the needed knowledge and mothers' practices activities regarding nephrotic syndrome.

Specific objectives:

By the end of each session of the program each mother will be able to :

- ✓ Define nephrotic syndrome.
- ✓ List causes of nephrotic syndrome.
- ✓ Identify signs and symptoms of nephrotic syndrome.
- ✓ Enumerate investigations needed to diagnose nephrotic syndrome.
- ✓ list the common treatment and/or management of nephrotic syndrome.
- ✓ Discuss the possible adverse effects of steroids.
- ✓ Mention the healthy food needed for children with nephrotic syndrome.
- ✓ Identify complications of nephrotic syndrome
- ✓ Apply the needed practice regarding managing edema, treatment, and corticosteroids used.
- ✓ Apply the committed practice and exercise for the children according to physician's prescription by the mothers.

Implementation of the health instructions program:

Application of the health instruction sessions organized according to the time available to the mothers in the outpatient clinic. The time required for the health instructional program implementation was eight months (18 hours) divided into 6 hours for the theoretical part and 12 hours for the practical part. The mothers were

divided into eight groups, each included from 3 to 5 mothers. The program content was converted into ten sessions for each group, one session per day to cover all the theoretical and practical instructions about the child with nephrotic syndrome care. The session lasts from one to two hours.

Different teaching methods were used, such as lectures, group discussion or pictures to facilitate mothers' understanding, demonstration and redemonstration, also, handout was provided in form of Arabic booklet with pictures. Mothers were motivated and reinforcement through praising and recognition to encourage them to participate in the program. The program was revised by expert nursing staff. Each mother received a hard copy of the health instructional program booklet.

Session one: started by personal interviewing of the studied mothers, introducing the researchers, clarified the aim of the study, and performed the pre-test.

Session two: started by greeting the studied mothers, identified duration of the study, nature of the nephrotic syndrome, and its causes,

Session three: started by revised the previous session, discussed types and manifestations of the nephrotic syndrome and the investigations done to the child.

Session four: started by revised the previous session, discussed the common treatment, and its adverse effects and complications of nephrotic syndrome.

Session five: started by revised the previous session, explained the appropriate nutrition style and pattern regarding nephrotic syndrome disorder.

Session six: started by revised the previous session, and applied the standard health instruction for edema.

Session seven: started by revised the previous session, applied the standard health instruction of commitment to the therapeutic management and child response to therapy.

Session eight: started by revised the previous session, applied the standard health instruction for corticosteroids and exercise.

Session nine: started by revised the previous session, applied the standard health instruction for prevention of respiratory infection.

Session ten: started by revised the previous session, applied the standard health instruction of commitment to the physician's order, and quickly revision to overall health instructions.

Evaluation phase:

The "post-test" was conducted after three months post program implementation to assess the impact of health instructions on knowledge and reported practice of mothers' having children newly diagnosed with nephrotic syndrome by using tool I; part three and tool II.

IV. Statistical Design:

The Statistical Package for Social Science was utilized in order to carry out the statistical analysis (SPSS 28.0). Coding and data entry both went through steps where extensive testing was performed. The data were presented with descriptive statistics in frequencies and percentages for qualitative variables. These statistics were used to describe the data. Fisher's exact test is applied to determine whether there is a link between two qualitative variables and a small number of samples. Microsoft Excel was used to create graphs for data visualization. Tests of statistical significance based on inference, such as the Pearson correlation and the relationships between the study variables. A correlation coefficient test was also utilized to determine the relationship between the total mothers' knowledge and the total mothers' practice, and a value of p less than 0.05 was considered statistically significant.

Results

Table (1) presented that 56.5% of children aged between 4- 6 years old, 70.6% were male, and 57.6% were the middle child among their family members.

Table (2) showed that 51.8% of mothers aged were ranged between 20 - 30 years old, 64.7% of them had middle education, 56.5% not working, 38.8% of them had one child in their family, 72.9% of them lived in a rural area, and 71.8% of mothers had not enough income.

Table (3) find that 71.1% of the children's the cause of the disease were unknown, and the most common symptoms that occurred among the children were edema, reduced urine amount, and fatigue with poor appetite (84.7%, 83.5%, and 75.3%, respectively).

Table (4) confirmed that mothers' knowledge about nephrotic syndrome increased after three months of health instructional program with high statistical significance differences.

Figure (1) illustrated that 97.6% of mothers had unsatisfactory knowledge level pre-health instructional program, and none (0.0%) of them after three months of health instructional program. In addition, non of them had satisfactory knowledge level pre-health instructional program implementation increased to 96.5% after three months of health instruction program implementation.

Table (5) Clearfield that improving in the mother reported practices regarding edema, commitment as therapeutic management, child's nutritional regement, their commitment to doctor's order if the child has a respiratory infection, and child' exercise needed after three

months of the health instructional program implementation with statistical significance differences Except statement about accurate doses as doctor order, undertake the times of the medications, protect the child from contact with an infected persons and keep the child warm and dry with highly statistically significant differences.

Figure (2) illustrated that 37.6% of the studied mothers had an average reported practice level during the pre-health instructional program assessment increased to 62.4% of them after three months from the implementation of the health instructional program.

Table (6) showed that all mothers get unsatisfactory knowledge level in the assessment stage pre-health instructional program implementation, as most of them their educational level were read and write or middle level of education with insufficient income, which shoud statistically significant differences with P value = < 0.002 & 0.02 respectively.

Table (7) found that 81.1% of mothers didn't care their children perfectly due to insufficient income with statistically significant differences, in which P - value = $< .001$.

Table (8) showed a strong positive relation between mothers' knowledge level and their practice level, which $r = 0.785$ and P value = $\leq .0001$.

Table (1): Distribution of the studied children to their personal characteristics (n= 85).

Child characteristics	No.	%
Age (year)		
1 - < 4	37	43.5
4 - 6	48	56.5
Gender		
Male	60	70.6
Female	25	29.4
Ranking		
Single	16	18.8
1st one	16	18.8
Middle	49	57.7
Last	4	4.7

Table (2): Distribution of the studied mothers according to their demographic characteristics (n = 85).

Mothers' demographic characteristics	No.	%
Age (year)		
Less than 20 years old.	13	15.3
20- <30	44	51.8
30- 40 years	28	32.9
Education level		
Read and write	18	21.2
Middle	55	64.7
High	12	14.1
Occupation		
Working	37	43.5
Not working	48	56.5
No. of children in the family		
One	33	38.8
Two	17	20.0
Three	26	30.6
More than three	9	10.6
Residence		
Rural	62	72.9
Urban	23	27.1
Income		
Insufficient	61	71.8
Sufficient	24	28.2

Table (3): Distribution of the studied children according to causes and symptoms of illness (n = 85)

Present medical history	No.	%
Causes of illness		
Genetic	20	23.0
Infection	5	5.9
Unknown	60	71.1
# Symptoms appear		
Edema/Swelling	72	84.7
Reduced urine	71	83.5
Fatigue/poor appetite	64	75.3
Hypoalbuminemia	8	9.4
Foamy urine/ bubbly urine	6	7.1
High blood pressure	6	7.1

#More than one symptom was observed on the same child

Table (4): Comparison between the studied mothers' answers according to the satisfactory knowledge level about nephrotic syndrome in pre and after three months from health instructional program implementation (n = 85).

Items	Satisfactory Mother's knowledge about nephrotic syndrome				P – value
	Pre		After three months		
	No.	%	No.	%	
Meaning of nephrotic syndrome	17	20.0	85	100.0	0.0001**
Causes nephrotic syndrome	5	5.9	72	84.7	0.0001**
Signs and symptoms of nephrotic syndrome	20	23.5	78	91.8	0.005**
Investigations are required	3	3.5	85	100.0	0.0001**
Common treatment	2	2.4	74	87.1	0.0001**
Adverse effects of steroids	2	2.4	80	94.1	0.0001**
Assistant in child's treatment	7	8.2	85	100.0	0.0001**
Healthy food for the child	26	30.6	73	85.9	0.003**
Complications of nephrotic syndrome	2	2.4	79	92.9	0.0001**

P – value was calculated by fisher exact test

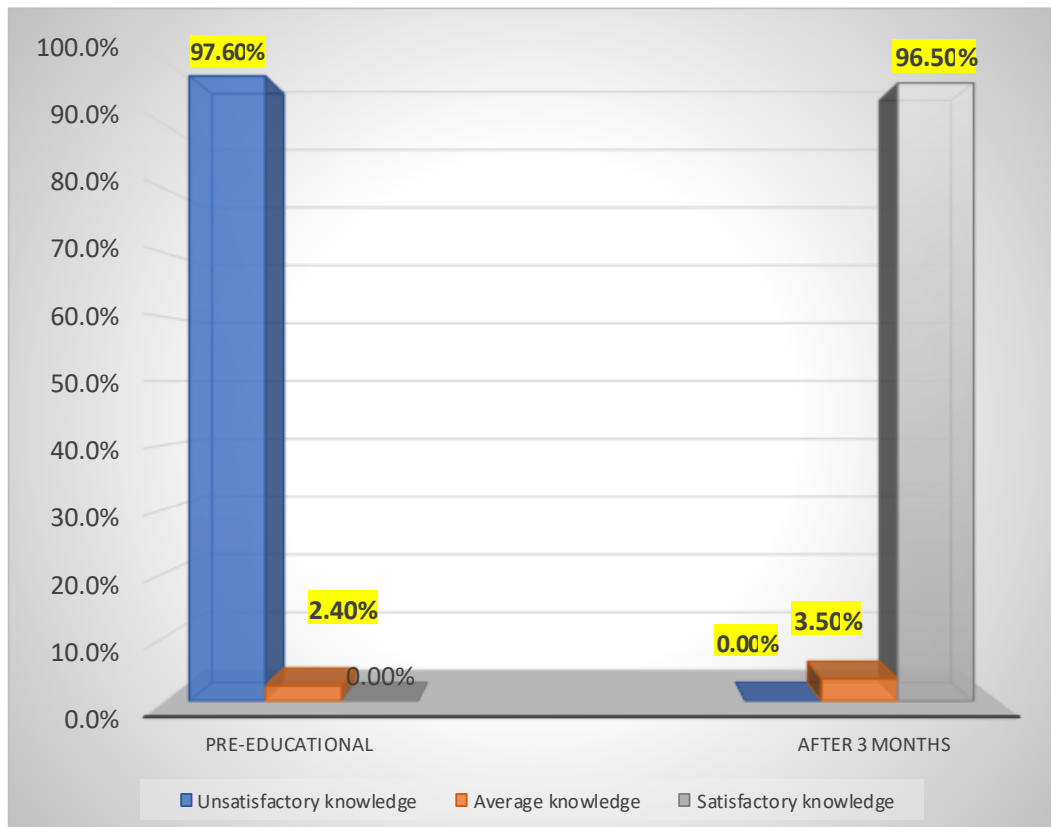


Figure (1): Comparison between the studied mothers' knowledge levels about nephrotic syndrome pre-test and after three months of the health instruction program implementation (n = 85).

Table (5): Comparison between the studied mothers' answers according to satisfactory level of the reported practice about nephrotic syndrome during the pre assessment and after three months of health instructional program imlementsions (n = 85).

No.	Item	Pre		After three months		X^2	P – value
		No.	%	No.	%		
A. mother's practice if the child has edema							
1	Avoid adding salt to the food	9	10.6	76	89.4	105.624	0.0001**
2	Take the child to the hospital to measure his weight	1	1.2	65	76.5	Fisher	0.0001**
3	Take the child to the hospital for a urine exam	2	2.4	76	89.4	Fisher	0.0001**
4	Allow the child to act normally	85	100.0	75	88.2	10.625	0.0001**
5	Interrupting therapy without a doctor's order	71	83.5	16	18.8	71.216	0.0001**
6	Urine exam at home by urine strip	0	.0	64	75.3	Fisher	0.0001**
7	Weighing the child by the same scale and the same clothes	0	.0	82	96.5	Fisher	0.0001**
8	Observe the decrease in urine amount with present of froth	1	1.2	28	32.9	Fisher	0.0001**
9	Fluid restriction	2	2.4	76	89.4	Fisher	0.0001**
10	Allow the child to go to the nursery	9	10.6	76	89.4	105.624	0.0001**
B. Mothers practice commitment to the therapeutic management							
11	Accurate doses as doctor order	76	89.4	85	100.0	2.489	0.06
12	Observe the side effect of the therapy	74	87.1	84	98.8	81.966	0.003**
13	Undertake the times of the medications	82	96.5	84	98.8	1.024	0.312 NS
14	Interruption of the therapy when the side effect appears	59	69.4	84	98.8	27.519	0.0001**
15	Protect the child from respiratory tract infection	79	92.9	84	98.8	3.725	0.05*
C. Mothers practice for the child's nutritional							
16	Give the child fish and chicken as protein compenss for ating	59	69.4	76	89.4	10.398	0.001**
17	Give the child eggs without yolk	2	2.4	73	85.9	6.643	0.01*
18	Give the child milk	30	35.3	71	83.5	7.850	0.005**
D. Mothers practice of commitment to physician's order if the child has a respiratory infection							
19	Protect the child from infected persons	85	100.0	85	100.0
20	Keep the child warm and dry	85	100.0	85	100.0
21	Give the child treatment as physician's order if the child has a respiratory infection	82	96.5	85	100.0	90.188	0.0001**
E. Mothers practice for the child's exercise							
22	Let the child participate in all sports and leisure activities within his or her capabilities, including those at school.	9	10.6	76	89.4	105.624	0.0001**
23	Help the child to exercise regularly to help counteract many of the adverse effects of steroids as weight gain.	2	2.4	76	89.4	Fisher	0.0001**
24	Prevent the child from strenuous exercises or overtiredness.	1	1.2	65	76.5	Fisher	0.0001**

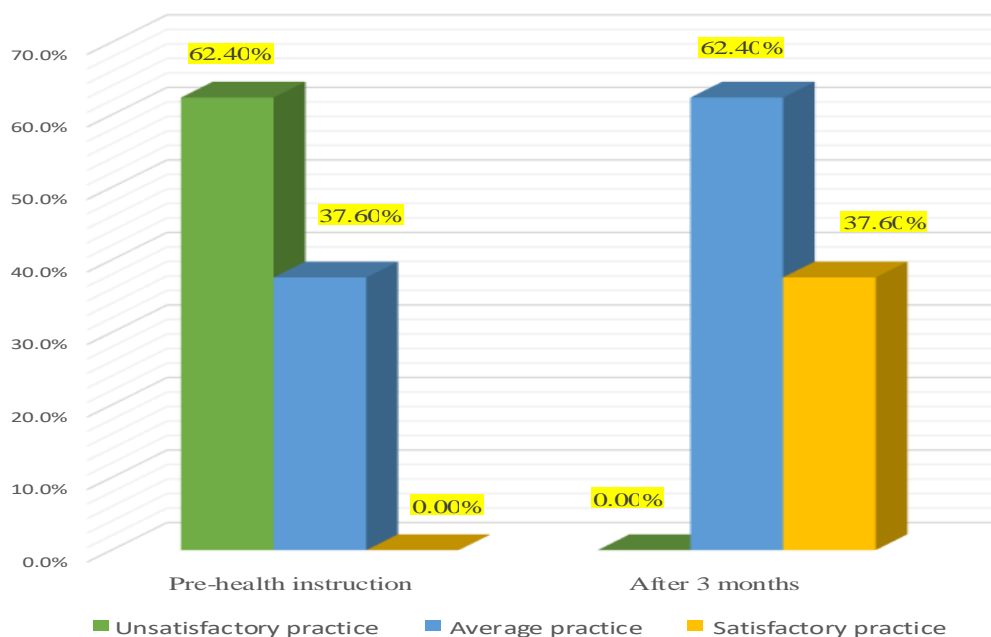


Figure (2): Comparison between the studied mothers' reported practice levels of the children with nephrotic syndrome pre and after three months of health instructions implementation (n = 85).

Table (6): Relation between the studied mother's knowledge level about nephrotic syndrome and their demographic characteristics during the pre-health instructional program assessment (n = 85)

Mother characteristics	Knowledge level pre-health instruction program				P - value
	Unsatisfactory (n= 83)		Average (n= 2)		
	No.	%	No.	%	
Age (year)					
Less than 20 years old	13	100.0	0	0.0	0.385 NS
20- <30	42	95.5	2	4.5	
30 - 40 years	28	100.0	0	0.0	
Education level					
Read and write	18	100.0	0	0.0	0.002**
Middle	55	100.0	0	0.0	
High	10	83.3	2	16.7	
Occupation					
Working	37	100.0	0	0.0	0.209
Not working	46	95.8	2	4.2	NS
Number of children in the family					
One	32	97.0	1	3.0	0.250 NS
Two	17	100.0	0	0.0	
Three	26	100.0	0	0.0	
More than three	8	88.9	1	11.1	
Residence					
Rural	60	96.8	2	3.2	0.383
Urban	23	100.0	0	0.0	NS
Family income					
Insufficient	61	100.0	0	0.0	0.02*
Sufficient	22	91.7	2	8.3	

Percentage calculated by row, the p-value was calculated by fisher test, NS= not statistically significant

* P - value \leq .05 ** P - value \leq 0.01

Table (7): Relation between the studied mothers' reported practices and their demographic characteristics pre-health instructions implementation (n = 85).

Mother characteristics	Reported Practice level pre-health instructional program				X^2	P - value
	Not done (n= 53)		Done (n= 32)			
	No.	%	No.	%		
Age (year)						
Less than 20 years old	10	76.9	3	23.1	3.233	0.199 NS
20- < 30	29	65.9	15	34.1		
30 - 40 years	14	50.0	14	50.0		
Education level						
Read and write	9	50.0	9	50.0	3.014	0.222 NS
Middle	38	69.1	17	3.9		
High	6	50.0	6	50.0		
Occupation						
Work	21	56.8	16	43.2	.874	0.350 NS
Not work	32	66.7	16	33.3		
No. of children in the family						
One	20	60.6	13	39.4	2.723	0.436 NS
Two	13	76.5	4	23.5		
Three	16	61.5	10	38.5		
More than three	4	44.4	5	55.6		
Residence						
Rural	38	60.6	24	39.4	.110	0.740 NS
Urban	15	76.5	8	23.5		
Family income						
Insufficient	43	61.5	18	38.5	6.096	0.01**
Sufficient	10	44.4	14	55.6		

NS= not statistically significant ** P – value \leq 0.01

Table (8): Correlation between the studied mothers' knowledge and their practice scores pre-health instructional program implementation (n= 85)

Items	Mother knowledge scores	
	r	P - value
Mother reported practice scores	0.785	0.0001**

** Correlation is significant at the .01 level

Discussion:

About the studied children's age, more than half (56.5%) were aged between 4- 6 years old. This finding was agreed with a recent Egyptian study conducted at Ain Shams University Children hospital (a tertiary hospital) from April 2018 to April 2020; confirmed that the mean age of children diagnosed with nephrotic syndrome were 4.5 ± 2.51 and 4.83 ± 2.51 among children with steroid-sensitive nephrotic syndrome and steroid-resistant nephrotic syndrome groups, respectively (Sharaf and Mohamed, 2022) Also, Tapia & Bashir (2022) mentioned that the first diagnosed of nephrotic syndrome,

among children usually between 1 to 6 years old.

Concerning the gender of the studied children, more than two-thirds were male. This result was consistent with a recent Egyptian study conducted in the Pediatric Nephrology Unit of Mansoura University Children's Hospital, which presented that nearly two-thirds of the studied participants were male children (Al-azzawy et al., 2022)

The current study finding revealed that the causes of nephrotic syndrome among the studied children, showed that more than two-thirds had unknown causes. This result was in line with recently published study, which mentioned that nephrotic syndrome possible

caused were some glomerular diseases and/or systemic diseases, but significantly among childhood, nephrotic syndrome was unknown (Vallepu et al., 2019).

Regarding symptoms of the nephrotic syndrome among the studied children, the majority had edema, reduced urine amount, poor appetite, and fatigue. This result was confirmed by a recent literature review which mentioned that children with idiopathic nephrotic syndrome presented with massive proteinuria, hypoalbuminemia, and edema, which accompanied with oliguria or anuria. (Mattoo & Sanjad, 2022).

Concerning mothers' satisfactory knowledge about nephrotic syndrome (meaning, causes, signs, and symptoms, common treatment, healthy food, and complications) all such information were increased after three months post health instructional program implementation with statistically significance differences. **This result on the same line with hypothesis (1)** and confirmed by a study conducted at the medical department of the children's hospital affiliated to Ain Shams University Hospitals, which showed statistically significant differences between the studied mothers regarding their knowledge in relation to meaning, causes, signs & symptoms of nephrotic syndrome, treatment & precautions of nephrotic syndrome throughout the pre and post-intervention of the educational program respectively (Mahran et al., 2021). **This finding might be interpreted that health instruction effectively improve the level of knowledge of the studied mother regarding nephrotic syndrome disorder.**

Regarding mothers' practice levels pre and after three months of the health instruction program implementation, more than one-third of the studied mothers had an average practice level pre-health instructional program implementation increased to nearly two-thirds of them post three months after implementation of the health instructional program. **This finding proves hypothesis (2)** and agreed with a study done in Pediatric Medical Inpatient Departments and Outpatient Clinics at two Pediatric Hospitals affiliated to Cairo University. It revealed that the highest

percentages of the children suffering from nephrotic syndrome and their mothers had unsatisfactory levels of knowledge and health-related practices (Khider et al., 2017). **This finding might be interpreted that health instruction program was effectively improved the practice level of the studied mother.**

Regarding the relation between the educational level of the studied mothers and their knowledge about nephrotic syndrome, as all women could read and write; or possess' middle educational degree had unsatisfactory knowledge level. According to a study conducted in pediatric ward at Minia University Hospital for Obstetrics and Pediatrics, its result showed significant differences between the level of mothers' knowledge pre-educational program and their educational level. **This finding might be due to that the studied mothers had a first experience with such disease, and the majority live in rural areas.** (Abolwafa & Hossein, 2018).

On the other hand, no statistically significant relation was found between the studied mother's level of knowledge about nephrotic syndrome and their age, residency, and occupation pre-health instructional program implementation. This finding, in the same line with the study, conducted in the outpatient department of a private hospital at Dehradun, Uttarakhand, and reported no statistically significant relation was found between pre-test levels of knowledge and selected sociodemographic variables of the caregivers such regarding their age and occupation (Negi et al., 2020).

Concerning the correlation between mothers' knowledge and reported practice pre-health instructional program implementation, a strong positive correlation was found. This finding, confirmed by a study performed in the urologic pediatric outpatient clinic at Pediatric Ain Shams university hospital, which showed a strong positive correlation between mothers' knowledge and their practice level at home. Also, Sarika (2017) found a positive correlation between parents' knowledge score and their practice scores.

This finding contradicted with **Madhushani & Bandara (2019)** who conducted study in Pediatric Nephrology Clinic at the Teaching Hospital, in Karapitiya and a weak negative correlation ($r = -0.240$, $p = 0.020$) was found between the level of knowledge and practices of the parents. **This finding was related to the differences in the educational level of the studied sample.**

Conclusion:

Based on the result of the present study, the studied mothers of children who were newly diagnosed with nephrotic syndrome at the urologic pediatric outpatient clinic in Pediatric Minia university hospital had unsatisfactory knowledge regarding meaning, causes, manifestations, investigations, common treatment, and complications of nephrotic syndrome pre-health instructional program and improved after three months with statistically significant differences. Also, more than one-third of the studied mothers had an average reported practice level pre-health instructional program implementation increased to nearly two-thirds of them after three months post implementation of the health instructional program with statistically significant differences. So, health instructions program was effectively improved level of knowledge and reported practice of the studied mothers' having children newly diagnosed with nephrotic syndrome.

Recommendations:

Based on the findings of the current study, the following recommendations were suggested:

1. Replicate this study on a large number of mothers who had children with nephrotic syndrome.
2. Replicate this study after one year to determine the consequences of nephrotic syndrome disease.
3. Perform continuous health instruction about nephrotic syndrome, especially for the newly diagnosed cases.

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