

## Effect of Nephrotic Syndrome on the Psychosocial Aspects Among School Age Children in Assiut City

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### Abstract:

**Background:** Nephrotic Syndrome is one of the prolonged illnesses of childhood that has a major link with behavioral problems. **Aim:** To assess effect of nephrotic syndrome on the psychosocial aspects of school age children in Assiut City. **Research design:** Descriptive research design. **Sample:** 200 children. **Tools:** Two tools; **Tool (1):** Children personal and clinical data. **Tool (2):** Included child behavior checklist; parent form. **Results:** The study revealed that 52%, 39% and 9% of the studied children had abnormal, normal and borderline problem score respectively. There were statistically significant differences between the total competence score with children age, educational level and duration of illness p-values=0.001, 0.038 and 0.038 respectively. Also, there were positive correlations between total score of problem and total score of competence scales among the studied children. **Conclusion:** This study pointed out that children who were suffering from nephrotic syndrome are at increased risk of developing psychological difficulties. **Recommendations:** Community, psychiatric and pediatric health nurses should be trained on how to deal with children suffering from nephrotic syndrome and to detect cases that needs preventive interventions.

**Keywords:** *Nephrotic syndrome, Psychosocial aspects, School age children, Competence, Behaviour & Problem.*

### Introduction:

One of the most frequent disorders in pediatric nephrology globally is primary Nephrotic Syndrome (NS). It is a clinical condition characterized by large proteinuria (more than 40 mg/m<sup>2</sup> per hour), hypoalbuminemia (less than 30 g/L), hyperlipidemia, edema and other consequences. Increased permeability through the damaged basement membrane of the renal glomerulus. It is caused by a glomerular permeability anomaly which can be primary with a kidney illness or secondary to congenital infections, diabetes, systemic lupus erythematosus, neoplasia, or medication usage (Raina & Krishnappa, 2019).

NS is one of the most frequent chronic renal disorders in children. It has an incidence of 2-16.9 per 100.00 children globally. The most frequent form of NS in children comprising around 90% of all cases is idiopathic NS, consisting of NS or primary glomerular disease without an identified cause or infectious illness (Abd-Elrehim et al, 2017).

Several studies such as (Zyada et al, 2013) documented that NS is one of the children's diseases which has a strong behavioral association. Most children with NS have a high incidence of behavioral disorders. For children with NS, parents and other

caregivers, not only the medical, but also the psychological burden is considerable.

NS also has biological, behavioral and social symptoms in children, as with any disease with consequences for the child's mental health, social and personal development and family coping. This is expected because of the relapse and referral pattern for individuals with NS. Long-term treatment with steroids may potentially lead to behavioral disorders in this particularly susceptible population. Also (Khanjari et al, 2018) documented those behavioral difficulties occur in children suffering from NS.

At the same regards, (Ghobrial et al, 2013) showed that NS in pediatric population is one of the most prevalent renal diseases. About 90% of the cases are caused by corticosteroid-sensitive immune dysfunction. The effects of steroid therapy on the mental, emotional and behavioral condition of children are often documented by parents and patients themselves. Behavioral and psychosocial adaptations in children with NS are affected.

Pediatric, community health and psychiatric nurses have a vital role in care of children with NS and this role can be achieved through raising the awareness of children and their mothers regarding identification of psychosocial problems associated with NS, how to adapt and cope with disease and how to deal with

signs and symptoms associated with it as changing in child shape due to edema, accept himself and increase socialization with other children. Improve child and family health outcomes by promoting recovery, speeding return to school, promoting health behavior and appropriately involving the child on his or her own care decisions (Mohammed et al, 2017).

### Significance of the study:

NS is considered as a serious kidney disease around 90% of infant nephrosis is accounted for by Idiopathic NS. It has an annual incidence of 2-7 per 100,000 children and worldwide of 12-16 prevalence per 100,000. NS in children has a significant impact on intellectual functions, behavioral aspects and mood disorders as anxiety and depression. Children with NS have been reported to have severe emotional and behavioral issues frequently, particularly with often recurrent patients, steroid dependency, resistance to the steroid, increased degree of anxiety, sadness attack and carelessness (Amro, 2012, Manti et al, 2013 & Mohammed et al, 2017).

Children with NS have shown weak social performance as well as delay of psychosocial development, depression, anxiety, pain, fatigue, and reduced mobility. School attendance, academic achievement, and contact with colleagues are also affected in the lack of sufficient psychosocial intervention; many chronically ill children continue to be outside the scope of formal education, something that in turn increases their isolation and misery (Khanjari et al, 2018). So the current study carried out to shed the light on the psychological aspects of NS children.

### Aim of the study:

The study aimed to assess effect of NS on psychosocial aspects among school age children in Assiut City.

### Research question:

- 1.What are psychosocial problems related to the disease that children with NS suffer from?
- 2.How the children personal data effect on psychosocial problems?

### Subjects and Method

**Research Design:** Descriptive research design.

**Setting:** The study carried out at Pediatric Renal Out-Patient Clinic and Nephrology Unit in Assiut University Children Hospital.

**Sample:**A convenient sampling of two hundreds (200) children with NS during six months were recruited from the inpatient and outpatient nephrology clinics in Assiut University Children Hospital.

### Inclusion criteria:

- 1.Children diagnosed with Idiopathic Childhood NS.
- 2.Age 6-12 years old.

3.Both sex.

### Exclusion criteria:

- 1.Children with NS who had associated chronic medical illnesses.
- 2.Children with a history suggestive of congenital nephrosis, psychiatric disorders, organic brain injury and mental retardation.

### Sample size estimation:

Current study conducted on 200 children suffered from NS. The sample calculated according to the following equation:  $N = \frac{[DEFF * N_p(1-p)]}{[(d^2/Z^2) - \alpha/2 * (N-1) + p * (1-p)]}$ , DEFF (Design effect) = 1, N (population) = 820, p (Hypothesized %) = 25% +/-5, d (tolerated margin of error) = 0.05, Z (level of confidence) = 1.96, alpha (Alpha) = 0.05, n =  $[1 * 1000 * 10\% +/-5 (1-10\% +/-5)] / [(0.05)^2 / (1.96)^2 - 0.05 * (1000-1) + 10\% +/-5 (1-10\% +/-5)]$ , n = 200 children.

### Tools of the study: Two tools utilized for this study:

**Tool (1):** A questionnaire included personal and clinical data of children as; age, sex, birth order, school level, number of other siblings, child's age at disease onset (years), duration of illness, positive family history of renal diseases, complications if present.

**Tool (2):** Child behavior checklist, parent form (Achenbach & Rescorla, 2001): This scale was for the children ages from (6-18) years and consisted from 113 questions. Arabic version was used; it translated by (Mohammed, 2001 & Abdel Khalek, 2006). It had two main components:

**Total competence scale:** This computed as a sum of activities level, social relationship and school performance (competence subscale). The scoring system of the scale was based on T-score. If T-score more than 40, considered in the normal range, while 37-40 represent borderline score and T-score less than 37 which represent the abnormal level.

**The problem scales:** These subscales compromised into three broad constructs they are internalizing behavioral problems and externalizing behavioral problems scales and a total problem score. The internalizing behavioral problems consisted of the sum of the scores of 3 subscales that included withdrawn, somatic complaints and anxious and depression subscales.

Externalizing behavioral problems consisted of the sum of the scores of 2 subscales that included delinquent and aggressive behavior subscales. The social problems thought problems and attention problems scales weren't included in either the internalizing or externalizing grouping, but were included in the total problems score, which included all core syndromes as demonstrated in the table.

The participants responded to (3) points Likert scale (never= zero, sometimes= 1 and always= 2). For total problems, externalizing behavioral problems and internalizing behavioral problems, if T-scores less than 60 was considered in the normal range, 60-63 represent borderline scores and scores greater than 63 was in the abnormal level.

**Child behaviour checklist (Parent Form)  
(Achenbach & Rescorla, 2001)**

Subscales	No of items	No. of questions
<b>I. Total competence scales</b>		
1. Activities level subscale	8	(I=A,B,C),(II=A,B,C) and (IV=A,B)
2. Social relationship subscale	6	(III=A,B),(V=1,2) and (VI=A,B)
3. School performance subscale	4	(VII=1,2,3,4)
<b>II. Problem scales</b>		
<b>A. Internalizing behavioural problems</b>		
1. Withdrawn	9	(42,65,69,75,80,88,102,103,111)
2. Somatic complain	9	(51,54,56a,56b,56c,56,56e,56f,56g)
3. Anxiety and Depression	14	(12,14,31,32,33,34,35,45,50,52,71,89,103,112)
<b>B. Externalizing behavioural problems</b>		
4. Delinquent behaviour	13	(26,39,43,63,67,72,81,82,90,96,101,105,106)
5. Aggressive behaviour	20	(3,7,16,19,20,21,22,23,27,37,57,68,74,86,87,93,94,95,97,104)
<b>C. Total problem scale</b>		
6. Thought problem	7	(9,40,66,70,80,84,85)
7. Social problem	8	(1,11,25,38,48,55,62,64)
8. Attention problem	11	(1,8,10,13,17,41,45,46,61,62,80)
<b>In addition to Internalizing and externalizing subscales</b>		

**Methods of data collection:**

An official permission was taken from the Dean of the Faculty of Nursing to Assiut University Children Hospital's manager and the head of the renal unit to collect the data after clarifying the study purpose.

**Ethical considerations:**

The research approved from the Ethical Committee at the Faculty of Nursing - Assiut University. The purpose and nature of the study were explained to children's mothers. Also, the children and their mothers informed that they had the right to agree or disagree to participate in the study. Oral agreement obtained to participate in the study from every mother

and they were informed that the information obtained would be confidential and were used only for the aim of the study.

**Tools Reliability:**

Cronbach Alpha done for the used tool and founded that Cronbach Alpha was 0.721 for personal characteristics tool and 0.961 for child behavior checklist.

**A pilot study**

was done on 10% (20) of the children with NS. The pilot study sample was included in the study sample because there weren't modifications or corrections. This study aimed to estimate the needed time to fill in the questionnaire.

**Field of the work:**

- The data collected through six months; from the 1<sup>st</sup> of February 2021 to the end of July 2021. The researchers interviewed the mothers at Nephrology Unit and Pediatric renal Out-Patient Clinic in Assiut University Children Hospital. The researchers introduced themselves to the mothers and explained the purpose and nature of the study during the interview.
- About 2-3 mothers were interviewed/day three times/week. The average time for filing the questionnaire and Child Behavior Check list was around 20-30 minutes depending on the response of the mothers.

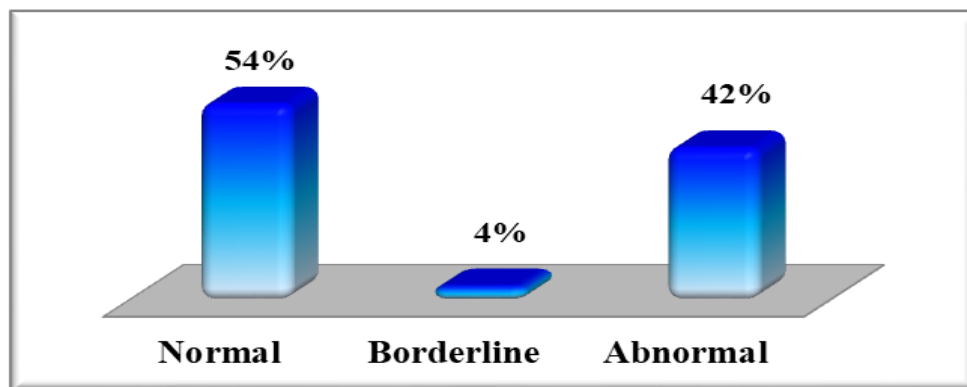
**Statistical design:**

Data analysis performed using SPSS 20 statistical software. The qualitative variables described using frequency and percentages. Chi-square test and Pearson Correlation were used. P value <0.05 was considered significant.

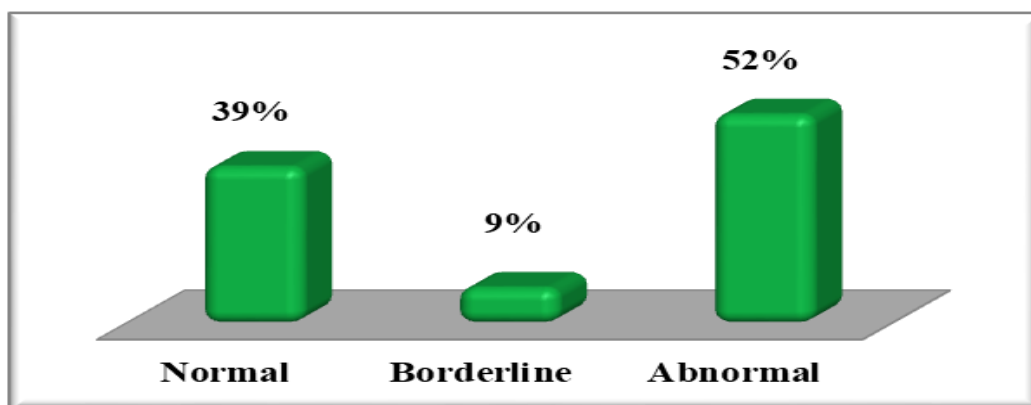
**Results:**

**Table (1): Percentage distribution of personal data of the studied school age children with NS**

Personal data	No. (n=200)	%
<b>Child age (years):</b>		
6-10	156	78.0
>10-12	44	22.0
<b>Age mean and SD</b>	<b>8.77±1.9</b>	
<b>Sex:</b>		
Male	117	58.5
Female	83	41.5
<b>Educational level:</b>		
First to third primary education	126	63.0
More than third primary education	74	37.0
<b>Number of siblings:</b>		
No	2	1.0
One	23	11.5
Two or more	175	87.5
<b>Birth order:</b>		
First	3	1.5
Second	85	42.5
Third or more	112	56.0
<b>Duration of illness:</b>		
Less than 2 months	126	63.0
2 months or more	74	37.0



**Figure (1): Total score of competence scale among the studied school age children with NS**



**Figure (2): Total problem score of the studied school age children with NS**

**Table (2): Relation between personal data and total score of competence scale of the studied school age children with NS**

Personal characteristics	Total score of competence scale						P-value
	Normal		Borderline		Abnormal (84)		
	N(108)	%	N(8)	%	N(84)	%	
<b>Child age/ years:</b>							
- 6-10	95	87.9	4	50.0	57	67.9	0.001**
- >10-12	13	12.1	4	50.0	27	32.1	
<b>Sex:</b>							
- Male	66	61.1	4	50.0	47	55.9	0.682
- Female	42	38.9	4	50.0	37	44.1	
<b>Educational year</b>							
- First to third primary education	76	70.4	3	37.5	47	55.9	0.038*
- More than third primary education	32	29.6	5	62.5	37	44.1	
<b>Number of sibling:</b>							
- No	1	0.9	0	0.0	1	1.2	0.971
- One	11	10.2	1	12.5	11	13.1	
- Two or more	96	88.9	7	87.5	72	85.7	
<b>Birth order:</b>							
- First	2	1.8	0	0.0	1	1.2	0.761
- Second	43	39.8	5	62.5	37	44.1	
- Third or more	63	58.4	3	37.5	46	54.7	
<b>Duration of illness</b>							
- Less than 2 months	76	70.4	3	37.5	47	55.9	0.038*
- 2 moths or more	32	29.6	5	62.5	37	44.1	

(\*) Statistical significant difference

(\*\*) highly statistical significant difference

**Table (3): Relation between personal data and total score of problem scale of studied school age children with NS**

Personal characteristics	Total score of problem scale						P-value
	Normal		Borderline		Abnormal		
	N(78)	%	N(18)	%	N(104)	%	
<b>Child age/ years</b>							
- 6-10	48	61.5	14	77.8	94	90.4	0.001**
- >10-12	30	38.5	4	22.2	10	9.6	
<b>Sex:</b>							
- Male	24	30.8	11	61.1	82	78.8	0.002**
- Female	54	69.2	7	38.9	22	21.2	
<b>Educational year</b>							
- -First to third primary education	24	30.8	11	61.1	91	87.5	0.002**
- -More than third primary education	54	69.2	7	38.9	13	12.5	
<b>Number of sibling:</b>							
- No	2	2.6	0	0.0	0	0.0	0.124
- One	7	8.9	4	22.2	12	11.5	
- Two or more	69	88.5	14	77.8	92	88.5	
<b>Birth order:</b>							
- First	2	2.6	0	0.0	1	1.1	0.812
- Second	31	39.7	8	44.4	46	44.1	
- Third or more	45	57.7	10	55.6	57	54.8	
<b>Duration of illness</b>							
- Less than 2 months	19	24.4	11	61.1	96	92.3	0.001**
- 2moths or more	59	75.6	7	38.9	8	7.7	

(\*) Statistical significant difference

(\*\*) highly statistical significant difference

**Table (4): Correlation between total score of problem scale and total score of competence scale of studied school age children with NS**

Total score of competence scale	Total score of problem scale						R -value	P-value
	Normal		Borderline		Abnormal			
	No.(78)	%	No.(18)	%	No.(104)	%		
Normal	73	93.6	2	11.1	33	31.7	0.293	0.001**
Borderline	2	2.6	0	0.0	6	5.8		
Abnormal	3	3.8	16	88.9	65	62.5		

**Table (1):** Reveals that 78.0%, 58.5%, 63.0% and 87.5 % of the studied children aged 6 to 10 years, were male, their educational level were in first to third primary education and had two or more sibling respectively. As regarding duration of illness 63.0% of them had the disease less than 2 months ago.

**Figure (1):** Illustrates that 54% and 42% of the studied children had normal and abnormal score of competence scale respectively, while; 4% of them had borderline competence level.

**Figure (2):** Presents that there were 52%, 39% and 9% of the studied children had abnormal, normal and borderline score of problem scale respectively.

**Table (2):** Demonstrates that there were statistically significant differences between total score of competence scale and child age, educational level and duration of illness p-values = 0.001, 0.038 and 0.038 respectively.

**Table (3):** Shows that there were statistically significant differences between total score of problem scale and child age, gender, educational level and duration of illness P-values =0.001, 0.002, 0.002 and 0.001 respectively.

**Table (4):** Represents that there was significant correlation between total score of problem scale and total score of competence scale of studied children (R -value = 0.293) & (P-value =0.001).

### Discussion:

Children with chronic physical illnesses are commonly considered at increased risk for behaviour difficulties; illnesses not only disturb their psychosocial development but also increase behaviour problems. Children with NS showed features of depressed, hyperactive, or aggressive behaviour. Somatic complaints, social withdrawal and poor school performance were also observed. This might be, in part, related to steroid-induced psychosis, which is one of the serious adverse effects of corticosteroid therapy (Neuhaus et al, 2018).

The present study aimed to assess the effect of NS on the psychosocial aspects among school age children in Assiut City.

Results of the current study revealed that childhood with NS nearly three-fifths of them were male, according to their educational level and duration of

illness three-quarters of them were in first to third primary education. This was in agreement with the results of the study of **Ozkaya, et al, (2014)** "Primary nephrotic syndrome during childhood in Turkey" who reported that more than half of children in five to third primary education.

On the other side, the studied children total score of competence scale; about more half of them hadn't any school score as they not enrolled to the school, so their total score of competence scale obtained from the summation of activity and social score only. This was consistent with the study of **Bagga & Mantan, (2005)** " Nephrotic syndrome in children in India" who recorded that children with medical illnesses may not develop at the same rate as healthy children because of delayed neurocognitive development, disruptions in education, and limited social experiences, in addition to the medical condition and treatment influences on intellectual and somatic growth and maturation.

This was in the same line with the results of another study by **Gipson et al, (2017)** "The nervous system and chronic kidney disease in children" they suggested that there was an increased risk for delays in neurocognitive development, particularly among toddlers. Also, this result is consistent with the results of the study of **Fennell et al, (2018)** "Correlations between performance on neuropsychological tests in children with chronic renal failure "who reported lower memory scores for children with chronic kidney disease not related to NS children with chronic kidney diseases; they suggested that there was an increased risk for delays in neurocognitive development, particularly among toddlers.

Moreover, the study of **Guha & colleagues, (2009)** "Behavior profile of children with nephrotic syndrome in India" attributed this association to frequent visits to the clinic, resulting in more absenteeism from school and isolation from peer groups. They found—in agreement with

In the present study, there was statistically significant differences between total score of competence scale and child age, educational level, duration of illness P-values= 0.001, 0.038 and 0.038 respectively. On the other hand, this was incongruent with study was made by **Thapet, (2018)** "Neurodevelopment and chronic illness: mechanisms of disease and treatment". who



observed that there was significant negative correlation between total competence and sociodemographic. Moreover, study was done by **Yusuf et al, (2018)** "Behaviour problems in nephrotic syndrome in India" who demonstrated that total competence hadn't significant relation with socio demographic data.

In accordance to internalizing behavioural problems, problem scale of anxiety and depression for children achieved by patients with NS on the internalizing subscale anxiety, depression and withdrawal were higher than those achieved by them on the externalizing subscale (aggressiveness) Moreover, the mean score on the internalizing problems subscale achieved by patients with NS was higher than that achieved.

There was a statistically significant difference between children in referral to withdrawal, anxiety/depression and thought and attention problems. These results was in agreement with those of a study that concluded that in NS, internalizing problems, such as anxiety and depression and externalizing problems, such as aggression and noncompliance, were potential concerns that need support and encouragement for the first year after diagnosis.

This was consistent with study carried out by **Slickers et al, (2007)** "Clinical predictors of neurocognitive deficits in children with chronic kidney disease "who found that most common internalizing symptoms were depression, anxiety, somatic complaints and social withdrawal of children who have kidney disease experience internalizing problems and more than third of children experience externalizing problems during the first year of diagnosis with NS, interpretation of this was related to children with chronic physical illnesses are generally considered at increased risk for behaviour difficulties.

The present study showed a statistically significant difference between total score of problem scale and total score of competence scale of the studied children. This result was agreed with those of study by **Bennett, 2015** "Depression among children with chronic medical problems: a meta-analysis" who concluded that NS, internalizing problems, such as anxiety and depression and externalizing problems, such as aggression, are potential concerns that need support and encouragement for the first year after diagnosis.

### Conclusion:

NS in children has a significant association with behavioural problems. Children with NS are existing with more withdrawal problems and somatic complaints. Age, educational level and years of illness were significantly associated with the total score of problem and competence. This study indicated that

children suffering from NS are at increased risk of developing psychological difficulties.

### Recommendations:

1. Educational material such as written booklets and brochure about NS in children should be present in children renal units and out-patients clinics.
2. Community, psychiatric and pediatric health nurses should be trained on how to deal with NS children and how to detect cases that needs preventive interventions.

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