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Cross-Sectional Study on Behavioral Abnormalities and Quality of Life in Children with Idiopathic Nephrotic Syndrome Following Corticosteroid Therapy

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Abstract

One of the kidney diseases that affect children the most frequently is idiopathic nephrotic syndrome. The most common treatment is corticosteroid medication. However, repeated or prolonged use of corticosteroids has been linked to negative effects, behavioral abnormalities, and a decline in children›s quality of life. The purpose of the current study was to evaluate the degree and type of behavioral aberrations and their effect on quality of life in children receiving corticosteroid therapy for idiopathic nephrotic syndrome. This cross-sectional survey was conducted in tertiary care facilities across Lahore, Pakistan, between March and June two thousand twenty-five. Included were two hundred fifty children aged six to eighteen years diagnosed with idiopathic nephrotic syndrome undergoing corticosteroid therapy. Data was gathered using validated tools, such as the Pediatrics Quality of Life Inventory version four point zero for physical, emotional, social, and school-related quality of life, and the Child Behavior Checklist for behavioral symptoms. Data was analyzed using Statistical Package for the Social Sciences and Stata software to identify statistically significant behavioral predictors through logistic regression models. Twenty-one of thirty behavioral symptoms showed significant differences, with younger children experiencing more issues such as arguing, low enjoyment, and cruelty to animals. These behaviors were strong predictors. Academic performance, emotional well-being, and physical health all declined, while social functioning remained largely unaffected. The findings show that children with idiopathic nephrotic syndrome on corticosteroids face reduced quality of life and recurring behavioral problems. Psychological support should be integrated with medical treatment.

Keywords: Idiopathic Nephrotic Syndrome, Corticosteroid Therapy, Behavioral Abnormalities, Quality of Life (QoL), Child Behavior Checklist (CBCL), PedsQL 4.0

1. Introduction

Idiopathic Nephrotic syndrome (INS) is among one of the most prevalent glomerular disease according to pediatric nephrology. The term “idiopathic” specifically signifies a condition that occurs spontaneously or for which the precise underlying cause has not been definitively identified. Nephrotic syndrome refers to a clinical syndrome that results in alteration of glomerular capillary wall permeability which is followed by excess proteinuria (more than 40mg/m^2/h), hypoalbuminemia (less than 30g/L) with sequelae hyperlipidemia, edema and other complications. Histopathology, responsiveness to steroid treatment, relapse pattern, or genetics can all be used to categorize idiopathic nephrotic syndrome [1]. Worldwide, the prevalence of INS is 0.016% [2]. Studies show a significantly higher burden of nephrotic syndrome in South Asian children than in European children. In the UK, rates of the condition have been reported to be as high as 0.009–0.016% in South Asian children, which is significantly higher than the 0.0023% in general UK population [3]. In Pakistan, recent hospital-based statistics show that INS form a substantial percentage of admissions of pediatric nephrology. It is estimated to have an about total prevalence rate of 0.002–0.005% [4].

Therapy with corticosteroids is considered to be the cornerstone for the treatment of nephrotic syndrome. Depending on the response to corticosteroids, nephrotic syndrome children sort into a steroid-sensitive category with a favorable long-term prognosis, but with a risk of recurrent relapses, and a steroid-resistant category with increased risk of progressing to chronic kidney disease. Response to drugs is very unpredictable with some children needing additional courses of steroid-sparing drugs and others responding with complete remission following the initial course of prednisone. Steroid-sparing drugs like cyclophosphamide, mycophenolate mofetil, calcineurin inhibitors, and rituximab

are commonly employed to induce or sustain remission with variable results [5]. Although corticosteroids like prednisolone continue to be effective in achieving remission in most patients but long-term can specifically impact their quality of life and behavior [6]. Studies revealed that patients with idiopathic nephrotic syndrome show behavioral abnormalities (such as depression, anxiety, aggressiveness, sadness, and/or disturbed sleep) and lower quality of life because of repeatedly occurring relapses, steroid therapy and psycho-social distress [7]. The main objective of our research is to assess the behavioral abnormalities and their impact on quality of life in pediatric patients with INS after corticosteroid treatment.

2. Methodology

This cross-sectional study was conducted in tertiary care hospitals of Lahore from March 2025 to June 2025. The study participants were children aged 6–18 years, diagnosed with INS, who was attending the pediatric nephrology clinic and undergoing corticosteroid therapy. Patients suffering from multiple diseases, such as systemic lupus erythematosus or vasculitis, and/or biopsy-proven membranous glomerulonephritis, or membranoproliferative glomerulonephritis were excluded from this study. After thorough literature review, a questionnaire with close ended questions was designed using adaptation method for the collection of data. This questionnaire consisted of 3 sections, the first one comprises of patient demographics the second section inquires persistence of behavioral abnormalities following corticosteroid therapy in children with initial episode of INS and the last one investigates quality of life to evaluate physical, emotional, social, and school functioning. The Achenbach system of empirically based assessment (ASEBA) was used to rate the child's behavior with application of the Child Behavior checklist (CBCL) as a tool. The respondents were asked to rate their child's behavior using yes or no. Pediatric Quality of Life Inventory-Version 4 (PedsQL™4.0) scores range from 0 to 100 points, with higher scores indicating better quality of life (QOL) and a 5-point Likert scale was used from 0 (never a problem) to 4 (almost always a problem). Statistical tests were conducted using the Statistical Package for Social Sciences (SPSS) version 27. Sample size was calculated using Daniel's Formula which turned out to be 206 with a drop out ratio of 20% [8]

$$N = \frac{\left[\left(Z_{\alpha/2}\right)^2 * P\,(1-P)\right]}{d^2}$$

Here,

N = sample size, Z = level of confidence (for a level of confidence of 95%, the Z value is 1.96), P = expected prevalence (with the prevalence of INS 15.5% in Lahore, the P value is 0.155), d = precision (for a precision of 5%, d value is 0.05). The questionnaires were used to gather data, which was then inputted and exported into SPSS Version 27. Using summary statistics, the participants were described. In our statistical analysis, the child's age was treated as the dependent variable to evaluate its relationship with behavioral and quality of life outcomes. Analysis using the chi-square test was done for categorical variables. P-values less than 0.05 were deemed statistically significant. Binary logistics regression analysis was employed to determine odds ratios with 95% confidence interval for behaviors like arguing, attention issues, social difficulties and to identify predictors of behavioral outcomes. Furthermore, multivariable logistic regression analysis was employed to determine the independent factors linked to behavioral abnormalities.

The PedsQL™4.0 questionnaire, which consists of 23 items and has been validated to measure health-related QoL for INS, was used to find out how INS affected perceived Quality of life. The PedsQL™4.0 comprises 23 items with four subscales: Physical functioning, Emotional functioning, social functioning and School functioning. Quality of life scores were calculated and categorized as mild (75-100), moderate (50-74), important (25-49), and very important (0-24). Mean and standard deviation values were computed for each quality-of-life domain. Better health-related quality of life is indicated by higher HRQoL subscale scores, while higher symptoms severity scores suggest more symptoms [6].

3. Results

A total of 250 children with idiopathic nephrotic syndrome (INS) undergoing corticosteroid therapy were included in the study. The majority were male, with a balanced distribution across age groups (child 6-10 and young 11-18). Most participants were enrolled from tertiary care hospitals in Lahore, Pakistan, between March and June 2025.

Questions	Child	Young	Significant P-values
1. Acts too young for his/her age			
Yes	88 (35.2%)	70 (28%)	0.191
No	59(23.6%)	33(13.2%)	
2. Argues a lot			
Yes	96 (38.4%)	41 (16.4%)	<.001
No	51(20.4%)	62(24.8%)	
3. Fails to finish things he/she starts			
Yes	105 (42%)	74 (29.6%)	0.943
No	42(16.8%)	29(11.6%)	

4. There is very little he/she enjoys			
Yes	122 (48.8%)	59 (23.6%)	<.001
No	25(10%)	44(17.6%)	
5. Bowel movements outside toilet			
Yes	45 (18%)	59 (23.6%)	<.001
No	102(40.8%)	44(17.6%)	
6. Bragging, boasting			
Yes	69 (27.6%)	26 (10.4%)	<.001
No	78(31.2%)	77(30.8%)	
7. Can't concentrate, can't pay attention for long			
Yes	76 (30.4%)	32 (12.8%)	.001
No	71(28.4%)	71(28.4%)	
8. Can't get his/her mind off certain thoughts			
Yes	98 (39.2%)	35 (14%)	<.001
No	49(19.6%)	68(27.2%)	
9. Can't sit still, restless, or hyperactive			
Yes	98 (39.2%)	45 (18%)	<.001
No	49(19.6%)	58(23.2%)	
10. Clings to adults or too dependent			
Yes	117 (46.8%)	50 (20%)	<.001
No	30(12%)	53(21.2%)	
11. Complains of loneliness			
Yes	76 (30.4%)	43 (17.2%)	.121
No	71(28.4%)	60(24%)	
12. Confused or seems to be in a fog			
Yes	61 (24.4%)	34 (13.6%)	.174
No	86(34.4%)	69(27.6%)	
13. Cries a lot			
Yes	71 (28.4%)	56 (22.4%)	.345
No	76(30.45)	47(18.8%)	
14. Cruel to animals			
Yes	23 (9.2%)	48 (19.2%)	<.001
No	124(49.6%)	55(22%)	
15. Cruelty, bullying, or meanness to others			
Yes	55 (22%)	60 (24%)	.001
No	92(36.8%)	43(17.2%)	
16. Daydreams or gets lost in his/her thoughts			
Yes	73 (29.2%)	51 (20.4%)	.982
No	74(29.6%)	52(20.8%)	
17. Deliberately harms self or attempts suicide			
Yes	21 (8.4%)	23 (9.2%)	.129
No	121(48.4%)	80(32%)	
18. Demands a lot of attention			
Yes	116 (46.4%)	50 (20%)	<.001
No	31(12.4%)	53(21.2%)	

19. Destroys his/her own things			
Yes	24 (9.6%)	19 (7.6%)	.662
No	123(49.2%)	84(33.6%)	
20. Destroys things belonging to his/her family or			
Yes	35 (14%)	26 (10.4%)	.795
No	112(44.8%)	77(30.8%)	
21. Disobedient at home			
Yes	74 (29.6%)	36 (14.4%)	.016
No	73(29.2%)	67(26.8%)	
22. Disobedient at school			
Yes	74 (29.6%)	21 (8.4%)	<.001
No	73(29.2%)	82(32.8%)	
23. Doesn't eat well			
Yes	111 (44.4%)	50 (20%)	<.001
No	36(14.4%)	53(21.2%)	
24. Doesn't get along with other kids			
Yes	97 (38.8%)	53 (21.2%)	.021
No	50(20%)	50(20%)	
25. Doesn't seem to feel guilty after misbehaving			
Yes	104 (41.6%)	53 (21.2%)	.002
No	43(17.2%)	50(20%)	
26. Easily jealous			
Yes	38 (15.2%)	39 (15.6%)	.043
No	109(43.6%)	64(25.6%)	
27. Breaks rules at home, school, or elsewhere			
Yes	72 (28.8%)	27 (10.8%)	<.001
No	75(30%)	76(30.4%)	
28. Fears certain animals, situations, or places other than school			
Yes	35 (14%)	35 (14%)	.078
No	112(44.8%)	68(27.2%)	
29. Fears going to school			
Yes	77 (30.8%)	28 (11.2%)	<.001
No	70(28%)	75(30%)	
30. Fears he/she might think or do something			
Yes	81 (32.4%)	70 (28%)	.041
No	66(26.4%)	33(13.2%)	

Table 1: Comparison of Behavioral Symptoms between Children and Young with INS Receiving Corticosteroids

Out of the 30 behavioral items assessed using the Child Behavior Checklist (CBCL), **21 items showed statistically significant differences (p < 0.05) between children and young participants.** Compared to the young group, children were significantly more likely to exhibit behaviors such as arguing a lot (38.4% vs. 16.4%; p < .001), showing very little enjoyment (48.8% vs. 23.6%; p < .001), clinging to adults (46.8% vs. 20%; p < .001), and demonstrating cruelty to animals (9.2% vs. 19.2%; p < .001). Other significantly more prevalent behaviors among children included disobedience at school (29.6% vs. 8.4%; p < .001), breaking rules (28.8% vs. 10.8%; p < .001), and showing signs of hyperactivity (39.2% vs. 18%; p < .001). In contrast, certain items such as "cries a lot" (p = 0.345), "confused or in a fog" (p = 0.174), and "deliberately harms self" (p = 0.129) did not demonstrate significant group differences.

Questions		Odd Ratio	Binary Regression		p value
			Lower	Upper	
1.	Argues a lot	2.846	1.691	4.791	.000
2.	There is very little he/she enjoys	3.639	2.036	6.506	.000
3.	Bowel movements outside toilet	.329	.195	.556	.000
4.	Bragging, boasting	.382	.220	.662	.001
5.	Can't concentrate, can't pay attention for long	.421	.248	.714	.001
6.	Can't get his/her mind off certain thoughts	.257	.151	.438	.000
7.	Can't sit still, restless, or hyperactive	.388	.231	.652	.000
8.	Clings to adults or too dependent	.242	.139	.422	.000
9.	Cruel to animals	4.705	2.609	8.486	.000
10.	Cruelty, bullying, or meanness to others	2.334	1.395	3.905	.001
11.	Demands a lot of attention	.252	.145	.439	.000
12.	Disobedient at home	.530	.316	.890	.016
13.	Disobedient at school	.253	.142	.450	.000
14.	Doesn't eat well	.306	.178	.525	.000
15.	Doesn't get along with other kids	.546	.326	.915	.022
16.	Doesn't seem to feel guilty after misbehaving	.438	.259	.741	.002
17.	Easily jealous	1.748	1.016	3.009	.044
18.	Breaks rules at home, school, or elsewhere	.370	.215	.638	.000

Table 2: Behavioral Predictors Identified Through Binary Logistic Regression

Binary logistic regression identified several behavioral traits significantly associated with corticosteroid exposure. Children who argued a lot (OR: 2.846; 95% CI: 1.691–4.791; $p < .001$), experienced little enjoyment (OR: 3.639; 95% CI: 2.036–6.506; $p < .001$), or exhibited cruelty to animals (OR: 4.705; 95% CI: 2.609–8.486; $p < .001$) had significantly higher odds of persistent behavioral disturbance. On the other hand, behaviors such as clinging to adults (OR: 0.242; 95% CI: 0.139–0.422; $p < .001$) and not eating well (OR: 0.306; 95% CI: 0.178–0.525; $p < .001$) were associated with lower odds.

Questions		Odd Ratio	Binary Regression		p value
			Lower	Upper	
1.	Argues a lot	.189	.074	.486	.001
2.	There is very little he/she enjoys	.217	.092	.514	.001
3.	Bowel movements outside toilet	5.232	2.064	13.262	.000
4.	Bragging, boasting	.186	.067	.517	.001
5.	Can't concentrate, can't pay attention for long	.699	.243	2.010	.506
6.	Can't get his/her mind off certain thoughts	1.039	.330	3.270	.948
7.	Can't sit still, restless, or hyperactive	1.729	.639	4.674	.281
8.	Clings to adults or too dependent	1.522	.468	4.948	.485
9.	Cruel to animals	7.428	2.137	25.813	.002
10.	Cruelty, bullying, or meanness to others	1.075	.339	3.407	.902
11.	Demands a lot of attention	1.088	.360	3.286	.881
12.	Disobedient at home	4.190	1.424	12.331	.009
13.	Disobedient at school	.181	.060	.544	.002
14.	Doesn't eat well	.198	.069	.567	.003
15.	Doesn't get along with other kids	6.031	1.889	19.255	.002
16.	Doesn't seem to feel guilty after misbehaving	.481	.172	1.347	.164
17.	Easily jealous	.718	.284	1.813	.483
18.	Breaks rules at home, school, or elsewhere	.480	.180	1.281	.143

Table 3: Independent Predictors of Behavioral Abnormalities from Multivariate Logistic Regression

After adjusting for confounders in multiple logistic regression, the association between cruelty to animals and behavioral disturbance remained statistically significant (adjusted OR: 7.428; 95% CI: 2.137–25.813; p = .002). Bowel movements outside the toilet (adjusted OR: 5.232; 95% CI: 2.064–13.262; p < .001) and disobedience at home (adjusted OR: 4.190; 95% CI: 1.424–12.331; p = .009) also remained significant predictors. Conversely, the association between poor concentration and behavioral outcome was no longer significant after adjustment (adjusted OR: 0.699; p = 0.506).

Sr no.	Questions (Physical Functioning)	Never a problem (0)	Almost never a problem (1)	Sometimes a problem (2)	Often a problem (3)	Always a problem (4)
		%	%	%	%	%
1.	How much of a problem has your child had with Walking 100 meters?	14	11	24	43	8
2.	How much of a problem has your child had with running?	9	9	8	46	28
3.	How much of a problem has your child had with lifting something heavy?	10	17	11	37	24
4.	How much of a problem has your child had with in participating in sports activities or exercise?	24	19	22	28	6
5.	How much of a problem has your child had with taking a bath or shower by him or herself?	48	14	15	20	4
6.	How much of a problem has your child had with doing chores, like picking up his or her toys?	38	28	13	17	4
7.	How much of a problem has your child had with having aches or pains?	10	18	7	10	55
8.	How much of a problem has your child had with feeling tired?	13	14	9	9	55
9.	How much of a problem has your child had with feeling afraid or scared?	28	28	27	7	10
10.	How much of a problem has your child had with feeling sad?	18	14	22	37	9
11.	How much of a problem has your child had with feeling angry?	4	14	19	21	42
12.	How much of a problem has your child had with trouble sleeping?	19	17	16	15	34
13.	How much of a problem has your child had with worrying about what will happen to him or her?	20	28	19	29	4
14.	How much of a problem has your child had with getting on with other children?	55	12	27	2	3
15.	How much of a problem has your child had with other children not wanting to be his or her friend?	51	19	20	6	4
16.	How much of a problem has your child had with getting teased by other children?	44	18	26	4	8
17.	How much of a problem has your child had with not being able to do things that other child his or her age can do?	31	24	22	18	6
18.	How much of a problem has your child had with keeping up when playing with other children?	53	12	23	7	6
19.	How much of a problem has your child had with paying attention in class?	44	18	28	2	7
20.	How much of a problem has your child had with forgetting things?	25	21	29	19	6
21.	How much of a problem has your child had with keeping up with school activities?	25	18	34	17	5
22.	How much of a problem has your child had with missing school because of not feeling well?	11	12	10	28	40
23.	How much of a problem has your child had with missing school to go to the doctor or hospital?	5	7	30	34	24

Table 4: PedsQL™4.0 Questionnaire Responses among children with Idiopathic Nephrotic Syndrome following corticosteroid therapy

Physical Functioning	Mild [75-100] Moderate [50-74] Important [25-49] Very Important [0-24] Mean ± SD	23.6% (n = 59) 14% (n = 35) 44% (n = 110) 18.4% (n=46) 46.4 ± 22.940
Emotional Functioning	Mild [75-100] Moderate [50-74] Important [25-49] Very Important [0-24] Mean ± SD	24% (n = 60) 17.2% (n = 43) 40% (n = 100) 18.8% (n = 47) 48.52 ± 22.884
Social Functioning	Mild [75-100] Moderate [50-74] Important [25-49] Very Important [0-24] Mean ± SD	59.6% (n = 149) 16.4% (n = 41) 23.6% (n = 59) 0.4% (n = 1) 73.04 ± 23.369
School Functioning	Mild [75-100] Moderate [50-74] Important [25-49] Very Important [0-24] Mean ± SD	12.8% (n = 32) 46.4% (n = 116) 34.4% (n = 86) 6.4% (n = 16) 51.7 ± 18.644

Table 5: PedsQL™4.0 Severity Domain Distribution among Children with Idiopathic Nephrotic Syndrome following corticosteroid therapy

Quality of life was evaluated using the PedsQL™4.0 across four domains: physical, emotional, social, and school functioning. Scores were categorized into mild (75–100), moderate (50–74), important (25–49), and very important (<25) impairment levels. The mean physical functioning score was 46.4 (SD ±22.94), with 44% of children classified as having important physical impairment. Emotional functioning also showed impairment, with a mean score of 48.52 (SD ±22.88); 40% experienced important limitations and 18.8% reported very important limitations.

Social functioning was comparatively better preserved with a mean score of 73.04 (SD ±23.37); 59.6% of participants were categorized under mild impairment, and only 0.4% reported very important impairment. School functioning was found to be substantially impaired. Among all PedsQL items, high percentages of participants reported problems with missing school due to not feeling well (40% marked "always a problem") and due to doctor or hospital visits (24% "always a problem").

4. Discussion

The findings from this cross-sectional study provide compelling evidence of a significant and multifaceted burden of behavioral abnormalities and impaired quality of life among children with Idiopathic Nephrotic Syndrome (INS) undergoing corticosteroid therapy. The observed prevalence of specific behavioral issues, such as frequent arguing, a marked reduction in enjoyment, heightened hyperactivity, and various forms of disobedience, collectively contribute to a profoundly diminished overall quality of life for these young patients. The detailed analysis, particularly through binary and multiple logistic regression, illuminated several behaviors as independent predictors of persistent behavioral disturbance, with "cruelty to animals" and "bowel movements outside toilet" emerging as particularly salient due to their exceptionally high adjusted odds ratios [9]. These are not merely common childhood issues but may serve as unique and severe indicators of profound underlying psychological distress or maladjustment, warranting immediate and thorough clinical attention. Their robust predictive power, even after meticulously accounting for potential confounding variables, suggests they are critical markers for significant underlying emotional or developmental problems that extend beyond the typical challenges associated with chronic illness [9].

A crucial comparative perspective is offered by the prospective longitudinal observations, which significantly enriches the interpretation of our cross-sectional findings. While the current study provides a snapshot of associations at a single point in time, the longitudinal data from a study reveals a critical temporal dimension: behavioral abnormalities can persist not only in children experiencing relapses but also, remarkably, in those who do not relapse [7]. Furthermore, the occurrence of disease relapse was identified as a significant factor that substantially increases the risk for the persistence of abnormal total behavior (at 36 weeks follow-up) [7]. This finding is profound, as it implies that the psychological impact of INS and its primary treatment extends far beyond acute phases and necessitates long-term psychosocial monitoring for all children with the condition, not solely those with frequent relapses. The exacerbating effect of relapse on behavioral persistence underscores the need for proactive psychological support during periods of disease activity and remission. Other studies also support the notion that relapses can lead to negative behavioral changes and that children with frequent relapses may need to consume steroids for prolonged periods, potentially contributing to behavioral disorders like depression, increased aggression, and generalized anxiety [10]. This comprehensive understanding shifts the clinical focus to addressing the chronic psychological sequelae of the disease and its treatment, regardless of relapse status,

while acknowledging that relapse significantly exacerbates the risk. This calls for integrated mental health support as a standard of care for all children with INS. The relationship between cumulative steroid dose and behavioral abnormalities appears complex and is subject to conflicting findings across various studies, highlighting a nuanced interplay of factors. In the multiple regression analysis of the current cross-sectional study, cumulative steroid dose was not found to be a significant independent predictor of behavioral disturbance [9]. Similarly, a study reported no significant association between cumulative steroid dose and the persistence of abnormal behavioral domains in their regression analysis [7].

However, after a thoroughly reviewing two studies side by side, both of which did find a significant correlation between prednisolone dose and behavioral abnormalities [7,11,12,13]. For instance, a study observed strong relationships for internalizing, externalizing, and total scores with cumulative dose of steroids [13]. Similarly, another study also found significant correlations of prednisolone dose with mean anxiety, depression, and aggression scores in relapsing nephrotic syndrome [11]. This divergence suggests that the relationship is not straightforward or linear. It implies that it might not be the quantity of steroid alone that directly drives behavioral issues, but rather the broader context of its administration, such as repeated courses due to relapse, and the associated psychological and social burden. The stress inherent in managing a chronic illness, frequent hospitalizations, parental anxiety, and disruptions to a child's normal life may exert a more profound and persistent influence on behavioral outcomes than merely the cumulative drug exposure [10]. Corticosteroids are known to affect behavior via indirect mechanisms, inducing chemical changes in specific sets of neurons that influence behavioral outcomes by strengthening or weakening neural pathways [11]. While mild psychiatric side effects like anxiety, insomnia, and restlessness are usually dose-dependent and reversible, severe reactions such as mania, depression, and aggressiveness have been reported, with incidence increasing with higher daily doses [10,14]. This points to a more nuanced understanding where the disease course and its psychosocial burden, including the emotional impact of chronic kidney disease (CKD) on development, social life, and school performance, might be primary drivers of behavioral persistence, necessitating a focus on holistic psychosocial support [10].

The observed impairments in quality of life, particularly in physical, emotional, and school functioning, further underscore the urgent need for comprehensive care that extends beyond purely medical management [9]. In physical functioning, the mean score was 46.4 (SD ±22.94), with a substantial 44% of children experiencing important physical impairment, manifesting as challenges with basic activities like walking, running, lifting, and participating in sports, alongside frequent aches, pains, and persistent tiredness [9]. Emotional functioning was similarly affected, with a mean score of 48.52 (SD ±22.88); 40% of children reported important limitations, and an additional 18.8% experienced very important limitations, indicating struggles with fear, sadness, anger, and sleep disturbances [9]. These findings align with other studies like Shukla in the Indian Journal of Nephrology reported significant negative impacts on the physical and psychological well-being of children with chronic conditions like INS, often leading to pain, fatigue, anxiety, sadness, fear, and depression [15].

A particularly concerning finding relates to school functioning, which was found to be substantially impaired. Among all PedsQL items, a high percentage of participants reported significant problems with missing school due to not feeling well (40% marked “always a problem”) and due to doctor or hospital visits (24% marked “always a problem”) [9]. This significant disruption to schooling highlights a profound and often overlooked long-term consequence of chronic illness and its management. Chronic absenteeism can lead to academic setbacks, reduced opportunities for peer interaction and social development, and potentially long-term educational and vocational disadvantages [9]. Children with CKD are at risk for impairment in school performance due to multifactorial reasons, including neurological side effects of the disease and treatments, as well as frequent school absences. This underscores the critical need for proactive educational support and flexible learning arrangements as an integral part of comprehensive care for these children.

In contrast, social functioning was comparatively better preserved among the participants, with a mean score of 73.04 (SD ±23.37). The majority, 59.6%, were categorized under mild impairment, and only a small fraction (0.4%) reported very important impairment [14]. This relative preservation of social functioning, despite significant physical and emotional challenges, suggests a potential area of resilience among children with INS. It implies that many children may still be able to maintain social connections, potentially leveraging social support as a coping mechanism [10]. Clinically, this indicates that fostering and supporting social networks, including peer groups and family, could be valuable resources for intervention strategies aimed at improving overall QOL, even when other domains are more severely affected. However, it is important to note that chronic kidney disease can place particular demands on a child's social life, leading to increased isolation and making peer acceptance a bigger issue due to frequent medical appointments and treatments.

The clinical implications of these findings are substantial and demand a paradigm shift in the comprehensive care of children with INS. There is an urgent need for routine psychosocial screening to proactively identify behavioral abnormalities and QOL impairments in children with INS [9]. This screening should be integrated into standard clinical practice, moving beyond solely disease management. Comprehensive support, including psychological counseling, educational accommodations, and robust family support, should be integrated into standard care protocols [14]. This integrated approach is essential to address the multifaceted challenges faced by these children and to improve their

overall well-being and long-term outcomes. Pediatric psychologists can adapt traditional approaches to meet the unique needs of patients with chronic health conditions, developing coping behaviors during hospitalizations, targeting unhelpful thoughts about their health, and providing families with strategies to manage behavioral concerns. Furthermore, peer support groups and specialized "kidney camps" can enable children with CKD to share experiences and build fellowship, while hospital-based school systems can help frequent inpatients keep up with their studies [14]. The research also seeks to inform clinical pharmacy practices, aiming to formulate interventional strategies that specifically address the mental and emotional needs of children on chronic pharmacologic treatment [10]. This translational goal underscores the importance of moving from observation to actionable clinical interventions.

5. Conclusion

In conclusion the research indicates that there is a high correlation between corticosteroids treatment of children with idiopathic nephrotic syndrome and severe behavioral disorders, such as aggression, disobedience, and lack of emotional control. Assessment of quality of life showed that there were significant impairments especially in physical, emotional and school functioning. These results support the need to include behavioral and psychological screening as an element of standard clinical management of pediatric nephrotic syndrome. These effects should be monitored and controlled by clinical pharmacists and nephrologists. Longitudinal study is suggested in the future to determine the long-term effects and determine the effectiveness of specific psychosocial interventions.

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