

EFFECTIVENESS OF EDUCATIONAL INTERVENTIONAL PACKAGE ON KNOWLEDGE AND PRACTICE OF MOTHERS REGARDING HOME CARE OF CHILDREN WITH NEPHROTIC SYNDROME.

ABSTRACT:

Background: Nephrotic syndrome is an important chronic renal disorder occurring in children and is characterized by heavy proteinuria, hypoalbuminemia, edema and hyperlipidemia. It can significantly affect the child's health and may impose considerable physical, psychological and caregiving burdens on the family. Childhood nephrotic syndrome is predominantly idiopathic, with minimal change disease representing an important histopathological form. Relapses are common, making appropriate home care, medication administration, fluid management, nutritional management, infection prevention and follow-up essential components of care.

Aim: To assess the effect of an educational interventional package on the knowledge and practice of mothers regarding home care of children with nephrotic syndrome.

Objectives: 1. To assess the knowledge and practice of mothers regarding home care of children with nephrotic syndrome. 2. To determine the effectiveness of the educational intervention package regarding knowledge and practice among mothers in the experimental and control groups. 3. To find out the correlation between knowledge and practice regarding home care of children with nephrotic syndrome in the experimental and control groups. 4. To determine the association between knowledge and practice regarding home care of children with nephrotic syndrome and selected demographic variables of mothers.

Materials and Methods: A quantitative experimental approach was reported in the dissertation methodology, while the dissertation abstract describes the study as a quasi-experimental, non-equivalent control group design. The study was conducted at Dr. Vitthalrao Vikhe Patil Pravara Rural Hospital, Loni (Bk). A total of 60 mothers participated, with 30 mothers in the experimental group and 30 in the control group. Data were collected using a structured questionnaire addressing demographic characteristics and knowledge/practice related to home care of children with nephrotic syndrome. The educational package included educational sessions, printed materials, visual aids, demonstrations and assessment through pre-test and post-test.

Results: Before the intervention, poor knowledge was observed among 93% of mothers in the control group and 90% of mothers in the experimental group. No participant in either group demonstrated good knowledge. Following the intervention, 67% of mothers in the experimental group demonstrated good knowledge, 33% demonstrated average knowledge, and none remained in the poor-knowledge category. The overall mean knowledge score increased from 4 (40%) in the pre-test to 7 (70%) in the post-test, representing a 30% improvement in mean percentage. The greatest improvement occurred in fluid restriction and home-care management, with an increase of 40 percentage points. Paired t-test findings demonstrated statistically significant differences between pre-test and post-test scores for all three knowledge domains: nephrotic syndrome and medication administration ($t = 7.67$), fluid restriction and home-care management ($t = 12.15$), and nutritional management ($t = 9.23$), with $df = 29$ and $p \leq 0.001$.

Conclusion: The educational interventional package was associated with a significant improvement in mothers' knowledge regarding home care of children with nephrotic syndrome. The largest improvement was observed in fluid restriction and home-care management. The study findings support the importance of structured educational interventions for mothers caring for children with nephrotic syndrome.

Keywords: Educational intervention, nephrotic syndrome, mothers, home care, knowledge, practice, children.

44 INTRODUCTION

45 Nephrotic syndrome is a chronic renal disorder characterized by heavy proteinuria, hypoalbuminemia,
46 edema and hyperlipidemia. In children, it may be congenital, primary/idiopathic or secondary. Primary
47 or idiopathic nephrotic syndrome is reported as the most common form in childhood. The clinical
48 course of childhood nephrotic syndrome is characterized by periods of remission and relapse.
49 Management frequently requires prolonged corticosteroid therapy and careful monitoring. Children
50 may develop periorbital and generalized edema, ascites, reduced urine output, frothy urine, appetite
51 disturbances and fatigue. Appropriate medication administration, dietary management, fluid restriction,
52 infection prevention and regular monitoring are therefore essential aspects of care. Nephrotic syndrome
53 is particularly important in paediatric nursing because the condition affects not only the child but also
54 the family. Mothers and other caregivers are required to undertake several aspects of care after
55 discharge, including medication administration, monitoring urine and edema, maintaining appropriate
56 dietary and fluid practices, preventing infection and recognizing warning signs.

57 The dissertation reported that nephrotic syndrome has an estimated incidence of approximately 2–7
58 cases per 100,000 children per year and prevalence of nearly 16 cases per 100,000. It also reported that
59 minimal change disease accounts for a substantial proportion of idiopathic nephrotic syndrome and
60 that relapse is a common feature of childhood disease. Previous literature included in the dissertation
61 has also identified deficiencies in parental knowledge and home-care practices. The study therefore
62 evaluated a structured educational intervention intended to address these deficiencies.

63 NEED FOR THE STUDY

64 Nephrotic syndrome is an important cause of hospitalization among children and commonly occurs
65 during early childhood. The condition is characterized by significant protein loss, edema and metabolic
66 abnormalities and may require prolonged treatment and follow-up. Relapses are frequent in childhood
67 nephrotic syndrome. Consequently, the mother or caregiver plays a critical role in recognizing early
68 signs of relapse and ensuring adherence to prescribed treatment and home-care
69 recommendations. Before the intervention, 90% of mothers in the experimental group and 93% in the
70 control group were categorized as having poor knowledge. This finding demonstrates the need for
71 structured educational interventions aimed at improving mothers' understanding of the disease and
72 strengthening their ability to provide appropriate home care.

73 AIM OF THE STUDY

74 To assess the effect of an educational interventional package on the knowledge and practice of mothers
75 regarding home care of children with nephrotic syndrome at Dr. Vitthalrao Vikhe Patil Pravara Rural
76 Hospital, Loni (Bk).

77 OBJECTIVES OF THE STUDY

- 78 1. To assess the knowledge and practice of mothers regarding home care of children with nephrotic
79 syndrome.
- 80 2. To determine the effectiveness of the educational intervention package regarding knowledge and
81 practice of mothers with nephrotic syndrome in the experimental and control groups.

3. To find out the correlation between knowledge and practice regarding home care of children with nephrotic syndrome.
4. To determine the association between knowledge and practice with selected demographic variables

RESEARCH HYPOTHESIS

Ho: There is no significant effect of the educational intervention package on the level of knowledge and practice regarding home care of children with nephrotic syndrome.

H₁: There is a significant effect of the educational intervention package on the level of knowledge and practice regarding home care of children with nephrotic syndrome.

MATERIALS AND METHODS

Research Approach

A quantitative research approach was used.

Research Design

The dissertation's abstract identifies the design as a quasi-experimental, non-equivalent control group design. The methodology section, however, describes the approach as quantitative with a true experimental research design. For this manuscript, the design is reported as the quasi-experimental, non-equivalent control group design stated in the dissertation abstract.

Study Setting

The study was conducted at Dr. Vitthalrao Vikhe Patil Pravara Rural Hospital, Loni (Bk), Maharashtra.

Study Population

The population consisted of mothers of children diagnosed with nephrotic syndrome.

Sample and Sampling Technique

A total of 60 mothers participated in the study: 30 mothers in the experimental group and 30 mothers in the control group. Non-probability purposive sampling was used for the present study

Inclusion Criteria

- Mothers who had a child with nephrotic syndrome.
- Mothers able to read and understand Marathi and English.
- Mothers willing to participate in the study.

Exclusion Criteria

Mothers working in the healthcare profession were excluded.

STUDY VARIABLES

Independent Variable: Educational interventional package.

Dependent Variables: Knowledge and practice of mothers regarding home care of children with nephrotic syndrome.

116 **Socio demographic Variables:** Socioeconomic status, maternal educational background, health status of the
117 child, access to healthcare services, family support, maternal age and previous experience with nephrotic
118 syndrome.

119 **DATA COLLECTION TOOLS**

120 The tool was developed after review of literature, books, journals, articles, reports and previous research, and in
121 consultation with experts and the research guide.

122 Section A: Demographic profile included maternal age, educational status, occupation, monthly family income,
123 marital relationship, type of family, and child age, gender and age at onset of nephrotic syndrome.

124 Section B: Knowledge and practice questionnaire covered three major areas: (1) nephrotic syndrome, its causes,
125 symptoms and medication administration; (2) fluid restriction and home-care management; and (3) nutritional
126 management.

127 **VALIDITY AND RELIABILITY**

128 Content validity of the tool was established through consultation with experts from Child Health Nursing,
129 Paediatrics and Statistics. Reliability was assessed among five mothers outside the study sample using the test-
130 retest method. A pilot study was planned on 10% of the main sample to assess feasibility and predictability of
131 the methodology and research tools.

132 **EDUCATIONAL INTERVENTIONAL PACKAGE**

- 133 • Interactive educational sessions and lectures/workshops.
- 134 • Information regarding nephrotic syndrome, causes and symptoms.
- 135 • Medication management.
- 136 • Fluid restriction and home-care management.
- 137 • Nutritional requirements.
- 138 • Printed booklets, pamphlets and handouts.
- 139 • Charts, diagrams and videos.
- 140 • Practice demonstrations and role-playing activities.
- 141 • Pre-test and post-test assessment.

142 **ETHICAL CONSIDERATIONS:**

143 The study was conducted after approval from the Institutional Research/Ethics Committee of Pravara Institute of
144 Medical Sciences. Permission was obtained from the concerned authorities. Written informed consent was
145 obtained from participants, confidentiality of information was maintained, and participation was voluntary. The
146 dissertation records Institutional Ethics Committee approval under approval number
147 PIMS/SSEVPCON/IEC/2023/17 dated 17/08/2023.

148 **STATISTICAL ANALYSIS:**

149 Descriptive statistics included frequency, percentage, mean and standard deviation. Inferential statistics included
150 t-test, chi-square test and Karl Pearson correlation coefficient.

151 RESULTS:

152 **Table 1. Sociodemographic Characteristics of Mothers**

Variable	Control n (%)	Experimental n (%)	Total n (%)
Age 20–25 years	2 (7)	2 (7)	4 (7)
Age 26–30 years	20 (67)	15 (50)	35 (58)
Age 31–35 years	5 (17)	10 (33)	15 (25)
Age >36 years	3 (10)	3 (10)	6 (10)
Primary education	15 (50)	12 (40)	27 (45)
Secondary education	7 (23)	10 (33)	17 (28)
Housewife	25 (83)	28 (93)	53 (88)
Farmer	5 (17)	2 (7)	7 (12)
Consanguineous	10 (33)	8 (27)	18 (30)
Non-consanguineous	20 (67)	22 (73)	42 (70)
Nuclear family	5 (17)	7 (23)	12 (20)
Joint family	20 (67)	18 (60)	38 (63)
Single parent	2 (7)	2 (7)	4 (7)
Divorced parent	3 (10)	3 (10)	6 (10)

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154 The majority of mothers were 26–30 years of age (58%), had primary education (45%), were housewives (88%),
 155 belonged to non-consanguineous marriages (70%), and lived in joint families (63%).

156 **Table 2. Sociodemographic Characteristics of Children**

Variable	Control n (%)	Experimental n (%)	Total n (%)
Birth–1 year	0 (0)	0 (0)	0 (0)
1–3 years	20 (67)	15 (50)	35 (58)
3–5 years	5 (17)	10 (33)	15 (25)
>5 years	5 (17)	5 (17)	10 (17)
Male	20 (67)	15 (50)	35 (58)
Female	10 (33)	15 (50)	25 (42)
Onset: Birth–1 year	0 (0)	0 (0)	0 (0)
Onset: 1–3 years	20 (67)	15 (50)	35 (58)
Onset: 3–5 years	5 (17)	10 (33)	15 (25)
Onset: >5 years	5 (17)	5 (17)	10 (17)

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158 **Table 3. Pre-intervention Level of Knowledge**

Level of knowledge	Control n (%)	Experimental n (%)
Poor	28 (93%)	27 (90%)
Average	2 (7%)	3 (10%)
Good	0 (0%)	0 (0%)

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160 Before implementation of the educational intervention, poor knowledge was present among 93% of mothers in
 161 the control group and 90% in the experimental group. No mother in either group had good knowledge.

162 **Table 4. Post-intervention Level of Knowledge**

Level of knowledge	Control n (%)	Experimental n (%)
Poor	28 (93%)	0 (0%)
Average	2 (7%)	10 (33%)
Good	0 (0%)	20 (67%)

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164 Following the educational intervention, 67% of mothers in the experimental group achieved good knowledge,
 165 while none of the mothers in the control group achieved good knowledge.

166 **Table 5. Area-wise Comparison of Mean Knowledge Scores**

Knowledge area	Max score	Pre-Mean	Pre SD	Pre-Mean %	Post Mean	Post SD	Post Mean %	Difference
Nephrotic syndrome, causes, symptoms and medicines	10	4	0.82	40%	6	1.23	60%	20%
Fluid restriction and home-care management	10	3	0.92	30%	7	0.90	70%	40%
Nutritional management	10	5	1.20	50%	8	1.11	80%	30%
Overall	30	4	0.89	40%	7	1.11	70%	30%

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168 The greatest improvement was observed in fluid restriction and home-care management, where the mean
 169 percentage increased from 30% to 70%. Overall mean knowledge increased from 40% to 70%.

170 **Table 6. Paired t-Test of Pre-test and Post-test Knowledge Scores**

Knowledge area	t value	Significance
Nephrotic syndrome, causes, symptoms and medication administration	7.67	Significant
Fluid restriction and home-care management	12.15	Significant
Nutritional management	9.23	Significant

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172 df = 29; table value = 3.646; $p \leq 0.001$. All calculated t values exceeded the table value, indicating statistically
 173 significant differences between pre-test and post-test knowledge scores.

174 **Table 7. Association Between Knowledge/Practice and Selected Demographic Variables**

Demographic variable	χ^2 value	Significance
Age of mother	0.10	Not significant
Educational status	0.44	Not significant
Occupation	0.30	Not significant
Family income	1.08	Not significant
Marital relationship	0.62	Not significant
Type of family	1.06	Not significant

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176 df = 1; table value = 3.84; $p \geq 0.05$. None of the selected maternal demographic variables demonstrated a
 177 statistically significant association with knowledge/practice regarding home care.

DISCUSSION:

The present study demonstrated substantial deficiencies in mothers' baseline knowledge regarding the home care of children with nephrotic syndrome. Before the intervention, 93% of mothers in the control group and 90% in the experimental group had poor knowledge. After implementation of the educational package, a marked improvement was observed in the experimental group. Sixty-seven percent of mothers achieved good knowledge, while 33% demonstrated average knowledge and none remained in the poor-knowledge category.

The overall mean knowledge percentage increased from 40% in the pre-test to 70% in the post-test. The most substantial improvement occurred in fluid restriction and home-care management, increasing from 30% to 70%.

The statistical findings further support the effectiveness of the intervention. Significant improvements were observed across all three knowledge domains. The *t* values of 7.67, 12.15 and 9.23 were all greater than the critical value of 3.646, with $p \leq 0.001$. The study also found no statistically significant association between knowledge/practice and maternal demographic variables such as age, education, occupation, family income, marital relationship and type of family.

MAJOR FINDINGS:

- The majority of mothers were 26–30 years old.
- Primary education was the most common educational level.
- Most mothers were housewives.
- Most mothers belonged to non-consanguineous marriages.
- Joint families were the most common family type.
- Most children were between 1 and 3 years of age.
- Before the intervention, 93% of control-group mothers and 90% of experimental-group mothers had poor knowledge.
- No mother in either group had good knowledge before intervention.
- After intervention, 67% of experimental-group mothers achieved good knowledge.
- No mother in the experimental group had poor knowledge after intervention.
- Overall mean knowledge increased from 40% to 70%.
- The greatest improvement was observed in fluid restriction and home-care management.
- The intervention produced statistically significant improvements in all three knowledge domains.
- No statistically significant association was found between knowledge/practice and the selected maternal demographic variables.

NURSING IMPLICATIONS

Nursing Education

Educational content concerning nephrotic syndrome and home-care management can be incorporated into nursing education to prepare nurses to provide effective caregiver education.

212 **Nursing Practice**

213 Paediatric nurses should provide structured education to mothers regarding medication administration, fluid
214 restriction, dietary management, monitoring edema and urine changes, prevention of infection, recognition of
215 warning signs and follow-up care.

216 **Nursing Administration**

217 Nursing administrators can develop standardized caregiver-education protocols and educational materials for
218 parents of children with nephrotic syndrome.

219 **Nursing Research**

220 Further studies can evaluate larger populations, compare different educational methods and assess long-term
221 retention of knowledge and actual home-care practices.

222 **LIMITATIONS**

- 223 • The study was conducted at a single hospital.
- 224 • The sample consisted only of mothers of children with nephrotic syndrome.
- 225 • The sample size was limited to 60 participants.
- 226 • Generalization of findings beyond the study setting should therefore be undertaken cautiously.
- 227 • The study focused on a specific group of caregivers and a specific clinical condition.

228 **CONCLUSION**

229 The present study demonstrated that mothers of children with nephrotic syndrome had considerable gaps in
230 knowledge regarding home care before the educational intervention. The educational interventional package
231 produced a substantial improvement in knowledge among mothers in the experimental group.

232 Following intervention, 67% of mothers in the experimental group achieved good knowledge, compared with
233 none in the control group. The overall mean knowledge percentage increased from 40% to 70%. The greatest
234 improvement occurred in fluid restriction and home-care management, where knowledge increased by 40
235 percentage points. The statistically significant t-test results further support the effectiveness of the intervention.
236 The findings indicate that structured, systematic and practical caregiver education can play an important role in
237 improving mothers' preparedness to care for children with nephrotic syndrome at home.

238 **RECOMMENDATIONS:**

- 239 • Regular educational workshops should be conducted for mothers of children with nephrotic syndrome.
- 240 • Refresher education should be provided during follow-up visits.
- 241 • Hospitals should develop standardized educational booklets and pamphlets for caregivers.
- 242 • Visual aids and demonstration-based teaching should be incorporated into caregiver education.
- 243 • Pediatric nurses should provide individualized discharge teaching.
- 244 • Support groups can be developed for parents of children with chronic renal conditions.
- 245 • Educational sessions can be integrated into routine paediatric nephrology clinics.
- 246 • Larger studies should be conducted in multiple hospitals.
- 247 • Future studies should evaluate long-term retention of knowledge.
- 248 • Future research should separately measure actual home-care practices using validated observational checklists.

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REFERENCES:

1. Smith J, Jones P. Nephrotic syndrome: an overview and clinical implications. In: Brown A, editor. Paediatric Nephrology. 4th ed. New York: Medical Publishing; 2020. p. 200–215.
2. The International Study of Kidney Disease in Childhood. Nephrotic syndrome: histopathological and clinical characteristics in children. *Pediatr Nephrol*. 2018;33(4):675–683.
3. Yamada T, Tanaka H, Suzuki K, et al. Epidemiological study of idiopathic nephrotic syndrome in Japanese children. *J Epidemiology*. 2017;27(2):123–130.
4. Kumar S, Gupta N. A study on the effect of educational intervention on mothers' knowledge and practice regarding home care of children with nephrotic syndrome. *Int J Nurs Stud*. 2022;59(2):100–110.
5. Hara H, et al. Supplements Azithromycin repressed relapses of idiopathic nephrotic syndrome in a child. *J Pediatr Nephrol*. 2018;33(2):145–152.
6. Xu K, et al. Clinical analysis of one infantile nephrotic syndrome caused by COQ2 gene mutation. *Pediatr Nephrol*. 2018;33(5):677–683.
7. Sarika. Knowledge and practices of parents regarding home management of children with nephrotic syndrome in Haryana, India. *Int J Nurs Sci*. 2017;4(2):150–158.
8. Khider S, et al. Nephrotic syndrome knowledge and health care-related practices among school-age children and their mothers. *Egypt J Health Care*. 2017;8(1):45–53.
9. Beanlands H. Learning to live with nephrotic syndrome: Experiences of adult patients and parents of children with nephrotic syndrome. *Health Expect*. 2017;20(5):996–1004.
10. Khanjari S, et al. The effect of blended training on the quality of life of children with nephrotic syndrome. *Pediatr Nephrol*. 2020;35(6):1045–1052.
11. Borges K, et al. Parental health literacy and outcomes of childhood nephrotic syndrome. *Nephrol Dial Transplant*. 2019;34(4):731–738.
12. Saraswathi KN, et al. Knowledge on nephrotic syndrome among mothers of children admitted with nephrotic syndrome in Bangalore. *Indian J Child Health*. 2018;5(4):324–329.
13. Wang CS, et al. Development of a novel mobile application to detect urine protein for nephrotic syndrome disease monitoring. *BMC Med Inform Decis Mak*. 2019;19(1):12.
14. Webb NJ, et al. Sixteen-week versus standard eight-week prednisolone therapy for childhood nephrotic syndrome. *Lancet*. 2019;394(10199):2242–2253.
15. Stabouli S, et al. Neurological complications in childhood nephrotic syndrome. *Pediatr Nephrol*. 2019;34(8):1287–1294.
16. Tullus J, et al. Management of steroid-resistant nephrotic syndrome in children and adolescents. *Lancet Child Adolesc Health*. 2018;2(11):880–890.
17. Chakraborty P, et al. Effectiveness of structured teaching programme regarding home care management of children with nephrotic syndrome. *J Pediatr Nurs*. 2017;36:105–112.
18. Illalu S, et al. Prevalence of Vitamin D deficiency in children with nephrotic syndrome. *Int J Pediatr Res*. 2019;6(4):185–191.
19. Sharma S, et al. Status of metabolic bone disease in pediatric steroid-resistant nephrotic syndrome in North India. *Indian J Pediatr*. 2018;85(4):316–322.
20. Polit DF, Beck CT. Nursing Research: Generating and Assessing Evidence for Nursing Practice. 10th ed. Philadelphia: Wolters Kluwer Health; 2017.

- 290 21. Creswell JW, Creswell JD. Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. 5th
291 ed. Thousand Oaks: SAGE Publications; 2018.
- 292 22. Kothari CR. Research Methodology: Methods and Techniques. 4th ed. New Delhi: New Age International
293 Publishers; 2020.

294 **IMPORTANT MANUSCRIPT VERIFICATION NOTES**

- 295 1. The dissertation abstract states a quasi-experimental, non-equivalent control group design, while the
296 methodology section states a true experimental research design. The design should be verified against the
297 approved protocol before journal submission.
- 298 2. The abstract states non-probability purposive sampling, whereas the methodology states probability sequential
299 sampling. The actual sampling method should be verified before publication.
- 300 3. The reported quantitative results primarily demonstrate knowledge improvement. Separate practice statistics
301 should not be inserted unless the original practice dataset/checklist is available.
- 302 4. References should be independently checked against the original publications before journal submission,
303 especially author names, journal titles, volume/issue, pages and DOI details.