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Effectiveness of Nurse Led Education Program on Knowledge Regarding Prevention and Management of UTI among Adolescent Girls in Selected Schools of Dist. Mandi, H.P. (2024-2025): A Quasi- Experimental Study

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ABSTRACT

Introduction: Urinary tract infection is bacterial infection which affects any part of the urinary tract. This includes the kidneys which make urine, ureters are tubes that carry urine from kidney and the urethra, the tube that carries urine from bladder out of body. UTIs are more common in girls due to their short urethra (3–4 cm) and its close proximity to the vagina and anus, which are colonized by bacteria like Enterobacteriaceae. The study to aim assess the effectiveness of nurse led education program on knowledge regarding prevention & management of UTI among adolescent girls

Methodology: Quasi- experimental non- randomized control group pretest, posttest research design was adopted to assess the effectiveness of nurse led education program on knowledge regarding prevention & management of UTI among adolescent. A total 110 participants (experimental group = 55, control group=55) were selected using the consecutive sampling technique. A self- structured questionnaire assessed the knowledge. Data was analyzed by descriptive & inferential statistics.

Results: The experimental group showed a statistically significant improvement in knowledge after the intervention (mean knowledge score increased from 12.16 to 18.60, p-value ≤0.001). The control group showed a slight, non-significant decrease from 12.15 to 12.05. In the experimental group, during the pre-test, age (p = 0.039), family income (p = 0.024), and prior knowledge of UTI (p = 0.040) were significantly associated with knowledge levels. In the control group, only mother's occupation was significantly associated with knowledge levels in both phases.

Conclusion: The Nurse Led Education Program was effective in increasing

the knowledge regarding prevention & management of UTI among adolescents.

Keywords: Quasi- Experimental design, Knowledge, UTI, Nurse led education program.

I. INTRODUCTION

Urinary tract infection is bacterial infection which affects any part of the urinary tract. This includes the kidneys which make urine, ureters are tubes that carry urine from kidney and the urethra, the tube that carries urine from bladder out of body.[1]India has the largest adolescent population in the world i.e., 253 million which means every fifth person is between the ages of 10 and 19 years. Further around 47% of the population is female.[2] UTIs are common in adolescent girls due to factors like menarche, poor hygiene, dysfunctional voiding, tight jeans, and synthetic underwear. [3]

Every year about 250 million people diagnosed with urinary tract infection. In young girls, the estimated number of UTIs are 0.5 per person per year. Moreover, repeated infections are common among 80% of infected persons; usually with in a period of 3 months of original infection.[4] Urinary tract infections are mostly seen in girls as compared to boys because the girl's anatomy contributes to women's increased likelihood of contracting a UTI. The female urethra is only 3 to 4 cm in length which lies in close proximity to the vagina, anus, and rectum, all of which are areas colonized with Enterobacteriaceae.[5]

Especially for the adolescent girls to prevent the occurrence and recurrence of urinary tract infection they have to maintain good personal hygiene during menses, each and every urination. Adolescent should be encouraged to void frequently and to avoid holding their urine. They should also be told not to hurry to empty their bladder completely. Dietary considerations include increased fluid intake, especially those fluid that acidify the urine, e.g. apple or cranberry juice and the fluid contain animal proteins.[6]

II. MATERIAL AND METHODS

The present study employed a quantitative research approach to evaluate the effectiveness of a nurse-led education program on knowledge regarding the prevention and management of UTIs among adolescent girls. A quasi-experimental, non-randomized control group pretest-posttest research design was utilized to achieve the study objectives. The study was conducted in selected senior secondary schools of District Mandi, Himachal Pradesh, specifically Government Senior Secondary School, Jarol, Sunder Nagar, and Government Senior Secondary School, Mahadev, Sunder Nagar. A total of 110 adolescent girls were selected using a consecutive sampling technique, with 55 assigned to the experimental group and 55 to the control group. Inclusion criteria for the study were adolescent girls who were enrolled in +1 and +2 classes at the time of the study, were able to understand either English or Hindi, had attained menarche, and provided willingness to participate. Adolescent girls who were absent during the time of data collection or were sick were excluded from the study.

Data collection was carried out using a tool developed under expert guidance, comprising two sections: demographic information and a self-structured knowledge questionnaire. The tool's validity was established through expert review, followed by necessary modifications. Ethical approval was

obtained from the Principal of Government Nursing College, SLBSGMCH, and formal permission was secured from the Principals of the participating schools. Written informed consent was obtained from each participant prior to data collection. The collected data were organized, tabulated, and analyzed using both descriptive and inferential statistics. Descriptive statistics such as mean, standard deviation, frequency, and percentage were used to summarize the demographic data and knowledge scores. Inferential statistics included the paired t-test to compare pretest and posttest knowledge scores within the experimental group, and the Chi-square test to analyze the association between selected demographic variables and knowledge regarding the prevention and management of UTIs.

III.RESULTS

Table 4.1 (a) Frequency and percentage distribution of demographic variables

N=110

SECTION-A SOCIO DEMOGRAPHIC PROFORMA		Experimental Group f (%)	Control Group f (%)
Age (in years)	14 Years	6 (10.9%)	5 (9.1%)
	15 Years	13 (23.6%)	**27 (49.1%)**
	16 Years	**33 (60.0%)**	18 (32.7%)
	17 Years	3 (5.5%)	4 (7.3%)
	18 Years	0 (0.0%)	1 (1.8%)
Class	11th	24 (43.6%)	**30 (54.5%)**
	12th	**31 (56.4%)**	25 (45.5%)
Residential Area	Rural	**53 (96.4%)**	**54 (98.2%)**
Educational Status of Mother	No formal education	4 (7.3%)	1 (1.8%)
	Primary education	5 (9.1%)	2 (3.6%)
	Secondary education	**40 (72.7%)**	**42 (76.4%)**
	Graduate & above	6 (10.9%)	10 (18.2%)
Educational Status of Father	No formal education	1(1.8%)	0 (0.0%)
	Primary education	7 (12.7%)	5 (9.1%)
	Secondary education	**41 (74.5%)**	**28(50.9%)**
	Graduate & above	6 (10.9%)	22 (40.0%)
Occupation of Mother	Home maker	**46 (83.6%)**	**48(87.3%)**
	Self- employed	2 (3.6%)	1 (1.8%)
	Government employee	1 (1.8%)	2 (3.6%)
	Private employee	6 (10.9%)	4 (7.3%)
Occupation of Father	Unemployed	**26 (47.3%)**	6 (10.9%)
	Self- employed	5 (9.1%)	17 (30.9%)
	Government employee	14 (25.5%)	3 (5.5%)

SECTION-A SOCIO DEMOGRAPHIC PROFORMA		Experimental Group f (%)	Control Group f (%)
	Private employee	10 (18.2%)	**29(52.7%)**
Family Monthly Income (in rupees)	≤15000/-	**34 (61.8%)**	23 (41.8%)
	15001- 25,000/-	12 (21.8%)	**16 (29.1%)**
	≥25,001	9 (16.4%)	16 (29.1%)
Have you ever experienced burning sensation while urinating	Yes	11 (20.0%)	12 (21.8%)
	No	**44 (80.0%)**	**43 (78.2%)**
Any previous knowledge related to UTI	No	**38 (69.1%)**	**44 (80.0%)**
	Yes	17 (30.9%)	11 (20.0%)
If yes, the source of information	Teacher	**13 (76.5%)**	**6 (54.54%)**
	Others	4 (23.5)	5(45.46%)

The table 1 depicts frequency and percentage distribution of socio-demographic variable. The majority of the experimental group were 16-year-olds (60%) and class 12th students (56.4%), while the control group mainly comprised 15-year-olds (49.1%) and class 11th students (54.5%). Most participants in both groups resided in rural areas (96.4% experimental, 98.2% control). Mothers in both groups predominantly had secondary education (72.7% experimental, 76.4% control), while fathers mostly had secondary education in the experimental group (74.5%) and graduate-level education in the control group (40%). Most mothers were homemakers (83.6% experimental, 87.3% control). A notable majority of fathers in the experimental group were unemployed (47.3%), while in the control group, most were private employees (52.7%). The majority in the experimental group had a monthly family income of ₹15,000 or less (61.8%), while in the control group, most earned more than ₹15,000. Most participants in both groups had **not** experienced a burning sensation while urinating (80% experimental, 78.2% control) and had **no** previous knowledge about UTIs (69.1% experimental, 80% control), with teachers being the primary source of information in both groups.

Table 2: Comparison of descriptive statistics between pre-test and post-test knowledge scores in experimental and control groups

N=110

Descriptive Statistics		Mean ±S.D.	Median Score	Maximum	Minimum	Range	Mean %
Pre-test knowledge	**Experimental Group**	12.16±3.468	12	19	5	14	40.55
	Control Group	12.15±3.709	13	21	4	17	40.48
Post-test knowledge	**Experimental Group**	18.60±3.670	18	26	9	17	62.00
	Control Group	12.05±3.566	13	21	4	17	40.18

Maximum= 30 Minimum= 0

Table 2 depicts that before the intervention, the experimental (12.16 ± 3.47; median = 12) and control (12.15 ± 3.71; median = 13) groups had similar knowledge levels, with nearly identical mean percentages (40.55% and 40.48%, respectively). In contrast, post-test scores showed a marked improvement in the experimental group (18.60 ± 3.67; median = 18; 62.00%), while the control group remained largely unchanged (12.05 ± 3.57; median = 13; 40.18%). This suggests that the intervention had a substantial positive impact on the experimental group's knowledge.

Table 3: Association of pretest and posttest knowledge scores with selected socio-demographic variables in experimental group

n=55

Variable	Pre- Test				Post- Test			
	Chi test	P value	Df	Table value	Chi test	P value	df	Table value
Age (in years)	8.370	**0.039***	3	7.815	7.477	0.279	6	12.592
Class	2.307	0.129	1	3.841	1.372	0.503	2	5.991
Residential area	0.929	0.335	1	3.841	0.851	0.653	2	5.991
Educational status of mother	1.227	0.746	3	7.815	3.328	0.767	6	12.592
Educational status of father	0.494	0.920	3	7.815	2.204	0.900	6	12.592
Occupation of mother	2.371	0.499	3	7.815	3.691	0.718	6	12.592
Occupation of father	1.566	0.667	3	7.815	5.071	0.535	6	12.592
Family monthly income (in rupees)	9.413	**0.024***	3	7.815	9.855	0.131	6	12.592
Have you ever experienced burning sensation while urinating	0.085	0.770	1	3.841	0.256	0.880	2	5.991
Any previous knowledge related to UTI	4.223	**0.040***	1	3.841	5.100	0.078	2	5.991
If yes, source of information	2.423	0.489	3	7.815	4.406	0.221	3	7.815

Significant*

Table 3 shows that in the pre-test, age (p = 0.039), family income (p = 0.024), and prior knowledge of UTI (p = 0.040) were significantly associated with knowledge levels. Participants aged 16, those from families earning ₹15,000 or less, and those with prior UTI knowledge tended to have higher or moderate scores. Other variables showed no significant association. In the post-test, no demographic variable was significantly associated with knowledge, indicating that the nurse-led education program improved knowledge uniformly across all demographic groups.

Table 4: Association of pretest and posttest knowledge scores with selected socio-demographic variables in control group

n=55

Variable	Pre- Test				Post- Test			
	Chi test	P value	Df	Table value	Chi test	P value	df	Table value
Age (in years)	13.117	0.108	8	15.507	15.341	0.053	8	15.507
Class	1.558	0.459	2	5.991	1.702	0.427	2	5.991
Residential area	0.456	0.796	2	5.991	0.382	0.826	2	5.991

Variable	Pre- Test				Post- Test			
	Chi test	P value	Df	Table value	Chi test	P value	df	Table value
Educational status of mother	1.687	0.946	6	12.592	1.425	0.964	6	12.592
Educational status of father	1.443	0.837	4	9.488	3.170	0.530	4	9.488
Occupation of mother	14.847	**0.021***	6	12.592	14.794	**0.022***	6	12.592
Occupation of father	0.989	0.986	6	12.592	1.893	0.929	6	12.592
Family monthly income (in rupees)	2.411	0.878	6	12.592	3.105	0.796	6	12.592
Have you ever experienced burning sensation while urinating	3.395	0.183	2	5.991	2.301	0.316	2	5.991
Any previous knowledge related to UTI	4.075	0.130	2	5.991	4.174	0.124	2	5.991
If yes, source of information	1.259	0.868	4	9.488	2.872	0.580	4	9.488

Significant*

The table 4 depicts that in the control group, only mother's occupation was significantly associated with knowledge levels in both phases. In the pre-test, this variable showed significance ($p = 0.021$), with homemakers having the highest number of moderate (33) and inadequate (15) scores. Other variables—such as age, class, parental education and occupation, income, prior UTI symptoms, prior knowledge, and source of information—showed no significant association. In the post-test, mother's occupation again showed a significant association ($p = 0.022$), with homemakers recording the most moderate (35) and inadequate (13) scores. No other variables were significantly associated, indicating that mother's occupation remained the only influencing factor in the control group across both phases.

IV. DISCUSSION

The study showed a significant increase in the experimental group's mean knowledge scores from 12.16 to 18.60 ($p \leq 0.001$), confirming the effectiveness of the nurse-led intervention. The control group showed no significant change (12.145 to 12.05; $p = 0.627$). Furthermore, present study revealed that in the experimental group, pre-test results showed significant associations between knowledge scores and age, income, and prior UTI knowledge, indicating variations based on demographics. Post-test results showed no such associations (all $p > 0.05$), suggesting the nurse-led program effectively equalized knowledge across groups. In the control group, mother's occupation remained significantly associated with knowledge in both pre- ($p = 0.021$) and post-tests ($p = 0.022$), indicating continued influence without intervention.

V. CONCLUSION

The present quasi-experimental study concluded that the nurse-led education program had a statistically significant positive impact on the knowledge levels of adolescent girls regarding the prevention and management of urinary tract infections. The study highlights the critical role of school health education in promoting preventive health behaviors among adolescents, suggesting that such initiatives can serve as a valuable strategy in reducing the incidence and complications associated with UTIs in this vulnerable population.

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