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Original Research Article

Change in Knowledge and Practices Regarding Preventive Measures of Urinary Tract Infection after Education

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ABSTRACT

Introduction: Urinary tract infection (UTI) is one of the major complications of immobility or bedridden condition. Between 46-59% of spinal cord injury patients develop UTI during the first year of trauma. Caretakers should have adequate knowledge and skills on preventive measures of UTI especially for bedridden patient. Educating the caretakers is one of the strategies with in the hospital that would support quality patient care.
Objective: The purpose of the study was to identify the effectiveness of the educational intervention in increasing the knowledge and practices of caretaker of bedridden patients on preventive measures of UTI.
Material and Methods: One group pre and post-test design was used in this study. After implementation of educational package, post-testing was taken to evaluate the caretakers' retention of knowledge and change in practices to prevent UTI. A self prepared structured interview questionnaire and observation check list was used to collect data from 30 caretakers by implying purposive & convenient sampling technique.
Results: There was significant difference (p=0.000) of the caretakers' knowledge on meaning, high risk group, contributing factors signs and symptoms, consequences and preventive measures of UTI after implementation of educational package. Similarly, caretakers' preventive practices of UTI to their patient' such as "wipe the perineal area from front to back after defecation", "use of clean and dry urinal/bedpan", "encourage the patient for drinking 2-3liters water per day", "hang the urinary bag below the bladder level of the patient", were highly significant after educational intervention.
Conclusion: The educational intervention was effective on increasing the knowledge and practices of caretaker to prevent urinary tract infection.

Key words: Knowledge and Practice of UTI, Nepal Orthopedic Hospital, Spinal Injury Hospital, Bedridden patient, Caretakers.

INTRODUCTION

Patient' mobility is restricted due to pain, paralysis, loss of muscles strength, systemic disease and use of immobilizing devise like cast, brace, traction etc. Frequently, patients are placed on bed rest or limited their activities for therapeutic purpose. Prolong immobilization is required to maintain skeletal alignment and to enhance bone healing specially for spinal fracture, lower limbs fracture, pelvic fracture and multiple limbs fracture patients. Immobility & bed rest brings many physiological complications if appropriate care is not provided.

Urinary tract infection (UTI) is one of the major complications of immobility or bedridden condition that influences the health and quality of life with enormous cost to the health system. Between 46-59% of spinal cord injury patients develop UTI during the first year of trauma. [1]

Likewise, untreated or persistent or recurrent UTI may cause serious complications such as kidney failure and prostate infections [2] that increases the mortality rate of bedridden patient. Although, effective treatment may resolve lower UTI by decreasing the duration of symptoms and incidence of progression to upper urinary tract infection.

Stool is a common and major source of UTI, therefore, bowel incontinent patients developed UTI almost three times more than bowel continent patients. The Escherichia coli are responsible for 80% to 85% of cystitis. [3] Likewise, use of indwelling urinary catheters and duration is the most significant risk factors to develop UTI. The risk of UTI rises from 19% for 5 days long catheterization to 50% for 14 days. [4] The costs for the prevention, detection and treatment of UTI significantly affect a country's health-care budget so that, decreasing in the UTI rate would have important economic implications. [5]

UTI can be prevented if appropriate preventive measures are adopted while providing care to the patient. Appropriate patient education is necessary to help the client understand the process and follow an effective treatment plan to prevent UTI. Nurses are the main professional components of the front line staff in most health system. Nursing care is essential to accomplish the goals for safe and effective care. But the world has entered into a critical period of shortage of nurses. The scarcity of nurses is being highlighted as one of the obstacles to achieve the wellbeing of the global population. [6] Therefore, the caretakers are the main/key persons to prevent complications of bedridden condition. Caretakers should be included while caring bedridden patients for continuity of the care during and after hospitalization. Educating the caretakers is one of the strategies with in the hospital that would support quality patient care. [7] If the caretakers have adequate knowledge and skills, they can incorporate that knowledge and skills while providing care to the patient continuously. Therefore, educational intervention type of study will be helpful to increase the knowledge and practices of caretakers regarding preventive measures of UTI. In addition, the main purpose of the study was to find out the effectiveness of the educational intervention in increasing the knowledge and practices of caretakers of bedridden patients on preventive measures of UTI.

MATERIALS AND METHODS

One group pre-test and post-test design was adopted in this study. The study was carried out in Nepal Orthopedic Hospital (NOH) and Spinal Injury & Rehabilitation Centre, Jorpati, (SIARC). The population of the study was caretakers of bedridden patients who were attending continuously at least for 7 days. A total 30 caretakers were selected purposively and available during the time of data collection.

Structured interview questionnaire was developed to collect the information about meaning, risk group, contributing factors, signs & symptoms, consequences and preventive measures of UTI. An observation check list was developed to measure the activities carried out by the caretakers to prevent UTI. Observation checklist-A, that consisted “encourage the patient for drinking 2-3liters water per day”, “avoid to drink bladder irritating fluids”, “use clean and dry urinal/bedpan” and “wipe the perineal area from front to back after defecation” for all 30 caretakers and encourage to void 2-3times per day for those caretakers whose patient’ were not with Foley’s catheter. An observation checklist-B, that consisted “hang the urinary bag below the bladder level of the patient”, “change the catheter once a week”, “get the urinary bag replace every three days”, “do the perineal care once a day” and encourage for Kegel exercise” for those caretakers whose patients were with Foleys catheter. Validity of the tools

was maintained by searching the available literature and consulting with urologist, neurologist and orthopedic surgeon. Reliability of the instrument was maintained by pre-testing the interview questionnaire with 5 caretakers of bed ridden patient of orthopedic ward in Nepal Medical College.

Before collecting data, permission was obtained from NOH and SIARC, Jorpati. The researcher herself was collected data within 4weeks period. Informed verbal consent was taken from all the caretakers who participated in the study. Pre-knowledge data was collected by administering structured interview questionnaire and pre-practices were observed by using observations check list only those caretakers who were participated in interview.

The researcher instructed the caretakers to show the amount of water drinking by the patient to the researcher from 8am to 4pm and to the nursing staff from 4pm to 8am (when the researcher was not available) for recording in intake and output chart (Nursing Note) each time within 24 hours. The next day, researcher herself was calculated the total amount of water taken by the patient within 24 hours on previous day. Likewise, the researcher herself observed and recorded each caretaker' practices related to use of urinal/bedpan and wiping from front to back at the same time after long toileting of the patient, hang urinary bag below the bladder level of the patient, do perineal care and encourage the patient to perform kegel exercise. Furthermore, researcher observed and recoded the date of urinary catheter and urinary bag change on nursing note.

After the pre-testing, two hours teaching session was conducted; one hour for mini-lecture & discussion and one hour demonstration for those caretakers who were participated in the pre-test by using educational package (meaning, risk group, contributing factors, signs & symptoms, consequences and preventive measures of UTI and demonstration on specific activities to prevent UTI) that was developed especially for this study. Demonstration included following procedures: wiping from front to back after long toileting and use of clean and dry urinal/bedpan for all 30 caretakers and technique of Kegel exercise for 19 caretakers with sensation intact patient and changing & hanging of urinary bag and perineal care for 11 caretakers whose patients were with Foleys catheter. The educational intervention was carried out one session in the NOH and one session SIARC, Jorpati.

After two weeks of educational intervention, post-test was taken for all 30 caretakers who were involved in educational intervention by using the same interview questionnaire and observation check list used in pre-test to find out the effectiveness of teaching and demonstration. The confidentiality of the information and privacy of each caretaker' were maintained during study.

The questionnaire was re-checked for the completeness and correctness. Identification number was given orderly in each interviewed questionnaire and observation checklist before entering the data. SPSS version 16 computer software programme was used for entering, cleaning and analysis of the data. Analyzed data were reported in descriptive statistics such as frequency, percentage, mean and standard deviation. To test the hypothesis, "paired t" test was used to differentiate the mean knowledge in each category and "Chi-square test" was used to differentiate in each practice between pre and post-test, at 0.05 level of significant and 'p' value was calculated.

RESULTS

Demographic information of the caretakers: Out of 30 caretakers, majority (53.3%) were female and 46.7% male. The mean age of the caretakers was 34 years and 73.3% were literate. Regarding caretakers' relation with patient, 90% were

family members and 10% were paid caretakers (Non Professional). Among the family members, 43.7% were housewife.

Level of knowledge among the caretakers on UTI: Total knowledge score on different aspects; meaning, risk factors, contributing factors, signs & symptoms, consequences and preventive measures of UTI was 52 (100%). Out of 30 caretakers, 53.3% attained low level knowledge (<50%) in pre-test where as 90% of the caretakers attained as high level knowledge (>80%) after receiving the education in the post test. It indicated that educational intervention is most effective to increase knowledge on preventive measures of UTI among the caretakers, as shown in table 1.

Difference in mean score (knowledge) on preventive measures of UTI: Out of 30 caretakers, total knowledge scored on meaning, risk group, signs & symptoms, contributing factors, consequences and preventive measures of UTI was 39.74% (620) in the pre-test and it was increased by 90.64% (1414) after educational intervention in the post-test. The mean knowledge was 20.66 with standard deviation 12.67 in the pre-test and it was changed by 47.13 with deviation 4.63 in the post-test.

This study finding rejected the null hypothesis and accepted alternative hypothesis "there will be difference in the knowledge on preventive measures of urinary tract infection between pre and post educational intervention among the caretakers of bedridden patient". The difference in the knowledge of caretakers regarding different aspects of UTI was calculated separately as well as over all between pre-test and post-test by using 'paired t' test and 'p' value was found highly significant (p=0.000), as shown in table 2.

Table 1: Level of knowledge on urinary tract infection (n=30)

Level of Knowledge	Pre-test		Post-test		Total score
	F	%	F	%	
High (>80%)	0	0.0%	27	90%	52
Moderate (50-80%)	14	46.6%	3	10%	
Low (<50%)	16	53.3%	0	0.0%	

Table 2: Caretakers' pre and post mean knowledge on UTI (n=30)

Knowledge on	Pre-test			Post-test			P value (paired' test)
	Scores	Mean	S.D.	Scores	Mean	S.D.	
Meaning of urinary tract infection	23	0.76	0.93	75	2.50	0.84	0.000
Risk group for urinary tract infection	45	1.50	1.71	147	4.90	1.29	0.000
Contributing factors for urinary tract infection	105	3.50	2.25	194	6.46	0.81	0.000
Signs and symptoms of urinary tract infection	147	4.90	3.33	303	10.10	1.44	0.000
Consequences of urinary tract infection	77	2.56	1.73	144	4.80	0.55	0.000
Preventive measures of urinary tract infection	223	7.43	4.62	551	18.36	1.73	0.000
Total score	**620 (39.74%)**			**1414 (90.64%)**			Paired 't' test
Over all mean score	**20.66**			**47.13**			**P value**
Standard deviation	**12.67**			**4.63**			**(0.000)**

Table 3: Caretakers' practices to prevent urinary tract infection

Practices of Respondents to Prevent Urinary Tract Infection (n=30)	Pre-test		Post-test		Chi-Sq P value
	F	%	F	%	
Encourage the patient for drinking 2-3 liters of water per day	23	76.6	29	96.6	0.012
Avoid bladder irritating fluids	2	6.6	29	96.6	0.000
Wipe the perineal area from front to back after defecation	1	3.3	30	100	0.000
Use clean and dry urinal/ bedpan	14	46.6	30	100	0.000
Encourage to void 2-3 hours interval (n=19)	3	15.7	18	74.7	0.000
Practice of Respondents' whose Patient were with Foleys Catheter (n=11)					
Hang the urinary bag below the bladder level of the patient	1	3.3	8	72.7	0.000
Change the urinary catheter once a week	0	0.0	5	45.5	0.000
Get the urinary bag replace every three days	0	0.0	1	9.1	0.341
Do perineal care once a day	0	0.0	11	100	0.000
Encourage to do Kegel exercise	0	0.0	14	63.3	0.000

Caretakers' practices to prevent UTI of their bedridden patient: Out of 30 caretakers, 76.6% were encouraged their patient for drinking 2-3liters of water to flush out the micro-organism from urinary passage and 6.6% were avoid to drink bladder irritating (alcohol, coffee, citrus) fluid in the pre-test and these practices were increased by 96.6% in the and post-test. Similarly, 3.3% and 46.6% the caretakers wiped their patients' perineal area from front to back after defecation and used clean and dry urinal/bedpan in the pre-test and all (100%) of the caretakers were started those practices after intervention in the post-test. Likewise, 11 caretakers whose patient were with Foley's catheter, only 3.3% of them were hanged the urine collecting bag below the bladder level of the patient and none of them changed the urine collecting bag every three days in the pre-test and those practices were applied by 72.7% and 9.09% respectively in the post-test. Furthermore, no one change the urinary catheter once a week, perineal care once a day and encourage for kegel exercise in the pre- test where as those practices were implemented by 45.5%, 100% and 63.3% after educational intervention, as shown in table 3.

Chi-square test was used for testing null hypothesis to find out the difference in each practice between the pre-test and post-test. The difference was found to be highly significant ($p<0.02$) except urinary bag change in every three days. It indicates that educational intervention was effective to increase the practices of caretakers to prevent UTI among the bedridden patient, as shown in table 3.

DISCUSSION

This study revealed that 53.3% of the caretakers were female; this may be due to the caring role of Nepalese women in the society. Generally, family member found to be the caretaker during sick in the Nepalese society but this study showed that 10% caretakers were hired for long term care. It indicates caring role is changing from family member to paid caretakers in Nepalese society too.

This study also revealed that mean knowledge of caretakers' regarding different aspects; meaning, contributing factors, high risk group, signs & symptoms, consequences and preventive measures of UTI and practices to prevent UTI were increased significantly ($p=0.000$) after receiving educational program (mini-lecture and demonstration) except the practice of urinary bag change in three days. Similar result was found in the study conducted by Cardenas to find out the impact of educational program (written materials on urinary tract infection) and the study revealed that interventional group attained higher scores than control group after receiving educational program. [8]

People with indwelling catheter must know about the definition, risk factors, signs & symptoms and preventive measures of urinary tract infection. If people with indwelling catheter have adequate knowledge, then only they can use their knowledge to prevent catheter related urinary tract infection. A study was conducted by Wilde [9] in the community with the people having indwelling catheter and found that almost all of them were unaware about risk factors, symptoms and preventive measures of UTI, in contrast, this study found that caretakers scored knowledge by 39.74% as a whole on definition, risk factors, contributing factors, signs & symptoms, complications and preventive measures of UTI before receiving educational intervention and score was increased by 90.64% after receiving educational intervention.

Urinary blockage is one of the contributing factors for UTI. To increase fluid intake is one of the measures to prevent urinary blockage. This study showed that 96.6% of caretakers encouraged their patient to drink 2-3liters

of water per day after receiving educational program. A study was carried out with 24 patients having an indwelling urinary catheter for at least 3 months, among them 13 experienced blockage. Those who experienced blockage, 6 developed UTI during the 6 months of the review. Therefore, the nurses or caretakers need to be encouraged or taught their patients to increase fluid intake to prevent urinary blockage. [10]

CONCLUSION

UTI is a second most common infection among the nosocomial infections and brings many undesirable complications including death. Infection can be prevented if appropriate preventive measures are adopted by the high risk patient and care takers or providers. Education plays major role to increase awareness and improve practice to prevent UTI. This study was conducted to find out the changes in knowledge and practices among caretakers to prevent UTI in bedridden patient after educational intervention. The findings of this study showed that overall mean score on knowledge of preventive measures of UTI was 20.66% in the pre-test and after educational intervention it was changed into 47.13% in the post-test. It indicates that the caretakers had less knowledge in the pre-test and it was increased significantly ($p=0.000$) in the post-test. Similarly, this study revealed that practices of caretakers were increased significantly ($p<0.02$) after educational intervention in the post-test except practice of replacing urinary bag every three days.

Finally, it can be concluded that education plays an important role in increasing awareness as well as practices. But, due to many extraneous variables, it cannot be generalized whether the changes in knowledge and practice was due to educational package or other extraneous variables. This study was done in one group pre-test and post-test design or there was no comparison group; it might threat internal validity. Therefore, further study should be carried out using control group in order to establish strong relationship between independent and dependent variables.

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