International Journal of Chemical and Biochemical Sciences
(ISSN 2226-9614)

Journal Home page: www.iscientific.org/Journal.html

Effectiveness of nursing interventions in enhancing elderly self-care for preventing recurrent urinary tract infections

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Abstract

This quasi-experimental study aimed to evaluate the effectiveness of nursing interventions in enhancing elderly self-care for preventing recurrent urinary tract infections. A purposive sample of 150 elderly individuals with UTIs was divided into a study group (n=75), which received both standard care and nursing intervention about self-care practices for preventing recurrent urinary tract infections, and a control group (n=75), which received only the standard care protocol. The study was conducted in the urology outpatient clinics at Zagazig University Hospitals. Two tools were used; Structured Interview Questionnaire on Demographic characteristic, Health History, and Self -Care Practice Assessment. The study findings showed that 8.0% of the study group had total satisfactory self-practice pre-intervention while, (84% & 81.3%) of them had total satisfactory self-practice post-test and follow-up, respectively, compared to (8.0% & 6.7%) in the control group. Factors such as income (sufficient), previous work experience (housewife), and education level (illiterate) have a significantly positive effect on total self-practice post-intervention with p-values of 0.027, 0.004, and 0.006, respectively. Both the study and control groups exhibited an overall deficiency in self-care practices related to recurrent urinary tract infections (RUTIs) during the pre-intervention phase. However, post-intervention results provide evidence confirming the effectiveness of the nursing intervention in significantly improving self-care practices among the elderly in the study group. Implement continuous self-care practice nursing intervention program for urinary tract infection in outpatient clinics and urology departments. Conduct further research on a larger probability sample to achieve generalizability and wider adoption of self-care practices for UTI prevention.

Keywords: Nursing intervention, Self-care practices, Elderly**,** Recurrent urinary tract infections.

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1. Introduction

The world's population is aging rapidly, with 703 million people now over the age of 65, and this number is projected to reach 1.5 billion by 2050 [1]. Urinary tract infection (UTI) is one of the most commonly diagnosed infections in older adults, with estimates indicating that more than 10% of women and 5% of men aged over 65 have reported a UTI within the previous 12 months [2]. UTIs are the second most common type of infection in human medicine after respiratory tract infections in the United States and Europe, and the third most common infectious pathology after respiratory and gastrointestinal infections worldwide. In general, UTIs include infections of the urethra, bladder, ureter, and kidneys, most frequently due to bacteria originating from the alimentary tract [3].

Increasing age is a risk factor for UTI. Aging disrupts acquired immunity due to T cell dysfunction and a blunted cytokine-mediated inflammatory response. Normal defense mechanisms include the ability to void completely, acidification of urine from organic acids, and immunoglobulin production. Women are especially prone to UTIs because of their shorter urethral length and frequent vaginal colonization. Other frequently seen risk factors are anatomical abnormalities, sexual activity at any age, anal intercourse, diabetes, urinary incontinence, and physical limitations [4].

Approximately 20-37.8% of older adults show no obvious symptoms after getting the infection, causing difficulty in diagnosis and increasing the risk of bloodstream infection and subsequent death [5]. Although the estimated mortality rate is generally lower than with respiratory tract infections, it may rise up to 26% if complicated with

bacteremia or septic shock [6]. Prevention of recurrent urinary tract infections (RUTIs) includes continuous, post-coital antimicrobial prophylaxis, and the use of topical estrogen in postmenopausal women [7].

Gerontological nursing provides elderly teaching and offers the elderly knowledge to recognize the manifestation of UTI to facilitate early detection and treatment of future infections [8]. Lack of self-care practices in patients with urinary tract infections includes difficulty in accessing information and lack of knowledge for making health-related decisions and controlling their health. Therefore, self-care practices refer to activities and attitudes those individuals perform on their behalf to maintain life, health, and well-being. UTI-related self-care practices include practicing careful personal hygiene, increasing fluid intake, urinating regularly, nutritional practices, engaging in exercises and daily activities, maintaining normal body weight, following the therapeutic regimen, and follow up [9]. This study aimed to evaluate the effectiveness of nursing interventions in enhancing elderly self-care for preventing recurrent urinary tract infections.

2. Methods

Study Design and Setting

This quasi-experimental study was conducted in the urology outpatient clinic at Zagazig University Hospitals, in Egypt.

Sampling Technique:

A purposive sample of 150 elderly individuals with UTIs was divided into a study group (n=75), which received both standard care and nursing intervention about self-care practices for preventing recurrent urinary tract infections, and a control group (n=75), which received only the standard care protocol. All participants had been diagnosed with urinary tract infection and met the specified criteria outlined below:

Inclusion Criteria:

- The ability to independently perform all self-care activities.
- Inclusion of both sexes.
- Willingness to actively participate in the study.
- Able to communicate.

Exclusion Criteria:

- Individuals with diagnosed mental disorders.

Sample size calculation

Sample size calculated using open epi is 150 who will receive self-care practice intervention. Percent of urinary tract infection among elderly with intervention program was (7.2%), whereas percent of urinary tract infection among elderly on routine care was (18%) [10]. Confidence level is 95% with power of study 80%, therefore the sample was 150 patients (75 patients in study group &75 patients in control group).

Tool of data collection

Two tools were used for collection of data. **Tool I:** an A structured interview questionnaire to assess collect the necessary data for the current study. It was consist of two parts:

Part 1: Demographic characteristics of the elderly participants:

To assess the elderly characteristics, which included age, residence, gender, and marital status, level of education, working before retirement, current working, monthly income, and living with.

Part 2: Health History of the elderly participants:

Composed of **past medical history** which included: (previous urinary system surgeries, the presence of urinary system stones, kidney ailments, previous occurrences of UTIs within the past year, previous hospitalizations, urinary catheter been inserted previously, family history of urinary tract infection, Suffer from chronic disease, and take medication for chronic disease). And **present medical history** which included: (The main complaint related to urinary tract infection, instances of infections in organs other than the urinary system, and the ongoing treatment being pursued for the urinary tract infection).

Tool II: Self -Care Practice Assessment:

It was developed by the researchers after reviewing related literatures [11-12] to gather information on self-care practices patients report using that minimize UTI. It contained (44) items divided into eight domains as follow; practicing careful personnel hygiene (22 items), adequate fluid intake (5 items), voiding frequently and regularly (3 items), nutritional practices (5 items), exercises and daily activities (3 items), maintain normal body weight (2 items), following the therapeutic regimen (3 items), and follow up (1 item). Self -care practice was rated on a three-point likert scale, which ranged from (0 - 2), where (0) represented never, (1) sometimes, and (2) always. The elderly participants responses to each item were summed, with the total score of the items being 88 points. The result was divided by the number of items to provide a mean score for each part. These scores were then transformed into a percentage score:

60% or more of the total score was considered satisfactory. < 60% of the total score was considered unsatisfactory.

Data Collection Process

The study was conducted in a separate room at the urology outpatient clininc at Zagazig University Hospital from February 2023 up to the end of August 2023. The data of the study were collected by the researchers by face-to-face interviews with the patients before and after the intervention. The researcher read and explained each item of the study tools to the elderly and then recorded her response to each item. Data collection took about 20-25 min to complete for each patient. The posttest was done after one month of completing the intervention and follow-up was conducted three months later for both groups.

The Self-Care Practices Intervention

It was designed by the researchers after revising of related literature [9-11-12-13]. The self-care practice intervention was exclusively administered to the study group. The study group was divided into 15 smaller groups, each comprising 5 elderly participants, fostering interaction and discussions. The instructional sessions were organized into 1 theoretical and 4 practical components, each lasting 30 to 45

minutes. In total, 15 theoretical sessions and 60 practical sessions were conducted on Saturdays, Mondays, Wednesdays, and Thursdays from 10 am to 1 pm.

The Self-Care Practices Intervention consisted of five sessions as follows:

Session 1: This session aimed to promote the elderly participants' knowledge about the concepts, different types, and significance of self-care practices in maintaining urinary health.

Session 2: The objective of this session was to help the elderly apply personal hygiene practices, particularly focusing on the steps required to care for the genitalia area.

Session 3: This session aimed to guide the elderly on adequate fluid intake, performing frequent and regular voiding, and accurately measuring urine output over 24 hours. The session also covered the correct procedure for taking a urine sample for testing.

Session 4: The focus of this session was to help the elderly apply nutritional practices and engage in regular physical exercise.

Session 5: The main objective of this session was to assist the elderly in managing their weight, adhering to therapeutic regimens, and ensuring regular follow-up with healthcare providers.

Participants engaged actively, gaining skills and autonomy to protect their urinary health. A PowerPoint presentation and group discussions reinforced comprehension. Feedback from the elderly was encouraged, and visually appealing brochures containing concise information were distributed for post-intervention reference.

***Ethical* Considerations**

The study proposal was subjected to thorough scrutiny and received approval from the Research Ethics Committee (REC) as well as the Postgraduate Committee of the Faculty of Nursing at Zagazig University, with the approval granted in November 2022. The ethical principles adhered to were as follows:

Informed Consent: Each elderly was provided with a verbal explanation of the study's objectives, along with the rights to non-participation or withdrawal at any point without needing to provide any reasons. Participants were informed that their involvement in the study was completely voluntary.

Confidentiality: Participants were assured that all data collected from them would remain confidential and would be used exclusively for research purposes.

Statistical *analysis*

Data collected from the studied sample was revised, coded and entered using Personal Computer (PC). Computerized data entry and statistical analysis were fulfilled using the Statistical Package for Social Sciences (SPSS) version 22. Data were presented using descriptive statistics in the form of frequencies, percentages and Mean SD. A correlation coefficient “Pearson correlation” is a numerical measure of some type of correlation, meaning a statistical relationship between two variables. Chi-square is a statistical test that examines the differences between qualitative data (study and control). McNemar test is a statistical test that examines the differences between qualitative data (pre, post and follow-up). ANOVA, which stands for Analysis of Variance, is a statistical test used to analyze the difference between the means (pre, post and follow-up). T-test, which stands for Analysis of Variance, is a statistical test used to analyze the difference between the means (study and control). Linear regression analysis is used to predict the value of a variable based on the value of another variable.

3. Results

The elderly’ characteristics in the intervention and control groups

Table 1 indicates that 50.7% of both study and control group had read and write, 64% of the study group and 62.7% of the control group had insufficient income. In addition, 60% of the study group and 62.6% of the control group lived with their spouse. There were no significant differences in terms of demographic characteristics across all domains between the study and control groups.

Elderly participants’ health history (past and present medical history) in the intervention and control groups

Table 2 describes that 81.3% of study group had no previous urinary system surgeries, comparable to 82.7% in the control group. Renal surgeries were reported by 78.6% in the study group and 76.9% in the control group. Additionally, urinary system stones were found in 50.7% of the study group and 52% of the control group, while kidney diseases were reported by 9.3% of the study group and 6.7% of the control group.

Furthermore, urinary tract infections in the past year were experienced by 92% of the study group and 93.3% of the control group. Among those with urinary tract infections, 85.5% in the study group suffered ≥4 times, while 88.6% in the control group experienced a similar frequency. Regarding previous hospitalization, 13.3% of the study group compared to 16% of the control group had been hospitalized. Additionally, in the study group, 22.7% and 29.3% compared to 25.3% and 32% in the control group had previously used catheters and had a family history of UTI, respectively. Moreover, 80% of the study group compared to 78.7% of the control group reported having chronic diseases, with diabetes being highly prevalent at 53.3% in the study group compared to 52.5% in the control group.

Table 3 demonstrates that 76% of participants in the study group and 77.3% in the control groups reported dysuria as the main complaint of UTI, and only 6.7% in the study group and 8% in the control group had infections in organs other than the urinary system. Additionally, 60% and 66.7% had respiratory infections. Concerning the current treatment for urinary tract infection, 32% in the study group and 34.7% in the control group received analgesics.

Effects of the Nursing Intervention on Patient’s Self-Care Practices

Table 4a reveals a highly statistically significant differences between pre, post, and follow-up intervention in the study group regarding their practice of personal hygiene, including wiping the anal area after a bowel movement from front to back, wiping the urethral area after urinating from front to back until dry, urinating before and after sexual activity, washing genitalia before and after sex, wearing loose cotton underwear, and drying the underwear by the sun ($P < 0.01$).

Moreover, there was highly statistically significant differences between the study and control groups regarding their practice of personal hygiene at post-test and follow-up ($P < 0.01$).

Table 4b explores highly statistically significant difference between pre, post, and follow-up intervention in the study group concerning various aspects of women personal hygiene, specifically the care of the genital area including, washing hands thoroughly, avoiding the use of vaginal douche, staying away from scented wipes and powder in the sensitive area, not using a rough loofah when bathing, replacing it with a soft loofah or a small cotton towel, and consulting a doctor if abnormal secretions are noticed ($p < 0.01$). Furthermore, there was a statistically significant difference between pre, post, and follow-up intervention in the study group concerning practices such as removing excess hair constantly, carefully washing the vagina and the area around it (the vulva) daily, rinsing the sensitive area at least twice a day with lukewarm water only, not leaving the sensitive area wet, drying it well, and changing underwear daily ($p < 0.05$).

Table 4c indicates highly statistically significant difference between pre, post, and follow-up intervention in the study group regarding various aspects of men personal hygiene, including washing hands thoroughly, gently washing the male organ (penis and testicles) from top to bottom, and rinsing the male organ well to get rid of the remaining soap ($p < 0.01$). Furthermore, there is a statistically significant difference between pre, post, and follow-up intervention in the study group concerning practices like constantly shaving pubic hair and testicles, using mild soap to wash the penis, and wearing clean, dry underwear, and changing them daily ($p < 0.05$).

Moreover, there was a highly statistically significant difference between the study and control groups at post-test and follow-up regarding washing hands thoroughly, gently washing the male organ (penis and testicles) from top to bottom, and rinsing the male organ well to get rid of the remaining soap ($p < 0.01$). Additionally, there was a statistically significant difference between the study and control groups at post-test and follow-up concerning practices such as constantly shaving pubic hair and testicles, using mild soap to wash the penis, and wearing clean, dry underwear, and changing them daily ($p < 0.05$).

Table 5 shows the distribution of the elderly participants based on self-care. Regarding adequate fluid intake and measuring the amount of fluid, a statistically significant difference is observed between pre, post, and follow-up intervention in the study group. Specifically, in the study group at post-test and follow-up , there were significant improvements in practices such as drinking fluids about 6-8 cups/day, avoiding drinking cola, avoiding drinking tea, avoiding drinking coffee drinks ($p < 0.01$), and drinking boiled barley ($p < 0.05$). Moreover, there was a highly statistically significant difference between the study and control groups at post-test and follow-up regarding these self-care practices ($p < 0.01$).

Concerning voiding frequently and regularly, a statistically significant difference is found between pre, post, and follow-up intervention in the study group. The improvements include going to the bathroom frequently enough, emptying the bladder, and avoiding holding urine ($p < 0.05$). Additionally, there was a statistically significant difference between the study and control groups at post-test and follow-up regarding these self-care practices ($p < 0.05$). Furthermore, in the control group, there was no statistically significant difference between pre, post, and follow-up regarding going to the bathroom frequently enough, emptying the bladder, avoiding holding urine, and measuring the amount of urine/24 hrs ($p > 0.05$).

Table 6 demonstrates a statistically significant difference between pre, post, and follow-up intervention in the study group regarding their nutritional practices, exercises, and daily activities ($p < 0.05$). Additionally, there was a statistically significant difference between the study and control groups at post-test and follow-up regarding their exercises and daily activities ($p < 0.05$). Moreover, there was a statistically significant difference between the study and control groups at post-test and follow-up regarding specific dietary practices, such as eating healthy fresh food, consuming food containing vitamin C, and avoiding spicy food ($p < 0.05$).

Furthermore, there was a highly statistically significant difference between the study and control groups at post-test and follow-up regarding the adoption of a high-fiber diet to avoid constipation ($p < 0.01$). Additionally, there was a statistically significant difference between the study and control groups at post-test and follow-up regarding the avoidance of using more sugar and salt in the diet ($p < 0.01$ and $p < 0.05$, respectively).

Table 7 presents the distribution of the elderly participants based on self-care. As for maintaining normal body weight, there was a statistically significant difference between pre, post, and follow-up intervention in the study group, regarding checking body weight regularly and follow a diet regime ($p < 0.05$). Moreover, there was a statistically significant difference between the study and control groups at post-test and follow-up regarding elements related to maintaining normal body weight ($p < 0.01$). Concerning following the therapeutic regimen, there was a statistically significant difference between pre, post, and follow-up intervention in the study group regarding taking prescribed medication on time and completing the course of medication ($p < 0.01$), and seeking medical advice when having UTI ($p < 0.05$). Moreover, there is a statistically significant difference between the study and control groups at post-test and follow-up regarding taking prescribed medication on time and completing the course of medication ($p < 0.01$) and seeking medical advice when having UTI ($p < 0.05$).

Regarding follow-up, there was a statistically significant difference between pre, post, and follow-up intervention in the study group regarding making follow-ups regularly, observing any manifestations, and notifying the doctor ($p < 0.05$). Also, there was a statistically significant difference between the study and control groups at post-test and follow-up regarding making follow-ups regularly, observing any manifestations, and notifying the doctor ($p < 0.05$).

Figure 1 illustrated that 8.0% of the study group had total satisfactory self-practice pre-intervention while, (84% & 81.3%) of them had total satisfactory self-practice post-test and follow-up, respectively, compared to (8.0% & 6.7%) in the control group.

Predictors of total self-care practices post- intervention in the study group

Table 8 describes to that a highly significant model was detected through an F-test (F = 7.665, p-value = 0.002). This model explains 39% of the variation in total self-practice post-intervention among the study group, as denoted by the coefficient of determination (r^2 = 0.39). Moreover, the table states that factors such as income (sufficient), previous work experience (housewife), and education level (illiterate) have a significantly positive effect on total self-practice post-intervention with p-values of 0.027, 0.004, and 0.006, respectively.

Table (1): Distribution of Elderly Participants Based on Their Demographic Characteristics in the Study and Control Groups (n=150)

Demographic Characteristics	Study group (n=75)		Control group (n=75)		Test P value
	No	%	No	%	
Age (years)					**T test**
60-<70	28	37.3	27	36	1.220
70-<80	26	34.7	25	33.3	>0.05
80 or more	21	28	23	30.7	
Mean± SD	**72.66±8.97**		**72.93±9.2**		
Residence					**Chi-square**
Rural	71	94.7	72	96	0.531
Urban	4	5.3	3	4	>0.05
Gender					
Male	30	40	28	37.3	0.916
Female	45	60	47	62.7	>0.05
Marital status					**Chi-square**
Married	45	60	47	62.7	1.009
Unmarried	2	2.7	1	1.3	>0.05
Divorced	0	0	0	0	
Widow	28	37.3	27	36	
Educational level					**Chi-square**
Illiterate	31	41.3	32	42.6	1.081
Read &write	38	50.7	38	50.7	>0.05
Primary education	3	4	2	2.7	
Secondary education	3	4	2	2.7	
University education	0	0	1	1.3	
Working before retirement					**Chi-square**
Employee	2	2.7	4	5.3	1.346
Housewife	50	66.7	48	64	>0.05
Farmer/Laborer	18	24	19	25.3	
Free business	5	6.7	4	5.4	
Current working					**Chi-square**
Working	6	8	8	10.7	0.781
Not working	69	92	67	89.3	>0.05
Monthly income					**Chi-square**
Insufficient	48	64	47	62.7	0.893
Sufficient	27	36	28	37.3	>0.05
Sufficient and save	0	0	0	0	
Living with					**Chi-square**
Alone	14	18.7	14	18.7	0.659
Spouse	45	60	47	62.6	>0.05
Sons /relatives	16	21.3	14	18.7	

*Significant at p ‹0.05. **Highly significant at p ‹0.01. Not significant at p>0.05

Table (2): Distribution of Elderly Participants Based on their Past Medical History in the Study and Control Groups (n=150)

Past Medical History	Study group	Control group	Chi-square

	(n=75)		(n=75)		P value
	No	%	No	%	
Have previous surgeries in the urinary system					
Yes	14	18.7	13	17.3	0.350
No	61	81.3	62	82.7	>0.05
***If the answer is yes, what is * n=14**		**n=13**			
Renal	11	78.6	10	76.9	1.009
Bladder	3	21.4	1	7.7	>0.05
Urethra	0	0	2	15.4	
Ureter	0	0	0	0	
Stones in the urinary system					
Yes	38	50.7	39	52	0.702
No	37	49.3	36	48	>0.05
Suffer from kidney disease					
Yes	7	9.3	5	6.7	1.022
No	68	90.7	70	93.3	>0.05
Previous urinary tract infection within the past year					
Yes	69	92	70	93.3	---
No	6	8	5	6.7	
Times you suffer n=69		**n=70**			
Once	0	0	0	0	.178
Twice	0	0	0	0	>0.05
Three	10	14.5	8	11.4	
Four or more	59	85.5	62	88.6	
Previous hospitalization					
Yes	10	13.3	12	16	1.032
No	65	86.7	63	84	>0.05
Urinary catheter been inserted previously					
Yes	17	22.7	19	25.3	1.101
No	58	77.3	56	74.7	>0.05
Family history of urinary tract infection					
Yes	22	29.3	24	32	1.300
No	53	70.7	51	68	>0.05
Suffer from chronic disease					
Yes	60	80	59	78.7	0.453
No	15	20	16	21.3	>0.05
If the answer is yes, what is * n=60		**n=59**			
HTN	27	45	28	47.5	0.604
DM	32	53.3	31	52.5	>0.05
Heart disease	19	31.7	18	30.5	
Respiratory disease	2	3.3	1	1.7	
GIT disease	6	10	5	8.5	
Liver disease	7	11.7	8	13.6	
Osteoporosis	6	10	7	11.9	
Neurological	3	5	4	6.8	
Take medication for chronic disease					
Yes	60	80	59	78.7	0.453
No	15	20	16	21.3	>0.05

*Significant at p ‹0.05. **Highly significant at p ‹0.01. Not significant at p>0.05

*More than one answer

Table (3): Distribution of Elderly Participants Based on their Present Medical History in the Study and Control Groups (n=150)

Present Medical History	Study group	Control group	Test

	(n=75)		(n=75)		P value
	No	%	No	%	
Main complaint of a urinary tract infection*					**Chi-square**
Suprapubic pain	34	45.3	32	42.7	1.701
Flank pain	39	52	40	53.3	>0.05
Hematuria	27	36	26	34.7	
Dysuria	57	76	58	77.3	
Frequency	51	68	53	70.7	
Urgency	43	57.3	44	58.7	
Burning during urination	38	50.7	37	49.3	
Infections in organs other than the urinary system					**Chi-square**
Yes	5	6.7	6	8	0.866
No	70	93.3	69	92	>0.05
If yes, report that n=5 n=6					**Chi-square**
Respiratory infection	3	60	4	66.7	1.253
Cardiovascular infection	0	0	0	0	>0.05
Gastrointestinal tract infection	2	40	2	33.3	
Current treatment for urinary tract infection*					**Chi-square**
Antibiotic	20	26.7	21	28	1.003
Analgesic	24	32	26	34.7	>0.05
Antifungal	3	4	3	4	
Anti –inflammatory	18	24	16	21.3	
None	19	25.3	17	22.7	

*Significant at p ‹0.05. **Highly significant at p ‹0.01. Not significant at p>0.05 *More than one answer

Table (4a): Distribution of Elderly Participants Based on Their Practices of Personnel Hygiene Across Pre, Post, and Follow-Up Intervention in the Study and Control Groups (n=150)

1. Personnel Hygiene	Group	Pre-test	Post-test (After 1 week)	Follow-up (After 3 months)	ANOVA	P
		M±SD	M±SD	M±SD		
Wipe the anal area after a bowel movement from front to the back	**Study**	0.76±0.02	1.85±0.66	1.81±0.47	5.923	<0.01**
	Control	0.69±.012	0.44±.035	0.43±.027	0.024	>0.05
	T. Test	.054	6.505	6.823		
		>0.05	<0.01**	<0.01**		
Wipe the urethral area after urinating from front to back until to dry	**Study**	0.63±0.08	1.79±0.29	1.73±0.36	6.119	<0.01**
	Control	0.66±.010	0.69±.030	0.67±.023	0.013	>0.05
	Test	.031	6.100	5.998		
		>0.05	<0.01**	<0.01**		
Urinate before and after sexual activity	**Study**	0.21±0.04	1.85±0.66	1.81±0.47	5.887	<0.01**
	Control	0.23±.017	0.44±.035	0.43±.027	0.024	>0.05
	Test	.043	6.777	5.613		
		>0.05	<0.01**	<0.01**		
Wash genitalia before and after sex	**Study**	0.19±0.06	1.69±0.34	1.70±0.51	5.803	<0.01**
	Control	0.20±.011	0.21±.017	0.21±.007	0.004	>0.05
	Test	.011	6.801	5.790		
		>0.05	<0.01**	<0.01**		
Wear cotton-loose underwear	**Study**	0.73±0.12	1.91±0.13	1.90±0.12	5.999	<0.01**
	Control	0.68±0.10	0.69±.011	0.68±.010	0.038	>0.05
	Test	.024	5.671	5.600		
		>0.05	<0.01**	<0.01**		
Dry the underwear by the sun	**Study**	0.64±0.09	1.82±0.22	1.80±0.20	6.000	<0.01**
	Control	0.66±.013	0.65±.013	0.65±.012	0.141	>0.05
	Test	.027	5.324	5.222		
		>0.05	<0.01**	<0.01**		

Table (4b): Distribution of Elderly Participants Women Based on Care of the Genital Area Across Pre, Post, and Follow-Up Intervention in the Study and Control Groups (n=150)

A. Care of the Genital Area in Women	**Group**	**Pre-test**	**Post-test (After 1 week)**	**Follow-up (After 3 months)**	**ANOVA**	**P**
		M±SD	**M±SD**	**M±SD**		
Wash the hands thoroughly	**Study** **Control**	0.71±0.11 0.69±0.17	1.95±0.17 0.70±0.13	1.94±0.29 0.69±0.10	6.011 0.250	<0.01** >0.05
	T.Test	.203 >0.05	5.675 <0.01**	5.801 <0.01**		
Remove excess hair constantly	**Study** **Control**	0.53±0.10 0.56±0.11	1.23±0.14 0.57±0.12	1.20±0.17 0.58±0.10	4.013 0.250	<0.05* >0.05
	Test	.189 >0.05	4.380 <0.05*	4.200 <0.05*		
Carefully wash the vagina and the area around it (the vulva) daily	**Study** **Control**	0.43±0.09 0.46±0.10	1.10±0.07 0.46±0.09	1.08±0.09 0.45±0.06	3.990 0.250	<0.05* >0.05
	Test	.113 >0.05	3.578 <0.05*	3.400 <0.05*		
Rinse the sensitive area at least twice a day with lukewarm water only.	**Study** **Control**	0.13±0.01 0.10±0.02	0.64±0.01 0.10±0.01	0.62±0.03 0.10±0.006	2.972 0.250	<0.05* >0.05
	Test	.006 >0.05	2.900 <0.05*	2.878 <0.05*		
Do not leave the sensitive area wet, dry it well	**Study** **Control**	0.34±0.09 0.33±0.02	0.96±0.12 0.34±0.08	0.98±0.11 0.33±0.026	3.124 0.450	<0.05* >0.05
	Test	.012 >0.05	3.240 <0.05*	3.190 <0.05*		
Change your underwear daily	**Study** **Control**	0.11±0.01 0.09±0.01	0.68±0.01 0.09±0.01	0.62±0.01 0.08±0.006	2.900 0.004	<0.05* >0.05
	Test	.002 >0.05	2.913 <0.05*	2.980 <0.05*		
Avoid the use of vaginal douche	**Study** **Control**	0.26±0.07 0.24±0.06	1.45±0.19 0.23±0.03	1.94±0.29 0.69±0.10	6.230 0.277	<0.01** >0.05
	Test	.203 >0.05	5.644 <0.01**	5.357 <0.01**		
Stay away from scented wipes and powder in the sensitive area.	**Study** **Control**	0.54±0.16 0.57±0.18	1.80±0.16 0.56±0.14	1.81±0.27 0.57±0.11	6.223 0.035	<0.01** >0.05
	Test	.177 >0.05	5.777 <0.01**	5.578 <0.01**		
Do not use a rough loofah when bathing, and replace it with a soft loofah or a small cotton towel	**Study** **Control**	0.42±0.05 0.43±0.09	1.65±0.13 0.47±0.03	1.61±0.21 0.46±0.14	4.744 0.760	<0.01** >0.05
	Test	.012 >0.05	4.599 <0.01**	4.766 <0.01**		
Consult a doctor if you notice secretions of an abnormal color	**Study** **Control**	0.44±0.06 0.42±0.08	1.59±0.22 0.41±0.031	1.57±0.21 0.43±0.012	4.677 0.250	<0.01** >0.05
	Test	.013 >0.05	4.560 <0.01**	4.226 <0.01**		

Table (4c): Distribution of Elderly Participants Men Based on Care of the Genital Area Across Pre, Post, and Follow-Up Intervention in the Study and Control Groups (n=150)

B. Care of the Genital Area in Men	Group	Pre-test	Post-test (After 1 week)	Follow-up (After 3 months)	ANOVA	P
		M±SD	M±SD	M±SD		
Wash the hands thoroughly	**Study** **Control**	0.73±0.14 0.71±0.16	1.90±0.15 0.70±0.12	1.91±0.20 0.69±0.11	6.234 1.050	<0.01** >0.05
	T.Test	.098 >0.05	5.890 <0.01**	5.956 <0.01**		
Constantly shaving pubic hair and testicles	**Study** **Control**	0.50±0.09 0.51±0.08	1.18±0.14 0.53±0.08	1.17±0.10 0.52±0.10	3.980 0.250	<0.05* >0.05
	Test	.182 >0.05	3.897 <0.05*	3.700 <0.05*		
Use mild soap to wash the penis.	**Study** **Control**	0.32±0.06 0.30±0.04	1.14±0.13 0.32±0.05	1.07±0.10 0.33±0.05	2.999 0.289	<0.05* >0.05
	Test	.012 >0.05	2.879 <0.05*	3.000 <0.05*		
Gently wash the male organ (penis and testicles) from top to bottom well	**Study** **Control**	0.44±0.05 0.45±0.09	1.61±0.14 0.47±0.03	1.60±0.20 0.46±0.15	4.777 0.360	<0.01** >0.05
	Test	.013 >0.05	4.600 <0.01**	4.666 <0.01**		
Rinse the male organ well to get rid of the remaining soap.	**Study** **Control**	0.44±0.05 0.45±0.09	1.61±0.14 0.47±0.03	1.60±0.20 0.46±0.15	4.777 0.360	<0.01** >0.05
	Test	.013 >0.05	4.600 <0.01**	4.666 <0.01**		
Wear clean, dry underwear and change them daily	**Study** **Control**	0.25±0.04 0.23±0.06	1.01±0.17 0.22±0.03	0.94±0.19 0.24±0.020	3.011 0.250	<0.05* >0.05
	Test	.143 >0.05	3.644 <0.05*	3.357 <0.05*		

Table (5): Distribution of Elderly Participants Based on Self-Care Across Pre, Post, and Follow-Up Intervention in the Study and Control Groups (n=150)

Self-care practices	Group	Pre-test	Post-test (After 1 week)	Follow-up (After 3 months)	ANOVA	P
		M±SD	M±SD	M±SD		
2. Adequate fluid intake:						
Drink fluids about6-8 cup/day	**Study**	0.47±0.06	1.80±0.65	1.81±0.42	5.980	<0.01**
	Control	0.40±.013	0.44±.030	0.43±.027	0.024	>0.05
	T. Test	1.005	5.901	5.670		
		>0.05	<0.01**	<0.01**		
Drink boiled barley	**Study**	0.21±0.06	0.79±0.13	0.77±0.12	2.980	<0.05*
	Control	0.19±.003	0.20±.009	0.31±.007	0.024	>0.05
	Test	1.005	5.901	5.670		
		>0.05	<0.01**	<0.01**		
Avoid drinking cola	**Study**	0.19±0.06	1.69±0.34	1.70±0.51	5.803	<0.01**
	Control	0.20±.011	0.21±.017	0.21±.007	0.004	>0.05
	Test	.011	6.801	5.790		
		>0.05	<0.01**	<0.01**		
Avoid drinking tea	**Study**	0.27±0.02	1.46±0.30	1.45±0.21	6.013	<0.01**
	Control	0.25±.013	0.23±.011	0.23±.014	0.013	>0.05
	Test	.026	5.780	6.001		
		>0.05	<0.01**	<0.01**		
Avoid drinking coffee	**Study**	0.43±0.04	1.62±0.14	1.60±0.20	4.773	<0.01**
	Control	0.42±0.09	0.43±0.03	0.44±0.16	0.260	>0.05
	Test	.013	4.538	4.600		
		>0.05	<0.01**	<0.01**		
3. Voiding frequently and regularly						
Go to the bathroom frequently enough and empty the bladder completely	**Study**	0.53±0.10	1.23±0.14	1.20±0.17	4.013	<0.05*
	Control	0.56±0.11	0.57±0.12	0.58±0.10	0.250	>0.05
	Test	.189	4.380	4.200		
		>0.05	<0.05*	<0.05*		
Avoid holding urine	**Study**	0.83±0.12	1.94±0.23	1.93±0.27	4.222	<0.05*
	Control	0.81±0.17	0.82±0.26	0.81±0.20	0.261	>0.05
	Test	.189	4.176	4.133		
		>0.05	<0.05*	<0.05*		
Measure the amount of urine/24 hours	**Study**	0.16±0.01	0.17±0.001	0.18±0.013	0.124	>0.05
	Control	0.19±0.01	0.16±0.002	0.17±0.02	0.150	>0.05
	Test	.0006	1.035	0.190		
		>0.05	>0.05	>0.05		

Table (6) Distribution of Elderly Participants Based on Self-Care Across Pre, Post, and Follow-Up Intervention in the Study and Control Groups (n=150)

Self-care practices	Group	Pre-test	Post-test (After 1 week)	Follow-up (After 3 months)	ANOVA	P
		M±SD	M±SD	M±SD		
4. Nutritional practices:						
Eat healthy fresh food and avoid preserved food	**Study**	0.34±0.09	0.96±0.12	0.98±0.11	3.124	<0.05*
	Control	0.33±0.02	0.34±0.08	0.33±0.026	0.450	>0.05
	T.Test	.012	3.240	3.190		
		>0.05	<0.05*	<0.05*		
Consume food containing vitamin C	**Study**	0.24±0.09	0.67±0.11	0.66±0.03	2.998	<0.05*
	Control	0.23±0.02	0.24±0.07	0.23±0.013	0.015	>0.05
	Test	.011	2.776	2.879		
		>0.05	<0.05*	<0.05*		
Increase fiber diet to avoid Constipation.	**Study**	0.21±0.06	0.79±0.13	0.77±0.12	2.980	<0.05*
	Control	0.19±.003	0.20±.009	0.31±.007	0.024	>0.05
	Test	1.005	5.901	5.670		
		>0.05	<0.01**	<0.01**		
Avoid using more sugar and salt in your diet	**Study**	0.23±0.04	0.98±0.16	0.96±0.12	3.103	<0.05*
	Control	0.21±.005	0.20±.0.03	0.22±.011	0.016	>0.05
	Test	0.017	3.100	3.456		
		>0.05	<0.01**	<0.05*		
Avoid spicy food	**Study**	0.29±0.06	0.76±0.07	0.74±0.04	2.998	<0.05*
	Control	0.31±0.03	0.30±0.09	0.29±0.010	0.015	>0.05
	Test	.011	2.776	2.879		
		>0.05	<0.05*	<0.05*		
5. Exercises and daily activities						
Housework with yourself	**Study**	0.13±0.01	0.66±0.01	0.65±0.02	2.654	<0.05*
	Control	0.09±0.01	0.08±0.01	0.08±0.003	0.008	>0.05
	Test	.002	2.775	2.883		
		>0.05	<0.05*	<0.05*		
Shopping with yourself	**Study**	0.12±0.03	0.49±0.01	0.50±0.11	2.888	<0.05*
	Control	0.15±0.02	0.14±0.02	0.13±0.019	0.017	>0.05
	Test	.012	2.666	2.900		
		>0.05	<0.05*	<0.05*		
Walk at least 30 minutes each day	**Study**	0.15±0.07	0.56±0.09	0.54±0.12	3.025	<0.05*
	Control	0.14±0.06	0.17±0.05	0.15±0.03	0.065	>0.05
	Test	.009	2.800	3.001		
		>0.05	<0.05*	<0.05*		

Table (7) Distribution of Elderly Participants Based on Self-Care Across Pre, Post, and Follow-Up Intervention in the Study and Control Groups (n=150)

Self-care practices	Group	Pre-test	Post-test (After 1 week)	Follow-up (After 3 months)	ANOVA	P
		M±SD	M±SD	M±SD		
6. Maintain normal body weight:						
Check your body weight regularly	**Study** **Control**	0.30±0.08 0.31±0.03	0.61±0.11 0.32±0.07	0.60±0.09 0.33±0.05	2.878 0.450	<0.05* >0.05
	T.Test	.012 >0.05	3.240 <0.05*	3.190 <0.05*		
Follow a diet regime	**Study** **Control**	0.20±0.05 0.21±0.06	0.66±0.12 0.22±0.09	0.63±0.10 0.20±0.06	2.908 0.316	<0.05* >0.05
	Test	.018 >0.05	3.506 <0.05*	3.700 <0.05*		
7. Following the therapeutic regimen						
Seek medical advice when you have UTI	**Study** **Control**	0.21±0.06 0.19±.003	0.79±0.13 0.20±.009	0.77±0.12 0.31±.007	2.930 0.024	<0.05* >0.05
	Test	1.005 >0.05	3.001 <0.05*	3.103 <0.05*		
Take the prescribed medication on time	**Study** **Control**	0.23±0.09 0.25±.004	1.36±0.24 0.26±.015	1.30±0.28 0.24±.014	5.001 0.024	<0.01** >0.05
	Test	0.613 >0.05	5.677 <0.01**	6.001 <0.01**		
Complete the course of medication.	**Study** **Control**	0.34±0.10 0.37±0.11	1.69±0.37 0.38±0.16	1.62±0.29 0.36±.014	6.111 0.410	<0.01** >0.05
	Test	0.350 >0.05	6.098 <0.01**	6.200 <0.01**		
8. Follow up						
Make follow up regularly, observing any manifestation, and notifying the doctor	**Study** **Control**	0.23±0.09 0.25±0.08	0.91±0.12 0.26±.014	0.90±0.15 0.24±.003	3.001 0.036	<0.05* >0.05
	Test	0.085 >0.05	2.998 <0.05*	2.876 <0.05*		

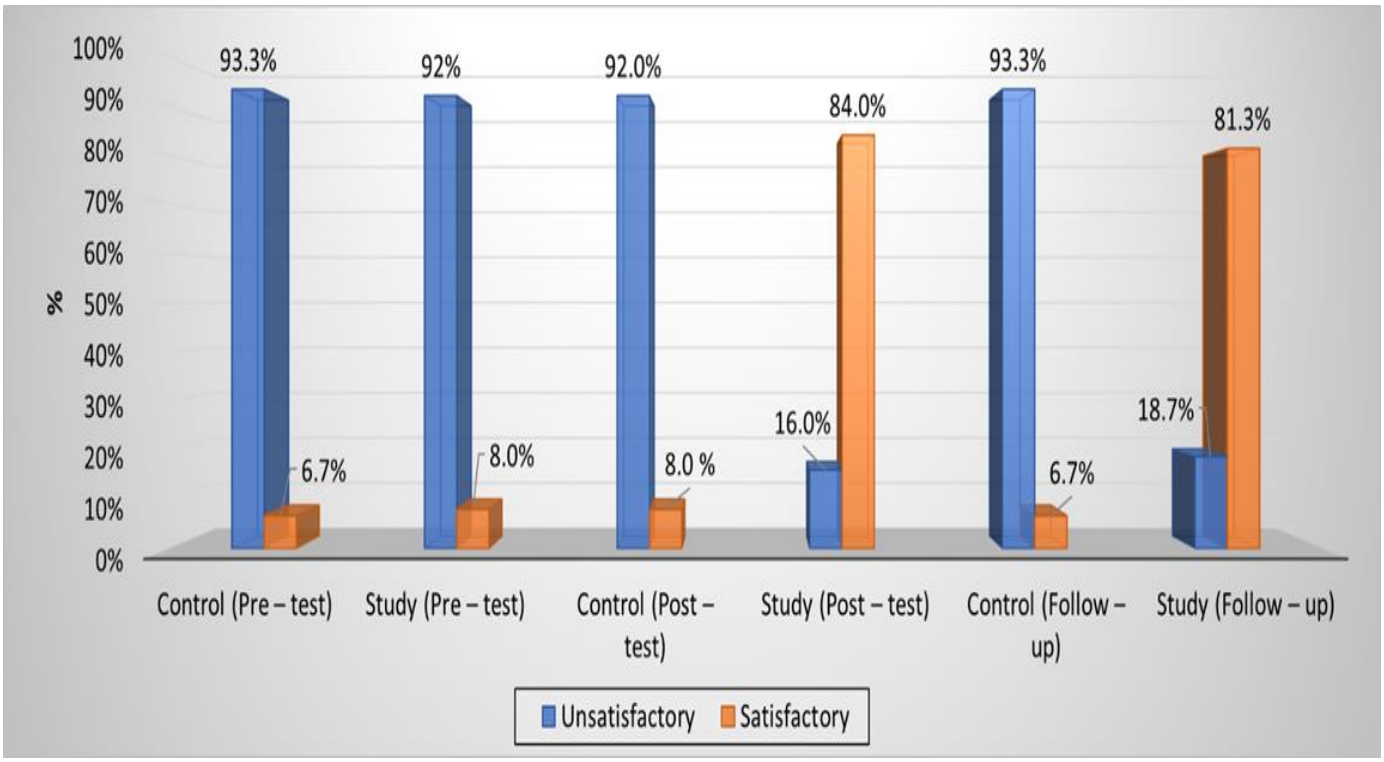

Fig. 1. Distribution of Elderly Participants Based on Their Total Self- Care Practice Across Pre, Post, and Follow-Up Intervention in the Study and Control Groups (n=150)

Table (8) Predictors of total self-care practices post- intervention in the study group

Variables		**Unstandardized Coefficients**	**standardized Coefficients**	**T**	**P. value**
		B	B		
Income (Sufficient)		.164	.118	3.001	.027*
Previous work (Housewife)		-.230	.194	6.399	.004**
Education level (Illiterate)		-.218	.187	5.660	.006**
Model	**R^2**	**Df.**	**F**	**P. value**	
Regression	**0.39**	2	7.665	.002**	

a. Dependent Variable: total self-practice
b. Predictors: (constant): Income (Sufficient), Previous work (Housewife), Education level (Illiterate)

4. Discussion

Urinary Tract Infections (UTIs) are among the most prevalent bacterial infections in older adults, account for around 25% of all infections. Clinical manifestations vary from self-limited illness to life-threatening sepsis (Godbole et al., 2020) [14]. In the context of health, experts are concerned about chronic illnesses and the consequences they cause in older persons. Therefore, as self-care is a practice that supports health, wellbeing, and healthy aging, it is thought to be one of the coping mechanisms (Floriano & Tavares, 2022) [15]. The key to preventing recurrent urinary tract infection is good management based on correct information and more fulfilling self-care practices (Gouda Ahmed et al., 2023) [16]. Hence, the present study was conducted to evaluate the effectiveness of nursing interventions in enhancing elderly self-care for preventing recurrent urinary tract infections.

In addressing the self-care practices to prevent recurrent urinary tract infections (RUTIs) among the elderly, eight domains were explored. The assessment of the first domain, personal hygiene, yielded significant insights. Before the nursing intervention, both the study and control groups exhibited the highest adherence to wiping the anal area after a bowel movement from front to back. In contrast, the lowest adherence was observed in washing the genitalia before and

after sexual activity. Following the nursing intervention, the study group displayed a statistically significant improvement across all domains of personal hygiene. Although these improvements slightly decreased during the follow-up phase, the overall impact remained noteworthy. In contrast, the control group demonstrated minimal improvement in certain aspects of personal hygiene, with a slight decrease in others during the same period.

A plausible explanation for these findings was the low educational levels within both groups before the intervention, contributing to a lack of health information acquisition. The post-intervention period witnessed increased awareness and commitment among elderly participants in the study group toward self-care practices, particularly in the domain of personal hygiene. This enhanced understanding and commitment among the elderly led to improved adherence to recommended self-care practices.

These results were supported by a study conducted in India by Vyas et al. (2015) [17], which established a significant association between perineal hygiene and UTIs. The study revealed a higher frequency of UTIs among participants utilizing incorrect techniques for perineal cleaning before the intervention. This concurrence with findings was further corroborated by research conducted in Benha, Egypt, by Abd EL-Menim et al. (2018) [18], whose study demonstrated a highly statistically significant difference ($P \leq 0.000$) before and after a nursing intervention on general hygienic practices related to vulvitis. Furthermore, a study done by Nofal et al. (2020) [19] in Zagazig, Egypt, reported a significant improvement in hygienic practices after implementing a program for the prevention of Genitourinary Tract Infection. The study's findings also resonated with research conducted in Istanbul, Turkey, by Demir et al. (2020) [20], which identified a significant correlation between performing genital area cleaning from back to front and UTIs before the intervention ($p=0.041$).

In the context of caring for the genital area in women, the findings of the present study revealed that, before the intervention, the highest percentage in both the study and control groups was associated with thoroughly washing hands, while the lowest percentage was related to changing underwear daily. Following the nursing intervention, the study group demonstrated an increase in the mean score for caring for the genital area in women. Although these improvements slightly decreased in the follow-up phase, the overall impact remained positive. In the control group, there was minimal improvement in some domains, including washing hands thoroughly, regularly removing excess hair, not leaving the sensitive area wet, drying it well, avoiding the use of a rough loofah, and replacing it with a soft loofah.

The findings in both the study and control groups before the intervention may have been attributed to a lack of awareness in rural areas. In contrast, the results in the study group after the intervention can be attributed to the success of the nursing intervention program, with elderly participants following instructions and applying correct techniques for caring for the genital area in women. These findings aligned with a study by Umami et al. (2022) [21] in Indonesia, which found that incorrect and inadequate genital hygiene behavior increased the risk of vaginal infection before the intervention.

The findings of the current study highlighted the importance of nursing interventions in enhancing male genital care among the elderly population. The pre-intervention assessment revealed that elderly individuals, both in the study and control groups, exhibited a higher mean score in the domain of thoroughly washing hands. However, there was a notable deficiency in knowledge and adherence to essential care practices related to wearing clean, dry underwear and changing them daily. The significant improvement observed in all domains of male genital care in the study group after the nursing intervention was notable. The decrease in improvements during the follow-up phase raised questions about the sustainability of the intervention's impact. This decline may have been attributed to various factors, such as a gradual fading of awareness or a lapse in the application of learned practices over time. These findings aligned with previous research conducted by Smith et al. (2019) [22] in Australia, which emphasized the effectiveness of educational programs in improving male genital care practices among diverse populations. The significant improvements in the study group aligned with previous research emphasizing the effectiveness of nursing interventions in promoting behavioral changes.

Similar studies by Johnson et al. (2018) [23] in the United States and Garcia et al. (2020) [24] in Spain reported substantial positive outcomes in male genital care practices following targeted educational programs. These findings aligned with the study by Wang et al. (2017) [25] in China, which demonstrated the effectiveness of educational programs in improving knowledge and practices related to personal hygiene among elderly participants. The slight decrease in improvements during the follow-up phase in the study group underscored the importance of sustained reinforcement and support to maintain positive changes in care practices. This finding resonated with studies by Anderson et al. (2019) [26] in the United States and Lee et al. (2021) [27] in South Korea, emphasizing the necessity of continuous support and periodic reminders to ensure the enduring impact of educational interventions on hygiene practices.

The exploration of self-care practices related to fluid intake and voiding habits among the elderly participants in both groups revealed that, in the pre-intervention phase, the most frequently practiced self-care behaviors were avoiding holding urine, while the least practiced behaviors were measuring the amount of urine over 24 hours, indicating potential gaps in knowledge or adherence to these specific self-monitoring practices. Following the nursing intervention, the study group experienced significant improvements across all domains of self-care practices. Notable enhancements included not only avoiding holding urine but also adhering to recommended fluid intake levels, abstaining from cola and coffee drinks, avoiding tea, ensuring regular bathroom visits, incorporating boiled barley into the diet, and actively measuring urine output over 24 hours.

These positive changes signified the effectiveness of the nursing intervention in instigating comprehensive modifications in self-care behaviors among the elderly participants. In contrast, the control group demonstrated only marginal increases in certain self-care domains, such as adherence to recommended fluid intake levels, drinking boiled barley, avoiding cola and coffee drinks, ensuring regular bathroom visits, and avoiding holding urine. The study's findings resonated with research conducted by Hooton et al. (2018) [28] in California, which investigated the impact of increased water intake as an antimicrobial-sparing strategy to prevent recurrent cystitis in women at high risk for recurrence

with low daily fluid consumption post-intervention.

Similarly, the "drink-up" study conducted in Scotland by Booth & Agnew (2019) [29] provided indicative evidence that incrementally increasing daily fluid intake positively influenced the number of urinary tract infections experienced by frail older individuals in care homes at post-test. The results were further corroborated by Scott et al. (2020) [30] in Australia, who reported a reduction in the number of participants with any urinary tract infection recurrence in the increased fluid intake group compared to the control after 12 months, with a significant reduction observed at ≤6 months, emphasizing the role of increased fluid intake in reducing overall rates of recurrent urinary tract infections.

The assessment of self-care practices in the fourth and fifth domains nutritional habits, exercises, and daily activities among elderly participants revealed that, before the intervention, the highest percentage in both groups was associated with eating healthy, fresh food, while the least practiced behaviors were engaging in housework and shopping independently. Following the nursing intervention, the study group showed statistically significant improvements across all domains of self-care practices. These observed results could be attributed to the researcher's ability to effectively convey new information and instill confidence in the participants, enabling them to apply self-care measures during each session of the nursing intervention. Conversely, the control group exhibited very slight improvements in all domains of self-care practices related to nutritional practices, exercises, and daily activities. The limited changes in the control group suggested that without targeted interventions, elderly participants might struggle to adopt and sustain positive self-care behaviors in these domains.

These findings, supported by a study conducted in Alexandria, Egypt, by Abd-Elwahab et al. (2021) [31], strengthened the evidence supporting the effectiveness of targeted nursing interventions in promoting self-care practices. The Egyptian study reported significant improvements in areas such as consuming a healthy diet and engaging in exercises immediately post-program and six weeks later, demonstrating the sustained impact of the nursing intervention. The slight reduction in practice levels observed after six weeks still maintained an improvement compared to pre-program initiation, emphasizing the potential for continued positive changes.

The assessment of self-care practices related to the sixth, seventh, and eighth domains maintaining normal body weight, following the therapeutic regimen, and regular follow-ups among elderly participants showed a decrease in the mean scores for all domains in both the study and control groups during the pre-intervention phase. However, the post-implementation phase of the nursing intervention demonstrated marked and statistically significant improvements in the study group. Although these improvements slightly decreased at the follow-up phase, the overall positive impact on self-care practices was evident. In contrast, the control group exhibited only minimal increases in self-care practices.

These results of the current study aligned with research conducted in Australia by Bergamin & Kiosoglous (2017) [32], which associated body mass index (BMI) with urinary tract infections (UTIs). The study found that women with an elevated BMI were significantly more likely to suffer from UTIs. Similarly, Abd-Elwahab et al. (2021) [31] in Alexandria, Egypt, reported significant improvements in UTI-related practices, including seeking medical follow-up and referral services, immediately post-program and six weeks later. Although a slight reduction in practice levels was observed after six weeks, the subjects' overall practice level remained better than before the program's initiation. The findings were also consistent with Haley et al. (2023) [33] in the USA, who reported that elderly participants visiting urology clinics for suspected acute complicated urinary tract infections (CUTIs).

Concerning total self-care practices, a minority of participants in both the study and control groups had satisfactory self-practice levels pre-intervention. This initial observation underscored the need for targeted interventions to address gaps in knowledge and behavior related to self-care practices among the elderly. Following the intervention, the majority of the study group achieved satisfactory self-practice levels in the post-test assessment, indicating the effectiveness of the nursing intervention in achieving its objectives. These findings aligned with results reported in studies conducted in various countries, including Egypt (AbdElkhalek & Elsayed, 2020; Sayed et al., 2022) [34,35], Iran (Heydari et al., 2019; Tehrani et al., 2014) [36,11], Australia (Grealish et al., 2020) [37], and the United Kingdom (Joseph, 2021) [38]. Collectively, these studies highlighted the positive impact of nursing interventions on improving self-care practices among the elderly.

Regarding the predictors for elderly total self-care practices post-intervention, the study results indicated that educational level, previous working experience, and monthly income had a highly significant positive effect on total self-care practice. Elderly individuals with satisfactory self-care practices typically had an educational level of reading and writing, previous work experience (especially as housewives), and insufficient monthly income. This suggested that those with lower educational levels and income had limited access to resources for learning about their health, hindering their ability to perform self-care. Additionally, lower socioeconomic status was associated with reduced access to healthcare services. Supporting this, AbdElkhalek & Elsayed (2020) [34] in Qena, Egypt, found a relationship between total self-care practices and educational level. Similarly, Abd Elfatah et al. (2021) [39] in Benha, Egypt, identified a highly significant relationship between the total attitude score of the studied women and monthly income.

5. Conclusions

The study findings revealed that both the study and control groups exhibited an overall deficiency in self-care practices related to recurrent urinary tract infections (RUTIs) during the pre-intervention phase. However, post-intervention results provide evidence confirming the effectiveness of the nursing intervention in significantly improving self-care practices among the elderly in the study group. Additionally, there was a slight decrease in self-care practices during the follow-up period, with sustained improvements evident compared to the control group.

6. Recommendations

Implement continuous self-care practice nursing intervention program for urinary tract infection in outpatient clinics and urology departments. Conduct further research on a larger probability sample to achieve generalizability and wider

adoption of self-care practices for UTI prevention.

Acknowledgments

This study was derived from a thesis in Doctorate of Nursing, Zagazig University, Egypt. The researchers would like to thank the studied elderly who kindly agreed to participate in this research and all medical staff in the urology department in Zagazig University Hospitals for their collaboration.

Declaration of Conflicting Interests

The Author(s) declare(s) that there is no conflict of interest.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

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