

ORIGINAL ARTICLE

Self-Efficacy and Quality of Life (QOL) in Women of Reproductive Age with Urinary Tract Infections (UTIs)

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Abstract

Background: Urinary tract infections (UTIs) are most frequently observed among women of reproductive age in both community and healthcare settings. About 50-60% of women suffer from UTIs at least once in their lifetime, and one out of four suffer from recurrences. UTIs significantly affect a person's quality of life (QOL). Recurrent UTIs are a serious problem for women and pose challenges for healthcare providers.

Objective: To assess the self-efficacy and quality of life (QOL) of women with the aim of developing a nurse-led prevention program.

Methods: A quantitative approach with a descriptive design was used. A purposive sampling method was used to recruit 120 women attending OPD of a selected hospital who tested positive for urine culture, presented with UTI symptoms, and were seeking treatment. Tools for data collection included the RAND SF-36 scale for QOL and a self-efficacy scale.

Results: The mean age of women was 27.76 ± 8.13 years. Recurrent infections were encountered in 73.4% women. Urine culture reports identified *Escherichia coli* in 85% cases and *Klebsiella* species in 15% cases as the causal organisms. Typical symptoms included pain/burning micturition (99.2%), frequent urination (94.1%), and urinary urgency (89.2%). The quality of life of women in the physical domain and mental domains were 56.26 ± 17.64 and 57.21 ± 17.07 respectively. The self-efficacy of women with UTI was 28.13 ± 4.35 . No correlation was found between self-efficacy and QOL. A significant association was found between the physical domain of QOL and the source of information received ($f=4.820$, $P=0.031$), as well as between self-efficacy and the source of information on UTI ($f=5.312$, $P=0.024$).

Conclusion: A limited QOL and moderate self-efficacy were seen among women with UTIs, affecting their daily life activities and well-being. This indicates the need to develop nurse-led preventive interventions for tackling urinary tract infections.

Keywords: UTIs, Women, QOL, *Escherichia coli*, *Klebsiella* species

Introduction

Urinary tract infections (UTIs) are among the most frequently encountered bacterial infections by the

healthcare professionals in clinical practice.¹ Half of women develop UTIs in their lifetime and a quarter experience recurrent infections.² UTIs are especially

prevalent among women of childbearing age, accounting for 6 to 7 million annual consultation visits.^{2,3} They impose substantial health and social costs and place a significant burden on affected individuals.² A study in Tamil Nadu reported 20.4% prevalence of UTIs in women aged 18 to 45.⁴ A similar study conducted in Mangalore, Karnataka found a lifetime prevalence of 13.4% among women.⁵ In early life, both men and women have a comparable risk of developing UTIs. However, between the ages of 16 and 35, women are up to 40 times more likely to develop a UTI than men.⁶ Sexual activity and childbirth increase the incidence of infection in women and recurrence within six months is frequently observed.⁷

It is common for pathogens from normal vaginal flora to colonize the outer third of the short urethra in women. Sexual activity increases the risk of UTIs due to factors such as skin trauma, urethral massage, and changes in vaginal flora.¹ In addition, malnutrition, poor personal hygiene, and abnormal urinary patterns also increase the risk. Silent UTIs occur in girls due to insufficient water intake.²

Although UTIs are generally considered self-limiting, they can significantly affect quality of life (QOL) by causing unnecessary discomfort. Even when not life-threatening, UTIs can substantially disrupt daily activities and social functioning. Treatment failure and antibiotic side effects also reduce QOL.⁸ Studies in the West reported that women with UTIs often experience psychological distress. There is evidence that UTI is independently associated with low morale in women, and attention is needed in the prevention, diagnosis and treatment.⁸

Despite this, UTI is poorly studied in terms of perceived health and QOL. It is important to identify the factors that contribute to impairment of QOL, which will help in designing and implementing programs to improve it.

Self-efficacy is essential to change behavior.^{1,8} A wealth of literature supports the gravity of self-efficacy in initiating health-related behaviors.^{9,10} Women between the ages of 18 and 45 are more prevalent in this demographic.¹¹

The purpose of the present study was to investigate the impact of UTIs on QOL and self-efficacy in women of childbearing age, and to develop a prevention program to help nurses motivate themselves and their patients to adopt healthy practices.

Materials and Methods

The study employed a quantitative research approach with a descriptive design. Women aged 18-45 years with UTIs were recruited from the Urology, Medicine, and Obstetrics and Gynaecology (OBG) outpatient departments of a well-equipped, tertiary health care centre.

Literate women who were available during the study period were included. Women were excluded if they were impaired, unconscious, pregnant, menopausal, had undergone hysterectomy or were diagnosed with major mental disorders or congenital disorders of the urinary system. Data collection was done between December 2019 and July 2021. Women were referred for urinalysis based on their presenting complaints, and 120 urine culture-positive women were selected and interviewed using the UTI Symptom Score Checklist (UTI-SSC) to assess typical symptoms of UTI.²

The sample size was calculated based on the results of a pilot study using the comparison of two mean techniques. The formula used was $n = Z^2 P (1-P)/d^2$. The minimum sample size required was calculated to be 108 and was rounded up to 120.

Ethical clearance: Ethical clearance was received from the Institutional Review Committee with the registration number IRC/FMCON/2018/FAC-15 and also from Institutional Ethics Committee: FMMCIEC/CCM/479/2018. The study was registered with Clinical Trials Registry – India (CTRI) under registration number CTRI/2018/10/016064. Prior, approval to conduct the study was obtained from the authorities of the college and medical hospital.

Data collection: The Symptom Score Checklist for UTI (UTI-SSC) was used as a tool for data collection and it comprised three parts: Part I incorporated typical UTI symptoms, Part II assessed the severity of these symptoms, and Part III included urinalysis results, including urine properties, microscopy, and culture findings. Other tools employed in the study included a 10-item socio-demographic questionnaire, and the Rand SF-36 questionnaire, which focuses on physical and mental domains. The physical domain encompasses concepts such as physical functioning, limitations due to physical health issues, energy/fatigue, pain, and general health. The mental domain of QOL includes concepts like role restrictions due to emotional problems, social functioning, emotional wellness, and general views of health.¹²

The self-efficacy tool is a four-point rating scale, with each item scored as follows: Never=1, Seldom=2, Often=3, and Very often=4. For negative statements, the scoring was reversed: Never=4, Seldom=3, Often=2, and Very often=1. The maximum possible total score was 40 and the minimum was 10. The scores of the self-efficacy tool were classified as very good (≥ 32), good (28-31), average (24-27) and poor (≤ 23). In this study, self-efficacy was measured to assess the ability of women diagnosed with UTI to manage issues related to prevention and treatment, as well as to make informed decisions.

All data collection tools were validated by 13 medical (two urologists) and nursing experts. The Rand SF-36 questionnaire demonstrated a content validity index (CVI) > 0.92 and a scale validity index (SVI) > 0.98 . For the self-efficacy scale, the CVI was > 0.85 and the SVI was > 0.90 . Reliability testing was conducted on 20 women meeting the eligibility criteria. The stability (intra-class correlation coefficient ($r > 0.9$)) and the internal consistency (Cronbach's α , $r > 0.7$) indicated that the tools were reliable. The UTI Symptom Score Checklist was administered via in-person interviews, while the other tools were completed using self-report methods during data collection.

Statistical analysis: The data were analysed using version 23 of SPSS (Statistical Package for Social Sciences). Statistical descriptive measures like frequency, percentage, mean, and standard deviation were used. Karl Pearson correlation test and Chi-square test were applied for the inferential statistics.

Results

The results showed that 36 women (30%) were aged between 21 and 25 years. The mean age was 27.76 ± 8.13 years. Around 78 (65%) were university graduates, and 48 (40%) were employed. A total of 32 participants (26.6%) experienced a single UTI, 59 (49.2%) experienced UTI 2-3 times per year, and 29 (24.2%) reported more than three UTIs per year. Seventy participants (58.4%) received information about UTIs from healthcare professionals, while 34 (28.3%) obtained information from relatives/friends. A total of 102 participants (85%) reported no history of other medical conditions, while 10 (8.3%) suffered from polycystic ovarian disease (PCOD), 5 (4.2%) experienced premenstrual syndrome and 1 (0.8%) had diabetic mellitus.

Regarding UTI symptoms, 118 (98.3%) experienced painful and burning micturition and 70 (58.3%) reported having fever. Frequent urination was experienced by 113 (94.2%) participants and urgency to urinate was reported by 107 (89.2%) subjects. About 85 (70.8%) subjects suffered from urinary incontinence, 35 (29.2%) reported haematuria and 56 (46.7%) participants experienced acute costovertebral angle pain. Urine culture results showed that 102 participants (85%) had *E. coli*, while 18 (15%) had *Klebsiella* species. Regarding urine characteristics, 94 (78.3%) subjects had cloudy urine and 73 (60.8%) had pungent urine odour. Urinary leukocytes were found in 94 (78.3%) subjects and 55 (45.8%) had urinary nitrates. Other details regarding the symptoms and their severity are presented in Table 1.

Table 1: Typical symptoms and severity of UTI in frequency and percentage (N=120)

Typical UTI symptoms	Group					
	Presence of Symptoms		Severity of Typical Symptoms			
		f	%		f	%
Pain/burning while passing urine	Never	2	1.7	Nil	1	0.8
	Seldom	22	18.3	Mild	21	17.5
	Often	59	49.2	Moderate	53	44.2
	Very Often	37	30.8	Severe	45	37.5
Fever ($>38^{\circ}\text{C}$) or 1.1 degree above baseline	Never	50	41.7	Nil	48	40.0
	Seldom	33	27.5	Mild	17	14.2
	Often	26	21.7	Moderate	39	32.5
	Very Often	11	9.1	Severe	16	13.3
Frequent urination of small volumes of urine	Never	7	5.8	Nil	7	5.9
	Seldom	23	19.2	Mild	19	16.0
	Often	50	41.7	Moderate	60	50.4
	Very Often	40	33.3	Severe	33	27.7

Urgent urination	Never	13	10.8	Nil	13	10.8
	Seldom	31	25.8	Mild	30	25.0
	Often	35	29.2	Moderate	51	42.5
	Very Often	41	34.2	Severe	26	21.7
No bladder control	Never	34	28.3	Nil	32	26.7
	Seldom	29	24.2	Mild	24	20.0
	Often	30	25.0	Moderate	44	36.7
	Very Often	27	22.5	Severe	20	16.6
Pain or uncomfortable pressure in the lower abdomen	Never	26	21.7	Nil	26	21.7
	Seldom	31	25.8	Mild	20	16.7
	Often	39	32.5	Moderate	49	40.8
	Very Often	24	20.0	Severe	25	20.8
Incomplete bladder emptying after urination	Never	35	29.2	Nil	34	28.3
	Seldom	35	29.2	Mild	17	14.2
	Often	30	25.0	Moderate	47	39.2
	Very Often	20	16.6	Severe	22	18.3
Haematuria	Never	85	70.8	Nil	85	70.8
	Seldom	18	15.0	Mild	12	10.0
	Often	8	6.7	Moderate	20	16.7
	Very Often	9	7.5	Severe	3	2.5
Acute costo-vertebral angle pain	Never	64	53.3	Nil	62	51.7
	Seldom	26	21.7	Mild	19	15.8
	Often	18	15.0	Moderate	33	27.5
	Very Often	12	10.0	Severe	6	5.0

Table 2: Domain-wise range, maximum and minimum obtained score and mean and standard deviation in terms of QOL (N=120)

Domains	Range	Maximum Obtained Score	Minimum Obtained Score	Mean \pm SD
Physical Functioning	100	100	0	60.54 \pm 22.03
Limitations to Physical Health	100	100	0	49.58 \pm 33.68
Limitations to Emotional Problems	100	100	0	58.33 \pm 36.30
Energy/Fatigue	70	85	15	51.33 \pm 21.95
Emotional Wellbeing	72	92	20	58.80 \pm 18.60
Social Functioning	87.5	87.5	0	60.31 \pm 21.55
Pain	100	100	0	61.02 \pm 25.27
General Health	75	100	25	55.21 \pm 18.00

Regarding the quality of life, the physical and mental domain scores were 56.26 \pm 17.64 and 57.21 \pm 17.07, respectively. Table 2 shows the domain-wise range, the maximum and minimum scores obtained, and the mean and standard deviation of the QOL.

Regarding self-efficacy, the mean score was 28.13 \pm 4.35, with a maximum score of 35 and a minimum of 18.

No correlation was found between quality of life and self-efficacy. The physical domain of QOL showed a significant association with the source of information received ($f=4.820$, $P=0.031$). A significant association was also observed between self-efficacy and the source of information on UTIs ($f=5.312$, $P=0.024$).

Discussion

In this study, women of reproductive age (18-45 years) were selected, as UTIs are more common in this age group.¹¹ The present study examined the impact of UTIs on women's quality of life and their self-efficacy in managing and preventing the condition, with the aim of developing a nurse-led intervention to empower women through health-promotive strategies and problem-solving methods.

The mean age of the women included in the present study was 27.76 ± 8.13 years. All participants were literate; 14 (11.7%) had completed post-graduate education, and 48 (40%) were employed. A monthly family income of more than ₹10,000/- was reported by 102 women (85%). More than half of the participants, 69 (57.5%), were married and 103 (85.8%) lived in nuclear families. A total of 59 women (49.2%) reported experiencing urinary tract infections more than once a year, while 29 (24.2%) experienced urinary tract infections more than three times annually. These findings are consistent with a study by Ahmed *et al.*, conducted in Saudi Arabia, which reported a mean age of 29 ± 9.89 years among participants, with approximately half of the women aged between 20 and 30 years.¹² A study conducted in Kancheepuram district, by Muthulakshmi *et al.*, among 250 women of childbearing age showed similar results, with 44% of women in the 15-24 age group, followed by 36% in the age group of 35-44. Almost 76% of the women were married. A majority had their high school diploma 100 (40%). The results of this study are also supported by Kodikara *et al.* who reported that 60% of women diagnosed with UTIs were in the age range of 20-30 years.¹³

In the present study, 118 (98.3%) subjects experienced painful and burning urination and 70 (58.3%) had fever. Frequent urination was experienced by 113 (94.2%) subjects, while urgency in urination was noted in 107 (89.2%). Bladder control was lost in 86 (71.7%) patients and incomplete voiding in 85 (70.8%) patients. Only 35 (21.7%) patients experienced haematuria and 56 (46.7%) had acute costo-vertebral angle pain. These results are consistent with the study conducted in Saudi Arabia by Ahmed *et al.*, which noted that 15 (35.7%) women had fever, 39 (92.8%) women had painful urination, and 28 (66.6%) women suffered from incontinence of urine.¹² A similar study conducted in Kancheepuram, India, by Muthulakshmi *et al.*, reported that 77% of women

experienced increased urination, 63% reported fever, and 59% experienced painful urination.⁴ Shaifali *et al.*, in their study found that 73.4% of participants experienced a burning sensation during urination, 43.9% reported increased frequency, and 20.1% experienced painful urination.¹⁴ Various other studies have also reported that UTIs present with a variety of clinical manifestations, such as fever, fatigue, nausea, vomiting, groin pain, nocturnal incontinence, bloody urine, and uncertainty/confusion.¹⁵

Various studies indicate that *E. coli* is the common organism responsible for urinary tract infections, accounting for 80-85% of all isolates, with *Staphylococcus saprophyticus* accounting for 5-10%.⁴ In the present study, urine culture results showed that 102 participants (85%) had *E. coli*, while 18 (15%) had *Klebsiella*.

Regarding the quality of life, the scores of physical and mental domains were 56.26 ± 17.64 and 57.21 ± 17.07 , respectively. All the concepts in the SF-36 quality of life indicators showed low QOL among women with UTIs. An exploratory study conducted by Ellis *et al.*, in Ontario involving 47 women with UTIs treated in a urology clinic and 71 women in a control group without appropriate treatment reported similar results. Across all sub-sections of the SF-36 quality of life assessment, there was a significant reduction in the subject group in comparison to the control group (lower scores indicate lower quality of life). These included: perception of overall health (63.3 vs. 78.9, $P < 0.001$), physical functioning (76.6 vs. 87.6, $P = 0.012$), restriction of role due to physical health (53.8 vs. 93.0, $P < 0.001$), emotional health of the person (67.4 vs. 88.3, $P < 0.001$), vitality (43.0 vs. 64.9, $P < 0.001$), emotional well-being of the person (64.4 vs. 80.2, $P < 0.001$), pain due to illness (58.7 vs. 91.5, $P < 0.001$), and social functioning restriction (60.4 vs. 90.4, $P < 0.001$).³

A web-based patient study by Wagenlehner *et al.*, assessed the socio-economic burden of recurrent UTIs and, along with another study by Erikson *et al.*, concluded that UTIs are independently associated with low morale.^{8, 16} Both studies emphasized the need for greater attention to prevention, diagnosis, and treatment of UTIs in women. Similarly, a study by Gopinath *et al.*, which evaluated the effect of counselling on quality of life, reported comparable findings. Only 1.2% of patients with UTIs initially had a good quality of life,

which increased to 71.4% after treatment. The study also demonstrated that patient counselling had a positive impact on overall quality of life.¹⁷

In this study, the self-efficacy of women was found to be 28.13 ± 4.35 . A similar study by Tehrani *et al.*, reported improvement in self-efficacy of women from 5.61 ± 2.36 to 9.60 ± 1.78 after the intervention.¹ They concluded that self-efficacy plays an important role in the prevention of urinary tract infections, and that counselling on healthy behaviours can support the development of self-care skills for effectively managing UTIs.

Recurrent UTI is defined as the occurrence of UTIs more than twice within one year. It negatively affects health-related quality of life and is recognized as a major public health concern.¹⁷ Teaching self-care practices and prevention strategies is a fundamental nursing responsibility in UTI prevention. Supporting women in managing their health as independently as possible is an important task of nurses. Achieving such independence often requires behaviour change, which is influenced by various factors, one of the most predominant being self-efficacy.

Studies have demonstrated that proper counselling, open communication, health education videos, case studies and real-world discussions can effectively improve health behaviours and enhance self-efficacy in women.^{1,2,17,18} Based on the present study findings, the investigator developed a preventive program titled SCAPS (Structured Counselling and Preventive Strategies).² This program aims to raise women's awareness of UTI prevention and promote healthy self-care practices, thereby gradually enhancing their self-efficacy and overall quality of life. A pilot study by Sequera *et al.*, demonstrated the effectiveness of this intervention.² Based on the available findings, the investigator plans to further develop and refine the intervention, which will be tested on a larger population.

The delimitations of the study include its restriction to a hospital setting. Additionally, the intervention developed based on the present findings will be implemented more broadly in both community and hospital settings, with a follow-up period of six months to assess its efficiency and effectiveness.

Conclusion

To culminate, although this study addresses a common issue, it offers valuable insights for initiating and designing interventions aimed at the prevention and

control of UTIs. One in three women experiences a UTI at least once in her lifetime, and many consider it a part of their normal life, despite its potential to become a serious concern if left untreated. As prevention remains the most effective strategy, implementing nurse-led interventions such as SCAPS can empower women to take corrective and preventive measures against UTIs. This, in turn, may reduce the recurrence, resulting in an improved quality of life.

Conflict of Interest

Nil

Financial Support

Nil

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