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THE EFFECT OF TOILET BEHAVIORS ON LOWER URINARY TRACT SYMPTOMS IN THIRD TRIMESTER PREGNANT WOMEN: A DESCRIPTIVE STUDY

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Abstract

This study was carried out to ascertain the effect of toilet behaviors on lower urinary tract infections and symptoms in pregnant women in the last trimester. The study was conducted in the obstetrics and gynecology outpatient clinics at a district state hospital in the Marmara Region. Data collection was carried out face-to-face with 198 third-trimester pregnant women using the participant introduction form, the Bristol Female Lower Urinary Tract Symptoms Questionnaire, and the Toileting Behaviors - Women's Elimination Behaviors Scale. In the study, the mean total scores were 22.71 ± 10.69 for the Bristol Female Lower Urinary Tract Symptoms Questionnaire and 52.23 ± 9.81 for the Toileting Behaviors - Women's Elimination Behaviors Scale. 13.5% of the total variance in lower urinary tract symptoms was explained by toilet behaviors. No significant relationship was found between urinary tract infections and toilet behaviors.

Based on these findings, we believe that pregnant women should be informed about the relationship between lower urinary tract symptoms and toileting habits. For future studies, it is recommended that researchers examine the relationship among toilet behaviors, lower urinary tract symptoms, and objectively detected urinary tract infection in pregnant women.

Keywords: Lower urinary tract symptoms, Pregnant, Women's health

INTRODUCTION

Urinary tract infection is one of the most important infections during pregnancy. The risk of urinary tract infection (UTI) is higher during pregnancy because of physiological changes. The most critical preparatory factors are hormonal changes and mechanical pressures during pregnancy (İnci and Davarcı, 2011). During pregnancy, ureteral tone decreases as progesterone levels increase, leading to urinary stasis in the bladder and an increased risk of infection. In addition, the growing uterus may mechanically obstruct the ureters and urinary flow , thereby predisposing pregnant women to UTI (Habak, Carlson and Griggs, 2024). Urinary tract infections during pregnancy have adverse effects on the fetus. Pregnant women with bacteriuria are more likely to deliver preterm and low-birth-weight (LBW) babies (İnci and Davarcı, 2011). UTI is a frequent but avoidable cause of complications during pregnancy (Kalinderi, Delkos, Kalinderis, Athanasiadis and Kalogiannids, 2017). The lower urinary tract is responsible for the storage and excretion of waste products produced by the kidneys. The lower urinary tract infection includes (LUTI) many symptoms caused by the pelvic floor, bladder, and various specific pathologies. These symptoms are classified into three main groups: storage, voiding, and post-voiding (Degirmenci and Vefikuluçay – Yılmaz, 2020). During pregnancy, hormonal, anatomical, and physiological changes can cause symptoms in the lower urinary tract. These symptoms include nocturia, incontinence, and frequent, sudden urination (Balik et al., 2016). The prevalence of lower urinary tract symptoms during pregnancy is reported to be 59.5% in the first trimester, 61% in the second trimester, and 81% in the third trimester. LUTS lead to restrictions in women's activities of daily living, reductions in overall and sexual quality of life, psychological problems, and increased economic burden (Degirmenci and Vefikuluçay –Yılmaz, 2020; Wan, Wu, Xu, Huang and Wang, 2017). To protect women's health, LUTS must be prevented and treated (Kumsar-Karakoc, Yilmaz –Taskin and Demirel, 2023).

Toilet behavior is an essential factor affecting bladder health (Seyhan Ak, Mecdi Kaydırak, Aydın Sayılan and Özbaş, 2019). The most important way to understand healthy toilet behavior is through the patient's perception of it. Unhealthy toilet behaviors learned in the past may also lead to or worsen lower urinary tract symptoms. Although lower urinary tract symptoms are prevalent during pregnancy, limited information is available regarding bladder habits (Parlas, Bilgiç and Dişsiz, 2023). Lower urinary tract symptoms can be prevented, and a better-quality pregnancy and childbirth experience can be supported by identifying deficiencies in pregnant women before urinary tract infections occur, finding solutions, and assessing toileting habits. For these reasons, this investigation was conducted to ascertain the impact of toileting behaviors on UTI and LUTS in pregnant women in their last trimester.

Research questions

- Is there a relationship between toilet behaviors and lower urinary tract symptoms in third-trimester pregnant women?
- Is there a relationship between urinary tract infections and toilet-related behaviors in pregnant women in the third trimester?
- Is there a relationship between sociodemographic, obstetric characteristics and toilet behaviors in third-trimester pregnant women?
- Is there a relationship between sociodemographic, obstetric characteristics and lower urinary tract symptoms in third-trimester pregnant women?

MATERIAL AND METHOD

Purpose and Type of Research

The aim of this study was to investigate the effect of the toileting behaviors of women in the third trimester of pregnancy on lower urinary tract symptoms. The research is descriptive and correlational in design.

Population and Sample of the Study

The study was carried out in the obstetrics and gynecology outpatient clinics of Gemlik State Hospital from March to September 2024. The study population for the sample-size calculation comprised the 360 pregnant women who presented to Gemlik State Hospital between January and December 2023 (N=360). Using the study by Balik et al. (2014), which reported a prevalence of lower urinary tract symptoms in pregnant women of 81.6%, as a reference, the sample size was calculated to be at least 143 using OpenEpi version 3.01 with a 95% confidence interval, a 5% margin of error, and a

design effect of 1.0. In the study, convenience sampling was employed. Data were collected face-to-face by the researcher so as not to disrupt the work order. The study determined that literacy, willingness to participate, and pregnancy in the third trimester (28–40 weeks) were inclusion criteria. The research data were finalized with n = 198 participants.

Data Collection and Analysis

Data were collected with the utmost care and attention to detail, using the Individual Description Form, the Bristol Female Lower Urinary Tract Symptoms Scale, and the Toilet Behaviors - Women's Elimination Behaviors Scale. The investigative data were gathered face to face among March -Semptember 2024.

Individual Description Form: The researchers revised the form based on a literature review with the aim of determining information on sociodemographic characteristics, obstetric history, and lower urinary symptoms. It consisted of 18 questions (Güzel-İnal and Timur-Taşhan, 2020; Şengül, 2022).

Bristol Female Lower Urinary Tract Symptoms Questionnaire (BFLUTSQ): The questionnaire was improved by Jackson et al. in 1996 (Jackson et al., 1996). It is a multidimensional 19-item questionnaire designed to assess lower urinary tract symptoms, sexual life, and quality of life. The Turkish validity and reliability of the BFLUTSQ were evaluated by Güngör and Yalçın in 2005. Scores obtainable from the questionnaire range from 0 to 71. The questionnaire consists of five sub-dimensions. The first three dimensions include questions about storage (questions 1-4), urination (questions 5-7), and incontinence (questions 8-12), the fourth sub-dimension includes questions about sexual life (questions 13-14), and the fifth sub-dimension includes questions about quality of life (questions 15-19). The questionnaire scores items on a scale from 0 to 3 (questions 4, 13, 14, 17, and 19) or from 0 to 4 (questions 1-3, 5-12, and 15-16). The higher the score obtained from the scale, the more adversely the quality of life and sexual life are affected, and the more severe the symptoms become. In the validity and reliability study of the scale conducted in our country, Cronbach's alpha coefficient for the total scale was 0.66 (Güngör, 2005). In this study, the Cronbach's Alpha coefficient for the total scale score was 0.83.

The Toileting Behaviors - Women's Elimination Behaviors (TB-WEB) Scale (adapted for pregnant population): It was developed by Wang and Palmer (2011) to assess women's toileting behaviors (Wang & Palmer, 2011). Parlas, Bilgiç and Dişsiz (2023) assessed the validity and reliability of the Turkish version in pregnant women. The scale includes 20 items and five sub-dimensions. Responses to each item are scored as follows: 1 = never, 2 = rarely, 3 = sometimes, 4 = usually, and 5 = always. Items 19 and 20 are scored as 0 = never, 1 = rarely, 2 = sometimes, 3 = usually, and 4 = always. The scale has no cut-off point. High scores on the scale indicate unhealthy toileting behavior. The scale sub-dimensions are as follows: Preferred place for urination sub-dimension — this factor group comprises four items (items 1–4). Early voiding sub-dimension: This factor group consists of five items (items 5–9). Delayed voiding sub-dimension: This factor group contains, numbered 10, 11, 12, and 18. Difficulty voiding sub-dimension: This factor group consists of nine items, including items numbered 13–17. Position preference for voiding sub-dimension: This factor group contains a total of two items: items 19 and 20. The scale's Cronbach's alpha was 0.77 (Parlas et al., 2023). In this investigation, Cronbach's alpha for the scale was 0.67.

Analysis

The Statistical Package for the Social Sciences (SPSS) for Windows, version 22.0, was used to analyze the study data. Frequency and percentage values, which are descriptive statistics, were used to summarize the information obtained. In order to determine the relationship between two variables, since the data displayed a normal distribution (BUFLUTSQ Skewness: 0.07; ± 0.17, Kurtosis: -0.97 ± 0.34, TB-WEB Scale Skewness: 0.23 ± 0.17, Kurtosis: -0.17 ± 0.34) Two-group averages were compared using a t-test, and multiple-group averages were compared using a one-way ANOVA test. The correlation between the scales was assessed using Pearson correlation analysis, and the scales' impact was evaluated using linear regression analysis.

Limitations of the Study

The study examined the effect of toilet behaviors during the last trimester of pregnancy on LUTI and LUTS. Factors affecting other lower urinary tract symptoms were not discussed in detail, and LUTI in pregnant women was not determined by any objective test but was based on the participants' statements. These were considered the most important limitations of the study. Future studies should examine the relationship among UTI, toilet behaviors, and lower urinary.

Ethical Aspects of the Research

Institutional consent from the hospital where the study was carried out, approval from the appropriate ethics committee (Date: 18.01.2024, Number: E.340598), and written informed consent from the participants were obtained. The principles of the Declaration of Helsinki were followed in the research.

RESULT AND DISCUSSION

The participants' average age in the study was 28.01±4.90 years; 46.0% were high school graduates; 70.7% had income equivalent to expenses; 87.4% had never had an abortion; 75.8% did not smoke; 51.0% consumed foods containing caffeine; 60.6% had no urinary tract infection during pregnancy; 68.7% changed underwear daily; 64.1% used cotton underwear; and 74.7% cleaned the genital area from front to back (Table 1).

Table 1. Sociodemographic-Obstetric Characteristics of the Participants

Variable	**Mean±Sd(Min-Max)**	
Age	28.01±4.90(18.00-40.00)	
	n	**%**
Education status		
Primary school graduate	62	16.3
High school graduate	91	46.0
Undergraduate-graduate graduate	55	27.8
Income status		
Income less than expenditure	35	17.7
Income equals expenditure	140	70.7
Income more than expenditure	23	11.6
Abortion status		
Yes	25	12.6
No	173	87.4
Smoking status		
Yes	48	24.2
No	150	75.8
Caffeine intake status		
Yes	101	51.0
No	97	49.0
Daily water intake		
5 glasses a day or less	102	51.5
6-8 glasses a day	98	48.5
Urinary tract infection during pregnancy		
Yes	78	39.4
No	120	60.6

Daily change of underwear		
Yes	136	68.7
No	62	31.3
Type of underwear		
Cotton	127	64.1
Other	71	35.9
Daily pad use status		
Yes	99	44.9
No	109	55.1
Direction of genital area cleaning		
Front to back	148	74.7
Back to front	50	25.3

Sd: Standart deviation, Min-Max: minimum maximum.

In the study, the mean total score of the BFLUTSQ was 22.71 ± 10.69, and the mean score of the TB-WEB Scale was 52.23 ± 9.81. When mean BFLUTSQ scale scores were compared across the following variables: income level, education level, abortion, urinary tract infection, daily underwear change, underwear type, and direction, no statistically significant differences were found. In contrast, smokers, caffeine consumers and those who drank participants who drank less than 5 glasses of water a day had higher mean BFLUTSQ scores. No significant differences were found for education level, income level, abortion, smoking, caffeine consumption, urinary tract infection, daily changing of underwear, type of underwear, direction of genital-area cleaning, and TB-WEB Scale. In contrast, those who consumed fewer than five glasses of water per day had a higher mean TB-WEB Scale score (Table 2).

Table 2. Comparison of the Mean Total Scores of the BFLUTSQ and TB-WEB Scale According to the Variables

	BFLUTSQ	**TB-WEB Scale**
	Mean±Sd	**Mean±Sd**
Education status		
Primary school graduate	21.32±10.52	51.36±11.03
High school graduate	23.59±10.59	52.25±8.69
University degree and above	22.65±11.67	53.01±10.42
F / p	0.71/0.49	0.37/0.69
Income status		
Income lower than expenditure	25.51±9.43	55.08±9.57
Income equals expenditure	21.90±11.04	51.14±9.27
Income more than expenditure	23.39±9.96	54.52±12.26
F/p	1.65/0.69	3.03/0.05
Abortion status		
Yes	26.08±10.07	54.72±9.64
No.	22.23±10.72	51.87±9.81
t test/p	1.68/0.09	1.35/0.17

Smoking status		
Yes	26.20±10.61	54.16±9.51
No.	21.60±10.51	51.61±9.85
t test/p	2.61/**0.01**	1.57/0.11
Caffeine intake status		
Yes	24.34±10.77	52.51±8.41
No.	21.02±10.40	51.93±11.11
t test / p	2.20/**0.02**	0.41/0.68
Daily water intake		
5 glasses a day or less	24.56±10.44	54.07±10.32
6 glasses or more per day	20.75±10.66	50.27±8.87
t test/p	2.54/**0.01**	2.77/**0.00**
Urinary tract infection during pregnancy		
Yes	22.74±19.76	51.32±9.26
No.	22.70±10.70	52.82±10.14
t test/p	0.02/0.97	-1.05/0.28
Daily underwear change status		
Yes	22.92±10.81	52.05±9.71
No.	22.25±10.51	52.61±10.09
t test/p	0.40/0.68	-0.36/0.71
Underwear type		
Cotton	22.47±11.03	52.27±9.85
Other	23.15±10.13	52.15±9.90
t test/p	-0.43/0.66	-0.08/0.93
Type of daily pad use		
Yes	23.56±10.37	53.37±10.94
No.	22.02±10.95	51.30±9.81
t test/p	1.00/0.31	1.48/0.14
Direction of genital area cleaning		
Front to back	22.66±10.66	52.64±9.75
Back to front	23.15±10.18	51.02±9.95
t test/p	-0.33/0.73	1.01/0.31

Sd: Standart deviation, t: Independent t test, F: One Way ANOVA test, $p<0.05$.

Correlation analysis indicated a strong positive association among the scales. ($r=0.59$, $p<0.05$) (Table 3).

Table 3. Correlation Analysis of TB-WEB Scale and BFLUTSQ

		BFLUTSQ	Storing	Urination	Incontinence	Sexual life	Quality of life
TB-WEB Scale	r	0.59	.280	-488	.450	.476	.486
	p	0.00	.000	.000	.000	.000	.000
The preferred place to urinate	r	-442	-.003	.452	-.491	-.433	.213
	p	.000	.643	.000	.000	.000	.000
Early urination	r	.650	.260	. 493	.540	.590	.161
	p	.000	.000	. 000	.000	.000	.002
Delayed voiding	r	.335	.214	.323	.304	.250	.215
	p	.000	.003	.000	.000	.000	.000
Difficulty urinating	r	.610	.234	.555	.509	.469	475
	p	.000	.001	.000	.000	.000	.000
Urination position	r	-.087	.310	-.051	-.134	-.026	.001
	p	.226	.000	.478	.006	.027	.857

In the regression model evaluating the predictive power of the participants' TB-WEB Scale on the BFLUTSQ, toilet behaviors (women's elimination behaviors) were significant predictors of the participants' lower urinary symptoms (R = .592, R2 = .135, Adjusted R2 = .351, F = 105.804, p = .000). Toilet behaviors explained 13.5% of the total variance related to lower urinary symptoms.

Table 4. Regression Analysis of the Effect of TB-WEB Scale on BFLUTSQ

BFLUTSQ

	B	Beta	t	p
Constant	-11.010	-	-3.300	**.001**
TB-WEB Scale total	0.646	0.592	10.286	**.000**

Linear regression analysis, p<0.05, R=.592/R2=.135/AdjustR2=.351,F=105.804/p=.000.

DISCUSSION

The literature reports that lower urinary tract symptoms, which are common in expectant women, can adversely impact their quality of life (Aydın, Kocaöz and Kara, 2020; Parlas et al., 2023). This study investigated the effect of toilet behaviors on lower urinary symptoms in pregnant women in their third trimester and found that toilet behaviors explained 13.5% of the total variance in these symptoms.

In addition to factors such as age, pregnancy, childbirth, menopause, hormones, and some operations, lifestyle behaviors such as smoking, alcohol and caffeine consumption, and fluid intake are among the risk factors for lower urinary tract symptoms (Degirmenci and Vefikuluçay –Yılmaz, 2020). This study is consistent with the literature, finding that smokers and caffeine consumers experience more lower urinary tract symptoms than do non-smokers and non-consumers, and that individuals who consume fewer than five cups (approximately 1000 ml) of water per day report

more symptoms than those who consume more. In a study conducted by Aydın et al. (2020) with pregnant adolescents, it was found that those who consumed coffee had a higher mean total score on the BFLUTSQ; non-smokers and those who quit smoking had a lower mean total score on the BFLUTSQ than smokers; and no significant difference was found with the amount of fluid consumed daily (Aydın et al., 2020). In a study of pregnant women, Balik et al. (2016) found that smokers experienced urinary incontinence more frequently than non-smokers. Güzel İnal and Timur Taşhan (2020) also found an increase in lower urinary tract symptoms in smokers and caffeine consumers (Güzel-İnal & Timur-Taşhan, 2020).

The study observed that those who consumed fewer than five glasses of water had poorer toileting behavior than those who consumed more water ($p < 0.05$). Lower urinary tract symptoms affect women's daily lives and lead to behaviors such as restricting fluid intake, avoiding public toilets, and carrying pads, which have psychological consequences for women (Seyhan Ak, et al., 2019). Inadequate fluid intake during pregnancy can lead to complications for maternal and fetal health (Song, et al., 2023). Therefore, it is important for pregnant women to be informed about this issue.

In the study, elimination behaviors of pregnant women were significant predictors of lower urinary symptoms ($p < 0.05$). In a study conducted by Destegül et al. (2023) among pregnant women, almost all participants (99%) experienced at least one lower urinary tract symptom, and 40% of these symptoms were attributed to toilet behaviors (Destegül, Kocaöz, Kara and Yavuz, 2023). Another study of participants aged 18–25 years found that toilet habits and lower urinary tract symptoms were also related (Sjögren, Malmberg and Stenzelius 2017). Karaaslan et al. (2024) also found that unhealthy toilet habits were associated with lower urinary tract symptoms. Based on these findings, toilet habits also affect lower urinary tract symptoms in pregnant women (Karaaslan, Korkut and Yilmaz, 2024).

Given that the BFLUTSQ score ranges from 0 to 71, pregnant women in the study were found to have lower urinary tract symptoms (mean total BFLUTSQ score: 22.71 ± 10.69). Aydın et al. (2020) found that 78.6% of pregnant adolescents experienced at least one lower urinary tract symptom, and Bosio et al. (2023) reported that 97.3% of pregnant women experienced urinary symptoms during pregnancy (Aydın et al., 2020; Bosio et al., 2023). A complete comparison cannot be made because the studies used different scales. However, since many factors affect urinary system symptoms and this study investigates the connection between toilet behaviors and those symptoms, this low-level result cannot be fully explained. Therefore, we believe that more studies comprehensively examining urinary symptoms during pregnancy should be conducted.

In this study, no significant association was found between toilet habits and lower urinary tract symptoms in women who reported not having a urinary tract infection. Previous studies have reported an association between UTI and lower urinary tract symptoms (Destegül et al., 2023; Wan et al., 2017). In this study, UTI was not evaluated with any objective test, and the data were analyzed using the participant's statement, so different results may have emerged.

CONCLUSION

While lower urinary tract symptoms are common in women, their relationship with toilet habits is often overlooked. Research has found that pregnant women in the third trimester experience mild urinary tract symptoms, and these symptoms are associated with toileting behaviors, smoking, caffeine consumption, and low fluid intake. Reducing lower urinary tract symptoms in pregnant women is crucial for improving quality of life and women's health. Therefore, to improve toileting behaviors during pregnancy, it is recommended to provide genital hygiene education, information on lower urinary tract infections and their symptoms, and guidance on healthy lifestyle behaviors that influence them. For future studies, it is recommended to examine the relationship between UTI, toilet behaviors, and lower urinary tract symptoms in pregnant women with UTI detected by objective testing.

This study was presented orally at the 11th Reproductive Health and Contraception Congress, "Reproductive Health in the Digital Age", İstanbul, on 21–22 September 2024.

Ethics Committee Approval: This study was approved by the ethics committee of Balıkesir University (Date: 18.01.2024, Number: E.340598)

Informed Consent: Written informed consent obtained from the participants.

Peer-review: Externally peer-reviewed.

Authors Contribution: Conception: Öy, CS; Design: ÖY, CS; Data Collection: CS; Analysis:ÖY; Literatüre Review: ÖY, CS;

Writing: ÖY, CS; Critical Review: ÖY, CS.

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