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ORIGINAL ARTICLE

A Comparison of Healthy Lifestyle Behaviors in Pregnant Women With and Without Stress Urinary Incontinence

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Abstract

Introduction and Hypothesis This study aimed to compare healthy lifestyle behaviors between pregnant women with and without stress urinary incontinence (SUI). We hypothesized that SUI might influence lifestyle behaviors, including hydration, nutrition, physical activity, and pregnancy-related responsibilities.

Methods This descriptive and comparative study was conducted at the obstetrics outpatient clinic of a maternity hospital between April and October 2024. The sample consisted of 210 pregnant women, including 105 diagnosed with SUI and 105 without SUI. Data were collected using a personal information form, the International Consultation on Incontinence Questionnaire-Short Form (ICIQ-SF), and the Healthy Lifestyle Behaviors in Pregnancy Scale.

Results Pregnant women with SUI had significantly higher mean ICIQ-SF scores than those without SUI ($t = 18.554$, $p = 0.001$, $d = 2.561$), indicating greater symptom severity. Although the SUI group scored lower on the Healthy Lifestyle Behaviors in Pregnancy Scale, this difference was not statistically significant ($U = 5102.00$, $p = 0.351$). In addition, correlation analyses revealed no significant relationship between urinary incontinence severity and healthy lifestyle behaviors in either group or in the total sample.

Conclusions The findings suggest that SUI does not significantly impact healthy lifestyle behaviors during pregnancy. Regardless of SUI status, most pregnant women appeared to maintain attention to health-promoting practices. These findings highlight the resilience and motivation of pregnant women in maintaining health-promoting behaviors despite physical challenges and contribute new evidence to the limited literature on this topic.

Keywords Pregnancy · Healthy lifestyle · Stress urinary incontinence

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Introduction

Stress urinary incontinence (SUI), defined as the involuntary leakage of urine during activities that increase intra-abdominal pressure (e.g., coughing, sneezing, or physical exertion), is the most common type of urinary incontinence experienced during pregnancy. Reported prevalence rates vary widely between 14 and 64%, with incidence increasing as gestation progresses [1–5]. The etiology of SUI in pregnancy is multifactorial and includes pelvic floor relaxation due to hormonal influences (e.g., relaxin, estrogen), mechanical pressure from the growing uterus, and existing risk factors such as advanced maternal age, high body mass index, multiparity, and chronic conditions [2, 6, 7].

During pregnancy, elevated levels of reproductive hormones and relaxin may lead to relaxation of the pelvic floor muscles and softening of connective tissues. As the expanding uterus increases intra-abdominal pressure, it can cause

displacement of the bladder and urethra, thereby reducing the capacity of pelvic muscles to contract effectively [7]. Although SUI is not a life-threatening condition, its psychosocial burden is significant. It can lead to embarrassment, reduced self-esteem, social withdrawal, and decreased quality of life in pregnant women [8, 9]. In response to these challenges, many women adopt behavioral adaptations such as restricting fluid intake, limiting physical activity, using absorbent pads, or avoiding public spaces [10, 11]. While these behaviors may reduce incontinence episodes, they can affect both maternal and fetal health either directly or indirectly. Healthy lifestyle behaviors during pregnancy such as maintaining adequate hydration, eating a balanced diet, engaging in regular physical activity, practicing good hygiene, and avoiding risky behaviors are essential for optimizing pregnancy outcomes and maternal well-being [12]. Studies show that pregnant women are generally motivated to adopt healthy behaviors, particularly when they perceive clear benefits for the fetus [13, 14]. However, physical discomforts, such as urinary incontinence, may disrupt or discourage such behaviors. Despite the known prevalence and consequences of SUI during pregnancy, there is a notable gap in the literature regarding how SUI affects women's ability to maintain healthy lifestyle behaviors. Understanding this relationship is important for guiding effective counseling, preventive strategies, and supportive care.

Therefore, this study aimed to compare healthy lifestyle behaviors between pregnant women with and without stress urinary incontinence. Understanding whether SUI influences engagement in healthy behaviors could provide insights for improving prenatal care, especially in symptom management and health promotion counseling.

Materials and Methods

Study Design

This study employed a descriptive and comparative cross-sectional design to assess healthy lifestyle behaviors in pregnant women with and without stress urinary incontinence.

Population and Sample of the Study

The study population comprised pregnant women registered for prenatal follow-up at the obstetrics outpatient clinic of a maternity hospital in northern Türkiye between April 1 and October 30, 2024. The sample size was calculated using G*Power (version 3.1.9.7) based on a two-tailed hypothesis test for independent group means, with a moderate effect size (Cohen's $d = 0.50$), 95% power ($1–\beta = 0.95$), and a significance level of $\alpha = 0.05$. The required sample size for each group was 105; consequently, the study included 210 pregnant women (105 with SUI and 105 without SUI). The sample was selected through purposive sampling among women attending the clinic, and group allocation (SUI vs. non-SUI) was determined on the basis of clinical diagnosis by an obstetrician. The data were collected through face-to-face interviews from the pregnant women who met the inclusion criteria and agreed to participate in the study after being informed about the study with a survey form administered by the researchers. It took the participants 10–15 min to fill in the data collection form.

Inclusion and Exclusion Criteria

Inclusion criteria for both groups were as follows:

- Age ≥ 18 years
- Ability to communicate in Turkish
- Ability to read and write
- Voluntary participation
- Being in the second or third trimester
- Diagnosis of urinary incontinence by an obstetrician
- Carrying a singleton, healthy fetus

Additional inclusion criteria for the SUI group:

- Clinically diagnosed stress urinary incontinence based on the obstetrician's evaluation and confirmed by ICIQ-SF score ≥ 6

Exclusion criteria for both the groups:

- High-risk pregnancy (e.g., preeclampsia, gestational diabetes)
- Pre-pregnancy urinary incontinence or previous pelvic surgery
- Known psychiatric disorders or ongoing treatment with psychotropic drugs
- First trimester or multiple gestations

Data Collection Tools

The data collection tool consists of three parts.

Personal Information Form Developed by researchers based on the relevant literature [8, 9]. It consists of ten questions regarding sociodemographic, obstetric, and health-related behaviors.

International Consultation on Incontinence Questionnaire Short Form (ICIQ-SF) Originally developed by Avery et al. (2004), this tool evaluates UI type, frequency, severity, and impact on quality of life [15]. It includes six items scored from 0 to 21. Higher scores indicate more severe symptoms

and a greater impact on the quality of life. The Turkish validation by Çetinel et al. (2004) reported a Cronbach's alpha of 0.71 [16]. In the present study, Cronbach's alpha was 0.85.

Healthy Lifestyle Behaviors in Pregnancy Scale Developed by Yilmaz and Karahan [17] to assess healthy lifestyle practices and risk-related behaviors during pregnancy [17]. It consists of 29 items across six subdimensions, scored on a 4-point Likert scale. Higher scores reflect healthier lifestyle behaviors. The original Cronbach's alpha was 0.83, and the current study found a Cronbach's alpha of 0.72.

Statistical Analysis

The data were analyzed using SPSS 22.0 (IBM SPSS Statistics for Windows, version 22.0). Before conducting inferential statistics, all variables were tested for normality using Kolmogorov–Smirnov and Shapiro–Wilk tests, and supported by skewness and kurtosis values (± 1.50). Descriptive statistics (frequency, percentage, mean, standard deviation) were calculated. Chi-square tests tests were used for categorical comparisons. Independent samples *t*-tests were used for comparing mean scores, and Levene's test was applied to assess homogeneity of variances. Spearman correlation was used to examine the relationship between incontinence severity and healthy lifestyle behaviors, stratified by SUI status. Statistical significance was set at $p < 0.05$.

Ethical Issues

This study was conducted in accordance with the ethical standards of the Declaration of Helsinki. Ethical approval was obtained from the X University Ethics Committee on February 23, 2024 (no. 2024-173). Institutional permission was obtained from the hospital where the data were collected. Informed consent, both written and oral, was obtained from each participant after providing detailed information about the study's aims, procedures, confidentiality, and voluntary nature.

Results

Analyses revealed that the two groups were similar in terms of sociodemographic and obstetric characteristics ($p > 0.05$), indicating homogeneity and comparability (Table 1). The majority of participants were aged 31 years or older (59.5%) and had at least a high school education (67.6%). While 20.0% of participants were employed at the time of the study, 50.0% reported not working, and 30.0% stated that they were unemployed due to pregnancy. Additionally, 54.8% of the participants had not previously given birth.

Regarding fluid consumption, none of the participants reported smoking or alcohol use. In both groups, nearly half of the pregnant women did not consume tea (48.6%), while 51.9% reported no coffee intake. The majority (71.4%) did not consume carbonated beverages, and 68.6% reported

Table 1 Comparison of the descriptive characteristics of pregnant women with and without stress urinary incontinence (SUI)

Characteristics		Pregnant women with SUI ($n=105$)		Pregnant women without SUI ($n=105$)		Total ($n=210$)		Test *p*-value
		n	%	*n*	%	*n*	%	
Age (years)	20–30	43	41.0	42	40.0	85	40.5	$x^2=0.020$
	≥ 31	62	59.0	63	60.0	125	59.5	$p=0.888$
Education	Primary–secondary school	32	30.5	36	34.3	68	32.4	$x^2=1.023$
	High school	41	39.0	34	32.4	75	35.7	$p=0.600$
	Undergraduate or higher	32	30.5	35	33.3	67	31.9	
Employment status	Employed	22	21.0	20	19.0	42	20.0	$x^2=0.197$
	Unemployed	51	48.6	54	51.4	105	50.0	$p=0.906$
	Unemployed due to pregnancy	32	30.5	31	29.5	63	30.0	
Gestational week	16–28	55	52.4	59	56.2	114	54.3	$x^2=0.307$
	≥ 29	50	47.6	46	43.8	96	45.7	$p=0.580$
Has a living child	Yes	48	45.7	47	44.8	95	45.2	$x^2=0.019$
	No	57	54.3	58	55.2	115	54.8	$p=0.890$
Previous delivery type	Vaginal birth	35	33.3	26	24.8	61	29.0	$x^2=3.219$
	Cesarean section	13	12.4	21	20.0	34	16.2	$p=0.200$
	Nulliparous	57	54.3	58	55.2	115	54.8	

x^2 Pearson chi-square test

drinking 6–10 glasses of water per day. There were no statistically significant differences between the groups in any of these consumption patterns ($p > 0.05$; Table 2).

The mean score on the International Consultation on Incontinence Questionnaire–Short Form (ICIQ-SF) was significantly higher in the SUI group (13.70 ± 2.16) than in the non-SUI group (5.39 ± 4.05), indicating greater severity of urinary incontinence symptoms ($t = 18.55$, $p < 0.001$). Although the mean total score on the Healthy Lifestyle Behaviors in Pregnancy Scale was slightly lower in the SUI group (91.89 ± 9.78) than in the non-SUI group (93.20 ± 9.33), the difference was not statistically significant ($t = -0.99$, $p = 0.79$). Similarly, none of the subdimensions showed significant differences between groups ($p > 0.05$ for all; Table 3).

Correlation analyses were conducted to examine the relationship between urinary incontinence severity and healthy lifestyle behaviors during pregnancy. Among pregnant women with urinary incontinence, no statistically significant correlation was found between the scores of the International Consultation on Incontinence Questionnaire—Short Form and the Healthy Lifestyle Behaviors in Pregnancy Scale ($r = -0.030$, $p = 0.764$). Similarly, in the group without urinary incontinence, the correlation between these two scales was not statistically significant ($r = -0.034$, $p = 0.732$). When all participants were analyzed collectively, no significant correlation was observed between ICIQ-SF scores and healthy lifestyle behavior scores ($r = -0.071$, $p = 0.303$) (Table 4).

Table 2 Comparison of daily fluid consumption among pregnant women with and without stress urinary incontinence (SUI)

Fluid Consumption pattern		Pregnant women with SUI ($n = 105$)		Pregnant women without SUI ($n = 105$)		Total ($n = 210$)		Test p-value
		n	%	*n*	%	*n*	%	
Daily tea consumption (cups)	0 cups	51	48.6	51	48.6	102	48.6	$x^2 = 0.151$ $p = 0.927$
	1–3 cups	30	28.6	32	30.5	62	29.5	
	≥ 4 cups	24	22.9	22	21.0	46	21.9	
Daily coffee consumption (cups)	0 cups	53	50.5	56	53.3	109	51.9	$x^2 = 0.175$ $p = 0.916$
	1–2 cups	39	37.1	37	35.2	76	36.2	
	≥ 3 cups	13	12.4	12	11.4	25	11.9	
Daily carbonated beverage consumption (cups)	0 cups	76	72.4	74	70.5	150	71.4	$x^2 = 1.845$ $p = 0.398$
	1 cup	19	18.1	25	23.8	44	21.0	
	2 cups	10	9.5	6	5.7	16	7.6	
Daily water consumption (cups)	6–10 cups	76	72.4	68	64.8	144	68.6	$x^2 = 1.414$ $p = 0.234$
	≥ 11 cups	29	27.6	37	35.2	66	31.4	

x^2 Pearson chi-square test

Table 3 Comparison of mean scores on the International Consultation on Incontinence Questionnaire Short Form and the Healthy Lifestyle Behaviors in Pregnancy Scale

Scales and subscales	SUI group ($n = 105$)	Non-SUI group ($n = 105$)	Test p-value
	Mean ± SD	Mean ± SD	
International Consultation on Incontinence Questionnaire Short Form (ICIQ-SF)	13.70 ± 2.16	5.39 ± 4.05	$t = 18.55$, $\mathbf{p = 0.001}$
Healthy Lifestyle Behaviors in Pregnancy Scale – Total	91.89 ± 9.78	93.20 ± 9.33	$t = -0.99$, $p = 0.79$
Hygiene	11.72 ± 3.48	12.08 ± 3.10	$t = -0.79$, $p = 0.14$
Nutrition	28.32 ± 4.24	28.82 ± 4.26	$t = -0.85$, $p = 0.47$
Physical activity	8.45 ± 2.68	7.92 ± 2.42	$t = 1.50$, $p = 0.43$
Travel	15.53 ± 3.21	15.85 ± 3.07	$t = -0.74$, $p = 0.60$
Pregnancy responsibility	15.07 ± 2.08	14.99 ± 2.35	$t = 0.27$, $p = 0.23$
Acceptance of pregnancy	12.77 ± 2.86	13.51 ± 2.60	$t = -1.96$, $p = 0.47$

t Independent sample *t*-test; *SD* Standard deviation

Table 4 Correlation between incontinence severity and healthy lifestyle behaviors in pregnant women according to SUI status

International Consultation on Incontinence Questionnaire Short Form (ICIQ-SF)	Spearman Rho and significant value	Healthy Lifestyle Behaviors in Pregnancy Scale
Pregnant Women with SUI group ($n=105$)	r	−0.030
	p	0.764
Pregnant Women without SUI group ($n=105$)	r	−0.034
	p	0.732
Total ($n=210$)	r	−0.071
	p	0.303

r spearman correlation coefficient; p significance level ($p<0.05$ was considered statistically significant)

Discussion

The primary aim of this study was to examine whether healthy lifestyle behaviors differ between pregnant women with and without stress urinary incontinence (SUI). Although women with SUI had lower healthy lifestyle behavior scores than those without SUI, no statistically significant difference was observed between the two groups when examining the subdimensions of hygiene, nutrition, physical activity, travel, pregnancy responsibility, and acceptance of pregnancy. These findings suggest that the presence of SUI may not be a determining factor in altering lifestyle behaviors during pregnancy. This result may be explained by the general tendency of pregnant women to adopt healthier lifestyle practices regardless of urinary symptoms. Pregnancy often leads to increased health awareness and greater motivation to engage in behaviors that support maternal and fetal well-being. Previous studies have shown similar trends [18]. In a comparable study by Çifçioğlu et al. [8], women with SUI had lower healthy lifestyle behavior scores than those without SUI [8]. For instance, a large-scale study conducted between 2005 and 2018 involving 9332 women reported that unhealthy lifestyle factors were associated with a higher risk of SUI [19]. However, existing literature also suggests that pregnant women tend to be more vigilant about healthy lifestyle behaviors for both maternal and fetal well-being [13, 14]. With the development of communication tools, pregnant women today have high levels of e-health literacy, which has been shown to enhance healthy lifestyle behaviors during pregnancy [20, 21]. Süt and Hür [14] found that pregnant women demonstrated higher healthy lifestyle scores compared to nonpregnant women [14]. Likewise, another study comparing two groups of women in the preconception period—one actively trying to conceive and the other planning pregnancy within 1–5 years—reported higher healthy lifestyle behavior scores in the actively planning group [13]. In addition to group comparisons, correlation analyses were conducted to explore the relationship between urinary incontinence severity and healthy lifestyle behaviors. No statistically significant correlation was found between the ICIQ-SF scores and healthy lifestyle behavior scores in either group (SUI or non-SUI), or in the overall sample. These findings suggest that the severity of urinary incontinence symptoms may not be directly associated with pregnant women's engagement in healthy lifestyle behaviors. This may be explained by the tendency of pregnant women to prioritize health-promoting behaviors irrespective of symptom severity, possibly due to increased health consciousness during pregnancy [14, 22].

Although the current study did not find statistically significant differences between groups, the lower mean scores among women with SUI may still carry clinical importance. The lack of statistical significance may be due to the overall high awareness and proactive behavior of pregnant women regarding health, or potentially due to sample homogeneity and insufficient effect size. Nonetheless, the observed trend indicates that SUI might subtly affect health behaviors, even if not strongly enough to reach statistical significance.

This study contributes to the limited literature on lifestyle behaviors in pregnant women with SUI and emphasizes the importance of individualized counseling during prenatal care. Future research with larger, more diverse samples and longitudinal designs could provide further insight into how SUI influences health behavior change over the course of pregnancy.

Strengths and Limitations

This study offers important contributions to the understanding of healthy lifestyle behaviors among pregnant women with and without stress urinary incontinence (SUI). One of its key strengths is the relatively large and balanced sample size, which enhances the statistical power and reliability of the findings. Additionally, the use of a standardized and validated measurement tool adds to the methodological rigor of the study.

However, certain limitations should be acknowledged. The study was conducted in a single tertiary maternity hospital, which may limit the generalizability of the results to the broader population of pregnant women across different

regions or healthcare settings. Nevertheless, the hospital is a high-capacity referral center that serves a demographically and socioeconomically diverse population within the province. For this reason, the sample can be considered broadly representative of the regional pregnant population. Future multicenter studies are recommended to further enhance external validity and support cross-regional comparisons.

Conclusion and Recommendations

This study revealed no statistically significant difference in healthy lifestyle behaviors between pregnant women with and without stress urinary incontinence (SUI). Both groups demonstrated relatively high engagement in healthy lifestyle practices, which may reflect the increased health awareness typically observed during pregnancy. Despite the absence of significant differences, the presence of SUI remains an important maternal health issue that can negatively affect quality of life. Therefore, it is essential to incorporate early screening for SUI into routine antenatal care and to provide appropriate counseling and support when symptoms are identified. It is also important to emphasize that the relatively high lifestyle behavior scores observed in both groups may be influenced by pregnancy-related motivation rather than the absence of symptoms. Thus, further studies with longitudinal designs and diverse populations are needed to explore the impact of SUI on health behaviors across different pregnancy stages and to determine whether targeted interventions can further improve outcomes.

On the basis of these findings, it is recommended that multidisciplinary teams, including midwives, obstetricians, physiotherapists, and health educators, collaborate to develop and implement comprehensive guidelines that promote healthy lifestyle behaviors in all pregnant women, with particular attention to those at risk of or affected by SUI. Furthermore, incorporating pelvic floor health education into routine antenatal care could enhance early identification and management of urinary symptoms during pregnancy. Personalized counseling and educational interventions may empower pregnant women to adopt healthier behaviors and prevent symptom progression. Strengthening collaboration among healthcare professionals will be essential in supporting maternal well-being and promoting sustainable health practices throughout pregnancy.

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Author's Contributions ŞB: Conceptualization, Formal analysis, Methodology, Supervision, Resources, Writing—original draft, Writing—review & editing. SY: Conceptualization, Data curation, Writing—original draft, Writing—review & editing. EK: Conceptualization, Methodology, Resources, Writing—original draft, Writing—review & editing.

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Data Availability The data are not publicly available in order to protect the privacy of the participants. The data that support the findings of this study are available on request from the corresponding author.

Declarations

Ethics Approval Ethical permission was obtained from Samsun Ondokuz Mayis University Social Sciences and Humanities (Date: February 23, 2024, no. 2024-173) and necessary permissions were obtained from the institution where the study was conducted.

Conflicts of interest The authors report no actual or potential conflicts of interest.

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