

Araştırma Makalesi/ Research Article

## Urinary Incontinence in Pregnancy and Its Effect on Quality of Life

### Gebelikte Üriner İnkontinans ve Yaşam Kalitesine Etkisi

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Geliş tarihi/ Date of receipt: 06/10/2023

Kabul tarihi/ Date of acceptance: 28/12/2023

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#### ABSTRACT

**Objective:** The aim of the study is to determine the incidence of urinary incontinence during pregnancy, its impact on quality of life, and the affecting factors.

**Methods:** The descriptive study was conducted on 300 pregnant women who applied to the pregnant outpatient clinic of a hospital in Ordu between December 2017 and May 2018. Data were collected using the Personal Information Form, Incontinence Quality of Life Scale (ASQI), and Incontinence Severity Index (ISI).

**Results:** It was determined that 91.7% of the pregnant women did not have urinary incontinence before pregnancy and 49.3% of them had urinary incontinence during pregnancy. It was found that 82.4% experienced incontinence during coughing and 75% during sneezing. It was determined that 35.7% of the pregnant women with urinary incontinence had mixed type UI, 31.6% had stress UI and 4.1% had urge UI. When the Incontinence Severity Index score of the pregnant women with urinary incontinence was evaluated, it was found that 54.7% were mild, 43.2% were moderate and 2% were in the severe group. There was a statistically significant difference between UI and the number of years, week, BMI, and type of delivery ( $p < 0.05$ ). There was a statistically significant difference between the gestational weeks of the patients with urinary incontinence in terms of quality of life and limitation of behavior subscale scores ( $p < 0.05$ ).

**Conclusions:** Incontinence quality of life levels of pregnant women with urinary incontinence were found to be lower than pregnant women without urinary incontinence.

**Keywords:** Pregnancy, urinary incontinence, quality of life, nursing

#### ÖZ

**Amaç:** Araştırmanın amacı gebelikte üriner inkontinans görülme durumu, yaşam kalitesi üzerine etkisi ve etkileyen faktörleri belirlemektir.

**Yöntem:** Tanımlayıcı tipte yapılan çalışma Aralık 2017- Mayıs 2018 tarihleri arasında Ordu ilindeki bir hastanenin gebe polikliniğine başvuran 300 gebe ile gerçekleştirildi. Araştırmanın verileri, Kişisel Bilgi Formu, İnkontinans Yaşam Kalitesi Ölçeği (İYKÖ), İnkontinans Şiddet İndeksi (İŞİ) kullanılarak toplandı.

**Bulgular:** Gebelerin %91.7'sinin gebelikten önce idrar kaçırma şikayetinin olmadığı, %49.3'ünün gebelik boyunca idrar kaçırma şikayeti olduğu belirlenmiştir. %82.4'ünün öksürme sırasında, %75'inin ise hapsirme sırasında idrar kaçırdığı saptanmıştır. Üriner inkontinans (Üİ)li gebelerin %35.7'si miks tipi Üriner İnkontinans, %31.6'sı Stres Üİ, %4.1'i ise urge Üİ olduğu tespit edilmiştir. Bu çalışmadaki Üriner inkontinanslı gebelerin İŞİ skorlamasına bakıldığında %54.7'si hafif, %43.2'si orta ve %2'sinin ise şiddetli grupta olduğu belirlenmiştir. Üİ ile eğitim, yaş, sigara kullanımı, kabızlık yaşama durumu arasında istatistiksel olarak anlamlı farklılık bulunmazken ( $p > 0.05$ ), gebelik sayısı, gebelik haftası, BKİ ve doğum şekli ile Üİ arasında anlamlı farklılık bulunmuştur ( $p < 0.05$ ).

**Sonuç:** Üriner inkontinanslı olan gebelerin olmayan gebelere göre inkontinans yaşam kalitesi düzeyleri daha düşük bulunmuştur.

**Anahtar Kelimeler:** Gebelik, üriner inkontinans, yaşam kalitesi, hemşirelik

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**Atf/Citation:** Keskin E., Şahin E. (2024). Urinary incontinence in pregnancy and its effect on quality of life. Ordu Üniversitesi Hemşirelik Çalışmaları Dergisi, 7(3), 604-615. DOI: 10.38108/ouhcd.1366777



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## Introduction

Urinary incontinence (UI) refers to the complaint of involuntary urinary leakage. UI can manifest in various types, categorized as stress, urge, mixed, nocturnal, postural, coital, and involuntary incontinence (Haylen et al., 2010).

Urinary incontinence is a prevalent issue, particularly among the elderly population, which constitutes an estimated 20% of the global population and represents a significant public health concern. Notably, UI is reported to be 2-5 times more common in women when compared to men. In studies conducted among women in our country, the prevalence of UI has been found to range from 16.4% to 49.7% (Başak et al., 2013). During pregnancy, the prevalence of UI has been reported as 27% by Kocaöz et al. (2010) and 41.7% by Dağdeviren et al. (2018).

The surge in hormone production during pregnancy leads to the relaxation of pelvic floor muscles and connective tissues, exacerbating pre-existing UI (Gökalp et al., 2020). Pregnancy-related changes, such as the pressure exerted by the developing uterus and fetus, increased progesterone, reduced levels of relaxing hormones, and decreased collagen synthesis, collectively diminish the supportive capacity of the pelvic floor muscles. Consequently, complaints of urinary incontinence increase, rendering pregnancy a significant risk factor for UI (Caruso et al, 2020; Güvenç et al., 2016).

Urinary incontinence during pregnancy is a substantial issue that negatively impacts the quality of life (Chang et al, 2021). In a study conducted in Ankara, it was reported that 31.9% of women experienced UI, 87% of whom continued to experience it in the postpartum period. Furthermore, 66.3% of these women reported that UI had some impact on their quality of life, with 26.1% experiencing a moderate effect. The study also identified a significant correlation between reduced quality of life, the prevalence, type, and volume of urinary incontinence, and the need for medical treatment (Kocaöz et al., 2012).

The prevalence of UI tends to increase as pregnancy progresses through the gestational weeks (Jean et al., 2018). In a study, UI was not observed in the 1st trimester, but it was noted in 24% during the 2nd trimester and 30% during the 3rd trimester (Okunola et al., 2018). Another study conducted in 2020 found that UI during pregnancy was most common in the third trimester (70.1%), with stress

urinary incontinence (SUI) being the most prevalent type (76.8%) (Mosdorf et al., 2021).

The nursing profession holds a pivotal role in the prevention of pelvic floor deficiencies and in promoting a healthy lifestyle for women. Nurses use their professional expertise to actively engage in the processes of identifying, planning, implementing, and evaluating care services for women who are at risk of experiencing urinary incontinence. This study aims to provide valuable insights that can contribute to raising awareness and enhancing interventions for women dealing with urinary incontinence during pregnancy.

## Aim

The study aimed to determine the incidence of UI during pregnancy and its effect on quality of life.

## Research Questions

1. How common is urinary incontinence in pregnant women?
2. Is there a difference in the quality of life due to incontinence between pregnant women with urinary incontinence and those without?
3. What are the risk factors of urinary incontinence in pregnancy?

## Method

### Research Design

This research is of the descriptive type. The research was conducted at the Pregnant Outpatient Clinic within the Gynecology and Pediatrics Service Building of the Ordu Province Ministry of Health, Ordu University Training and Research Hospital. This hospital has a total of seven pregnant polyclinics, where an average of 50-60 individuals are examined daily. Each outpatient clinic is staffed with one physician and one secretary. The data was collected between December 2017 and May 2018, with the active participation of pregnant women who voluntarily agreed to be part of the study.

### Study Population and Sample

The study's population comprised pregnant women who sought care at the pregnancy outpatient clinic at the relevant hospital between January 1, 2016, and December 31, 2016, and met the predetermined inclusion criteria. 4,163 pregnant women were admitted to the outpatient clinics at that time. To determine the sample size, Kocaöz et al. (2010) reported a 27% prevalence of urinary incontinence in pregnancy. Calculating the required sample size using a 95% confidence interval, a significance level of 0.05, the frequency of the event (0.30), and the theoretical table value (1.96) according to the formula for sample size calculation

from a known population (Sümbüloğlu and Sümbüloğlu, 2009), and 300 pregnant women should be included in the study.

#### ***Inclusion Criteria***

- Having at least a primary school education
- Agreeing to participate in the study
- Being able to communicate verbally

#### ***Exclusion Criteria***

- Having a psychiatric diagnosis
- Having a surgical intervention for incontinence
- Having a history of pelvic prolapse

#### **Data Collection Tools**

The Personal Information Form, the Incontinence Quality of Life Instrument, and the Incontinence Severity Index were used for data collection

***Personal Information Form:*** The form includes 26 questions about some characteristics of pregnant woman, their habits, and characteristics related to urinary incontinence (Erbil et al., 2011, İnal, 2019, Kocaöz et al., 2010).

***Incontinence Quality of Life Instrument (I-QOL):*** The Incontinence Quality of Life Scale (I-QOL) was originally developed in the United States. Patrick et al. (1999) examined the scale and reduced it from its initial form to 22 questions after psychometric evaluations. In Turkey, the scale's reliability and validity were established by Özerdoğan in 2003 (Özerdoğan, 2003). The I-QOL comprises three sub-dimensions: avoiding and limiting behaviors, psychosocial impact, and social embarrassment. A higher score on this scale indicates a higher quality of life and Cronbach's alpha value is 0.96. In the I-QOL, all items are evaluated on a five-category Likert-type scale (1 = very much, 2 = quite a bit, 3 = moderately, 4 = a little, 5 = not at all). For a better understanding of the total score, it is converted to a scale value from 0 to 100. I-QOL sub-dimension scales are scored in the same way. In this study, Cronbach's alpha value for the I-QOL was determined to be 0.802. Furthermore, Cronbach's alpha values for the sub-dimensions were also found to be highly reliable, with 'avoiding and limiting behaviors' at 0.596, 'psychosocial impact' at 0.726, and 'social embarrassment' at 0.820.

***The Incontinence Severity Index (ISI):*** The Incontinence Severity Index (ISI), developed by Sandvik et al. (2000) and applied to women with urinary incontinence, is a concise and easily administered index that has gained wide acceptance. The validity and reliability of the ISI in Turkey were evaluated by Uyar Hazar and Şirin in 2008. ISI

consists of two sub-articles. These are determined as 'How often do you leak urine?', 'How much urine do you leak each time?' ISI scores are determined by multiplying the numbers of the questions in both items. These scores are categorized as follows: 1-2 for mild, 3-6 for moderate, 8-9 for severe, and 12 for very severe (Sandvik et al., 2000). The Cronbach's alpha value for the ISI in this study was found to be 0.404.

#### **Data Collection**

Pregnant women who visited the outpatient clinic of a hospital located in the Black Sea region were informed about the study. Those who agreed to participate, following the principle of volunteerism, received comprehensive information about the study. Using face-to-face interviews, pregnant women completed the Personal Data Collection Form, I-QOL scale, and ISI, which took approximately 20 minutes for each participant. Data collection for the study took place between December 2017, and May 2018.

#### **Data Analysis**

Descriptive statistics were computed. The reliability of the I-QOL as a measurement tool was assessed using Cronbach's alpha internal consistency coefficient. Additionally, the Kolmogorov-Smirnov normality test was applied to all scores, and independent sample t-test, ANOVA, and Tukey test were employed.

#### **Ethical Considerations**

Pregnant women who consented to participate in the study were announced about the research, and their written informed consent was obtained. Written permissions for utilizing the scales and indices employed in the study were received from their respective authors. Additionally, formal authorization was granted from the relevant institution (dated August 25, 2017, Number: 43087058-772.02) to conduct the research. Ethical approval was obtained from the Clinical Research Ethics Committee of a hospital in the Black Sea region on October 26, 2017 (Number: 2017/125).

#### **Results**

The distribution of pregnant women based on their socio-demographic characteristics was as follows: the mean age of the women was 27.89±5.82 years. Notably, 30% of the pregnant women were in the age range of 21-25 years, 35.3% were secondary school graduates, the spouses of 42.7% had a high school education, 79% were unemployed, the spouses of 93.3% were employed, 78% had a nuclear family structure, 93.7% had social security

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coverage, 57.7% had “adequate” income, 61% lived in a city, 91.3% had no chronic diseases, and 41.3% were overweight with an average BMI of 27.90±4.66, although not included in the table.

Table 1 shows women’s obstetric characteristics. The average number of pregnancies was 2.36±1.32, with 31.8% experiencing their second pregnancy. 69.1% had a history of miscarriage; the mean number of living children was 1.56±0.73; and 54.4% had one living child. 40% of the pregnant women had not experienced a live birth, while 56.5% had a history of vaginal delivery. 53.3% had undergone an episiotomy, 97.8% did not require vacuum-forceps assistance during childbirth, 14.1% gave birth to macrozomic babies, and 50% were between 29-40 weeks gestation.

**Table 1.** Some characteristics of pregnant women

Obstetric Characteristics	n	%
<b>Number of pregnancy (n=300)</b> (mean 2.36±1.32)		
1 pregnancy	90	30.1
2 pregnancy	95	31.8
3 pregnancy	67	22.1
4 pregnancy	27	9.0
5 pregnancy and over	21	7.0
<b>Number of miscarriages (n=97)</b>		
1 miscarriage	67	69.1
2 miscarriages	18	18.6
3 miscarriages	10	10.3
4 miscarriages	2	2.0
<b>Number of living children (n=182)</b>		
1 child	99	54.4
2 children	68	37.4
3 children	11	6.0
4 children and over	4	2.2
<b>Number of live births (n=300)</b>		
No birth	120	40.0
1 birth	98	32.8
2 births	67	22.4
3 births and over	15	5.0
<b>Mode of birth (n=184)</b>		
Vaginal	104	56.5
Caesarean section	80	43.5
<b>Episiotomy application (n=184)</b>		
Yes	98	53.3
No	86	46.7
<b>Use of vacuum-forceps (n=184)</b>		
Yes	4	2.2
No	180	97.8
<b>Delivering a macrosomic baby (n=184)</b>		
Yes	26	14.1
No	158	85.9
<b>Gestational week (n=300)</b>		
1-12 weeks	51	17
13-28 weeks	99	33
29-40 weeks	150	50

\*Percentages were calculated using the specified number “n”.

Table 2 provides insight into the distribution of pregnant women concerning characteristics related to urinary incontinence. 91.7% of the pregnant women did not report urinary incontinence complaints before pregnancy, while 49.3% experienced urinary incontinence during pregnancy. Approximately 57.4% of pregnant women did not use any protective materials. Among those experiencing urinary incontinence, 55.4% reported experiencing it several times a month, and 90.5% described it as “a few drops.” 82.4% experienced urinary incontinence during coughing and 75% during sneezing. Additionally, 90.5% of pregnant women with urinary incontinence expressed a fear of urine odor. When assessing the ISI scores among pregnant women with urinary incontinence, 54.7% fell into the mild category, 43.2% in the moderate category, and 2% in the severe category, with none classified as very severe.

**Table 2.** Characteristics of pregnant women related to urinary incontinence

Characteristics related to urinary incontinence	n	%
<b>Urinary incontinence before pregnancy (n=300)</b>		
Yes	25	8.3
No	275	91.7
<b>Urinary incontinence during pregnancy (n=300)</b>		
Yes	148	49.3
No	152	50.7
<b>Duration of urinary incontinence (n=148)</b>		
1 year and less	131	88.5
2-4 years	17	11.5
<b>Use of protective materials (n=148)</b>		
Yes	63	42.6
No	85	57.4
<b>Frequency of urinary incontinence (n=148)</b>		
Less than a few times a month	2	1.4
A few times a month	82	55.4
A few times a week	60	40.5
Every day or every night	4	2.7
<b>Amount of urinary incontinence (n=148)</b>		
A few drops	134	90.5
Small spots	14	9.5

**Table 2.** (Continue) Characteristics of pregnant women related to urinary incontinence

Characteristics related to urinary incontinence	n	%
<b>ISI score (n=148)</b>		
Mild	81	54.7
Moderate	64	43.2
Severe	3	2.0
<b>Urinary incontinence during activity*</b>		
Coughing	122	82.4
Sneezing	111	75.0
Laughing	28	18.9
Getting out of bed	5	3.4
Climbing stairs	9	6.1
Lifting something	24	16.2
Physical activity	20	13.5
Doing something in a hurry	36	24.3
Sexual intercourse	2	1.4
<b>Problems experienced with urinary incontinence**</b>		
Fear of urine odor	134	90.5
Fear of urine leakage from the pet/diaper	37	25.0
Avoiding laughing too much	31	20.9
Avoiding lifting things	27	18.2
Avoidance of physical activity	24	16.2
Avoiding daily activities (housework, shopping)	40	27.0
Restricting fluid intake	16	10.8
Avoiding sexual intercourse	2	1.4

\* More than one answer was given.

\*\* More than one answer was given.

Table 3 highlights the distribution of mean scores of the I-QOL in women with and without urinary incontinence during pregnancy. The study identified a statistically significant difference in the mean scores of qualities of life and the sub-dimensions of avoiding and limiting behaviors, psychosocial impact, and social embarrassment between pregnant women with and without urinary incontinence ( $p < 0.05$ ). Pregnant women with urinary incontinence had significantly lower mean scores in these domains compared to those without urinary incontinence.

Table 4 examines the occurrence of urinary incontinence in pregnant women based on certain characteristics. No statistically significant differences were observed in the presence of urinary incontinence based on education, age, smoking, or constipation ( $p > 0.05$ ). However, significant differences were found between urinary incontinence status and BMI, number of pregnancies, and mode of delivery ( $p < 0.05$ ). Accordingly, the rate of urinary incontinence was lower among participants in the underweight/normal BMI group compared to those in the 2nd/3rd degree obese group. Furthermore, pregnant women with one pregnancy had a lower rate of urinary incontinence compared to those with four, five, or more pregnancies. Additionally, women who had vaginal deliveries had a higher rate of urinary incontinence compared to those who had cesarean deliveries. A statistically significant difference was also noted in urinary incontinence status concerning gestational weeks ( $p < 0.05$ ). Pregnant women in the 29–40-week gestation group had a higher rate of urinary incontinence compared to those in the 1-12- and 13-28-week gestation groups, and those in the 13-28-week gestation group had a higher rate of urinary incontinence than those in the 1-12-week gestation group.

**Table 3.** Mean scores of I-QOL in women with and without urinary incontinence during pregnancy

n	Urinary Incontinence	n	ALB	PI	SE	Total I-QOL
			Mean±SD	Mean±SD	Mean±SD	Mean±SD
Yes	148	27.53±4.500	41.40±3.670	21.39±2.412	90.06±9.358	
No	152	33.44±4.107	43.63±1.227	24.93±0.529	101.69±5.108	
Test and p			t= -11.880; p=0.000	t= -7.030; p=0.000	t= -17.430; p=0.000	t= -13.311; p=0.000

ALB: Avoiding, Limiting behaviors; PI: Psychosocial Impact; SE: Social Embarrassment; t= Independent Sample t Test

**Table 4.** Prevalence of urinary incontinence according to some characteristics of pregnant women

	Urinary Incontinence Yes		Urinary Incontinence No		Test and p
	Number	Percent	Number	Percent	
<b>Education</b>					
Primary School	26	57.8	19	42.2	$\chi^2=1.922, p=0.589$
Secondary School	52	49.1	54	50.9	
High School	43	48.9	45	51.1	
Undergraduate/Postgraduate	27	44.3	34	55.7	
<b>Age</b>					
20 years old and below	12	40.0	18	60.0	$\chi^2=7.911, p=0.095$
21-25 years	43	47.8	47	52.2	
26-30 years	35	44.9	43	55.1	
31-35 years	34	50.0	34	50.0	
36 years and over	24	70.6	10	29.4	
<b>Smoking</b>					
Yes	19	55.9	15	44.1	$\chi^2=0.658, p=0.417$
No	129	48.5	137	51.5	
<b>Constipation</b>					
Yes	48	53.9	41	46.1	$\chi^2=1.071, p=0.301$
No	100	47.4	111	52.6	
<b>BMI</b>					
Underweight/normala	37	39.8	56	60.2	$\chi^2=8.923, p=0.030$ Difference; a-c, a-d
25-29,9 kg/m2(overweight) b	60	48.4	64	51.6	
30-34,9 kg/m2(1. degree obese) c	34	58.6	24	41.4	
2./3. degree obese d	17	68.0	8	32.0	
<b>Number of pregnancy</b>					
1 pregnancy <sup>a</sup>	32	35.6	58	64.4	$\chi^2=13.198, p=0.010$ Difference; a-d, a-c
2 pregnancies <sup>b</sup>	47	49.5	48	50.5	
3 pregnancy <sup>c</sup>	38	57.6	28	42.4	
4 pregnancies <sup>d</sup>	18	66.7	9	33.3	
5 pregnancies and over <sup>e</sup>	13	61.9	8	38.1	
<b>Mode of birth</b>					
Vaginal birth	72	69.2	32	30.8	$\chi^2=15.059, p=0.000$
Caesarean section	33	40.7	48	59.3	
<b>Gestational week</b>					
1-12 weeks <sup>a</sup>	10	19.6	41	80.4	$\chi^2=31.169, p=0.000$ Difference; c-a, c-b, b-c
13-28 weeks <sup>b</sup>	43	43.4	56	56.6	
29-40 weeks <sup>c</sup>	96	63.3	55	36.7	

Table 5 shows the comparison of the mean scores of I-QOL and ISI according to the obstetric characteristics of pregnant women. Among the pregnant women with urinary incontinence, the mean score of ISI of those with 5 or more pregnancies ( $\bar{x}=3.69$ ) was significantly higher than the mean scores of those with 2 ( $\bar{x}=2.40$ ) and 3 ( $\bar{x}=2.50$ ) pregnancies ( $p<0.01$ ). The mean ISI score for pregnant women with one living child ( $\bar{x}=2.46$ ) was significantly lower than the mean score for those with two or more living children ( $\bar{x}=3.02$ ) ( $p<0.01$ ). Furthermore, the mean ISI score for pregnant women with one live birth ( $\bar{x}=2.40$ ) was

significantly lower than the mean score for pregnant women with three or more live births ( $\bar{x}=3.60$ ) ( $p<0.05$ ).

However, no significant differences were observed in the mean scores of the I-QOL based on the number of pregnancies, number of living children, or number of live births ( $p>0.05$ ). Similarly, there were no significant differences in the mean scores of the I-QOL and ISI based on the type of delivery, episiotomy application, or occurrence of a macrozomic baby birth among pregnant women with urinary incontinence ( $p>0.05$ ).

**Table 5.** Comparison of the mean scores of I-QOL and ISI according to some obstetric characteristics of pregnant women with urinary incontinence

	<b>n</b>	<b>Quality of Life Total Score Mean±SD</b>	<b>Incontinence Severity Index Score Mean±SD</b>
<b>Number of pregnancy</b>			
1 pregnancy <sup>a</sup>	32	89.5±10.659	2.88±1.561
2 pregnancies <sup>b</sup>	47	91.06±10.979	2.4±0.614
3 pregnancy <sup>c</sup>	38	91.68±5.905	2.5±1.084
4 pregnancies <sup>d</sup>	18	89±7.34	3.06±1.349
5 pregnancies and over <sup>e</sup>	13	84.54±9.243	3.69±1.653
<i>Test and p</i>		F=1.669; p=0.160	F= 3.862; p=0.005** Difference; e-b, c
<b>Number of miscarriages</b>			
1	42	89.36±9.502	2.86±1.407
2 and over	16	86.44±9.626	3.06±1.526
<i>Test and p</i>		t=1.042; p=0.302	t= -0.486; p=0.629
<b>Number of living children</b>			
1 child	54	89.8±11.172	2.46±0.77
2 children and over	50	90.24±6.956	3.02±1.436
<i>Test and p</i>		t= -0.245; p=0.807	t= -2.438; p=0.017*
<b>Number of live births</b>			
None <sup>a</sup>	46	89.83±9.441	2.78±1.428
1 birth <sup>b</sup>	53	89.92±11.208	2.4±0.566
2 births <sup>c</sup>	39	91.08±6.209	2.87±1.38
3 births and over <sup>d</sup>	10	87.9±9.279	3.6±1.713
<i>Test and p</i>		F=0.340; p=0.797	p=0.021*Difference; b-d
<b>Mode of birth</b>			
Vaginal	72	90.06±7.733	2.75±1.286
Caesarean section	33	89.67±12.254	2.67±0.854
<i>Test and p</i>		t= 0.197; p=0.844	t=0.339; p=0.735
<b>Episiotomy application</b>			
Yes	68	90.21±7.591	2.68±1.19
No	37	89.43±11.994	2.81±1.126
<i>Test and p</i>		t= 0.404; p=0.687	t= -0.563; p=0.575
<b>Delivering a macrosomic baby</b>			
Yes	19	87.74±9.568	3.37±1.606
No	86	90.42±9.264	2.58±1
<i>Test and p</i>		t= -1.135; p= 0.259	t= 2.050; p=0.053

t= Independent Sample t-test p= Significance Level, F= One-Way Analysis of Variance (ANOVA)

\*p<0.05 Independent Sample t-test p=Significance Level, F=One-Way Analysis of Variance (ANOVA)

### Discussion

In this study, the mean number of pregnancies was found to be 2.36. The mean number of pregnancies was reported as 1.78 by Kılıçarslan (2008), and 2.4 by Altınparmak (2006), which is consistent with this present study.

Regarding the mode of delivery, 56.2% of pregnant women in this study had previously given birth vaginally. In Kılıçarslan's (2008) study, the rate of vaginal delivery in prior pregnancies was 68%, while another study by Altınay et al. (2002) showed a rate of 64%. İnal (2019) found that 61.2% of pregnant women had given birth vaginally. These results demonstrate that the rate of vaginal delivery in our study is consistent with the findings of previous studies, indicating that more than half of the births were vaginal.

Furthermore, the study identified that episiotomies were performed on 53.3% of the pregnant women. In Yılmaz et al.'s (2014) research involving 200 women, 58.7% underwent episiotomies. In another study, İnal (2019) reported that 59.3% of women experienced episiotomies. It can be noted that differences in episiotomy rates between our study and other research findings may be attributed to variations in the number of births among the study participants.

In our study, we found that the prevalence of UI among pregnant women was 49.3%. This figure was found to be 52.6% of pregnant women in a relevant study (İnal, 2019). Terzi et al. (2013) discovered a UI prevalence of 44.8% in women, while it was determined to be 42.6% among women living in Nicosia (Durmaz, 2011). In another study, UI was reported to be 40.4% in pregnant women (Erbil et al., 2011). In a study involving 306 pregnant women, UI prevalence was found to be 34.3% (Abdullah et al., 2016). These collective findings suggest that nearly half of pregnant women experience urinary incontinence, although the prevalence may vary depending on the stage of gestation.

The frequency of urinary incontinence among women experiencing UI was reported as follows: 27.5% experienced it several times a month, 35% several times a week, and 16.5% several times a day in a study of 200 women (Yılmaz et al., 2014). In our study, among pregnant women with UI, we observed that 1.4% experienced it less than a few times a month, 55.4% a few times a month, 40.5% a few times a week, and 2.7% every day or every night. This variability in frequency could be

attributed to differences in study populations, pregnancy status, and various other factors.

As women age, the pelvic floor muscles that support the bladder and urethra tend to weaken, leading to urethral displacement (Parazzini et al., 2003). In a study with 393 pregnant women, a significant relationship was found to exist between age and UI (Kocaöz et al., 2010). In contrast, UI rates were noted at 17.5% in the 20-30 age group, 26.9% in the 31-40 age group, 21.9% in the 41-50 age group, 19.4% in the 51-60 age group, and 14.4% in the 61 and over age group (Durmaz, 2011). In our study, we did not find a significant relationship between age and UI ( $p>0.05$ ). However, we observed that 40% of pregnant women under 20 years of age, 47.8% of those aged 21-25, 44.9% of those aged 26-30, 50% of those aged 31-35, and 70.6% of those aged 36 and older had UI. This differs from some prior research, possibly due to the age-related physiological changes that contribute to increased UI rates in pregnant women within our study population.

In our study, upon examining the relationship between urinary incontinence (UI) and the educational status of pregnant women, we observed that 57.8% of pregnant women with UI were primary school graduates, 49.1% were secondary school graduates, 48.9% were high school graduates, and 44.3% were undergraduate or postgraduate degree holders. In a study conducted by Terzi et al. (2013), it was observed that the prevalence of UI decreased significantly among individuals with high school and undergraduate education levels (primary school 57.3%, high school/undergraduate 23.7%). Demircan et al. (2016) also reported a decrease in UI with increasing education levels. These findings suggest that women with higher educational backgrounds may be more informed about preventing urinary incontinence, aligning with the existing literature.

As body mass index (BMI) increases, urinary incontinence may occur due to elevated intraabdominal pressure on the bladder and increased urethral motility (Süt, 2015). In our study, of pregnant women with UI, 39.8% were underweight or normal, 48.4% were overweight, 58.6% were 1<sup>st</sup>-degree obese, and 68% were 2<sup>nd</sup> or 3<sup>rd</sup>-degree obese. The rate of urinary incontinence in the underweight/normal BMI group was significantly lower than in the 2<sup>nd</sup>/3<sup>rd</sup> degree obese BMI group. The rate of urinary incontinence in people with a BMI of underweight or normal is significantly lower than in people with a BMI of



grade 2 or 3 obese. In Terzi et al.'s (2013) study, the prevalence of UI was 29% in normal-weight women with a BMI between 18.5-25.0 and 62.3% in women with a BMI over 30. Similarly, in another study, 36.7% of underweight women, 36.6% of normal-weight women, 43.8% of slightly obese women, 63.3% of moderately obese women, and 49.3% of obese women experienced urinary incontinence (Durmaz, 2011). Our study results are consistent with the literature, indicating that urinary incontinence tends to increase as BMI rises.

In a study conducted by İnal (2019) involving pregnant women, constipation complaints were linked to urinary incontinence during pregnancy. Durmaz (2011) found a statistically significant difference in the incidence of urinary incontinence between those with and without constipation in a study conducted in Nicosia. However, in another study, no increase was observed in constipation complaints among women with urinary incontinence (Korur, 2008). In our study, we did not find a statistically significant relationship between the urinary incontinence status of pregnant women and constipation ( $p>0.05$ ). These findings are similar to the study conducted by Korur (2008) and differ from other studies. This discrepancy is thought to be influenced by cultural dietary habits.

When intra-abdominal pressure increases, such as during coughing, the bladder is subjected to more pressure than the urethra, which can result in urinary incontinence (Mihmanlı and Yüksel, 2013). In our study, it was determined that 82.4% of pregnant women with urinary incontinence experienced incontinence when coughing. Given that the presence of a cough complaint can impact the frequency of urinary incontinence, this finding is consistent with the literature.

In Durmaz's study (2011), urinary incontinence was found to be 28.3% in women who had never been pregnant, 37.5% in women with one pregnancy, 27.5% in women with two pregnancies, and 63.1% in women with three or more pregnancies. Terzi et al. (2013) also found that the incidence of UI increased with an increasing number of pregnancies (Terzi et al., 2013). In our study, the incidence of urinary incontinence in pregnant women was 35.6% in those with one pregnancy, 49.5% in those with two pregnancies, 57.6% in those with three pregnancies, 66.7% in those with four pregnancies, and 61.9% in those with five or more pregnancies. A significant relationship was observed between the number of pregnancies and UI. While our findings are consistent with the

literature regarding the increased frequency of UI as the number of pregnancies rises, it is suggested that an increased number of pregnancies may negatively affect UI and impact the quality of life.

As the number of vaginal deliveries increases, there can be changes (stretching) in the muscles, nerves, and ligaments of the pelvic floor. These changes can lead to irreversible functional and anatomical alterations in the pelvic floor. The deterioration in the functions of the structures that support the urethra and bladder can result in urinary incontinence (Kocaöz and Eroğlu, 2009). Durmaz (2011) reported that 55.2% of women who delivered vaginally, 28.6% of women who had cesarean section deliveries, and 50% of women who had both vaginal and cesarean section deliveries experienced UI, and the difference in the prevalence of UI among these groups was statistically significant. In our study, 69.2% of pregnant women with urinary incontinence had delivered vaginally, while 40.7% had delivered by cesarean section. Our study findings are consistent with the literature, highlighting a significant relationship between the mode of delivery and urinary incontinence.

Among the pregnant women in our study, 63.3% experienced urinary incontinence (UI) between the 29th and 40th weeks of gestational age. This study revealed a statistically significant relationship between UI status and gestational week. In a study conducted by İnal (2019), it was found that 73.4% of pregnant women experienced UI at 36 weeks and beyond, and a significant relationship was also observed. Our study's findings are in line with İnal's study, indicating that the incidence of UI increases as the gestational week progresses. This could be attributed to the pressure exerted on the bladder during fetal head engagement.

Urinary incontinence is a medical and social concern that has a detrimental impact on quality of life. The mean scores of the sub-dimensions of the I-QOL among pregnant women with UI in our study were found to be  $27.53\pm 4.500$  for the avoiding and limiting behaviors,  $41.40\pm 3.670$  for the psychosocial impact,  $21.39\pm 2.412$  for the social embarrassment and  $90.06\pm 9.358$  for the total I-QOL score. On this scale, a lower score indicates a poorer quality of life, while a higher score signifies a better quality of life (Özerdoğan & Beji, 2003). In a study by Göral (2014), the mean scores for women with UI were reported as  $60.00\pm 21.84$  for the avoiding and limiting behaviors sub-dimension,  $59.92\pm 22.71$  for the psychosocial impact sub-dimension,  $53.72\pm 22.06$  for the social embarrassment sub-

dimension, and  $61.00 \pm 22.06$  for the total mean score of the I-QOL. Another study found mean scores of  $47.48 \pm 26.94$  for avoiding and limiting behaviors,  $66.75 \pm 27.84$  for psychosocial impact,  $58.20 \pm 29.26$  for social embarrassment, and  $57.80 \pm 25.97$  for the total score of the I-QOL among women with UI (Yılmaz et al., 2014). These findings suggest that pregnant women with UI in our study had lower quality of life scores in the avoiding and limiting behaviors and psychosocial impact sub-dimensions compared to some previous studies. The impact of UI on quality of life can vary among individuals and may be influenced by cultural, social, and personal factors. In a study conducted by İnal (2019) among pregnant women with urinary incontinence, the mean scores according to the sub-dimensions of the I-QOL were reported as follows:  $55.63 \pm 19.69$  for avoiding and limiting behaviors,  $73.04 \pm 23.75$  for psychosocial impact, and  $60.27 \pm 21.55$  for social embarrassment. The mean total score of the scale was found to be  $63.64 \pm 20.93$ . Our study aligns with the findings of Göral's study but differs from those of Yılmaz and İnal. This variation is likely attributable to regional differences and the behavioral patterns of pregnant women. Urinary incontinence affects pregnant women at different levels in terms of performing daily life activities, maintaining social life, and affecting behavior.

In our study, a significant difference was observed between the number of births and the mean scores of the ISI. Kaya et al. (2015) also reported a significant difference between the number of births, BMI, and severity of urinary incontinence among women with SUI and mixed urinary incontinence. The findings of the study are similar to the literature in terms of an increase in the severity of urinary incontinence as the number of births and BMI of women with urinary incontinence increase. It is thought that the severity and amount of incontinence may increase with an increasing number of births and progressive weight gain in pregnant women with UI.

Nearly half of the pregnant women (49.3%) who participated in the study had UI, and the frequency and severity of UI significantly affected their incontinence quality of life.

### Conclusion and Recommendations

In our study, we discovered that 49.3% of pregnant women experienced urinary incontinence during pregnancy. Significant differences were observed between the presence of UI and factors such as BMI, the number of pregnancies, and the

mode of delivery among the participating pregnant women. Additionally, we found a significant difference between the number of pregnancies, live births, and ISI scores of pregnant women with urinary incontinence.

Furthermore, the study revealed a significant difference in the mean scores of the I-QOL and ISI between pregnant women who had urinary incontinence before pregnancy and those who did not. It is highly advisable that pregnant women experiencing urinary incontinence receive education on how to prevent risk factors and be encouraged to seek medical assistance promptly if they encounter any issues related to urinary incontinence. Since urinary incontinence during pregnancy can significantly negatively affect a person's quality of life, it is recommended to plan studies that reveal risk factors and increase evidence-based practices to prevent urinary incontinence during pregnancy.

### Limitations

It is important to note that the study's findings may not apply to all women due to its specific focus on pregnant women who were admitted to the Pregnancy Outpatient Clinic of Ordu University Training and Research Hospital Obstetrics and Gynecology Annex Service Building in 2017.

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**Ethics Committee Approval:** Pregnant women who consented to participate in the study were announced about the research, and their written informed consent was obtained. Written permissions for utilizing the scales and indices employed in the study were received from their respective authors. Additionally, formal authorization was granted from the relevant institution (dated August 25, 2017, Number: 43087058-772.02) to conduct the research. Ethical approval was obtained from the Clinical Research Ethics Committee of a hospital in the Black Sea region on October 26, 2017 (Number: 2017/125).

**Peer-review:** External referee evaluation.

**Author Contributions:** Conception and design: EŞ, EK; Collection of data: EK; Literature review: EŞ, EK; Analysis and interpretation of data: EŞ, EK; Drafting the manuscript: EŞ, EK; Reviewing manuscript: EŞ; Final approval of the version to be submitted: EŞ, EK.

**Conflict of interest:** The authors declare that they have no conflict of interest.

**Financial Disclosure:** No financial support has been received for this research.

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**What did the study add to the literature?**

- Approximately half of pregnant women (49.3%) have urinary incontinence.
- Urinary incontinence significantly affects the incontinence quality of life during pregnancy.
- Evidence-based studies are needed to prevent urinary incontinence risk factors during pregnancy.

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