

Voiding Dysfunction between Women Following Vaginal Vs Cesarean Section Delivery: A Comparative Study

**Nashwa Ahmed Mohamed Zakzouk¹, Farida Mahmoud Habib²,
Rania Ezzat³ & Howida A. Mohamed⁴**

¹*Head Nurse at Obstetric & Gynecological Operating Theater,
Menoufia University hospital*

²*Professor of Maternal and Newborn Health Nursing,*

³*Lecturer of Maternal and Newborn Health Nursing,*

⁴*Assistant Professor of Maternal and Newborn Health Nursing,*

^{2,3,4} *Faculty of Nursing, Menoufia University*

Abstract: Background: Postpartum voiding dysfunction is a common, transient health problem occurring in women immediately after giving birth. **Purpose:** This study was conducted to compare between voiding dysfunction among women following vaginal and cesarean section. **Methods:** Descriptive correlational design was used. A purposive sample of 200 women who delivered at Obstetric & Gynecological department, Menoufia University Hospital in Shebin El-kom. **Instruments:** Voiding dysfunction interviewing questionnaires was used. **Results:** Women who had dysuria and pain during urination following vaginal delivery represented (32%) compared to (21%) among women following cesarean section. **Conclusion:** Women who delivered vaginally were more prone to have voiding dysfunction problems than cesarean section delivery. **Recommendations:** Health education programs related to identification and management of voiding dysfunction should be developed for women before delivery.

Key words: *Cesarean section, Vaginal delivery, Voiding dysfunctions*

Introduction

Labor is defined as the culmination of pregnancy, marked by the exit of one or more babies from the mother's internal environment through vaginal delivery or caesarean section. Labor unfolds across four stages: the first stage involves the shortening and opening of the cervix; the second stage

comprises the descent and birth of the baby; the third stage entails the delivery of the placenta; and the fourth stage, also known as the postpartum period, focuses on the recovery of both the mother and baby (Wahdan et al., 2022).

***Voiding Dysfunction between Women Following Vaginal Vs Cesarean Section Delivery:
A Comparative Study***

The initial stage is characterized by abdominal cramping or back pain lasting around half a minute and occurring every 10–30 minutes. Contractions progressively intensify and become more frequent. As labor advances, the pain associated with contractions increases in frequency and intensity. The second stage concludes upon the full expulsion of the baby, while the third stage involves the delivery of the placenta. The fourth stage encompasses the mother's recovery, delayed clamping of the umbilical cord, and neonatal monitoring (Bruno et al., 2023).

The primary indication of labor is strong, recurrent uterine contractions. The pain during contractions is often likened to severe menstrual cramps. Crowning may result in intense stretching or a burning sensation. "Back labor" refers to specific pain experienced in the lower back, just above the tailbone, during childbirth. Another noticeable sign of labor is the rupture of membranes, commonly known as "water breaking." Throughout pregnancy, the baby is surrounded and cushioned by a fluid-filled sac. Typically, this sac ruptures at the onset or during labor (Desai et al., 2023).

Vaginal delivery is considered the safest method for both the fetus and the mother when the newborn reaches full-term between 37 to 42 weeks of gestation. The preference for vaginal delivery stems from the increasing morbidity and mortality rates associated with operative cesarean births over time (Lagrew et al., 2018).

In the United States, about 15% of vaginal deliveries (VDs) result in an unscheduled Cesarean delivery (uCD). Certain subgroups, such as nulliparous women and those in need of labor induction, have even higher incidence of uCD, with reported rates of 21% and 26%, respectively. Compared to elective cesarean births (CD), uCD during attempted VD is linked to greater rates of morbidity and mortality, including maternal trauma, bleeding, febrile illness, and other problems. Accurate pre-labor identification of women at high risk of uCD may help to lower the morbidity associated with uCD (Meyer et al., 2023).

Worldwide, the number of cesarean deliveries has surged in the past few decades. It is projected to be 25% in Europe, 40% in Latin America, 32% in the US, and 32% in Oceania. Nowadays, cesarean section presently stands as the most frequently performed surgery globally. Researchers have a poor understanding of the causes of this tendency. The choice is frequently influenced by the obstetrician, his training and views, the gravidity features, the hospital setting and internal procedures, the growing prevalence of induction of labor, the medicolegal ramifications, and lastly, the mother's capacity to request a caesarean section if there is no medical reason to do so (Sorrentino et al., 2022).

Voiding dysfunction refers to the abnormality of bladder emptying in neurologically normal individuals, marked by increased external sphincter activity during voluntary voiding

***Voiding Dysfunction between Women Following Vaginal Vs Cesarean Section Delivery:
A Comparative Study***

(Avondstondt et al., 2020). It manifests as sudden aching or an inability to fully urinate, necessitating urinary catheterization for over 12 hours after childbirth or failure to spontaneously void within 6 hours of vaginal delivery (Perú Biurrun et al., 2020).

Symptoms of voiding dysfunction may encompass incomplete relaxation of muscles controlling urine flow, persistent feeling of fullness in the bladder, urgency, difficulty urinating, urinary tract infections, frequent urination, pain, hesitancy, dribbling, intermittent urine flow, and discomfort in the back, flank, or abdomen (Avondstondt et al., 2020). If left untreated, it can lead to iatrogenic injuries. A single instance of bladder overdistension can result in prolonged or permanent voiding dysfunction, recurrent urinary tract infections, uremia, sepsis, spontaneous bladder rupture, renal failure, and pulmonary edema (Li et al., 2020).

In the early postpartum phase, difficulties voiding and retention of urine are common occurrences. This is a disorder that is often underdiagnosed, despite its broad clinical significance. Voiding dysfunction is defined as the total or relative inability to empty the bladder as a result of either increased bladder outlet resistance or decreased bladder contractility (magnitude or duration), or both (Swathi & Samant 2020).

Postpartum urinary retention (PUR) is the most common postpartum voiding dysfunction. Risk factors for postpartum urinary retention (PUR) include: a prolonged second stage of labor, (high grade) perineal lacerations,

and episiotomy, degree of perineal pain, fetal birth weight, use of systemic narcotics, null parity, cesarean section, epidural analgesia, intermittent catheterization during labor, an increasing number of catheterizations, and an absence of spontaneous voiding before leaving the delivery room (Mohr et al., 2022).

Significance of the Study

According to Swathi and Samant (2020), postpartum voiding dysfunction (PPVD) incidence is 20.2%. Among these dysfunctions, postpartum urinary retention (PUR) stands as the most prevalent, with its incidence varying widely from 0.18% to 47% (Stefan et al., 2022). This disparity could be attributed to many patients with urinary retention being asymptomatic, leading to undiagnosed cases. Unfortunately, there is insufficient published data in Egypt concerning this issue, making it imperative to explore and shed light on this condition. Therefore, this study aims to compare between voiding dysfunction among women following vaginal and cesarean section deliveries.

Purpose:

The main purpose of the current study is to compare between voiding dysfunction among women following vaginal and cesarean section deliveries.

Research questions:

What is the difference between voiding dysfunction among women following vaginal and cesarean section delivery?

*Voiding Dysfunction between Women Following Vaginal Vs Cesarean Section Delivery:
A Comparative Study*

Operational definitions of the variables

- ◆ Vaginal delivery: -In this study, vaginal delivery refers to the spontaneous delivery of a full-term fetus, typically presenting headfirst, without medical assistance. It occurs solely through uterine contractions and without complications to either the mother or the fetus.
- ◆ Cesarean delivery (C-section): -In this study, is a mode of delivery executed through an abdominal incision. It is opted for when vaginal delivery is contraindicated, primarily to safeguard the life of the mother, the baby, or both.
- ◆ Voiding dysfunction: - In this study, voiding dysfunction encompasses various urinary issues, including involuntary dripping, potential presence with or without stress, difficulty or straining during urination, and discomfort associated with urethral spasm. Assessment of voiding dysfunction involves the use of risk factor assessment and specific questionnaires designed for evaluating voiding problems.

Methods:

Research design:

A descriptive correlational design was used.

Research setting:

The study is conducted at Obstetric & Gynecological department, Menoufia University Hospital Shebin El-kom. The University hospital was established in 1993. The bed capacity of the MUH is 700 beds. This divided into four buildings. Obstetrics and

Gynecology department in the third level, which contains obstetrics surgeries and obstetrics department. The department consists of 3 sonography rooms, 8 inpatient rooms; the bed capacity of the department is 52 beds. The flow rate of postpartum women at university hospital is around 1000 women per year (2021).

Sample:

A purposive sample of 200 women (100 who had vaginal deliveries and 100 who underwent cesarean sections) from the aforementioned setting met the inclusion criteria of being full-term (> 36 weeks) and undergoing either vaginal or cesarean delivery. Exclusion criteria involved women with multiple pregnancies, prior surgeries for uterovaginal prolapse or urinary incontinence, severe cardiopulmonary or renal diseases, preeclampsia, and insulin-dependent diabetes mellitus, aiming to control extraneous variables. Utilizing G*Power software with an independent sample t-test, a significance level of 0.05, power of 0.95, and a medium-low effect size of 0.15 were considered. Initially, the sample size was calculated as 80 women in each group, which was subsequently increased to 100 in each group to ensure representativeness.

Instruments of data collection:

A single instrument was employed to fulfill the objectives of the present study.

▪ **Part 1: -Demographic characteristics and obstetric history:**

Encompassing details such as age, educational level, occupation,

*Voiding Dysfunction between Women Following Vaginal Vs Cesarean Section Delivery:
A Comparative Study*

telephone number, and marital status.

- **Part 2: -Obstetric history:** Covering information on number of pregnancies, number of living children, mode of delivery (spontaneous vaginal delivery, cesarean section delivery), complications at delivery, gender and condition of newborn (male or female, alive or dead), fetal or maternal complications in the puerperium and time of last delivery.
- **Part 3: -Medical and Surgical History:** Gathering data on any chronic illnesses and prior surgical procedures experienced by the women.
- **Part 4: -Risk factors assessment of voiding dysfunction:** Consisting of inquiries regarding anesthesia types, use of fundal pressure during the second stage of labor, prolonged second stage of labor, delivery of macrosomic newborn, perineal laceration as well as episiotomy and injury to the bladder during the delivery.
- **Part 5: Voiding dysfunction assessment:** This part contained close ended questions to assess voiding dysfunction after delivery. It included close ended questions such as number of voiding times per day, stress incontinence, urgency, straining during urination, dysuria, if there was any intermittent urine flow, and if there was back pain, flank, or abdominal pain.

Instrument Validity:

To ensure validity, the instrument underwent scrutiny by a panel of experts, which included two professors specializing in obstetric nursing and one in obstetrics and gynecology. The questionnaire was meticulously developed and then reviewed for content validity by five experts, comprising three professors in maternity nursing from the Faculty of Nursing and two professors from the Obstetrics and Gynecology department at the Faculty of Medicine. Their evaluation focused on assessing content accuracy, internal validity, completeness, relevance, content coverage, and question clarity. Subsequent to their assessment, necessary modifications were carried out.

Reliability of the instruments:

The reliability of this instrument was evaluated among 10 participants using the test-retest method with a two-week interval between the assessments. The Cronbach's alpha coefficient between the two sets of scores was calculated to be 0.78.

Pilot Study:

A pilot study was conducted on 20 women, representing 10% of the total sample, to assess the instruments' feasibility, applicability, and comprehensibility. Based on the pilot study's findings, necessary modifications were implemented. These pilot participants were subsequently excluded from the total sample to ensure result stability.

***Voiding Dysfunction between Women Following Vaginal Vs Cesarean Section Delivery:
A Comparative Study***

Ethical considerations:

An approval from the research and ethical committee of the Faculty of Nursing, Menoufia University was obtained dated (17-9-2022). Approaches to ensure ethical issues were considered in the study. Confidentiality was achieved by the use of locked sheets with the name of participants replaced by numbers. All participants were informed that the participation in the study is voluntary and information they provided during the study would be kept confidential and used only for statistical purpose and after finishing the study, the findings would be presented as a group data with no personal participant's information remained.

Procedure:

- An official letter was submitted from the Dean of the Faculty of Nursing, Menoufia University to the director of Memofia University Hospital, explaining the purpose and methods of data collection.
- Data collection spanned six months, from beginning of June 2022 and ended in 20 November 2022. The researcher completed data collection in the following steps:
 - At first the researcher introduced herself to the participants and provided verbal explanation of the study.
 - ◆ The researcher went to Menoufia University hospital 4 days weekly (Sunday, Monday, Wednesday and Thursday). Known to have high flow rate from 10 am to 5pm. the researcher interviewed 2:3 women a day.

- ◆ The 3rd step: the researcher used questionnaires to assess the effect of vaginal and cesarean section delivery on voiding dysfunction.
- ◆ Each woman was individually interviewed and the researcher recorded the answers. Each interview lasted for 8-10 minutes.

Statistical design:

- Data were collected, tabulated, and statistically analyzed using an IBM personal computer with Statistical Package for the Social Sciences (SPSS) version 22 (SPSS, Inc., Chicago, Illinois, USA). The following statistical analyses were applied:
 - Descriptive Statistics: Quantitative data were presented as mean (X²), standard deviation (SD), range, while qualitative data were presented as numbers and percentages.
 - Kruskal-Wallis Test (nonparametric test): A significance test was used for comparing non-normally distributed quantitative variables among three or more groups.
 - If P value was <0.05 a statistical significance was found. P value of <0.001 was considered highly statistical significance.

RESULTS

Table 1:- illustrates a comparison between the studied women who underwent vaginal deliveries and those who had cesarean sections concerning their sociodemographic data. It was evident that more than two-thirds (67%) and more than half (51%) of the women who had vaginal deliveries and cesarean sections, respectively, were aged between 20 to less than 30 years.

Voiding Dysfunction between Women Following Vaginal Vs Cesarean Section Delivery:

A Comparative Study

A highly statistically significant difference was observed between women who had spontaneous vaginal deliveries and those who had cesarean sections regarding their age and educational level ($p= 0.001$ for both). Additionally, a statistically significant difference was noted between the two groups concerning their residence.

Table 2:- demonstrates a comparison between the studied women who underwent vaginal deliveries and those who had cesarean sections concerning their obstetric history. It was evident that more than two-thirds (73%) and majority (90%) of the women who had vaginal deliveries and cesarean sections, respectively, were multigravida. There was no statistically significant difference observed between women who had spontaneous vaginal deliveries and those who had cesarean sections regarding number of pregnancies ($p= .253$). Majority of the women (84%,90%) who had vaginal deliveries and cesarean sections respectively had no previous history of abortion. Also, more than two thirds (67%) of women who had vaginal deliveries compared to more than one third (33%) of women who had cesarean section their number of deliveries ranged from 3 to 4 times. Additionally, statistically significant differences were noted between the two groups concerning their number of abortion number of deliveries, and previous mode of deliveries ($p=.001,.013,.001$ respectively).

Table 3:- demonstrates the variation of voiding dysfunction symptoms between women who had vaginal and cesarean section deliveries. As evident

from the table, there were statistically significant differences between women who had spontaneous vaginal delivery and women who had cesarean section delivery according to their duration of the first voiding after delivery, hesitancy during urination, and intermittent urine flow ($p= 0.012, 0.005$ and 0.015 respectively). There were no statistically significant differences between women following spontaneous vaginal delivery and cesarean section delivery related to dysuria after giving birth, how many times urinate, time of urination after delivery, urine drips with or without stress, feels the urgency of urination, any straining during urination, pain during urination, pain in the back, flank, or abdomen.

Figure 1:- shows the occurrence of dysuria among women who had vaginal and cesarean section delivery. About one third (32%) of women following vaginal delivery had dysuria after giving birth while 21% of women had dysuria after cesarean section.

Table 4:- shows the difference between primiparous and multiparous women voiding dysfunction symptoms. As evident from the table, there were highly statistically significant associative relation between primiparous and multiparous women concerning the time and quantity of urination after delivery ($p=0.004$ and 0.049 , respectively). There were no statistically significant associative relation between primiparous and multiparous regarding having dysuria after giving birth, how many times of urination, hesitancy during urination, intermittent urine flow, drip with or

Voiding Dysfunction between Women Following Vaginal Vs Cesarean Section Delivery:

A Comparative Study

without stress, feel the urgency of, any straining during urination and any pain in the back, flank, or abdomen.

Table 5:- shows associative relation between the number of deliveries and symptoms of voiding dysfunction in the studied groups. There were highly statistically significant associative relation between the number of deliveries, amount or volume of urine output, and the first voiding after delivery ($p = 0.001$). Moreover, there were statistically significant associative relation between the number of deliveries and postpartum dysuria, frequency of micturition in the last 12 hours, and dysuria during urination ($p = 0.043, 0.045, \text{ and } 0.028$, respectively). there were no statistically significant associative relation between number of deliveries and drip with or without stress, feel the urgency, times of urination is there any intermittent urine flow, any straining during urination, any pain in the back, flank, or abdomen, having any pain during urination, amount of urinate after delivery).

Table 6:- illustrates the correlation between obstetrical variables (such as

the number of previous deliveries, complicated labor, and mode of previous delivery) and voiding dysfunction. There was a highly statistically significant negative correlation between the number of previous deliveries of the studied participants and post-delivery urine output. Additionally, a highly statistically significant negative correlation was observed between the time of urination after delivery and complicated labor as well as the mode of previous delivery. Furthermore, there were highly statistically significant positive correlations between the type of delivery and experiencing hesitancy during urination and intermittent urine flow. Moreover, a statistically significant negative correlation was found between the number of previous deliveries of the studied participants and the time of urination after delivery. Also, there was a statistically significant positive correlation between the number of previous deliveries and feelings of urgency, hesitancy during urination, intermittent urine flow, and dysuria.

**Voiding Dysfunction between Women Following Vaginal Vs Cesarean Section Delivery:
A Comparative Study**

Table (1): Comparison between Studied Women who had Vaginal Deliveries and those who had Cesarean Section Regarding their Sociodemographic Data(N=100)

Personal data	Spontaneous Vaginal Delivery N=100		Cesarean Section Delivery N=100		X2	P value
	No.	%	No.	%		
Age						
- Less than 20	25	25.0	6	6.0	-6.733	.001**
- 20 to less than 30	67	67.0	51	51.0		
- 30 to 40	8	8.0	37	37.0		
- More than 40	0	0	6	6.0		
Occupation						
- House wife	42	42.0	46	46.0	0.325	0.569
- Works	58	58.0	54	54.0		
Educational levels						
- Illiterate	0	0	2	2.0	28.56 0	0.001**
- Read & write	2	2.0	6	6.0		
- Preparatory	16	16.0	2	2.0		
- Secondary	52	52.0	32	32.0		
- University	30	30.0	58	58.0		
Residence						
- Rural	65	65.0	49	49.0	5.222	0.022*
- Urban	35	35.0	51	51.0		

**NB:P < 0.001: Means very highly statistically significant difference

Table (2): Comparison between Studied Women who had Vaginal Deliveries and those who had Cesarean Section Regarding their Obstetric History (N=100)

Obstetric history	Spontaneous Vaginal Delivery N=100		Cesarean Section Delivery N=100		X2	P value
	No.	%	No.	%		
Number of pregnancies						
- Primigravida	27	27	10	10	2.481	.253
- Multigravida	73	73	90	90		
Number of abortions						
- No	84	84	90	90	2.376	0.001**
- 1-4	14	14	10	10		
- More than 4	2	2	0	0		
Number of deliveries						
- 1-2	9	9	60	60	8.151	.013*
- 3-4	67	67	33	33		
- More than 4	24	24	7	7		
Mode of previous deliveries						
- Spontaneous vaginal delivery	90	90	7	7	152.69	.001**
- Cesarean section	4	4	91	91		
- Spontaneous vaginal & cesarean section deliveries	6	6	2	2		

**NB:P < 0.001: Means very highly statistically significant difference

Voiding Dysfunction between Women Following Vaginal Vs Cesarean Section Delivery:

A Comparative Study

Table (3): Comparison between Studied Women who had Vaginal Deliveries and those who had Cesarean Section according to their symptoms of voiding dysfunction (N=100)

Symptoms of voiding dysfunction	Spontaneous Vaginal Delivery N=100		Cesarean Section Delivery N=100		X2	P value
	No.	%	No.	%		
Dysuria after giving birth						
• Yes	32	32.0	21	21.0	3.106	.078
• No	68	68.0	79	79.0		
Frequency of micturition in the last 8 Hours						
• 1-2 times	16	16.0	21	21.0	.547	.284
• 3-5 times	30	30.0	26	26.0		
• 6-8 times	54	54.0	53	53.0		
First voiding after delivery						
• No	2	2.0	2	2.0	8.275	.100
• less than hour	10	10.0	62	62.0		
• 1-3 hours	27	27.0	23	23.0		
• 4- 6 hours	29	29.0	3	3.0		
• More than 6 hours	32	32.0	10	10.0		
Amount or volume of urine out put						
• No	2	2.0	2	2.0	2.868	.012*
• 20-40 ml	65	65.0	16	16.0		
• 50-70 ml	33	33.0	77	77.0		
• 80-100 ml	0	0	5	5.0		
Presence of urinary incontinence						
• Yes	6	6.0	4	4.0	.421	.516
• No	94	94.0	96	96.0		
Presence of urgency						
• Yes	12	12.0	12	12.0	.000	1.000
• No	88	88.0	88	88.0		
Straining during urination						
• Yes	5	5.0	4	4.0	.116	.733
• No	95	95.0	96	96.0		
Dysuria during urination						
• Yes	41	41.0	48	48.0	.992	.319
• No	59	59.0	52	52.0		
Hesitancy during urination						
• Yes	16	16.0	4	4.0	8.000	.005*
• No	84	84.0	96	96.0		
Intermittent urine flow						
• Yes	17	17.0	6	6.0	5.944	.015*
• No	83	83.0	94	94.0		
Pain in the back, flank, or abdomen						
• Yes	90	90.0	84	84.0	1.592	.207
• No	10	10.0	16	16.0		

**NB:P < 0.001: Means very highly statistically significant difference

Voiding Dysfunction between Women Following Vaginal Vs Cesarean Section Delivery:

A Comparative Study

Figure (2): Comparison between Studied Women who had Vaginal Deliveries and those who had Cesarean Section Regarding dysuria (N=100)

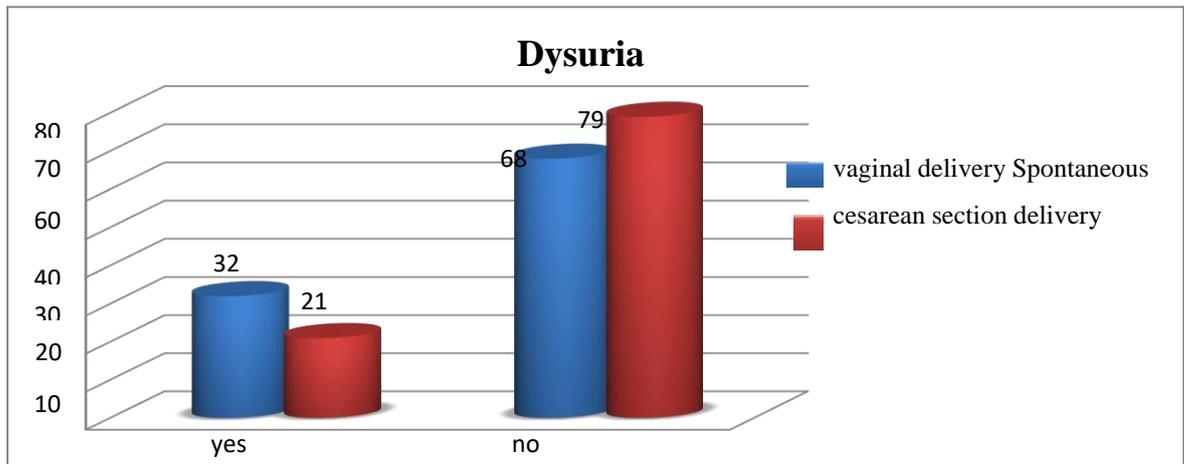


Table (4): Comparison between primipara and multipara regarding their symptoms of voiding dysfunction (N=100)

Symptoms of voiding dysfunction	Primipara N=67		Multipara N=133		X ²	P value
	No.	%	No.	%		
Have you had any dysuria after giving birth?						
- Yes	17	25.3	36	27.1	.066	.798
- No	50	74.7	97	72.9		
How many times do you urinate?						
- 1-2 times	15	22.3	22	16.5	4.230	.121
- 3-5 times	23	34.4	33	24.8		
- 6-8 times	29	43.3	78	58.7		
When did you urinate after delivery?						
- No	2	2.9	3	2.2	15.664	.004**
- Less than hour	35	52.3	36	27.1		
- 1-3 hours	15	22.3	35	26.3		
- 4- 6 hours	4	6.0	28	21.1		
- More than 6 hours	11	16.5	31	23.3		
How much you urinate after delivery?						
- No	2	2.9	2	1.5	6.509	.049*
- 20-40 ml	8	11.9	8	6.0		
- 50-70 ml	50	74.7	92	69.2		
- 80-100 ml	7	10.5	31	23.3		
Do you drip with or without stress?						
- Yes	4	6.0	6	4.5	.200	.655
- No	63	94	7	95.4		
Do you feel the Urgency?						
- Yes	9	13.4	15	11.3	.658	.196
- No	58	86.6	118	88.3		
Is there any Straining during urination?						
- Yes	4	6.0	5	3.7	.507	.477
- No	63	94.0	128	96.3		
Is there any Pain during urination?						
- Yes	33	49.2	56	42.1	.922	.337
- No	34	50.8	77	57.9		
Is there any Hesitancy during urination?						
- Yes	4	6.0	16	12.0	1.818	.178
- No	63	94.0	117	88.0		

**Voiding Dysfunction between Women Following Vaginal Vs Cesarean Section Delivery:
A Comparative Study**

Is there any intermittent urine flow?						
- Yes	9	13.4	14	10.5	.370	.543
- No	58	86.6	119	89.5		
Is there any pain in the back, flank, or abdomen?						
- Yes	59	88.1	115	86.5	.100	.752
- No	8	11.9	18	13.5		

**NB:P < 0.001: Means very highly statistically significant difference

Table (5): Associative relation between number of deliveries and symptoms of voiding dysfunction (N=100)

Symptoms of voiding dysfunction	Number of deliveries						X ²	p
	1-2 delivery		3-4 delivery		More than 4 delivery			
	No.	%	No.	%	No.	%		
Difficulty urinating after giving birth Or Dysuria								
- Yes	15	7.5	34	17	4	2	6.292	.043*
- No	53	26.5	67	33.5	27	23.5		
Frequency of micturition in the last 12 Hours								
- 1-2 times	18	9	17	8.5	2	1	9.744	.045
- 3-5 times	14	7	28	14	14	7		
- 6-8 times	36	18	56	28	15	7.5		
First voiding after delivery								
- No	1	0.5	4	2	0	0	42.529	.001**
- Less than hour	38	19	33	16.5	0	0		
- 1-3 hours	16	8	22	11	12	6		
- 4-6 hours	2	1	18	9	12	6		
- More than 6 hours	11	10.5	24	12	7	3.5		
Amount or volume of urine out put								
- No	0	0	3	1.5	1	0.5	23.143	.001**
- 20-40 ml	8	4	8	4	0	0		
- 50-70 ml	56	28	69	34.5	17	8.5		
- 80-100 ml	4	2	21	10.5	13	6.5		
Presence of urinary incontinence								
- Yes	2	1	7	3.5	1	0.5	1.605	.448
- No	66	33	94	47	30	15		
Presence of urgency								
- Yes	7	3.5	16	8	1	0.5	3.859	.145
- No	61	30.5	85	42.5	30	15		
Presence of straining during urination								
- Yes	3	1.5	5	2.5	1	0.5	.166	.920
- No	65	32.5	96	48	30	15		
Dysuria during urination								
- Yes	33	16.5	49	24.5	7	3.5	7.137	.028*
- No	35	17.5	52	26	24	12		
Hesitancy during urination								
- Yes	5	2.5	13	6.5	2	1	1.888	.389
- No	63	31.5	88	44	29	14.5		
Intermittent urine flow								
- Yes	5	2.5	15	7.5	3	1.5	2.365	.307
- No	63	31.5	86	43	28	14		
Pain in the back, flank, or abdomen								
- Yes	56	28	90	45	28	14	1.998	.368
- No	12	6	11	5.5	3	1.5		

**NB:P < 0.001: Means very highly statistically significant difference

**Voiding Dysfunction between Women Following Vaginal Vs Cesarean Section Delivery:
A Comparative Study**

Table (6): Correlation Between selected obstetrical variables (such as number of previous deliveries, complicated labor and mode of previous delivery) and voiding dysfunction (N=100)

Symptoms of voiding dysfunction	Selected Obstetrical Variables					
	Number of deliveries		Type of deliveries		Complicated labor	
	r	P value	r	P value	r	P value
Have you had any difficulty urinating after giving birth?	.095	.182	.107	.131	-.046	.521
How many times do you urinate?	-.043	.547	.186**	.008	-.011	.872
When did you urinate after delivery?	-.140*	.048	-.455**	.001	-.205**	.004
How much you urinate after delivery?	-.235**	.001	-.200**	.004	-.088	.215
Do you drip with or without stress?	.029	.680	.062	.382	-.129	.069
Do you feel the Urgency?	.150*	.034	.036	.618	-.063	.372
Is there any Straining during urination?	.094	.184	.042	.555	.047	.505
Is there any Pain during urination?	.142*	.044	.060	.401	-.056	.434
Is there any hesitancy during urination?	.174*	.014	.207**	.003	.008	.913
Is there any intermittent urine flow?	.163*	.021	.185**	.009	.018	.804
Is there any pain in the back, flank, or abdomen?	-.067	.345	.093	.191	.148*	.037

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

Discussion:

As regards to correlation between voiding dysfunction and the obstetric history of the study participants. The present study revealed that voiding dysfunction was found to be higher in primiparity than multiparity women. This result is in accordance with Perú Biurrun et al. (2020) who studied "post-partum urinary retention and related risk factors" a retrospective observational. It was found that nearly half of the women experiencing voiding dysfunction were primiparity. This may be due to inhibited reflexes by fear, the process of delivery itself, and a lack of knowledge among primiparous women.

On the other hand, it contradicted with Chen et al. (2020) who studied "development of predictive risk models of postpartum stress urinary incontinence primiparous and multiparous women. They found

that about one-fifth of the women were complaining of voiding dysfunction and about one fifth of these women were m being multipara. This difference could be due to increased knowledge and better health services.

Concerning the mode of previous deliveries and symptoms of voiding dysfunction among the studied groups. This study observed that women with previous vaginal delivery tended to urinate slowly after delivery with hesitancy than women with previous cesarean sections. This might be associated with fear and increased pain experienced in vaginal deliveries. This finding was in harmony with a study performed by Perú Biurrun et al. (2020) who studied " postpartum urinary retention and related risk factors". this may be due to fear of pain.

*Voiding Dysfunction between Women Following Vaginal Vs Cesarean Section Delivery:
A Comparative Study*

These findings were in disagreement with conflict with the study done by Salman et al. (2021) who studied "postpartum voiding dysfunction following vaginal versus caesarean delivery". This difference could be attributed to their small sample size. Regarding factors that lead to postpartum voiding problems. the current study showed that the use of fundal pressure during the second stage of labor, rupture of the perineum during childbirth, as degree of perineal pain from perineal lacerations repair or trauma to the pelvic floor muscles. these factors lead to urinary retention due to urethral spasm or damage to the pudendal nerve resulting in neurological damage to micturition. This study found that there are other factors that led to post-partum voiding problems following CS such as insertion of urinary catheter.

This finding was supported by a study by Saraswathi et al. (2019) who studied " Postpartum voiding dysfunction in vaginal delivery: Identify the Risk Factors " voiding problems could be attributed to urinary tract infection and pain.

On the other hand, this finding contradicted with Degasper et al., (2023) who studied "Post void residual bladder volume after uncomplicated vaginal delivery". They found that longer duration of labor was the major risk factor.

For continuous urinary tract infection (UTI) complaints among women following vaginal or cesarean section delivery.

The current study revealed that, more than half of women following cesarean section complained of delivery continuous UTI, while less than half of the women who delivered vaginally complained of continuous UTI. This may be due to use of analgesia significantly affects bladder care. Also, catheterization increase the incidence of UTIs.

This study contradicted with Schwartz et al. (2019) who studied "risk factors for urinary tract infection in the postpartum period". they found that UTI were less prevalent among women at Washington. This could be attributed to improvements in healthcare services and disinfection. Concerning the distribution of women according to voiding dysfunction following vaginal and cesarean section delivery. The present study revealed that women who delivered vaginally were more prone to have voiding dysfunction problems than cesarean section delivery as more than one-third of the women who delivered vaginally had voiding dysfunction compared to only one-fifth of cesarean section delivery.

This study was consistent with Salman et al. (2021) who studied "Postpartum Voiding Dysfunction Following Vaginal Versus Caesarean Delivery." This could be attributed to trauma result in neurological damage, perineal pain from perineal lacerations repair and urethral spasm reflex causing voiding dysfunction.

*Voiding Dysfunction between Women Following Vaginal Vs Cesarean Section Delivery:
A Comparative Study*

Conclusion:

The current study findings revealed that the women following cesarean section delivery complained from UTI more than women following vaginal delivery. Women who delivered vaginally were more prone to have voiding dysfunction problems than cesarean section delivery. Voiding dysfunction was found to be higher in primiparity than multiparity women.

Recommendations

In the light of the current study findings:

Training programs for nurses focused on proper nursing interventions for women with voiding dysfunction including: Early identification and management of voiding dysfunction is required. Every obstetric unit should have a protocol for the management of voiding dysfunction. Instructional booklets should be provided for postpartum. They should include good bladder health and voiding practices at the time of discharge. Replication of study to another setting using a larger sample size is required. Follow up study to assess the prognosis of urinary dysfunction after delivery

References

Avondstondt, A. M., Hidalgo, R. J., & Salamon, C. G. (2020). Intrapartum risk factors for postpartum urinary retention: a case-control study. *International urogynecology journal*, 31(11), 2395–2398.

<https://doi.org/10.1007/s00192-020-04378-2>

Bruno, A. M., Horns, J. J., Allshouse, A. A., Das, R., Paudel, N., Silver, R. M., & Metz, T. D. (2023). Physician cesarean delivery rates and severe perinatal morbidity among low-risk nulliparas. *Journal of perinatology: official journal of the California Perinatal Association*, 43(1), 34–38. <https://doi.org/10.1038/s41372-022-01540-0>

Chen, L., Luo, D., Chen, X., Jin, M., Yu, X., & Cai, W. (2020). Development of Predictive Risk Models of Postpartum Stress Urinary Incontinence for Primiparous and Multiparous Women. *Urologia internationalis*, 104(9-10), 824–832. <https://doi.org/10.1159/000508416>

Degasper, C., Späth, L., Fessler, S., Widschwendter, A., Abdel Azim, S., & Ritter, M. (2023). Postvoid residual bladder volume after uncomplicated vaginal delivery. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics*, 161(3), 820–826. <https://doi.org/10.1002/ijgo.14668>

Desai, N. M., & Tsukerman, A. (2023). *Vaginal Delivery*.

*Voiding Dysfunction between Women Following Vaginal Vs Cesarean Section Delivery:
A Comparative Study*

- In StatPearls. StatPearls Publishing.
- Lagrew, D. C., Kane Low, L., Brennan, R., Corry, M. P., Edmonds, J. K., Gilpin, B. G., Frost, J., Pinger, W., Reisner, D. P., & Jaffer, S. (2018). National Partnership for Maternal Safety: Consensus Bundle on Safe Reduction of Primary Cesarean Births-Supporting Intended Vaginal Births. *Journal of obstetric, gynecologic, and neonatal nursing: JOGNN*, 47(2), 214–226.
<https://doi.org/10.1016/j.jogn.2018.01.008>
- Li, Q., Zhu, S., & Xiao, X. (2020). The risk factors of postpartum urinary retention after vaginal delivery: A systematic review. *International journal of nursing sciences*, 7(4), 484–492.
<https://doi.org/10.1016/j.ijnss.2020.09.002>
- Meyer, R., Weisz, B., Eilenberg, R., Tsadok, M. A., Uziel, M., Sivan, E., Mazaki-Tovi, S., & Tsur, A. (2023). Utilizing machine learning to predict unplanned cesarean delivery. *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics*, 161(1), 255–263.
<https://doi.org/10.1002/ijgo.14433>
- Mohr, S., Raio, L., Gobrecht-Keller, U., Imboden, S., Mueller, M. D., & Kuhn, A. (2022). Postpartum urinary retention: what are the sequelae? A long-term study and review of the literature. *International urogynecology journal*, 33(6), 1601–1608.
<https://doi.org/10.1007/s00192-021-05074-5>.
- Perú Biurrun, G., Gonzalez-Díaz, E., Fernández Fernández, C., & Fernández Corona, A. (2020). Post Partum Urinary Retention and Related Risk Factors. *Urology*, 143, 97–102.
<https://doi.org/10.1016/j.urology.2020.03.061>
- Salman, L., Shmueli, A., Aharony, S., Pardo, A., Chen, R., Wiznitzer, A., & Gabbay-Benziv, R. (2022). Postpartum voiding dysfunction following vaginal versus caesarean delivery. *Journal of obstetrics and gynaecology : the journal of the Institute of Obstetrics and Gynaecology*, 42(2), 256–260.
<https://doi.org/10.1080/01443615.2021.1907553>
- Schwartz, M. A., Wang, C. C., Eckert, L. O., & Critchlow, C. W. (1999). Risk factors for urinary tract infection in the postpartum period. *American journal of obstetrics and gynecology*, 181(3), 547–553.
[https://doi.org/10.1016/s0002-9378\(99\)70491-6](https://doi.org/10.1016/s0002-9378(99)70491-6)
- Sorrentino, F., Greco, F., Palieri, T., Vasciaveo, L., Stabile, G.,

Voiding Dysfunction between Women Following Vaginal Vs Cesarean Section Delivery:

A Comparative Study

- Carlucci, S., Laganà, A. S., & Nappi, L. (2022). Cesarean Section on Maternal Request-Ethical and Juridic Issues: A Narrative Review. *Medicina (Kaunas, Lithuania)*, 58(9), 1255.
<https://doi.org/10.3390/medicina58091255>
- Stefan M., Briskin, R., Calimente, H. S., Kallabat, H., & Estanol, M. V. (2022). Prevalence and Risk Factors for Prolonged Persistent Postpartum Urinary Retention [A346]. *Obstetrics & Gynecology*, 139, 100S
- Swathi HV, Samant PY. (2020). Postnatal bladder dysfunction. *Int J Reprod Contracept Obstet Gynecol*, 9(7), 3025-31.
- Wahdan, M., Hakim, S., El Gaafary, M., Sos, D., Wassif, G., Hussein, W., Mokhtar, A., Hussein, A., El Awady, M., Rady, M., & Anwar, W. (2022). Rising trends in Cesarean section in 6 Egyptian governorates. *Eastern Mediterranean health journal = La revue de sante de la Mediterranee orientale = al-Majallah al-sihhiyah li-sharq al-mutawassit*, 28(5), 336–344.
<https://doi.org/10.26719/emhj.22.012>