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## Original Article

# Long Term Effect of Mode of Delivery on Sexual Function: A Cross-Sectional Study

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## ABSTRACT

**Background:** Female sexual dysfunction [FSD] is a significant challenge. Some researchers reported an association between FSD and delivery mode, while others did not report such association.

**Aim of the work:** To study the long-term effect of delivery mode on female sexual function in primiparous mothers.

**Subjects and Methods:** This is a cross-sectional analytical study conducted to study sexual dysfunction and its related factors after delivery. It included 260 primiparous mothers who attended the healthcare centers in Dakahlia and Damietta governorates. They were divided according to the delivery mode into two groups, each of 130 mothers; the first for normal vaginal delivery [NVD], and the second for cesarean delivery [CD]. All participants were evaluated by complete history taking [demographics, obstetric and medical history, duration since delivery, mode of delivery and use of contraception], and female sexual function assessment. Female sexuality was assessed by an Arabic version of the Female Sexual Function Index [FSFI] questionnaire, which is a brief, multidimensional, validated tool for evaluation of female sexual function [FSF] during sexual activity.

**Results:** Results revealed a non-significant difference between females delivered by NVD and those delivered by cesarean section [CS]. Also, there was no significant difference between groups regarding female sexual dysfunction index [FSDI] single domains and total score. Female sexual dysfunction [FSD] was reported in 20.8% and 25.4% in NVD and CS groups, respectively. The duration since the last delivery, recurrent urinary tract infection [UTI], and Vulvo-vaginitis were the individual risks of female sexual dysfunction. Vulvovaginitis was the only independent predictor factor for sexual dysfunction.

**Conclusion:** Female sexual function was not affected by the delivery mode, and there was no basis for advocating the cesarean section for delivery to prevent future female sexual dysfunction. However, identifying vulvovaginitis as the sole significant factor affecting FSD represented significant findings in the current work.

**Keywords:** Female sexual function; Normal vaginal delivery; Cesarean delivery; Sexual Function Index; Primiparous

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\* Main subject and any subcategories have been classified according to the research topic.

## INTRODUCTION

Sexual activity and satisfaction are recognized as one of the most critical dimensions in human life [1], and according to World Association for Sexual Health [WAS], sexual desires are integral parts of every person's personality [2].

The sexual function includes desire, arousal or excitement, orgasm, and resolution [3]. The postpartum time may be an ideal period to obtain information on sexual life and identifying women's needs regarding sexual function and health [4].

Sexual dysfunction is a chain of psychosexual disorders and challenging experience of individuals and couples that are manifested in terms of dysfunction in sexual desire, sexual arousal, orgasm, and pain during intercourse [5], and it is one of the commonest problems affecting about 40-45% of females [6].

Several factors can influence sexual dysfunction in the childbirth period, such as parity, breastfeeding, delivery mode, episiotomy, stress, exhaustion, physical and psychological conditions like postpartum depression [2].

Postpartum depression usually affects maternal health and her infant or child's normal growth [7-8] and development [9] and paternal depression [10].

Several periods of hormonal changes in women's lives, such as menstruation, pregnancy and childbirth, postpartum, menopause, and multiple pregnancies, affect their sexual performance [6].

Pregnancy and childbirth are definite periods that cause hormonal and physical alterations and markedly affect mothers' health and quality of life [11]. Many females restart their sexual activity within three months after delivery; however, 83% of them have sexual problems within three months of delivery and 18-30% of reported sexual problems within sixth months of delivery, and 30% to 52.5 % of them complain from dyspareunia or pain during intercourse [12].

Pregnancy and delivery lead to an anatomical and functional change in the pelvic floor muscle, as most postpartum women complained about sexual problems during this period, which these sexual problems usually

resolve one year after childbirth [13].

The rate of cesarean delivery continues to increase worldwide. Possible causes of cesarean delivery on maternal request may be the fear of sexual dysfunction due to the loss of vaginal muscle tone [14]. The absence of genital tract trauma in cesarean delivery was proposed to preserve postpartum sexual function [15].

Many trials blamed vaginal delivery for pelvic floor disorders after delivery [16-18]. The anal sphincter lacerations were reported in 2.2-19% after vaginal delivery, leading to short and/or long-term local perineal pain and dyspareunia. Also, orgasm could be intensified by voluntary contraction of pelvic floor muscles [19].

General pain is usually reported equally after vaginal or cesarean deliveries. However, perineal or abdominal pain is variably reported three months after delivery [20]. However, comparisons between cesarean and vaginal delivery regarding pain severity are few within the first postpartum year [21]. Postpartum pain exerts a negative effect on the quality of life after delivery [22]. Further research on sexual health-related to reproductive health was recommended due to its importance independently, the underlying cause of many disorders and diseases, and awareness of lack of sexual health worldwide [23]. This represented the rationale of the current study.

## AIM OF THE WORK

The present work aimed to study the long-term effect of delivery mode on female sexual function in primiparous women.

## SUBJECTS AND METHODS

This study is a cross-sectional analytical study conducted to study sexual dysfunction and its related factors after delivery. It included primiparous mothers who attended the healthcare centers in Dakahlia and Damietta governorates. The study included 260 primiparous mothers divided according to the delivery mode into two groups, each of 130 mothers; the first group for normal vaginal delivery, and the second for cesarean delivery. The study was completed at three health centers in Dekahliya and Damietta governorates [El-Sinbillaween General hospital, Damietta General

Hospital, and Kafr Saad General Hospital]. Females were included if they were mothers who get pregnant once and delivered at least two years before inclusion in the study. Their age ranged between 18 and 38 years old, and who were using non-hormonal birth control methods. On the other side, females were excluded if they had an odd obstetric history [as obstructed labor, stillbirth, neonatal death, fetal anomalies, non-elective cesarean section, ugly episiotomy scar, and instrumental vaginal delivery]. Besides, females with known chronic pelvic inflammatory disease [PID] or with chronic medical disorders that might affect sexual function [such as long-term diabetes mellitus [DM] and hypertension] were also excluded.

### Ethical considerations

Each participant signed informed consent before inclusion in the study, explaining the study's value and the conducted procedures. Besides, the whole study design was approved by the ethics committee of the faculty of medicine, Al-Azhar University. Confidentiality and personal privacy were respected in all stages of the study. Patients felt free to withdraw from the study at any time without any consequences. Finally, the collected data were not and will not be used for any other purpose.

All participants were subjected to complete history taking [demographics, obstetric and medical history, duration since delivery, mode of delivery and use of contraception], and female sexual function assessment. Female sexuality was assessed by an Arabic version of the Female Sexual Function Index [FSFI] questionnaire, which is a brief, multidimensional, validated tool for assessment of female sexual function [FSF] during sexual activity [24].

The FSFI questionnaire is a 19-item questionnaire. The sexual function domains consisted of sexual desire, arousal, lubrication, orgasm, satisfaction, and pain during sexual activity/ intercourse. For each of the 19 questions, there were 5 possible answers. A full explanation of each question and its 5 possible answers was done, and each female's answers were reported as they said. The score [0-5] or [1-5 in some questions] was calculated. Identifying the sexual dysfunction according to a total score of FSFI [cutoff

point = 26.55]

**Statistical analysis of data:** The collected data were coded, processed, and analyzed using the SPSS [Statistical Package for Social Sciences] version 22 for Windows® [IBM®SPSS® Inc, Chicago, IL, USA]. Data of categorical variables were presented as number [frequency], and comparison between two groups containing qualitative data was compared using Chi-Square test [ $\chi^2$ ]. Quantitative data were checked for normal distribution by the Kolmogorov-Smirnov test. Parametric data were presented as mean  $\pm$  [SD; standard deviation].

Student t-test was used to compare two groups with parametric quantitative data [expressed as t]. Nonparametric data were presented as median [min-max]. Mann-Whitney test [expressed as z] was used for comparison between groups. Univariate and multivariate regression logistic regression analysis was used to detect associated dependent and independent risk factors with sexual dysfunctions. For all tests, the p-value  $\leq$  0.05 was considered significant.

### RESULTS

Results about the patient's age, education, residence, occupation, duration of the marriage, duration from the delivery to inclusion in the study, associated medical diseases, use, and contraception methods were presented in [Table 1].

Results revealed a non-significant difference between females delivered by normal vaginal delivery [NVD] and those delivered by cesarean section [CS]. In addition, there was no significant difference between both groups regarding any domain of female sexual dysfunction index [FSDI] or total score. Besides, the incidence of FSD was 20.8% and 25.4% in NVD and CS groups, respectively [Table 2].

The univariate regression analysis of the risk factors for sexual dysfunction revealed that duration since last delivery, recurrent urinary tract infection [UTI], and Vulvo-vaginitis were shown to be risks of sexual dysfunction. However, with multivariate regression analysis, vulvovaginitis was the only independent predictor factor for sexual dysfunction [Table 3].

**Table [1]:** Comparison between groups regarding patient characteristics

Variable		NVD [n=130]	CS [n=130]	Test	P
Age [years] [mean±SD]		29.43 ± 10.58	27.47 ± 2.73	1.632	0.169
Education level	Primary	35[26.9%]	27[20.8%]	2.675	0.214
	Middle	42[32.3%]	46[35.4%]		
	High	53[40.8%]	57[43.8%]		
Residence	Urban	58[44.6%]	63[48.5%]	1.936	0.326
	Rural	72[55.4%]	67[51.5%]		
Occupation	Unemployed	84[64.6%]	79[60.8%]	2.157	0.384
	Employed	4[35.4%]	51[39.2%]		
Duration of marriage [years]		3.27 ± 0.43	3.65 ± 0.41	1.936	0.265
Duration from last delivery [months]		33.12 ± 4.27	35.21 ± 5.02	2.190	0.327
Medical diseases	DM	12[9.2%]	14[10.8%]	2.348	0.181
	SLE	3[2.3%]	3[2.3%]		
	Hypothyroidism	2[1.5%]	0[0.0%]		
	HCV	5[3.8%]	3[2.3%]		
	Multiple sclerosis	0[0.0%]	1[0.08%]		
	Recurrent UTI	19[14.6%]	24[18.5%]		
	Vulvovaginitis	7[5.4%]	11[8.5%]		
Use of contraception		50[38.5%]	45[42.3%]	0.083	0.886
Method of contraception	IUD	43[33.1%]	38[29.5%]	1.326	0.251
	Condom	7[5.4%]	7[5.4%]		

**Table [2]:** Comparison between groups regarding Female sexual dysfunction

Variable		NVD	CS	Test	P
FSDI domains and Total score	Desire	4.29±1.14	4.25± 1.24	0.261	0.794
	Arousal	4.49± 1.12	4.53± 1.11	0.255	0.799
	Lubrication	4.68± 0.98	4.96± 0.89	1.023	0.385
	Orgasm	4.54± 1.19	4.75± 1.09	1.278	0.203
	Satisfaction	4.98± 1.17	5.04± 1.18	0.386	0.700
	Pain	4.58± 1.05	4.43± 1.12	0.957	0.340
	Total score	27.33±5.61	27.95±4.88	0.852	0.395
Sexual dysfunction	Absent	103[79.2%]	97 [74.6%]	1.833	0.265
	Present	27 [20.8%]	33 [25.4%]		

**Table [3]:** Univariate and multivariate regression analysis associated with female sexual dysfunctions regardless of the mode of delivery [N=60]

Variables	Univariate analysis	Multivariate analysis		
		B	95% CI	P value
Age	0.231			
Education level	0.391			
Occupation	0.412			
Residence	0.063			
Duration of marriage	0.471			
Duration since last delivery	0.028*	0.736	0.661-1.453	0.085
Use of contraception	0.118			
Previous obstetric complications	0.238			
DM	0.618			
SLE	0.219			
Hypothyroidism	0.741			
HCV	0.485			
Multiple sclerosis	0.932			
Recurrent UTI	0.015*	0.528	0.398 – 1.05	0.362
Vulvo-vaginitis	0.011*	1.824	1.273- 2.982	0.043*

CI: confidence interval; \*: statistically significant [p< 0.05]

## DISCUSSION

Sexual function comprised a crucial constituent of human well-being. It is characterized by multifaceted interactions between many hormonal and psychological inputs [25]. Thus, abnormalities in sexual activity could affect mothers' quality of life due to associated different psychological disorders [26]. Literature had a growing body of evidence indicating a significant link between VD and postpartum FSD [27].

This present study was conducted to compare the effect of vaginal delivery and a cesarean section on female sexual function in primiparous mothers. Results revealed no significant difference between delivery modes regarding patient characteristics, marriage duration, and duration passed since delivery. Also, sexual dysfunction did not affected by the mode of delivery. However, female sexual dysfunction was significantly associated with duration since the last delivery, recurrent urinary tract infection [UTI], and vulvovaginitis. With multiple regression, vulvovaginitis was the only independent predictor factor for sexual dysfunction regardless of delivery mode.

Dabiri *et al.* [27] reported comparable results and showed that there was no difference between groups regarding patient demographics.

In line with current results, a prospective study of 452 nulliparous females yielded non-significant differences in FSFI between CS and VD at three and six months postpartum. The authors concluded that the CS had no superior action on postpartum female sexual function [FSF] than VD [28]. Others confirmed such results after a longer follow-up [two years] after the delivery [29].

Botros *et al.* [30] reported that an increased number of previous deliveries was associated with a significant reduction of desire and excitement. However, the delivery mode [vaginal or caesarean section] had no role. Doğan *et al.* [31] reported a negative long-term effect on FSF. However, this effect is negligible from the clinical point of view and did not lead to FSD. Similarly, Dabiri *et al.* [27] reported no association between delivery mode and postpartum FSD, and no items of FSFI had any significant differences.

Boroumandfar *et al.* [32] included 384 females and

showed no significant association between FSF and the delivery mode. Another study showed no association between delivery mode and postpartum sexual performance [33]. Rezaei *et al.* [4] reported no association between delivery mode and any of FSFI scores. Besides, a systematic review showed that the available evidence is inadequate to support CS's performance to avoid postpartum FSD [34].

On the other side, Saleh *et al.* [35] reported that females with a history of CS had higher FSFI and better function than females with VD. Notably, females with elective sections had statistically significant higher FSFI scores than those with emergency sections. Besides, Dean *et al.* [36] reported that female sexual satisfaction and the tone of vaginal muscles were significantly reduced in females with normal than cesarean section, after a long-term follow-up period [sixth years]. Also, Gungor *et al.* [37] showed that vaginal delivery is associated with a significantly higher prevalence of sexual dissatisfaction than a cesarean section delivery.

On the opposite side, Mousavi *et al.* [38] evaluated the postpartum quality of life and reported more sexual satisfaction after vaginal delivery, especially with the regain of their original body appearances.

The difference between studies could be attributed to the wide geographical distribution between the different studies. Besides, some studies included multipara; others included nullipara, while some studies, as our current study, included primiparous. The repetition of vaginal delivery was thought to affect the sexual function compared with single vaginal delivery [39-40].

In this study, duration since the last delivery was a risk factor for sexual dysfunction, but it wasn't an independent risk factor. These results agreed with Saleh *et al.* [35] who showed a significant trend to resume better FSF after the sixth postpartum month.

Evidence about postpartum FSD existence mainly during the first three postpartum months, and females usually regain their normal sexual activity after the sixth months after delivery [41].

In line with the current work results, a previous study revealed a significant relation between

postpartum FSD and the time passed after delivery [32].

Another randomized study revealed that the scores of FSFI were significantly increased after the third postpartum months, and this increase continued to the seventh month, regardless of pelvic floor exercise performance or not [42].

In general, the recurrent study revealed that FSF was not affected by the delivery mode, and there was no evidence to advocate a cesarean delivery to prevent future female sexual dysfunction. However, identifying vulvovaginitis as the sole significant factor affecting FSD represented significant findings in the current work.

The study limitations include the relatively small sample size. Also, the descriptive nature of the study restricts the power of conclusions. Thus, wide further improvements are needed in other future studies.

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