

SEXUAL DYSFUNCTION AMONG WOMEN IN THE FIRST YEAR POSTPARTUM

PhD Thesis

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1. Introduction

Postpartum sexual function is influenced by physical, hormonal, psychological, social, and other factors, and this influence may result in a woman suffering from sexual dysfunction during the postpartum period. The prevalence of postpartum sexual dysfunction is estimated to be 19-83% at 2-3 months, 26-43% at 6 months and 11-49% at 6-12 months postpartum. Women's sexual function is a complex phenomenon; therefore, it is difficult to assess and address its influencing factors.

In the literature, physical and psychological factors such as infant feeding method, urinary incontinence, mode of delivery, relationship satisfaction, and postpartum depression have been examined in association with postpartum female sexual dysfunction. However, reports of the influence of these factors on women's postpartum sexual function are inconsistent.

2. Objectives

The general objective of this thesis was to assess sexual function in postpartum Hungarian women within a year after their delivery and determine the influence of potential influencing factors on female sexual function.

The specific objectives of the research were:

- to assess female sexual function in the first year postpartum, using the Female Sexual Function Index (FSFI) questionnaire,
- to assess any changes in the prevalence of overall female sexual dysfunction within the first year postpartum,

- to assess the influence of infant feeding method on female sexual function at three months postpartum,
- to assess the influence of urinary incontinence on female sexual function at three months postpartum,
- to assess the connection between mode of delivery and female sexual dysfunction at 3, 6, and 12 months postpartum,
- to assess the connection between female relationship satisfaction and female sexual dysfunction at 3, 6, and 12 months postpartum, using the Relationship Assessment Scale (RAS) questionnaire,
- to assess the connection between female depressive symptoms and female sexual dysfunction at 3, 6, and 12 months postpartum, using the Edinburgh Postnatal Depression Scale (EPDS) questionnaire.

3. Methods

3.1. Study design

In this thesis we introduce two cross-sectional analyses, and one prospective longitudinal analysis with the same background.

The studies were carried out in three obstetric institutes in Budapest, Hungary. Women were personally invited within 3 days postpartum to participate. The study was approved by the Semmelweis University Regional and Institutional Committee of Scientific and Research Ethics in May 2018 (SE-REB number: 24/2017).

Data were collected using online questionnaires. We sent the first questionnaire to the participants at 3 months postpartum (T1). The second questionnaire was sent at 6 months postpartum (T2) for those women, who completed

the first questionnaire. The third questionnaire was sent at 12 months postpartum (T3) for those women, who completed the second questionnaire.

Some influencing factors for sexual function were examined only at T1 in a cross-sectional way, others were examined at T1, T2 and T3 in a longitudinal way.

In this thesis we introduce the results of three analyses:

- **Analysis 1:** A cross-sectional study, that was designed to assess the influence of infant feeding method on sexual function at T1.
- **Analysis 2:** A cross-sectional study, that was designed to assess the influence of urinary incontinence on sexual function at T1.
- **Analysis 3:** A longitudinal study, that was designed to assess the connection between mode of delivery, relationship satisfaction, depressive symptoms and sexual dysfunction at T1, T2 and T3.

3.2. Measures

Self-constructed questions and validated questionnaires were used in the analyses.

To distinguish the **infant feeding method**, participants were categorized into three groups: (1) exclusive breastfeeding (2) mixed feeding and (3) formula-feeding group.

To distinguish **urinary incontinence**, participants were asked whether they experienced accidentally urine leakage after the delivery. According to the answer, we created (1) urinary incontinence and (2) no urinary incontinence group.

Mode of delivery was analyzed based on five groups: (1) vaginal delivery with intact perineum (no sutures were

needed), (2) vaginal delivery with episiotomy (sutures were needed after the delivery), (3) vaginal delivery with perineal tears (sutures were needed after the delivery), (4) acute cesarean section (cesarean section was decided during the labor), and (5) elected cesarean section (the day of the cesarean section was scheduled).

Sexual function was evaluated using the Hungarian version of the Female Sexual Function Index (FSFI) in each analysis. The FSFI reflects women's sexual experience over the previous four weeks and assesses six domains of sexual function: desire, arousal, lubrication, orgasm, satisfaction, and pain. The lowest possible score is 2, and the highest is 36. We used 26.55 as a cut-off score (FSFI<26.55 meant sexual dysfunction; FSFI>26.55 meant no sexual dysfunction).

Satisfaction with relationship was assessed by the Hungarian version of Relationship Assessment Scale (RAS). RAS assesses the general satisfaction with a romantic relationship. The total score can vary between 7 and 35, higher scores are associated with greater satisfaction.

Postpartum level of depression was evaluated by the Hungarian version of the Edinburgh Postnatal Depression Scale (EPDS). The EPDS assesses the severity of depressive symptoms in the postpartum period and reflects women's experience of the last 7 days. The total score can vary between 0 and 30, where a higher score means more severe depressive symptoms.

3.3. Statistical analysis

Data were analyzed using the TIBCO Statistica 13.5.0.17 program. Descriptive statistical values such as percentage,

mean, mode, and standard deviation were calculated to describe the sample.

Analysis 1. The differences between the median scores of FSFI and subgroups in the three categories of infant feeding methods were evaluated by the Kruskal–Wallis test. Mann–Whitney U test with Bonferroni correction was used for pairwise comparisons.

Analysis 2. Mann-Whitney U tests were used to assess the association between urinary incontinence and FSFI scores.

Analysis 3. To assess the connection between sexual dysfunction and potential risk factors, univariate and multivariate logistic regression models were developed. Univariate logistic regression was used to assess the connection between sexual dysfunction and independent variables. Variables which significantly connected to sexual dysfunction in a univariate regression model were examined in a multivariate regression model. Their connection was adjusted for parity, age, and education level.

4. Results

4.1. Results of Analysis 1.

Table 1. Comparison of FSFI scores in exclusive breastfeeding, mixed feeding, and formula-feeding groups

	Min-max score ^a	Total sample (n=300) Median (min-max)	Exclusive Breast-feeding (n=180) Median (min-max)	Mixed feeding (n=75) Median (min-max)	Formula-feeding (n=45) Median (min-max)	p value ^b
Desire	1.2-6.0	3.6 (1.2-6)	3.6 (1.2-6.0)	4.2 (1.2-6.0)	4.2 (1.2-6.0)	0.003
Arousal	0-6.0	4.5 (0-6.0)	4.5 (0-6.0)	4.8 (0-6.0)	4.8 (1.8-6.0)	0.006
Lubrication	0-6.0	5.1 (0-6.0)	4.8 (0-6.0)	5.4 (0-6.0)	5.7 (2.1-6.0)	0.008
Orgasm	0-6.0	4.8 (0-6.0)	4.8 (0-6.0)	5.2 (0-6.0)	5.2 (2.8-6.0)	0.009
Satisfaction	0.8-6.0	4.8 (0.8-6.0)	4.8 (1.2-6.0)	4.8 (0.8-6.0)	5.2 (1.2-6.0)	0.027
Pain	0-6.0	4.8 (0-6.0)	4.4 (0-6.0)	4.8 (0-6.0)	5.6 (2.0-6.0)	0.012
FSFI	2.0-36.0	27.4 (2.0-36.0)	26.0 (4.0-36.0)	27.9 (2.0-34.8)	29.8 (12.7-36.0)	<0.001

^a Minimum and maximum score according to FSFI

^b Comparison was done with the Kruskal-Wallis test.

Of the participants, 45.66% had sexual dysfunction according to total FSFI scores 50.55% of participants reported sexual dysfunctions in the exclusive breastfeeding group, 42.66% in the mixed feeding group, and 31.11% in the formula-feeding group.

Significant differences were observed in total FSFI (H [2, N = 300]= 14.28051 p <0.001), desire (H [2, N= 300]= 11.42183 p= 0.003), arousal (H [2,N= 300= 9.959603 p= 0.006), lubrication (H [2, N= 300]= 9.592776 p = 0.008), orgasm (H [2, N= 300]= 9.276175 p= 0.009), satisfaction (H [2, N= 300]= 7.155117 p= 0.027), and pain (H [2, N= 300]= 8.817909 p= 0.012) subgroup scores among different infant feeding groups. The lowest total FSFI and subgroup scores were found in the exclusive breastfeeding group and the highest in the formula-feeding group. (Table 1.)

In the pairwise comparison, Mann-Whitney U tests with a Bonferroni correction showed that exclusive breastfeeding mothers had significantly lower total FSFI (p=0.002), arousal (p=0.034), lubrication (p=0.020), orgasm (p=0.015), and pain scores (p=0.021) than formula-feeding mothers. No significant difference was found between mixed feeding and exclusive breastfeeding, or between mixed feeding and formula-feeding mothers in any FSFI subgroups.

4.2. Results of Analysis 2.

According to total FSFI scores, the prevalence of postpartum sexual dysfunction was 43.70% in the group of women without urinary incontinence, and 62.50% in the group of women with urinary incontinence. Women with urinary incontinence had significantly lower FSFI scores (p=0,006). We found significantly lower scores in the arousal (p=0.033), lubrication (p=0.022), satisfaction (p=0.006), and pain (p=0.032) domains. (Table 2.).

Table 2. FSFI scores and their connection with urinary incontinence (n=207)

	p ^a	Women without urinary incontinence (n=151)		Women with urinary incontinence (n=56)	
		Mean	±SD	Mean	±SD
Desire	0.135	3.68	1.25	3.38	1.28
Arousal	0.033	4.25	1.31	3.81	1.46
Lubrication	0.022	4.69	1.49	4.24	1.52
Orgasm	0.063	4.39	1.58	3.99	1.65
Satisfaction	0.006	4.50	1.35	3.97	1.32
Pain	0.032	4.38	1.65	3.84	1.70
FSFI	0.006	25.89	6.88	23.22	7.03

a Data were compared using the Mann-Whitney U test.

4.3. Results of Analysis 3.

According to the results of the multivariate regression analyses, lower RAS scores increased the odds of having sexual dysfunction within 12 months postpartum, even after adjusting for other independent variables at each measurement point. A one-unit increase in the RAS score meant that participants were 0.90 times less likely to experience sexual dysfunction at T1 (OR=0.90;95%CI:0.83-0.98;p=0.016), 0.90 times less likely at T2 (OR=0.90;95%CI:0.84-0.97;p=0.010), and 0.84 times less likely at T3 (OR=0.84;95%CI:0.72-0.98;p=0.032). EPDS scores were mildly connected with sexual dysfunction, even after adjustment. A one-unit increase in the EPDS score meant a 1.11-fold increase in the odds of suffering from sexual dysfunction at T1 (OR=1.11;95%CI:1.04-1.17;p<0.001), a 1.07-fold increase at T2 (OR=1.07;95%CI:1.01-1.14;p=0.035), and a 1.12-fold increase at T3 (OR=1.12;95%CI:1.01-1.26;p=0.043). Those women who were amenorrheic were 2.25 times as likely at T1 (OR=2.25;95%CI:1.19-

4.24;p=0.012) and 2.88 times at T2 (OR=2.88;95%CI:1.50-5.55;p=0.001) to experience sexual dysfunction, compared to those who had already menstruated. (Table 3-5.)

Table 3. Risk factors for sexual dysfunction at T1

	Univariate regression			Multivariate regression		
	OR	CI (95%)	p	aOR ^a	CI (95%)	p
Mode of delivery						
Vaginal delivery with intact perineum	1.42	0.64-3.11	0.239			
Vaginal delivery with episiotomy	1.03	0.54-1.96	0.918			
Vaginal delivery with perineal trauma	0.99	0.45-2.18	0.956			
Acute cesarean section	0.72	0.37-1.39	0.154			
Elective cesarean section	ref.					
BMI						
Underweight	3.98	1.03-15.40	0.045	4.06	0.96-17.07	0.055
Normal weight	ref.			ref.		
Overweight	1.32	0.78-2.26	0.295	1.60	0.88-2.90	0.119
Obese	0.55	0.24-1.23	0.010	0.60	0.24-1.47	0.021
Menstruation						
Yes	ref.			ref.		
No	2.07	1.20-3.56	0.008	2.25	1.19-4.24	0.012
RAS	0.89	0.83-0.95	0.001	0.90	0.83-0.98	0.016
EPDS	1.10	1.05-1.16	<0.001	1.11	1.04-1.17	<0.001

a. adjusted for age, educational level, and parity

BMI Body Mass Index, RAS Relationship Assessment Scale, EPDS Edinburgh Postnatal Depression Scale

Table 4. Risk factors for sexual dysfunction at T2

	Univariate regression			Multivariate regression		
	OR	CI (95%)	p	aOR ^a	CI (95%)	p
Mode of delivery						
Vaginal delivery with intact perineum	0.53	0.21-1.35	0.471			
Vaginal delivery with episiotomy	0.64	0.30-1.36	0.815			
Vaginal delivery with perineal trauma	0.59	0.23-1.52	0.686			
Acute cesarean section	0.73	0.72-1.64	0.825			
Elective cesarean section	ref.					
BMI						
Underweight	1.86	0.23-3.13	0.282			
Normal weight	ref.					
Overweight	1.45	0.77-2.74	0.244			
Obese	0.30	0.08-1.10	0.071			
Menstruation						
Yes	ref.			ref.		
No	2.78	1.57-4.92	<0.001	2.88	1.5-5.55	0.001
RAS	0.89	0.83-0.94	<0.001	0.90	0.84-0.97	0.010
EPDS	1.09	1.02-1.14	0.002	1.07	1.01-1.14	0.035

a. adjusted for age, educational level, and parity

BMI Body Mass Index, RAS Relationship Assessment Scale, EPDS Edinburgh Postnatal Depression Scale

Table 5. Risk factors for sexual dysfunction at T3

	Univariate regression			Multivariate regression		
	OR	CI (95%)	p	aOR ^a	CI (95%)	p
Mode of delivery						
Vaginal delivery with intact perineum	1.75	0.35-8.66	0.988			
Vaginal delivery with episiotomy	1.41	0.35-5.69	0.608			
Vaginal delivery with perineal trauma	2.62	0.43-15.85	0.522			
Acute cesarean section	2.62	0.50-13.68	0.473			
Elective cesarean section	ref.					
BMI						
Underweight	2.20	0.45-10.63	0.325			
Normal weight	ref.					
Overweight	0.58	0.15-2.24	0.436			
Obese	0	0	>0.99			
Menstruation						
Yes	ref.					
No	2.15	0.72-6.41	0.167			
RAS	0.83	0.73-0.94	0.005	0.84	0.72-0.98	0.032
EPDS	1.16	1.05-1.29	0.003	1.12	1.01-1.26	0.043

a. adjusted for age, educational level, and parity

BMI Body Mass Index, RAS Relationship Assessment Scale, EPDS Edinburgh Postnatal Depression Scale

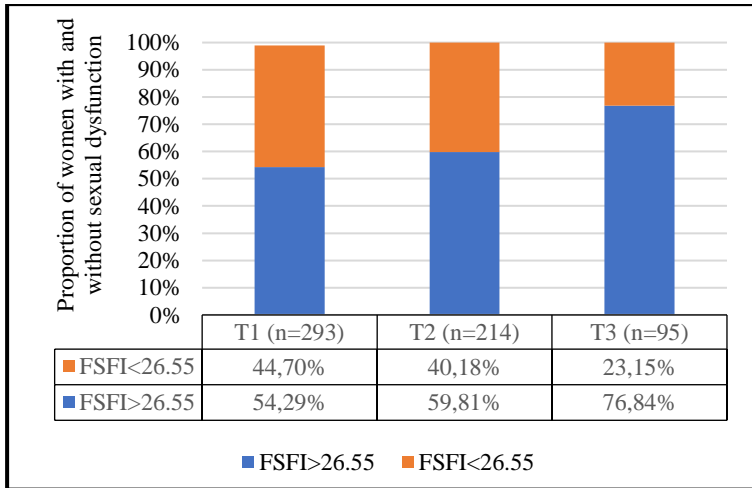


Figure 1. The prevalence of postpartum sexual dysfunction according to total FSFI scores at 3, 6, and 12 months postpartum

The proportion of women with sexual dysfunction decreased over time (Figure 1.).

Among the FSFI subgroups, the lowest mean scores appeared in the Desire subgroup at any time points.

5. Conclusions

Infant feeding method seems to influence sexual function. Exclusive breastfeeding mothers had the lowest level of sexual functions comparing to mixed feeding and formula feeding mothers. Significant difference in sexual functions could be assessed only between exclusive breastfeeding and formula feeding mothers. Amenorrhea connected to higher odds of having sexual dysfunction at 3 and 6

months postpartum. It seems that exclusive breastfeeding itself or the hormonal changes due to breastfeeding connect to sexual dysfunction within 3-6 months postpartum.

Urinary incontinence seems to be an influencing factor of sexual function. Women with urinary incontinence symptoms had lower level of sexual functions than women without urinary incontinence.

It seems, that mode of delivery is not a risk factor for sexual dysfunction. Mode of delivery did not influence the odds of having sexual dysfunction at 3, 6 and 12 months postpartum.

It seems, that lower level of relationship satisfaction is a risk factor for sexual dysfunction. Lower relationship satisfaction connected to higher odds of having sexual dysfunction at 3, 6 and 12 months postpartum.

Depressive symptoms seem to connect to sexual dysfunction. The more severe the depressive symptoms were, the higher odds the mothers had sexual dysfunction at 3, 6 and 12 months postpartum.

The level of the overall sexual function increased over time. Lower level of sexual functions can be temporarily considered as normal in the postpartum period, especially lower level of sexual desire.

6 Bibliography of the candidate's publication

6.1 Related to the thesis

Szöllősi K, Komka K, Szabó L. (2021) Risk factors for sexual dysfunction during the first year postpartum: A prospective study. *Int J Gynecol Obstet*, First

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6.2 Not related to the thesis

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