Sexual function and associated factors at 24 months postpartum: a cohort study

Função sexual e fatores associados aos 24 meses de pós-parto: um estudo de coorte

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RESUMO

O objetivo deste estudo foi, primariamente, investigar as taxas de indicativos de disfunção sexual (DS) no último mês gestacional e aos 24 meses de pós-parto. Secundariamente, verificar os principais fatores associados a esta condição, quando relacionados aos 24 meses. A amostra deste estudo incluiu 131 mulheres, entre o período de outubro de 2018 a abril de 2019, as quais tiveram seus partos nas maternidades de dois hospitais públicos, do sul do Brasil. Na primeira etapa (T1), realizou-se uma entrevista no período de internação das participantes, durante o puerpério imediato, com base em uma ficha clínica e no questionário de função sexual feminina (*Female Sexual Function Index* – FSFI). Na segunda etapa (T2), a avaliação passou a ser via telefonema, face às restrições da pandemia da Covid-19, após 24 meses da coleta inicial. Nessa etapa, utilizou-se uma ficha clínica atualizada, seguida do questionário FSFI. A amostra final foi composta por 82 mulheres. A análise dos dados foi efetuada por meio de estatística descritiva. A normalidade dos dados foi verificada por meio do teste de Kolmogorov-Smirnov. Para comparação de variáveis categóricas em dois tempos, foi utilizado o teste de qui-quadrado. O teste de Wilcoxon foi disposto para comparar o escore do FSFI e seus domínios, tanto no último mês gestacional quanto aos 24 meses pós-parto. Para análise da correlação de fatores associados ao escore do FSFI, fez-se o uso do teste de Spearman. Quanto a função sexual (FS), das mulheres que tiveram atividade sexual nas últimas

quatro semanas de gestação (n=33), 39,4% (n=13) apresentaram indicativo de DS, enquanto aos 24 meses pós-parto, 20,7% (n=17). Não houve diferença estatisticamente significativa entre os escores totais do FSFI referente aos dois períodos observados, porém, a análise dos domínios do FSFI demonstrou uma melhora significativa do desejo sexual (p=0,01) e da dor durante a relação sexual (p=0,04) no *follow-up* de 24 meses de pós-parto. Sendo assim, o indicativo de DS, tanto no último mês de gestação quanto aos 24 meses pós-parto, apresentou taxas consideradas moderadas. Ainda, foi possível identificar fatores associados de forma positiva, bem como de forma negativa, à FS aos 24 meses de pós-parto.

Palavras-chave: pós-parto, disfunção sexual, fatores associados.

ABSTRACT

The aim of this study was primarily to investigate the rates of indicative sexual dysfunction (SD) in the last gestational month and at 24 months postpartum. As a secondary objective, we sought to identify the main factors associated with SD at 24 months. The study sample included 131 women who gave birth in maternity wards at two public hospitals in southern Brazil between the period of October 2018 and April 2019. In the first stage (T1), an interview was carried out while the participants were hospitalized, during the immediate postpartum period, based on a clinical record and on the female sexual function questionnaire (Female Sexual Function Index – FSFI). In the second stage (T2), assessments were made via telephone, given the restrictions of the Covid-19 pandemic, 24 months after the initial data collection. At this stage, an updated clinical record was used, followed by the FSFI questionnaire. The final sample consisted of 82 women. Data analysis was performed using descriptive statistics. Data normality was verified using the Kolmogorov-Smirnov test. The chi-square test was used to compare categorical variables in two stages. The Wilcoxon test was used to compare the FSFI score and its domains, both in the last gestational month and at 24 months postpartum. To analyze the correlation of factors associated with the FSFI score, Spearman's test was used. As for sexual function (SF), of the women who were sexually active in the last four weeks of pregnancy (n=33), 39.4% (n=13) indicated SD, while at 24 months postpartum, the percentage was reduced to 20.7% (n=17). There was no statistically significant difference between the total FSFI scores for the two periods observed; however, the analysis of the FSFI domains showed a significant improvement in sexual desire (p=0.01) and a reduction in pain during intercourse (p=0.04) at the 24-month postpartum follow-up. Thus, indications of SD, both in the last month of pregnancy and at 24 months postpartum, can be considered moderate. Furthermore, it was possible to identify factors associated positively, as well as negatively, with SF at 24 months postpartum.

Keywords: postpartum, sexual dysfunction, associated factors.

1 INTRODUCTION

Worldwide, sexual dysfunctions (SD) are highly prevalent and affect about 25% to 63% of the female population.[1] In 2021, dyspareunia was estimated to affect around 35% of women.[2] Specifically during the postpartum period, rates of SD range from 41%

to 83% in the first two-to-three months, and 64% at six months after birth, not reaching the pre-pregnancy levels of approximately 38%.[3 4 5]

However, when it comes to a period longer than 18 months postpartum, the possible indicators of SD prevalence rates are relatively unexplored in the literature.[6] Until then, what is known is that at this stage women tend to present significantly low levels of sexual pleasure and emotional satisfaction,[5 6 7] which can lead to decreased sexual desire, low arousal, difficulty in reaching orgasm and/or dyspareunia.[8] In addition, it is known that some factors potentiate the onset of SD, such as perineal trauma, type of delivery, and breastfeeding.[5]

Among the factors mentioned, the presence and extent of perineal trauma seem to be related to the onset and intensity of dyspareunia at between three and six months postpartum.[7 9] Regarding the type of delivery, instrumentalized vaginal delivery presents greater risks for the development of dyspareunia when compared to spontaneous delivery.[7 10 11] Studies diverge on the influence of cesarean sections on SF.[12 13] Finally, breastfeeding has been considered as the main factor for dyspareunia in the six months after delivery.[14 15]

In this context, in general, during the postpartum period, the quality of life of women decreases.[14] Problems such as depression, difficulty with breastfeeding, urinary incontinence, and SD are some of the complications that contribute to this fact. [14 16 17 18] In the case of female sexual dysfunctions (FSD), their impacts on quality of life are already recognized by the World Health Organization (WHO).[16] The functional impairment of sexual activity causes emotional destabilization in the lives of women and couples, mainly because this is a phase with moments of fragility and constant adaptations.[16 17 18]

Considering the clinical and social relevance of this topic and the insufficiency of studies that conduct a prolonged follow-up, mainly in the national territory, our objective was primarily to investigate the rates of SD in the last gestational month and at 24 months postpartum and then to check the main factors associated with this condition.

2 MATERIALS AND METHOD

2.1 STUDY DESIGN

This is a quantitative cohort study with intentional non-probabilistic sampling.[19] The sample included a total of 131 women who gave birth between October 2018 and April 2019 in the maternity wards of two public hospitals in the South in Brazil: the

Polydoro Ernani University Hospital of São Thiago (HU) and the Regional Hospital of São José (HRSJ), located respectively in the cities of Florianópolis and São José, in Santa Catarina State. After receiving all the information about the study, the participants signed the Free and Informed Consent Form – FICF (Appendix A).

The study was approved by the Ethics Committee for Research with Human Beings (CEP) of the University of the State of Santa Catarina (UDESC), under approval protocol nº. 2.670.952 (CAAE nº. 78018317.3.0000.0118) (Appendix B); by the Committee of Ethics and Research of the HU, under protocol nº. 2,719,498 (CAAE nº. 78018317.3004.0121) (Appendix C); and by the Ethics and Research Committee of the HRSJ, approved by the Institution's Term of Agreement (Appendix D).

The research took place at two different times. First, an interview was carried out while the participants were still hospitalized, that is, during the immediate postpartum period, based on a clinical record and a questionnaire on sexual function (FS) (Female Sexual Function Index – FSFI). Furthermore, a follow-up evaluation took place via telephone, 24 months after the initial data collection (in-person interviews were not possible given the restrictions generated by the Covid-19 pandemic) with the same instruments used in the first stage. At no time did the participants receive any form of remuneration for taking part.

2.2 PARTICIPANTS

This study included intentionally targeted women who were hospitalized in the pre-selected maternity hospitals for the study, during their immediate postpartum period, which is considered a period of up to ten days postpartum.[20]

The sample consisted of participants who cumulatively met the inclusion criteria: (1) being between 18 and 45 years old and (2) fully understanding and answering all the questionnaires. As for the exclusion criteria, these included: (1) hospitalization for curettage; (2) stillbirth; (3) twin pregnancy; (4) neonate admitted to intensive care at the time of the initial interview; (5) hospital stay longer than ten days and; (6) difficulty in understanding the Portuguese language questionnaires.

2.2.1 Sample Calculation

To determine the statistical power of the sample, the G* Power 3.1.[21] program was used. Then, an a priori test was performed for the Wilcoxon test, with a significance level

(α) of 0.05, effect size of 0.33 and power of 0.95, which resulted in a sample of 128 participants.

2.3 INSTRUMENTS AND DATA COLLECTION

2.3.1 Clinical File

To characterize the sample, a clinical form (Appendix E) with sociodemographic, gynecological-obstetric, and childbirth-related information was applied.[22]

In the first part of the form, the sociodemographic characteristics included: age (in years), profession, education (up to eight years of study/more than eight years of study), monthly family income (in minimum wages), ethnicity (Caucasian, mulatto, black, indigenous, Asian), marital status (with a partner/without a partner), and the length of relationship with the partner (in years).

In addition, smoking and the consumption of alcohol and other drugs were acquired by self-report, in addition to anthropometric variables (mass before pregnancy, mass acquired with pregnancy, and height) and physical activity practice (yes/no).

As for gynecological-obstetric information, the number of pregnancies (cesarean, vaginal, and/or abortions) was included. Regarding sexual activity we questioned the occurrence of sexual intercourse during the gestational period (yes/no), the monthly frequency, the date of the last intercourse, and the existence of reasons for not having it.

Also, birth data were obtained through the analysis of the participants medical records, such as: date of birth and duration of pregnancy (in weeks, based on the ultrasound examination). Items such as desired pregnancy (yes/no) and postpartum complications (yes/no) -the latter including both the mother and the newborn- were collected through self-report.

2.3.2 Female Sexual Function

To assess FS, the Female Sexual Function Index (FSFI) (Appendix F) was used. Developed by Rosen et al. (2000), this is a brief questionnaire, which can be self-administered, in order to assess female sexual response in a multidimensional way. This instrument is divided into six domains, namely: sexual desire, sexual arousal, vaginal lubrication, orgasm, sexual satisfaction and pain, distributed into 19 multiple-choice Likert-type items, which assess SF in the last four weeks prior to data collection.[23]

In addition, this questionnaire has been validated for the Brazilian population [24] and for application via telephone call.[25] Its answer alternatives are scored, related to the

presence of the questioned function, from 0 to 5. A zero score indicates that the respondent does not report having sexual activity in the last four weeks.[24] Finally, the total score results in the sum of the scores for each domain, which are calculated according to the stipulated multiplication factor. Total scores that are equal to or less than 26.55 points are indicative of sexual dysfunction (SD).[26]

2.3.3 *Follow Up*

Twenty-four months after the first interview, the participants were contacted again, this time via telephone, regarding the following data: marital status (with a partner/without a partner); current BMI (via weight and height); use of contraceptives (yes or no; if the answer was yes, what type of contraceptive was used); presence of an active sexual life (yes or no; if the answer was yes, what was the frequency of sexual intercourse in the last month); pain in the vulva region and/or during sexual intercourse, both collected using the Visual Analog Scale (VAS) and quantified from 0 (no pain) to 10 points (unbearable pain); maternal sleep quality (quantified from 0 to 10 points, subjectively); and, finally, breastfeeding (yes or no; if the answer was yes, if it influenced the participant's routine (yes or no)).

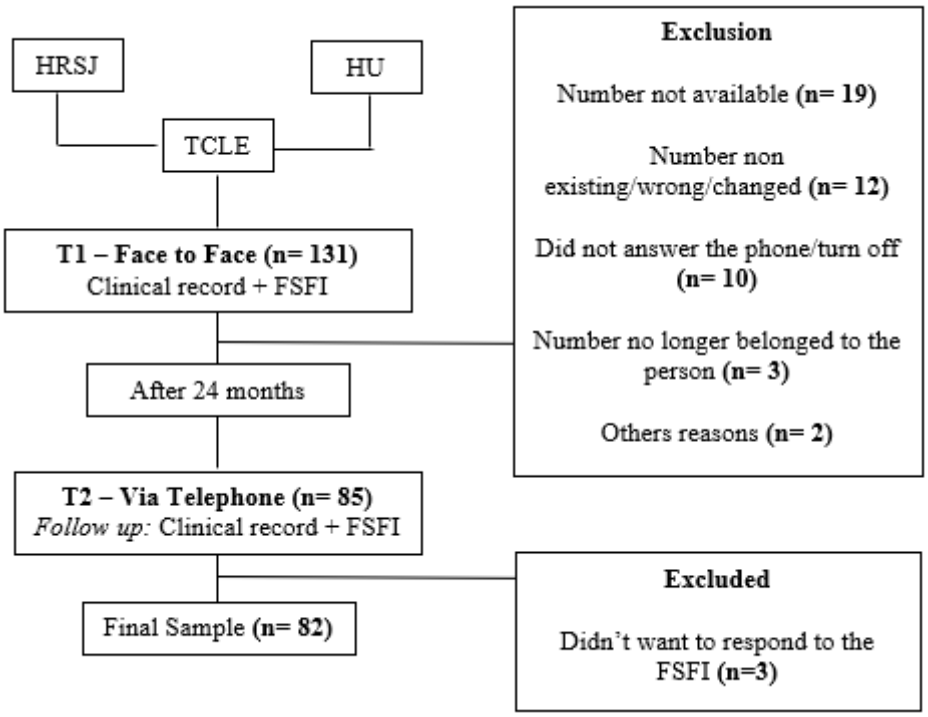
2.3.4 Data collection procedure

Initially, all women received explanations regarding the study objectives. Then, the mothers who agreed to participate signed the consent form. After signing, the collection took place at two different times, T1 and T2.

In the first stage, T1, the clinical form was applied at the bedside, followed by the application of the FSFI questionnaire, referring to the last four weeks of pregnancy. Data were collected on alternate days of the week (Mondays, Wednesdays, and Fridays), by three different researchers who were properly trained for this function. As for the information gathered, data were preferably collected in the afternoon, to avoid clashes with medical rounds. Any doubts during this period were promptly clarified.

In the second stage, T2, the participants responded again to the clinical form, which was updated, and to the FSFI, via phone call. There was an exclusion if a maximum of four calls were not answered (attempts on alternate days of the week and at different times). Each collection lasted around ten to fifteen minutes (Figure 1).

Figure 1 – Collection Steps Flowchart.



2.4 STATISTICAL DATA ANALYSIS

Data were organized in the Excel program (version 2010) and then analyzed in the SPSS software (version 20.0). For descriptive statistics, measures such as frequencies for categorical variables; mean and standard deviation for parametric variables; and median and interquartile range for non-parametric variables were used. As for data normality, this was verified using the Kolmogorov-Smirnov test.

To compare categorical variables at two times, the chi-square test was used. The Wilcoxon test was used to compare the FSFI score and its domains in the last gestational month and at 24 months postpartum. Finally, for the analysis of the correlation of factors associated with the FSFI score, the Spearman test was used. The significance level adopted was $p<0.05$.

3 RESULTS

Of the 131 women who met the inclusion criteria and participated in the initial collection, 85 of them continued with the 24-month postpartum follow-up. Three participants were excluded for not being willing to answer the FSFI questionnaire, which resulted in 82 being included in the statistical analysis.

Sociodemographic data showed a mean age at 24 months after delivery of 30.36 ± 4.93 years and a BMI of 26.69 ± 4.67 kg/m2. As for education, 79.3% of participants (n=65) had more than eight years of schooling. The income of 87.8% (n=72) of the participants in stage T1, which was from one to four minimum wages, remained the same at follow-up, with 82% (n=65) (Table 1).

Table 1 – Sociodemographic characteristics of pregnant women and women 24 months postpartum (n = 82).

Variable	Women in the immediate postpartum period % (n)	Women in the 24-month postpartum period % (n)	X^2	*P*
Work			0.07	0.80
Employee	75.6% (62)	47.6 (39)		
Unemployed	24.4% (20)	52.4 (43)		
Marital Status			20.07	0.00*
With a partner	92.7% (76)	82.9 (68)		
Without a partner	7.3% (6)	17.1 (14)		
Physical activity			4.35	0.04*
Yes	43.9 (36)	42.7 (35)		
No	56.1 (46)	57.3 (47)		

X^2 = chi-square. *$p < 0.05$.

3.1 GYNECOLOGY-OBSTETRIC DATA IN THE IMMEDIATE POSTPARTUM PERIOD AND 24-MONTH FOLLOW-UP

Among the participants, 75.6% (n=62) reported having wanted the pregnancy. As for the type of delivery, 36.6% (n=30) had a cesarean section and 63.4% (n=52) had vaginal delivery, with 43.2% (n=35) of the latter reporting perineal laceration and 2.5 % (n=2) underwent episiotomy.

Regarding sexual history, 87.8% (n=72) reported having sexual intercourse during pregnancy. Among the factors considered as barriers to sexual practice during pregnancy, 19.5% (n=16) reported pain, 8.5% (n=7) fear, 6.1% (n=5) tiredness, 6.1% (n=5) lack of desire, and 6.1% (n=5) medical advice. On the other hand, about 53.7% did not report any type of barrier. In the 24-month follow-up, when the use of contraceptives was evaluated, 81.7% (n=67) of the participants reported, on the day of the interview, that they were using it. In all, 24.4% (n=20) used condoms; 19.5% (n=16) non-hormonal IUD; 18.3%, (n=15) oral contraceptive; 9.8% (n=8) ligation; 8.5% (n=7) hormonal injection; 1.2% (n=1) hormonal IUD. Only 6.1% (n=5) had a new pregnancy during this period.

The average relationship time was 8 [7] years and most women 98.8% (n=81) reported having a support network. About 54.9% (n=45) stated that their children sleep

in separate rooms. On a scale from 0 to 10 points, sleep quality was subjectively rated at a mean of 7.17 [4] and relationship satisfaction, 8.75 [2].

3.2 SEXUAL FUNCTION IN THE IMMEDIATE POSTPARTUM PERIOD AND AT 24 MONTHS POSTPARTUM

Of the 33 women who had been sexually active in the last four weeks of pregnancy, 39.4% of them (n=13) indicated SD according to the FSFI questionnaire score. At 24 months postpartum, 20.7% (n=17) of women who had been sexually active in the last four weeks had dysfunction according to the same questionnaire. There was no statistically significant difference between the total FSFI scores for the last weeks of pregnancy and 24 months postpartum. However, when the domains were analyzed separately, there was a significant improvement in desire (p=0.01) and reduction in pain during sexual intercourse (p=0.04) at 24 months after delivery (Table 2).

At the time of the follow-up, the frequency of sexual activity was 11.08 [11] times a month. On a scale from 0 to 10 points, sexual satisfaction was 8.63 [2]. As for the item pain, 17.1% (n=14) reported pain during sexual intercourse and 8.5% (n=7) reported pain in the vulva region.

Table 2 – Female sexual function in the last month of pregnancy and at 24 months postpartum.

Domains	**FSFI of the women in the immediate postpartum period (n=33)**	**FSFI of the women at 24 months postpartum (n=17)**	***P***
Desire	3.6 [1.2]	4.2 [1.8]	0.01*
Excitation	4.2 [1.5]	4.8 [0.6]	0.08
Lubrication	4.8 [1.5]	5.1 [1.2]	0.72
Orgasm	4.8 [2]	5.2 [0.8]	0.19
Satisfaction	5.2 [2]	4.8 [1.2]	0.81
Pain	4.4 [2]	6 [1.4]	0.04*
TOTAL	27.5 [7.75]	29.6 [4.75]	0.05

Wilcoxon Test. *p < 0.05.

As factors that correlated with female sexual function at 24 months postpartum, we observed marital status, the bedroom shared between the couple and the child, the quality of maternal sleep, sexual satisfaction, pain during sexual intercourse and, finally, pain in the vulva region (Table 3).

Table 3 – Factors related to female sexual function at 24 months postpartum (n=82).

Variable	Spearman's RHO	*P*
Desired pregnancy	-0.07	0.52
Vaginal delivery	-0.09	0.41
Cesarean delivery	0.05	0.65
Perineal laceration	0.06	0.6
Episiotomy	0.02	0.86
Age	0.05	0.62
BMI	0.09	0.45
Type of contraceptive	-0.06	0.59
Physical activity	0.11	0.32
Work	0.11	0.31
Condition marital	0.31	0.00*
Relationship satisfaction	0.17	0.16
Support network	0.06	0.6
Child sleeps in a separate room	0.25	0.03*
Sleep quality	0.26	0.02*
Satisfaction with motherhood	0.28	0.01
Sexual satisfaction	0.35	0.00*
SR pain	-0.29	0.01*
Vulva pain	-0.26	0.02*

BMI=body mass index; SR=sexual relationship.

Among the factors that are positively correlated with sexual function are: the presence of a partner (rho = 0.31; p = 0.00), the child sleeping in a separate room (rho = 0.25; p = 0.03), maternal sleep quality (rho = 0.26; p = 0.02), and satisfaction with sexual life (rho = 0.35; p = 0.00).

On the other hand, the factors that are negatively correlated with sexual function: pain during intercourse (rho = -0.29; p = 0.01) and pain in the vulva region (rho = -0.26; p = 0.02).

4 DISCUSSION

The present study compared the rates of indications of sexual dysfunction in the last gestational month and at 24 months postpartum, and did not identify statistically significant differences between the results. However, when comparing the FSFI domains in isolation, increased sexual desire and decreased pain during intercourse were related to FS improvement at 24 months postpartum.

Sexual desire encompasses physical, emotional, and hormonal spheres, which directly influence the individual's sexual life. In the present study, there was a significant improvement in the domain related to sexual desire at 24 months postpartum. According to Wallwiener et al. (2017), part of this effect derives from the reduction in physical discomfort and increase in estrogen concentrations over time postpartum, as postulated by Salin et al. (2010) and Holanda et al. (2014), who highlight this period as being the

one in which female sexuality is once again explored more effectively.[27] [28] [29] These findings are in agreement with the results of the present study regarding the increase in sexual desire at 24 months after birth, suggesting a potential advance of SF at this stage.

In addition, there was a significant reduction in pain during intercourse at the 24-month follow-up. However, this research does not present exactly the beginning and the end of the process of minimizing this complaint. Although this pain is documented in systematic reviews, as stated by Benaei et al. (2020), presenting results with a decrease in the prevalence of dyspareunia in the postpartum from 42% to 22%, in analyses from two to six months and at twelve months, respectively, being in line with the findings of another Brazilian study, which believes in the progress of SF at 24 months of childbirth.[30]

Concomitantly to the aforementioned factors, other factors were positively associated with SF at 24 months postpartum, such as the presence of a partner, the child sleeping in a separate room, the quality of maternal sleep, and satisfaction with sexual life. These results corroborate evidence described in other studies, which show the same factors as being positive in SF in the postpartum period.[31] [32] [33] [34] [35]

Regarding the presence of a partner, a decrease was found in the number of women who had a partner at 24 months postpartum. The analysis of this data allowed us to believe that there may be intrinsic variables, not controlled for in this research, combined with specific sociocultural factors in the Brazilian reality, where the presence of a partner has a significant impact on SF. Mateis et al. (2018) only reinforced these results, stressing that the good quality of the relationship with the partner positively affects postpartum SF.[15]

As for children who sleep in separate rooms, the literature presents few studies that associate this with SF. However, Volkivich et al. (2018) correlate the decrease in the quality of maternal sleep to mothers who have children who share the same room.[36] Following this logic, it is believed that, in addition to decreasing the quality of sleep, the presence of the child in the same room limits the intimacy and privacy of the couple and, consequently, may reflect negatively on SF. Thus, the condition of sleeping in separate rooms from the children, as previously explained, may have been a positive factor for SF at 24 months after birth.

Also, considering the quality of maternal sleep as being essential in improving SF, Aksu et. al (2019) and Carrega et al. (2020) point to a strong relationship between the decrease in the quality of sleep in the postpartum period and the effectiveness of breastfeeding.[37] [38] When verifying that, at 24 months postpartum, the level of participants

who continued breastfeeding decreased, it is possible to associate this condition improves the quality of sleep and, consequently, has a positive influence on SF.

As for sexual satisfaction, this is associated with physical aspects and emotional well-being.[39] During the postpartum period, sexual interest is usually reduced, especially in the first months.[39 40] Based on this condition, we can attribute the significant increase in sexual satisfaction of the participants, at 24 months after birth, to several factors, including the child sleeping in a separate room, the mother no longer breastfeeding, the presence of an active sex life, decreased pain during sexual intercourse, and increased sexual desire. Both factors, already discussed above, resulted in factors that were positively correlated with SF.

Despite highlighting strengths, this study has limitations to be discussed. The first is due to the significant sample loss, estimated at 30% of the initial sample. However, even if this loss was not expected, a relatively satisfactory sample (n=82) was reached when compared to a similar study, considering that the data was collected by phone, 24 months after the initial interview, making it difficult to carry out this follow-up stage.

Another limitation detected is the lack of frequent follow-ups, since the Unified Health System (SUS) has insufficient records and many of them are outdated throughout the entire 24-month study process. This fact made it impossible to fully map more robust information and reduced the chances of creating a bond with the participants.

Finally, since the first stage of this study took place in the immediate postpartum period of the participants and the information collected regarding the SF questionnaire referred to the last gestational month, we considered this fact a memory bias. Thus, considered as a limitation of the study.

Thus, it is suggested that future studies continue to investigate SF at 24 months postpartum, aiming to track and detail the events in the long term. Furthermore, they propose a safe management for the gradual improvement of the SF and quality of life of this population.

5 CONCLUSION

The rates of indicators of sexual dysfunction in the population studied were considered moderate, both in the last gestational month and at 24 months postpartum.

Factors such as the presence of a partner, the child sleeping in a separate room, the quality of maternal sleep, and satisfaction with sexual life were positively correlated

with the improvement in SF at 24 months. However, pain during sexual intercourse and in the vulva region were negatively correlated.

Therefore, it is considered opportune to identify, early, the indications of sexual dysfunctions from the gestational period, in order to contain impacts on the quality of life of women and couples, not only in the short term but also in the long term.

CONFLIT OF INTEREST

No financial, legal, or political conflict involving third parties (government, companies and private foundations, etc.) has been declared for any aspect of the submitted work.

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