THE JOURNAL OF
SEXUAL MEDICINE

Sexual Distress and Sexual Problems During Pregnancy: Associations With Sexual and Relationship Satisfaction

Sarah A. Vannier, PhD,[1] and Natalie O. Rosen, PhD[1,2]

ABSTRACT

Introduction: Sexual problems are common during pregnancy, but the proportion of pregnant women who experience sexual distress is unknown. In non-pregnant samples, sexual distress is associated with lower sexual and relationship satisfaction.

Aim: To identify the proportion of women experiencing sexual distress during pregnancy and to compare the sexual and relationship satisfaction of women who report sexual distress during pregnancy with that of women without distress.

Methods: Two-hundred sixty-one pregnant women completed a cross-sectional online survey.

Main Outcome Measures: Women completed validated measurements of sexual functioning (Female Sexual Function Index; score < 26.55 indicates a sexual problem), sexual distress (Female Sexual Distress Scale; score ≥ 15 indicates clinically significant distress), sexual satisfaction (Global Measure of Sexual Satisfaction), and relationship satisfaction (Couples Satisfaction Index).

Results: Overall, 42% of women met the clinical cutoff for sexual distress. Of sexually active women ($n = 230$), 26% reported concurrent sexual problems and distress and 14% reported sexual distress in the absence of sexual problems. Sexual distress and/or problems in sexual functioning were linked to lower sexual and relationship satisfaction compared with pregnant women with lower sexual distress and fewer sexual problems.

Conclusion: Sexual distress is common during pregnancy and associated with lower sexual and relationship satisfaction. Health care providers should ask pregnant women about feelings of sexual distress. Identifying pregnant women who experience sexual distress and referring them to appropriate resources could help minimize sexual and relationship problems during pregnancy. **Vannier SA, Rosen NO. Sexual Distress and Sexual Problems During Pregnancy: Associations With Sexual and Relationship Satisfaction. J Sex Med 2017;14:387–395.**

Copyright © 2017, International Society for Sexual Medicine. Published by Elsevier Inc. All rights reserved.

Key Words: Pregnancy; Sexual Function; Sexual Distress; Sexual Satisfaction; Relationship Satisfaction

INTRODUCTION

Although 10% to 22% of pregnant women report increased sexual frequency, satisfaction, and desire during this time (compared with before pregnancy),[1] problems with sexual functioning are far more common. In cross-sectional research, 31% to 58% of pregnant women report sexual problems, including decreases in sexual desire, arousal, lubrication, and orgasm and increases in genito-pelvic pain.[1–4] During the third trimester, as many as 52% to 73% of women meet clinical cutoffs on standardized measurements for sexual problems.[5,6] Pregnancy also is linked with lower sexual satisfaction: one cross-sectional study of 589 pregnant women found that 63% were dissatisfied with their sex life.[7] Because sexual and relationship satisfaction are closely related in non-pregnant samples,[8–10] sexual problems during pregnancy can be associated with lower relationship satisfaction. In turn, sexual and relationship difficulties in pregnancy can set the stage for postpartum sexual and relationship problems, which are common,[11–14] and ongoing relationship problems can have critical consequences for the parent-child relationship and later child development.[15–17] The aim of the present study was to examine the prevalence of a potentially key aspect of pregnant women's sexual functioning and sexual and relationship satisfaction, namely sexual distress.

In the past two decades clinicians and researchers have highlighted the importance of including measurements of sexual

Received October 3, 2016. Accepted December 29, 2016.

[1]Department of Psychology and Neuroscience, Dalhousie University, Halifax, NS, Canada;

[2]Department of Obstetrics and Gynaecology, IWK Health Centre, Halifax, NS, Canada

Copyright © 2017, International Society for Sexual Medicine. Published by Elsevier Inc. All rights reserved.

http://dx.doi.org/10.1016/j.jsxm.2016.12.239

distress when assessing the prevalence of female sexual problems.[18,19] Sexual distress is defined as negative emotions about one's own sex life, including guilt, frustration, stress, worry, anger, and embarrassment.[20] Sexual distress is an independent construct from sexual satisfaction (eg, distress is more closely related to sexual functioning and more sensitive to treatment)[21] and is required for a clinical diagnosis of sexual dysfunction.[22,23] There are several characteristics of sexuality during pregnancy that can foster feelings of sexual distress. First, changes in sexual functioning, such as a decrease in sexual desire or onset of pain during intercourse, can be sudden and unexpected, especially if women have not discussed these changes with a health care provider.[1] Second, many pregnant women worry that sexual activity could harm their pregnancy, and these worries can lead to increased distress.[24] Third, sexual distress tends to increase when women believe that their sexual problems have led to lower sexual frequency or lower sexual pleasure for themselves or their partner,[25] which are outcomes that are common during pregnancy.[1] Nevertheless, researchers have neglected to examine sexual distress in pregnancy.

Although sexual changes and problems are common during pregnancy, one cannot infer the presence of sexual distress from the presence of a sexual problem. In research with non-pregnant samples, most women with sexual problems did not report sexual distress.[19,26] In population-based samples of Finnish and American women, 34% to 43% met the clinical cutoff for sexual problems, 12% to 20% reported concurrent sexual problems and distress, and 15% of the Finnish sample reported sexual distress in the absence of a sexual problem.[27,28] A British population study found even lower rates: although 51% of the sample reported sexual problems, only 11% reported sexual distress.[29] Thus, although many women experience sexual problems during pregnancy,[5,6] it is likely that a smaller proportion is actually distressed by these problems and might require intervention. In addition, there could be a subset of pregnant women who experience sexual distress in the absence of a sexual problem. Moreover, sexual distress might be more likely to co-occur with specific sexual problems. For example, Witting et al[27] found that non-pregnant women experiencing problems with arousal, lubrication, and satisfaction were more likely to be distressed compared with women who reported problems with desire.

Although there are other identified factors that might play a role in women's sexual and relationship satisfaction during pregnancy (eg, body image, sexual self-esteem, impending role changes, and physiologic changes[24,30]), women's sexual distress could be a key source of variability. In clinical and community samples, women who reported more sexual distress also reported lower sexual satisfaction.[31,32] Similarly, in a cross-sectional, nationally representative survey, women with concurrent low desire and sexual distress were more likely to describe themselves as unhappy with their relationship compared with women without sexual distress.[32] Thus, pregnant women who report sexual distress could be at an increased risk for sexual and relationship dissatisfaction, and this might be particularly true for women who report concurrent sexual problems.

AIMS

Our first aim was to describe the proportion of women experiencing sexual distress during pregnancy alone and concurrently with global and specific sexual problems. Our second aim was to compare the sexual and relationship satisfaction of women who report sexual distress during pregnancy alone and concurrently with sexual problems with the sexual and relationship satisfaction of women without distress. Based on the literature reviewed, we hypothesized that (i) women with concurrent sexual distress and problems would report lower sexual and relationship satisfaction compared with women with no problems or distress and women with problems only and (ii) women with sexual distress would report only lower sexual and relationship satisfaction compared with women with no problems or distress. Given the limited research assessing sexual problems and sexual distress, all other comparisons were made on an exploratory basis.

METHODS

Participants and Procedure

Participants were recruited online from August 2015 to March 2016 through Facebook (62.5%), classified ads (6.9%), word of mouth (5.8%), Reddit (5.4%), and unspecified sources (19.5%) as part of a larger study on sexuality during pregnancy. Eligible participants were pregnant (no minimum pregnancy length), older than 18 years, in a romantic relationship, residing in the United States or Canada, and fluent in English. Eligible participants who provided consent completed a single online survey (mean completion time = 35.74 minutes, SD = 18.82). Upon completion, participants were entered into a prize draw for a $25 gift card and received a list of online resources related to sexuality and relationships in pregnancy. This study received approval from our institution's ethical review board.

The final sample included 261 women. In total, 411 women provided consent, but 111 withdrew before completing the survey. Data from 39 participants who completed the survey were removed from analyses for answering an "attention check" question incorrectly (n = 35), skipping more than 20% of a measurement (n = 2), or duplicate IP address (n = 2). Excluded participants did not differ from the final sample on any demographic variables. There were fewer than 1% missing data and mean substitution was used to replace missing values.[33]

Main Outcome Measures

Sample Characteristics

Participants responded to questions assessing age, sex, sexual orientation, race and ethnicity, education, income, relationship

status, relationship length, partner's sex, number of past births, length of current pregnancy, and frequency of sexual activity (manual genital stimulation, cunnilingus, fellatio, vaginal intercourse, anal intercourse) in the past 4 weeks.

Sexual Functioning

Sexual functioning was assessed using the Female Sexual Functioning Index (FSFI).[34] The FSFI is a well-validated and reliable 19-item measurement that assesses six domains of sexual functioning (ie, desire, arousal, lubrication, orgasm, satisfaction, and pain). Participants respond to each item on a five- or six-point Likert scale. Total scores range from 2 to 36, with higher scores indicating higher sexual functioning. Sexually active women with sexual problems were identified using the established clinical cutoff score lower than 26.55 on the overall scale[35] and the domain subscale cutoff scores created by Witting et al[27] (ie, one SD lower than the scale-specific means for women without sexual dysfunctions as reported by Wiegel et al[35]). The domain subscale cutoff scores were 3.16 for desire, 3.97 for arousal, 4.31 for lubrication, 3.75 for orgasm, 3.85 for sexual satisfaction, and 4.22 for pain. Reliability was good for the overall scale ($\alpha = 0.94$).

Sexual Distress

Sexual distress was assessed using the validated and reliable Female Sexual Distress Scale (FSDS).[36] The FSDS was selected to allow the comparison of the proportion of women reporting sexual distress with the prevalence rates found in population studies.[28,37] The FSDS includes 12 items. Participants rate how often they had bothersome or distressing sexual feelings in the past 30 days on a five-point Likert scale. Scores are summed and can range from 0 to 48, with higher scores indicating greater distress. Women with sexual distress were identified using the established cutoff score of at least 15.[36] The FSDS demonstrated excellent reliability ($\alpha = 0.94$).

Sexual Satisfaction

Sexual satisfaction was assessed using the well-validated and reliable Global Measure of Sexual Satisfaction.[38] Participants rate their sexual relationship on five seven-point bipolar scales (e.g, good vs bad and pleasant vs unpleasant). Scores are summed and range from 5 to 35, with higher scores indicating greater sexual satisfaction. Internal consistency in the present sample was high ($\alpha = 0.94$).

Relationship Satisfaction

Relationship satisfaction was assessed using the 32-item Couples Satisfaction Index (CSI-32), which has been found to be valid and reliable in previous research.[39] Participants rate various facets of their relationship satisfaction in the past 4 weeks (eg, happiness and disagreements) on six- or seven-point Likert scales. Scores are summed and range from 0 to 161, with higher scores indicating higher relationship satisfaction. The CSI-32 demonstrated strong reliability ($\alpha = 0.97$).

Table 1. Descriptive statistics for all participant characteristics (N = 261)

Participant characteristics	Mean (range) or n	SD	%
Age (y)	28.64 (19–41)	4.47	–
Education level (y)	16.00 (10–28)	3.16	–
Household annual income			
$0–$39,000	54	–	20.6
$40,000–$79,000	97	–	37.2
≥$80,000	109	–	41.7
Sexual orientation			
Asexual	7	–	2.7
Bisexual	21	–	8.0
Lesbian	4	–	1.5
Heterosexual	219	–	83.9
Pansexual or queer	10	–	3.8
Country			
United States	169	–	64.8
Canada	92	–	35.2
Race/ethnicity			
American Indian/First Nations	5	–	1.9
African American/Black	4	–	1.5
Asian	10	–	3.8
Caucasian/White	219	–	83.9
Hispanic/Latino	8	–	3.1
Native Hawaiian/Pacific Islander	1	–	0.4
Multiracial	14	–	5.4
Pregnancy length (wk)	23.35 (4–40)	9.09	–
Previous births (n)	0.76 (0–6)	0.98	–
Trimester			
First	43	–	16.5
Second	123	–	47.1
Third	95	–	36.4
Relationship length (y)	6.78 (0.25–21.5)	3.80	–
Relationship status			
Married	206	–	78.9
Engaged	14	–	5.4
Cohabiting or common law	37	–	14.1
Dating	4	–	1.5
Partner's sex*			
Male	250	–	92.3
Female	20	–	7.3

*One participant identified the partner's sex as non-binary.

RESULTS

Sexual Problems and Sexual Distress

Descriptive statistics are presented in Table 1 and bivariate correlations are presented in Table 2. Women reported engaging in manual genital stimulation (82.8%), fellatio (67.4%), cunnilingus (55.8%), vaginal intercourse (88.5%), and anal intercourse (21.1%) at least once in the past month. A total

Table 2. Descriptive statistics and bivariate correlations for all study variables

	Descriptive statistics		Bivariate correlations								
	Mean (range)	SD	2	3	4	5	6	7	8	9	10
1. Sexual distress	15.20 (0–46)	12.63	−0.60§	−0.28§	−0.47§	−0.40§	−0.38§	−0.71§	−0.36§	−0.55§	−0.31§
2. Overall sexual functioning*	27.23 (8.3–36)	5.94	—	0.67§	0.90§	0.76§	0.78§	0.72§	0.62§	0.61§	0.26§
3. Desire	3.56 (1.2–6)	1.48		—	0.61§	0.39§	0.36§	0.34§	0.25§	0.41§	0.04
4. Arousal	4.58 (1.2–6)	1.31			—	0.65§	0.69§	0.58§	0.45§	0.56§	0.20‡
5. Lubrication	5.07 (1.2–6)	1.21				—	0.48§	0.46§	0.51§	0.35§	0.09
6. Orgasm	4.52 (1.2–6)	1.56					—	0.50§	0.33§	0.41§	0.21‡
7. Satisfaction	4.60 (1.2–6)	1.30						—	0.30§	0.69§	0.37§
8. Pain	4.71 (1.2–6)	1.29							—	0.30§	0.14†
9. Sexual satisfaction	25.04 (5–35)	8.18								—	0.48§
10. Relationship satisfaction	133.31 (17–161)	24.64									—

*Only those participants who engaged in vaginal penetration in the past 4 weeks could complete all six subscales of the Female Sexual Function Index: overall (n = 230), desire (n = 261), arousal (n = 232), lubrication (n = 232), orgasm (n = 230), satisfaction (n = 230), and pain (n = 231).
†$P < .05$; ‡$P < .01$; §$P < .001$.

sexual functioning score could be calculated only for women who engaged in sexual activity in the past 4 weeks (n = 230).[34] As such, unless otherwise indicated, analyses were conducted on this subsample of 230 women. Of the 31 women (12% of sample) who did not engage in sexual activity in the 4 weeks before the study, 55% (n = 17) met the cutoff score for sexual distress.

Of the 230 women who had engaged in sexual activity in the prior 4 weeks, 40% (n = 92) met the clinical cutoff for sexual distress and 36% (n = 83) met the cutoff for significant sexual problems (Table 3). Twenty-six percent (n = 60) reported concurrent sexual problems and sexual distress, 14% (n = 32) reported sexual distress in the absence of sexual problems, and 10% (n = 23) reported sexual problems in the absence of distress. The remaining 50% (n = 115) did not meet clinical cutoffs for sexual problems or sexual distress.

Next, we examined the proportions of women who reported a specific sexual problem and concurrent sexual distress (Table 3). The proportions of women who reported each sexual problem ranged from 21% (lubrication) to 37% (desire) and on average women reported 1.70 sexual problems (range = 1–6, SD = 1.86). To account for the different base rates for each problem, we applied a formula developed by Witting et al[27]: (number of women who reported a sexual problem and concurrent distress)/(number of women who reported that sexual problem) × 100. The percentages of women who reported concurrent distress for each sexual problem were 65% (55 of 85) for desire, 75% (49 of 65) for arousal, 73% (36 of 49) for lubrication, 67% (44 of 66) for orgasm, 84% (49 of 58) for sexual satisfaction, and 57% (38 of 67) for pain.

Table 3. Prevalence of sexual problems and sexual distress

			Sexual distress, n (%)	
Sexual functioning domain	Sexual problem, n (%)		Yes (n = 92, 40%)	No (n = 138, 60%)
Overall	83 (36.1)	Yes	59 (25.7)	24 (10.4)
		No	33 (14.3)	114 (49.6)
Desire	85 (37.0)	Yes	55 (23.9)	30 (13.0)
		No	37 (16.1)	108 (47.0)
Arousal	65 (28.3)	Yes	49 (21.3)	16 (7.0)
		No	43 (18.7)	122 (53.0)
Lubrication	49 (21.3)	Yes	36 (15.7)	13 (5.7)
		No	56 (24.3)	125 (54.3)
Orgasm	66 (28.7)	Yes	44 (19.1)	22 (9.6)
		No	48 (20.9)	116 (50.4)
Satisfaction	58 (25.2)	Yes	49 (21.3)	9 (3.9)
		No	43 (18.7)	129 (56.1)
Pain	67 (29.1)	Yes	38 (16.5)	29 (12.6)
		No	54 (23.5)	109 (47.4)

Table 4. Group differences in sexual and relationship satisfaction*

Group	n	Sexual satisfaction, mean (SD)	Relationship satisfaction, mean (SD)
1. No problems or distress	114	30.71 (4.99)[a]	141.93 (17.19)[a]
2. Concurrent problems and distress	59	20.41 (6.02)[b]	127.04 (23.79)[b]
3. Distress only	33	23.33 (6.85)[b]	126.48 (26.01)[b]
4. Problems only	24	22.42 (7.34)[b]	128.79 (24.41)[b]

*Same superscript letters in the same column indicate that groups do not differ ($P < .01$).

Sexual and Relationship Satisfaction

Four groups were created based on clinical cutoff scores for overall sexual functioning and sexual distress[20,27]: (i) concurrent sexual problems and sexual distress (n = 60), (ii) no sexual problems and no sexual distress (n = 115), (iii) sexual distress only (n = 32), and (iv) sexual problems only (n = 23). There were no differences among groups for age ($F_{3,226} = 2.28$; $P = .08$), years of schooling ($F_{3,226} = 2.08$; $P = .10$), income ($F_{3,225} = 1.29$; $P = .28$), pregnancy length ($F_{3,226} = 1.04$; $P = .38$), trimester ($\chi^2_6 = 7.07$; $P = .31$), number of previous births ($F_{3,226} = 0.58$; $P = .63$), or relationship length ($F_{3,226} = 2.08$; $P = .10$). A one-way between-groups multivariate analysis of variance was conducted to examine differences among groups on the dependent variables of sexual satisfaction and relationship satisfaction, which are known to be correlated.[8–10] Means and SDs are presented in Table 4.

There was an overall significant difference among groups ($F_{6,448} = 20.97$; $P < .001$; Wilk $\lambda = 0.61$), and group membership accounted for 22% of the variance in sexual and relationship satisfaction. To follow-up on this significant effect, we conducted two one-way between-groups univariate analyses of variance. There was a significant difference among groups for sexual satisfaction ($F_{3,226} = 48.30$; $P < .001$; $\eta^2_p = 0.39$). Pairwise comparisons indicated partial support for our first hypothesis: women with concurrent distress and problems reported lower sexual satisfaction compared with women with no problems or distress but did not differ from women with sexual problems only or women with distress only. Consistent with our second hypothesis, women with distress reported only lower sexual satisfaction compared with women with no problems or distress. There was no difference between women with distress only and women with sexual problems only.

There also was a significant difference among groups in relationship satisfaction ($F_{3,226} = 9.26$; $P < 0.001$; $\eta^2_p = 0.11$). Pairwise comparisons showed partial support for our first hypothesis: women with concurrent distress and problems reported lower relationship satisfaction compared with women with no problems or distress but did not differ from women with sexual problems only or women with distress only. Consistent with our second hypothesis, women with distress reported only lower relationship satisfaction compared with women with no problems or distress. There was no difference between women with distress only and women with sexual problems only. In summary, women with concurrent sexual distress and sexual problems reported lower sexual and relationship satisfaction compared with women with no problems or distress. However, there were no differences in sexual and relationship satisfaction between women with concurrent problems and women with sexual problems only or sexual distress only.

DISCUSSION

Our first aim was to identify the proportion of women experiencing sexual distress during pregnancy alone and concurrently with sexual problems. Sexual distress was common: overall, 42% of pregnant women in our sample met the cutoff score for sexual distress. Of women who were sexually active in the preceding 4 weeks, approximately one fourth experienced distress concurrently with sexual problems, and an additional 14% of women reported distress in the absence of sexual problems. These rates of distress appear to be slightly higher than those found in Finnish and US population-based studies of women who were not pregnant.[27,28] In addition, the rates of specific types of distressing sexual problems (eg, desire, arousal, and lubrication) appear to be higher than in non-pregnant women, with the exception of pain.[27] Sexual distress might be more common during pregnancy compared with other stages of life because of the unique characteristics of this period. For example, in addition to decreases in sexual functioning and frequency,[1–4] many pregnant women report changes in body shape and image,[40,41] which have been linked with increased sexual distress in non-pregnant women.[41,42] Pregnant women also report difficulty reconciling the changing sexual and maternal aspects of their self-identity.[43] Such changes can translate into feelings of guilt, frustration, worry, and embarrassment in regard to their sexuality and be linked to decreased sexual and relationship satisfaction, even in the absence of problems with sexual functioning. Further, women who are unprepared to experience these changes could be at greater risk for distress. Future research should assess expectations for postpartum changes to one's sexuality and in conjunction with sexual and relationship satisfaction.

Prior studies have largely ignored the level of sexual distress during pregnancy, which can translate into a lack of awareness by health care providers that a substantial subset of pregnant women experience sexual distress (sometimes in the absence of a sexual problem) and that not all pregnant women with a sexual problem are distressed by that problem. Given that health care

provider-patient discussions about sexuality during pregnancy are frequently restricted to whether or not intercourse is safe,[1] women might have an inadequate opportunity to discuss feelings of distress, guilt, or anxiety regarding their sexuality during this period. The limited discourse about sexuality during pregnancy can create a gap in care in which women with distress are not identified and as such cannot be directed to appropriate resources.

Our second aim was to compare the sexual and relationship satisfaction of pregnant women with sexual distress with those without distress. The experience of more sexual distress and/or problems in sexual functioning was linked to lower sexual and relationship satisfaction compared with pregnant women who endorsed lower sexual distress and better sexual functioning. This result contrasts data from a nationally representative survey of women with low sexual desire, in which sexual dissatisfaction was three times as common in women with concurrent distress compared with women with a sexual problem but no distress.[32] In pregnant women, sexual problems or distress alone can be sufficient to negatively affect women's broader sexual and relationship well-being. Greater sexual distress and/or sexual problems could be associated with greater avoidance of sexual activity, which has been linked with poorer sexual and relationship satisfaction in community and clinical samples.[44,45] Indeed, prior studies have suggested that some women avoid sexual activity because of fears of harming their pregnancy,[24] which could further exacerbate sexual distress and interfere with sexual functioning. Being more concerned about sex and/or experiencing sexual problems also might be associated with lower couple intimacy, which has been linked to lower sexual and relationship satisfaction in community couples.[46] Of course, the data were cross-sectional and as such do not allow us to draw conclusions about the directionality of associations between variables. Longitudinal research is needed to explore the temporal associations between distress and sexual and relationship satisfaction and to examine the links among sexual distress, sexual problems, and sexual and relationship satisfaction from before to after pregnancy.

Overall, findings suggest a need for education and interventions aimed at minimizing sexual distress alone or concurrent with sexual problems in pregnant women. Providers should take steps to identify women who are experiencing sexual distress regardless of their level of sexual functioning. The Female Sexual Distress Scale—Revised[20] could be administered to provide a standardized measurement of sexual distress during pregnancy. A recent study suggested that a single item (ie, "In the past 30 days, how often did you feel distressed about your sex life?") might be sufficient to identify distressed women,[47] although it has not been validated in younger or pregnant populations. Because distress encompasses a range of complex emotions, health care providers should follow up this single item with questions about guilt, worry, and frustration to better understand the driving force behind the distress and to tailor interventions accordingly. Sex therapy that incorporates cognitive-behavioral techniques can lessen sexual distress in women with sexual dysfunction[21] and might be valuable for women experiencing sexual distress or problems during pregnancy. At a minimum, health care providers can initiate discussions about possible sexual concerns in pregnancy and within the greater context of women's overall relationships. A Canadian study found that only 31% of women attending prenatal clinics reported discussing sexual activity during pregnancy with a health care provider,[1] and physician-patient discussions about sexuality during pregnancy are often limited to whether or not intercourse is safe.[48,49] Women might benefit from conversations in which their health care providers normalize the discussion of sexuality in the context of their broader well-being. Further, because we found no association between pregnancy length and the presence of sexual distress or sexual problems, women might benefit from these conversations at all stages of pregnancy. The present findings suggest that interventions aimed at alleviating sexual distress and problems in pregnancy can have an additional positive impact on women's overall subjective evaluation of their sexual and romantic relationship.

Limitations and Future Directions

Some limitations of the findings are important to consider. Sexual functioning was assessed using the FSFI because it offers a validated clinical cutoff score for identifying women with sexual problems.[35] As such, only women who had engaged in sexual activity in the past 4 weeks received a sexual functioning score and were included in most analyses. Future research would benefit from using measurements of sexual functioning that can be administered to women who are not sexually active or whose sexual repertoire does not include vaginal penetration. There was a high rate of attrition after women consented to participate in the present study. Possible reasons for attrition could be survey length, the nature of compensation (prize draw), or the personal nature of survey questions. Women who withdrew before completing they survey might have differed in their sexual and relationship satisfaction or other characteristics that were not assessed. Despite this limitation, online surveys have been identified as an effective method for collecting data on sensitive topics such as sexuality[50] and data from hard-to-reach populations such as pregnant women.[51] The methodology of the present study was similar to that used in previous studies of sexual well-being during and after pregnancy and had a similar attrition rate as these prior studies.[51–54] Our sample was predominantly heterosexual, married, and in mixed-sex relationships, which limits generalizability. We did not ask participants whether their pregnancy was planned or wanted, which could have implications for their sexual and relationship satisfaction.[55] We surveyed only pregnant women, but sexual and romantic relationships are inherently interpersonal such that each partner affects the other person's experience.[56] As such, a partner's response to sexual changes and distress during pregnancy could

contribute to women's outcomes, and vice versa. Studies using a dyadic design are needed to assess these complex associations.

CONCLUSIONS

This study advances our understanding of sexuality during pregnancy by assessing sexual distress in addition to sexual functioning. As such, the data provide a more accurate picture of the proportion of women who experience sexual challenges during pregnancy. Sexual distress, concurrently and in the absence of sexual problems, is common during pregnancy and was associated with lower sexual and relationship satisfaction. Health care providers should ask pregnant women about feelings of sexual distress (ie, guilt, frustration, stress, worry, anger, and embarrassment) in the context of broader discussions of sexuality during pregnancy. Identifying women who experience sexual distress during pregnancy and referring them to appropriate resources could help minimize sexual and relationship problems during pregnancy and the postpartum period.

ACKNOWLEDGMENT

We would like to thank Jaimie Beveridge for her assistance with data collection and all of the women who generously gave their time to participate in the study.

Corresponding Author: Sarah A. Vannier, PhD, Department of Psychology and Neuroscience, Dalhousie University, 1355 Oxford Street, PO Box 15000, Halifax, NS B3H 4R2, Canada; E-mail: svannier@dal.ca

Conflicts of Interest: The authors report no conflicts of interest.

Funding: This research was supported by an operating grant from the Canadian Institutes of Health Research (CIHR) and an establishment grant from the Nova Scotia Health Research Foundation (NSHRF) awarded to N.R.

STATEMENT OF AUTHORSHIP

Category 1

(a) Conception and Design
Sarah A. Vannier; Natalie O. Rosen

(b) Acquisition of Data
Sarah A. Vannier; Natalie O. Rosen

(c) Analysis and Interpretation of Data
Sarah A. Vannier; Natalie O. Rosen

Category 2

(a) Drafting the Article
Sarah A. Vannier; Natalie O. Rosen

(b) Revising It for Intellectual Content
Sarah A. Vannier; Natalie O. Rosen

Category 3

(a) Final Approval of the Completed Article
Sarah A. Vannier; Natalie O. Rosen

REFERENCES

1. Bartellas E, Crane JMG, Daley M, et al. Sexuality and sexual activity in pregnancy. Br J Obstet Gynaecol 2000; 107:964-968.
2. Erenel AS, Eroglu K, Vural G, et al. A pilot study: In what ways do women in Turkey experience a change in their sexuality during pregnancy? Sex Disabil 2011;29:207-216.
3. Glowacka M, Rosen N, Chorney J, et al. Prevalence and predictors of genito-pelvic pain in pregnancy and postpartum: the prospective impact of fear avoidance. J Sex Med 2014; 11:3021-3034.
4. Pauleta JR, Pereira NM, Graça LM. Sexuality during pregnancy. J Sex Med 2010;7:136-142.
5. Gałązka I, Drosdzol-Cop A, Naworska B, et al. Changes in the sexual function during pregnancy. J Sex Med 2015; 12:445-454.
6. Leite APL, Campos AAS, Dias ARC, et al. Prevalence of sexual dysfunction during pregnancy. Rev Assoc Med Bras 2009; 55:563-568.
7. Erol B, Sanli O, Korkmaz D, et al. A cross-sectional study of female sexual function and dysfunction during pregnancy. J Sex Med 2007;4:1381-1387.
8. Byers ES. Relationship satisfaction and sexual satisfaction: a longitudinal study of individuals in long-term relationships. J Sex Res 2005;42:113-118.
9. De Judicibus MA, McCabe MP. Psychological factors and the sexuality of pregnant and postpartum women. J Sex Res 2002;39:94-103.
10. McNulty JK, Wenner CA, Fisher TD. Longitudinal associations among relationship satisfaction, sexual satisfaction, and frequency of sex in early marriage. Arch Sex Behav 2016; 45:85-97.
11. Ahlborg T, Dahlof L-G, Hallberg LRM. Quality of the intimate and sexual relationship in first-time parents six months after delivery. J Sex Res 2005;42:167-174.
12. Belsky J, Kelly J. The transition to parenthood: how a first child changes a marriage. Why some couples grow closer and others apart. New York: Dell; 1994.
13. Bertozzi S, Londero AP, Fruscalzo A, et al. Prevalence and risk factors for dyspareunia and unsatisfying sexual relationships in a cohort of primiparous and secondiparous women after 12 months postpartum. Int J Sex Health 2010;22:47-53.
14. Yıldız H. The relation between prepregnancy sexuality and sexual function during pregnancy and the postpartum period: a prospective study. J Sex Marital Ther 2015;41: 49-59.
15. Amato PR. Children of divorce in the 1990s: an update of the Amato and Keith (1991) meta-analysis. J Fam Psychol 2001; 15:355.
16. Amato PR, Cheadle J. The long reach of divorce: divorce and child well-being across three generations. J Marriage Fam 2005;67:191-206.

17. Yu T, Pettit GS, Lansford JE, et al. The interactive effects of marital conflict and divorce on parent—adult children's relationships. J Marriage Fam 2010;72:282-292.
18. Basson R, Leiblum S, Brotto L, et al. Revised definitions of women's sexual dysfunction. J Sex Med 2004;1:40-48.
19. Hayes RD, Dennerstein L, Bennett CM, et al. Risk factors for female sexual dysfunction in the general population: Exploring factors associated with low sexual function and sexual distress. J Sex Med 2008;5:1681-1693.
20. DeRogatis L, Clayton A, Lewis-D'Agostino D, et al. Validation of the Female Sexual Distress Scale—Revised for assessing distress in women with hypoactive sexual desire disorder. J Sex Med 2008;5:357-364.
21. Stephenson KR, Meston CM. Differentiating components of sexual well-being in women: are sexual satisfaction and sexual distress independent constructs? J Sex Med 2010;7:2458-2468.
22. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed. Washington, DC: American Psychiatric Association; 2013.
23. Ferenidou F, Kapoteli V, Moisidis K, et al. Presence of a sexual problem may not affect women's satisfaction from their sexual function. J Sex Med 2008;5:631-639.
24. Pauls RN, Occhino JA, Dryfhout VL. Effects of pregnancy on female sexual function and body image: a prospective study. J Sex Med 2008;5:1915-1922.
25. Stephenson KR, Meston CM. Why is impaired sexual function distressing to women? The primacy of pleasure in female sexual dysfunction. J Sex Med 2015;12:728-737.
26. Bancroft J, Loftus J, Long JS. Distress about sex: a national survey of women in heterosexual relationships. Arch Sex Behav 2003;32:193-208.
27. Witting K, Santtila P, Varjonen M, et al. Female sexual dysfunction, sexual distress, and compatibility with partner. J Sex Med 2008;5:2587-2599.
28. Shifren JL, Monz BU, Russo PA, et al. Sexual problems and distress in United States women: prevalence and correlates. Obstet Gynecol 2008;112:970-978.
29. Mitchell KR, Mercer CH, Ploubidis GB, et al. Sexual function in Britain: findings from the Third National Survey of Sexual Attitudes and Lifestyles (Natsal-3). Lancet 2013;382:1817-1829.
30. Johnson CE. Sexual health during pregnancy and the postpartum. J Sex Med 2011;8:1267-1284.
31. Stephenson KR, Meston CM. When are sexual difficulties distressing for women? The selective protective value of intimate relationships. J Sex Med 2010;7:3683-3694.
32. Rosen RC, Shifren JL, Monz BU, et al. Correlates of sexually related personal distress in women with low sexual desire. J Sex Med 2009;6:1549-1560.
33. Tabachnick BG, Fidell LS. Using multivariate statistics. 6th ed. Boston, MA: Pearson Education; 2013.
34. Rosen RC, Brown C, Heiman J, et al. The Female Sexual Function Index (FSFI): a multidimensional self-report instrument for the assessment of female sexual function. J Sex Marital Ther 2000;26:191-208.
35. Wiegel M, Meston C, Rosen R. The Female Sexual Function Index (FSFI): cross-validation and development of clinical cutoff scores. J Sex Marital Ther 2005;31:1-20.
36. Derogatis LR, Rosen R, Leiblum S, et al. The Female Sexual Distress Scale (FSDS): initial validation of a standardized scale for assessment of sexually related personal distress in women. J Sex Marital Ther 2002;28:317-330.
37. Witting K, Santtila P, Alanko K, et al. Female sexual function and its associations with number of children, pregnancy, and relationship satisfaction. J Sex Marital Ther 2008;34:89-106.
38. Lawrance KA, Byers ES. Sexual satisfaction in long-term heterosexual relationships: The interpersonal exchange model of sexual satisfaction. Pers Relatsh 1995;2:267-285.
39. Funk JL, Rogge RD. Testing the ruler with item response theory: increasing precision of measurement for relationship satisfaction with the Couples Satisfaction Index. J Fam Psychol 2007;21:572.
40. Fox P, Yamaguchi C. Body image change in pregnancy: a comparison of normal weight and overweight primigravidas. Birth 1997;24:35-40.
41. Skouteris H, Carr R, Wertheim EH, et al. A prospective study of factors that lead to body dissatisfaction during pregnancy. Body Image 2005;2:347-361.
42. Pujols Y, Meston CM, Seal BN. The association between sexual satisfaction and body image in women. J Sex Med 2010;7:905-916.
43. Bailey L. Gender shows: first-time mothers and embodied selves. Gender Soc 2001;15:110-129.
44. Impett EA, Peplau LA, Gable SL. Approach and avoidance sexual motives: Implications for personal and interpersonal well-being. Pers Relatsh 2005;12:465-482.
45. Rosen NO, Muise A, Bergeron S, et al. Approach and avoidance sexual goals in couples with provoked vestibulodynia: associations with sexual, relational, and psychological well-being. J Sex Med 2015;12:1781-1790.
46. McCabe MP. The interrelationship between intimacy, relationship functioning, and sexuality among men and women in committed relationships. Can J Hum Sex 1999;8:31.
47. Carpenter JS, Reed SD, Guthrie KA, et al. Using an FSDS-R item to screen for sexually related distress: a MsFLASH analysis. Sex Med 2015;3:7-13.
48. Barrett G, Pendry E, Peacock J, et al. Women's sexuality after childbirth: a pilot study. Arch Sex Behav 1999;28:179-191.
49. Barrett G, Pendry E, Peacock J, et al. Women's sexual health after childbirth. Br J Obstet Gynaecol 2000;107:186-195.
50. Burkill S, Copas A, Couper MP, et al. Using the web to collect data on sensitive behaviours: a study looking at mode effects

on the British National Survey of Sexual Attitudes and Lifestyles. **PloS One 2016;11:e0147983**.

51. Sagiv-Reiss DM, Birnbaum GE, Safir MP, et al. Changes in sexual experiences and relationship quality during pregnancy. **Arch Sex Behav 2012;41:1241-1251**.
52. Sinclair M, Close C, McCullough J, et al. How do women manage pregnancy-related low back and/or pelvic pain? Descriptive findings from an online survey. **Evid Based Midwifery 2014;12:76**.
53. Arcia A. Facebook advertisements for inexpensive participant recruitment among women in early pregnancy. **Health Educ Behav 2014;41:237-241**.
54. Cobey KD, Havlíček J, Klapilová K, et al. Hormonal contraceptive use during relationship formation and sexual desire during pregnancy. **Arch Sex Behav 2015;45:2117-2122**.
55. Cox MJ, Paley B, Burchinal M, et al. Marital perceptions and interactions across the transition to parenthood. **J Marriage Fam 1999;61:611-625**.
56. Rosen NO, Muise A, Bergeron S, et al. Daily associations between partner responses and sexual and relationship satisfaction in couples coping with provoked vestibulodynia. **J Sex Med 2015;12:1028-1039**.