Effect of sexual diary keeping and self-evaluation on female sexual function and depression: A pilot study

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ABSTRACT

Objectives The aim of the trial was to assess the effect of self-evaluation and sexual diary keeping on female sexual function and depressive symptoms in women diagnosed with sexual dysfunction.

Methods A single-arm non-randomised trial included 30 women (53 ± 7 years of age) with female sexual dysfunction (Female Sexual Function Index [FSFI] < 27) and a stable partnership duration of 5–40 years. Female sexual function was assessed by sexual, psychological and gynaecological history taking and validated questionnaires including the FSFI, Female Sexual Distress Scale (FSDS) and Hamilton Depression Scale (HDS), before and after 4 weeks of sexual diary keeping.

Results A subjective improvement in communication of sexual problems was reported by 60% of participants; no participants reported any worsening of communication. FSFI and FSDS scores were, respectively, 18.0 ± 7.7 and 22.0 ± 10.0 at baseline and 20.2 ± 7.2 and 20.6 ± 11.5 after 4 weeks. HDS score decreased from 6.0 ± 4.0 at baseline to 4.4 ± 2.7 after 4 weeks (p = 0.042).

Conclusions Self-evaluation and sexual diary keeping may improve aspects of sexual life, such as couple communication, without a direct effect on variables measured with validated questionnaires on different domains of sexual function.

KEYWORDS: Communication; Female sexual dysfunction; Placebo; Sexual diary keeping; Sexual life quality

INTRODUCTION

Female sexual dysfunction affects approximately 43% of women¹. The most prevalent form of female sexual dysfunction is hypoactive sexual desire disorder, which affects approximately 21 to 36% of European women². Hypoactive sexual desire disorder is defined as ‘persistently or recurrently deficient sexual fantasies and desire for sexual activity’ causing ‘significant distress’³ for a minimum duration of 6 months with presence of symptoms 75 to 100% of the time, due to medical, hormonal or psychosocial problems; there is a positive correlation with increasing female age and transition into menopause. Few pharmaceutical treatment options are available to treat the disorder, and many still lack formal approval by the Food and Drug Administration⁴. A proven
cornerstone in treating female sexual dysfunction is patient-centred, individualised therapy and psychological guidance.

In behavioural change therapy, paper diaries have a strong foundation in self-monitoring and have been recognised as an essential tool showing measurable success. Most commonly, diaries are implemented in weight loss programmes to measure dietary intake and expenditure, in sleep research and in bladder dysfunction. In sexual research, coital diaries have been used for a long time in epidemiological studies to collect data and establish risk factors in behaviour and sexual practices among populations at increased risk of sexually transmitted diseases such as HIV. In the classical form, sexual diaries are paper-based documents that reveal information on time and place of sexual activity, the number and gender of partners involved, use of tools (e.g., contraceptive methods such as condoms or cups, toys, lubricants, recreational drugs) and the modality of the sexual act itself. It has been shown that socially stigmatised or unusual sexual acts were more frequently reported using a coital diary than were noted during clinic-based interviews with professional staff.

In this study, we hypothesised that diary keeping and self-evaluation of female partners may be effective in improving female sexual function over a period of 4 weeks.

METH O D S

Study concept

Data presented in this article are a subset of a two-part trial that included 30 couples seeking treatment for female sexual dysfunction (Figure 1).

Part I was a single-arm non-randomised trial (‘sexual diary study’) consisting of two study visits: visit 1 and visit 2, each lasting 1.5 h per couple. Data from this phase represent the net effect of the use of sexual diaries on female sexual function and depression; hence, the results of part I are independent of the subsequent pharmacological study and are presented in this paper as individual data.

In the first part of the study, all participants were provided with a sexual diary and a sexual activity record to be filled in by hand at home. Those two tools had to be used by the participants after each sexual event. The sexual activity record had to be documented with the date and time of the sexual event, and its completion was crosschecked with the sexual diary in order to ensure compliance. In the sexual diary, both men and women were asked to record their current sexual satisfaction and/or fantasies, as well as anything that might have interfered with their most recent sexual activity (such as partner’s absence, in the case of masturbation; conflicts in the relationship; concomitant medication; or disease).

At baseline (visit 1) and after 4 weeks (visit 2), participants were asked to fill in questionnaires including the Female Sexual Function Index (FSFI), Female Sexual Distress Scale (FSDS), Sexual Quality of Life–Female (SQoL-F), Sexual Interest and Desire Inventory–Female (SIDI-F), Hamilton Depression Scale (HDS) and IIEF (International Index for Erectile Function). At visit 2, participants were asked whether they felt their intimacy with their partner, sexual life and dyadic communication had undergone a change within the 4 weeks of the study period. Answers were collected and analysed at the end of the study.
Part II of the study was a prospective double-blind, placebo-controlled crossover trial consisting of five further study visits each lasting 1.5 h per couple (EudraCT number 2011-001310-34; AGES number PHMS-717505/0002; Clinical Trials registration number NCT02229721; article in press). In group 1, participants received placebo for 8 weeks and were then switched to oxytocin nasal spray, after a washout phase, for an equivalent treatment duration. In group 2, participants received oxytocin nasal spray first and were given placebo in the second study period after the washout phase.

During follow-up periods 1 and 2, participants were seen at visits 3 and 4, each 4 weeks apart, and at visits 6 and 7, respectively. At these visits, participants were again asked to fill in questionnaires. Oxytocin and placebo resulted in an improvement in sexual function (not significant between groups).

**Patient population**

Recruitment was carried out via medical campaigns and on medical referral from general practitioners and sexual therapists. Thirty women with diagnosed hypoactive sexual desire, arousal or orgasmic disorders (FSFI < 27) who were between the ages of 41 and 65 years and who had been in a heterosexual relationship for at least 3 months were eligible to participate. Exclusion criteria included primary sexual dysfunction, sexual abuse, severe psychiatric diseases, untreated medical conditions and chronic intake of medication with associated reduction of sexual function.

A pregnancy test was performed in women with childbearing potential. Premenopausal participants had to use a medically accepted contraceptive method for the duration of the study for ethical reasons. All women kept a handwritten personal sexual diary and completed questionnaires at baseline and after 4 weeks, consisting of the FSFI, FSDS and HDS. Since there is known to be a bidirectional association between depression and sexual dysfunction (the incidence of sexual dysfunction is 50–70% higher when depression is present; the incidence of depression is 130–210% higher when sexual dysfunction is present)\(^{11,12}\), the HDS helped us to exclude patients with severe depression and to assess their mood scores at baseline and after the study period.

**Sexual diary**

Both men and women had to keep a handwritten sexual diary that was provided by the investigators for each of the study weeks. It consisted of a standard form in which both men and women were individually asked to record the date and time of sexual activity, their current fantasies, as well as anything that might have interfered with their most recent sexual activity (such as current illness; personal or professional stress or conflicts in the relationship; partner's absence, in case of masturbation; concomitant medication; or disease) without sharing this information with their partner (see the Supplementary Appendix to be found online at http://informahealthcare.com/doi/abs/10.3109/13625187.2015.1074676). The duration, presence or absence of desire, arousal, lubrication, orgasm, satisfaction and pain were voluntarily noted. Participants were instructed to fill in the diary after each sexual event. After the study period, participants were asked to return their sexual diary for further evaluation. The effect of diary keeping has been shown and validated in long-term guidance of patients, especially in those with chronic diseases\(^{13-15}\), as it allows monitoring of treatment outcome and enhances compliance by self-monitoring.

**Questionnaires**

**Female Sexual Function Index (FSFI)**

The FSFI was developed by Rosen *et al.* in 2000\(^{16}\) and consists of 19 questions that assess six domains of sexual functioning (desire, subjective arousal, lubrication, orgasm, satisfaction and pain). The approximate administration time is 10–15 min. The total score is the summation of the results of all 19 items, ranging from
2.0 (minimum score: no sexual activity in the previous 4 weeks) to 36.0 (maximum score). A score \( \leq 26.55 \) is classified as female sexual dysfunction\(^{17}\). In this study, the cut-off value for FSFI was set at \(< 27\) for inclusion of patients. The questionnaire has been shown to discriminate reliably between women with no sexual disorder and those meeting the criteria for female orgasmic disorder or hypoactive sexual desire disorder\(^{18}\). The FSFI is more sensitive than sexual behaviour frequency in detecting sexual improvement after treatment\(^{19}\).

**Female Sexual Distress Scale (FSDS)**

The FSDS was developed by Derogatis et al. in 2002\(^{20}\) and comprises 12 questions that have been shown to provide a valid evaluation of sexually-related personal distress in women in the previous 30 days. Response choices are never (0), rarely (1), occasionally (2), frequently (3) and always (4). When the scores of each of the 12 items are added together, the total score may range from 0 (no sexually related personal distress) to a maximum of 48 points (highly distressed). A score of \(\geq 11\) discriminates between women with female sexual distress and those with none.

**Hamilton Depression Scale (HDS)**

The HDS was developed by Max Hamilton in 1960\(^{21}\) to assess the severity of depression in patients already diagnosed as depressed. It consists of 21 questions covering somatic, emotional and psychological aspects of depression. Response choices range from absent/never/none (0) to severe/always/present (4), resulting in a valid estimation of mild depression (scores 0–10), moderate depression (scores 20–29) or severe depression (scores 30–66).

**Clinical visits**

Participants were seen at baseline and after 4 weeks. The first visit entailed an examination to exclude any severe comorbidities hindering the individual from participating and it included measurement of height and weight for calculation of body mass index (BMI), measurement of systolic and diastolic blood pressure, and an electrocardiogram. A demographic questionnaire was obtained along with the past medical, surgical, gynaecological, psychological and sexual history, and a record of current medications. Participants were asked to fill in the FSFI, FSDS and HDS questionnaires and document their satisfaction rates with their sexual activity using a sexual diary provided by the investigator. At the 4-week follow-up visit, the above examination and questionnaires were repeated.

**Statistical analysis**

Patient characteristics were presented using descriptive statistics. All data were tested for normality using the Shapiro–Wilk test, which revealed a skewed distribution of the data; therefore, changes between baseline and 4-week questionnaire scores were analysed using the non-parametric Wilcoxon’s test. All reported \(p\)-values are two-sided, and statistical significance was set at \(p < 0.05\). Results are expressed as mean ± standard deviation (SD), median, minimum and maximum. All statistical tests were performed using SPSS software (version 20.0.0; SPSS, Chicago, IL, USA).

**R E S U L T S**

**Participant characteristics**

Baseline characteristics are presented in Table 1. The study population comprised white Europeans aged 53 ± 7 years, and the average relationship duration was 18 ± 12 years. The BMI was 23.8 ± 3.6 kg/m\(^2\). The systolic blood pressure was 126±15 mmHg, and the diastolic blood pressure was 75±12 mmHg.

**Table 1** Patients’ baseline characteristics.

| Variable                      | Mean ± SD | n (%)  |
|-------------------------------|-----------|-------|
| Age, years                    | 53 ± 7    |       |
| Relationship duration, years  | 18 ± 12   |       |
| BMI, kg/m\(^2\)              | 23.8 ± 3.6|       |
| Systolic blood pressure, mmHg | 126±15    |       |
| Diastolic blood pressure, mmHg| 75±12     |       |
| Menopausal status             |           |       |
| Perimenopausal                | 9 (30)    |       |
| Postmenopausal                | 20 (66.7) |       |
| Unknown                       | 1 (3.0)   |       |
| Comorbidities                 |           |       |
| None                          | 12 (40)   |       |
| Rheumatology/orthopaedics     | 9 (30.0)  |       |
| Gynaecology                   | 6 (20.0)  |       |
| Thyroid dysfunction           | 4 (13.3)  |       |
| Hypertension                  | 2 (6.7)   |       |
| Mild depression               | 2 (6.7)   |       |
| Gastrointestinal              | 3 (10.0)  |       |
| Allergies                     | 1 (3.0)   |       |
| Vascular                      | 1 (3.0)   |       |
| Medications                   | 23 (76.7) |       |
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53 ± 7 years. Nine of the participating women were premenopausal and 20 were postmenopausal at the time of recruitment. In one patient the menopausal status could not be elicited with certainty. Twelve women had no comorbidities; others had a past medical history of rheumatological and orthopaedic problems, past gynaecological problems (including leiomyoma and recurrent vaginal infections), thyroid dysfunction, hypertension, mild depression, gastrointestinal problems, allergic reactions and vascular problems.

At the beginning of the study, 23 women were on medication, including psycho-pharmaceutical drugs, vaginal local oestrogen preparation, antihypertensive medication, hormonal contraception, painkillers, thyroid hormone substitution, hormonal replacement therapy and non-hormonal contraception. All patients reported that their medication intake had not induced or aggravated any pre-existing sexual dysfunction.

BMI ranged from 23.6 to 31.0 kg/m². Baseline blood pressure was 126 ± 15/75 ± 12 mmHg. The mean relationship duration at recruitment was 18 ± 12 years (range 5–40 years).

**FSFI**

The FSFI score in women with female sexual dysfunction was 18 ± 7.7 (minimum to maximum 1.2–28.3) at baseline and 20.2 ± 7.2 (minimum to maximum 1.2–28.8) after 4 weeks (p = 0.24; Figure 2).

**FSDS**

The FSDS score was 22.0 ± 10.0 (minimum to maximum 8–52) at baseline and 20.6 ± 11.5 (minimum to maximum 4–52) after 4 weeks of sexual diary keeping (p = 0.71; Figure 3).

**HDS**

The HDS score at baseline was 6 ± 4 (minimum to maximum 1–14.5), which improved to 4.4 ± 2.7 (minimum to maximum 0–8) after 4 weeks (p = 0.042; Figure 4).

**Sexual diary keeping and partner communication**

In the sexual diary and at the follow-up visit, 18 of 30 patients (60%) reported a subjective improvement in sexual life and communication about sexuality, sexual wishes, fantasies, needs, problems, etc. with their partners.

In the following list are selected statements from participants (translated from German into English) that were documented at the follow-up visit:

- It was so funny to observe that as we filled in the diary together we started to talk about things we had never spoken about before.
- We have had the same sexual fantasies for years but we did not dare to talk about it because we felt too embarrassed.

**Figure 2** FSFI total scores at baseline and after 4 weeks of sexual diary keeping. Individual data and mean ± SD are indicated (n = 30). Arrows refer to median.

**Figure 3** FSDS total scores at baseline and after 4 weeks of sexual diary keeping. Individual data and mean ± SD are indicated (n = 30). Arrows refer to median.
We could laugh about our sexual concerns.

- I did not know that my husband was so fond of my belly … I always thought myself too fat during sexual activity.
- It was a great relief for me to understand that my wife also likes manual stimulation. It releases me from the burden to think I always have to perform.
- I told my girlfriend that it has nothing to do with my feelings towards her if I masturbate occasionally. I need it to relax when I have problems at work.

DISCUSSION

Findings and interpretation

The main finding of our study is that the participants reported an improvement in their sexual life, which was paralleled by a reduction in the HDS score ($p = 0.04$). This symptomatic improvement, however, was not detectable in objective measures of sexual dysfunction such as the FSFI and FSDS.

The use of sexual diaries as a proactive intervention for symptom control and self-monitoring may increase patient awareness about behavioural and communicational attitudes and induce positive changes in a relationship. Interestingly, a cognitive and behavioural change may also be observed in their intimate partner, hence indirectly contributing to treatment success by the partner expectations of the outcome of the study.

The effect of keeping a sexual diary on improvement of sexual dysfunction has not hitherto been shown in the literature; however, we hypothesised that greater awareness of sexual needs or concerns with associated increased self-esteem may help in articulating delicate subjects in front of an intimate partner, thus improving communication and shifting the relationship on to a newer level of mutual empathy and understanding. In partner counselling, sexual diary keeping allows both men and women to reflect their role in their interaction, raise awareness in their behaviour and introspect their feelings or wishes, and it helps clarify concerns, all of which lead to a more open and therefore more satisfactory communication style. Sexual communication is a vital part of a healthy relationship and includes discussing various aspects of dyadic intimate life. In relationships with restricted communication style, dissatisfaction and depression are more prevalent among affected couples. This is especially known to occur in couples with infertility who undergo or have unsuccessfully undergone fertility treatment, the impact of which can cause great stress and dissatisfaction in a relationship, leading to reduced sexual function in women more than in men.

This is in accordance with our main finding that sexual diary keeping is a useful tool in reducing estimated depressive mood, as assessed by the HDS. Since the 1960s, the HDS has established itself as the gold standard in diagnosing the severity of depression in patients with depressive disorders. Our population had only mild depression as indicated by a cut-off point of 10. Nonetheless, we found a significant improvement in depression scores over 4 weeks, leading to the assumption that the intervention had elicited some benefit towards the emotional, psychological and somatic wellbeing of the participants.

Clinical studies of sexual dysfunction have shown a significant impact of the placebo effect on women, with an improvement in symptoms by up to 40% in postmenopausal women and those with hypoactive sexual desire disorder. The placebo effect is believed to be due to a change in patients’ behavioural manner, which on its own is a well-established cornerstone in sexual therapy and known to foster the outcome of treatment when there is good compliance. The placebo effect may be enhanced by older age of the participating women and longer relationship duration. A recent review by Bradford and Meston retrieved the data of 16 articles in which the placebo effect had been reported in women enrolled in clinical studies for sexual disorders; however, to our knowledge, no study has yet published the data of women on sexual diaries.
investigated the effect of sexual diary keeping as a placebo on female sexual disorder and the question remains open how long this effect may last.

**Strengths and weaknesses of the study**

The merit of our study is the concept in which a measurement (use of a diary) becomes an intervention for improvement of sexual distress and function. The effect of diary keeping has been proven and validated in many specialties when guiding patients over a longer period of time, especially in chronic disease such as depression, asthma, obesity or cancer. This tool allows good monitoring of treatment outcome, yet at the same time increases the motivation of the participant by providing a valid method for concomitant self-monitoring. To our knowledge, this is the first study to investigate this effect in women with female sexual dysfunction; hence, this paper will remind researchers of the intervention potential of measurement devices or methods such as a diary.

We acknowledge several limitations of our study inherent to the small number of participants, the heterogeneity of the study population, and its study concept based on self-evaluation questionnaires in which history was self-reported and therefore subject to recall bias and mood variability over the 4-week period. Comorbidities might have influenced decision making regarding pre-study treatment with local or systemic oestrogen preparations, thus introducing a selection bias of patients interested in participating. It is known that hormonal changes due to the menopause can have a negative impact on sexual function (desire and arousal); and vice versa, hormone replacement therapy may improve domains such as lubrication and satisfaction. Another limitation may be the failure to control for the change in communication and relationship function over the study period and different forms of other sexual stimuli provided through various media or sex toys. In addition, we did not have any prior information on the communication style between the partners, which is a known prognostic factor associated with better placebo outcomes in couples. Also, the use of a paper diary may be regarded as a methodological limitation compared with electronic diaries in which entries can be followed by exact date and time documentation. With the increasing rate of internet use, especially among young people, the advantage of unlimited data storage, along with quickly available statistical analysis and higher compliance rates among study participants, web-based diaries are more often used in the research setting. Nonetheless, in our population group, the classical handwritten method was used with excellent compliance. Finally, we acknowledge the lack of an experimental control group, which was part of the protocol of the main study, in which all 30 couples were subsequently enrolled.

**Relevance of the findings: Implications for clinicians and policy-makers**

Despite its limitations, this study is the first to analyse the effect of sexual diary keeping on the subjective assessment of interpersonal communication and we suggest it had a similar effect to that of placebo in women with hypoactive sexual desire disorder. As with behavioural training in sexual therapy, the impact of sexual diaries could be of valid use in relationship counselling and initial treatment beyond the research setting.

**Unanswered questions and future research**

The exact influence of sexual diary keeping on dyadic communication remains poorly understood, warranting further work to better understand its positive effects on sexual function in women and to investigate whether the improvement in communication is stable.

Larger prospective studies or meta-analyses of all available placebo-controlled pharmaceutical trials are needed to address the impact of sexual diary keeping on improvement in hypoactive sexual desire, arousal or orgasmic disorders in women over a longer period of time.

**Conclusion**

Our data demonstrate that sexual diary keeping and self-evaluation of female sexual function may reduce depression scores and result in subjective improvement of sexual life over a period of 4 weeks.

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REFERENCES

1. Laumann EO, Paik A, Rosen RC. Sexual dysfunction in the United States: Prevalence and predictors. JAMA 1999 Feb 10;281:537–44.
2. Graziotin A. Prevalence and evaluation of sexual health problems – HSDD in Europe. J Sexual Med 2007;4(Suppl. 3):211–9.
3. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed. Arlington, VA: American Psychiatric Association 2013.
4. Palacios S. Hypoactive sexual desire disorder and current pharmacotherapeutic options in women. Women’s Health 2011;7:95–107.
5. Ramjee G, Weber AE, Morar NS. Recording sexual behavior: Comparison of recall questionnaires with a coital diary. Sexually Trans Dis 1999;26:374–80.
6. Lees S, Cook C, Vallely A, Desmond N, Allen C, Kiro K, et al. Comparison of sexual behavior data collected using a coital diary and a clinic-based interview during a microbicide pilot study in Mwanza, Tanzania. Sexually Trans Dis 2010;37:497–501.
7. Katz BP, Fortenberry JD, Tu W, Harezlak J, Orr DP. Sexual behavior among adolescent women at high risk for sexually transmitted infections. Sexually Trans Dis 2001;28:247–51.
8. McAuliffe TL, DiFrancesco W, Reed BR. Effects of question format and collection mode on the accuracy of retrospective surveys of health risk behavior: A comparison with daily sexual activity diaries. Health Psychol 2007;26:60–7.
9. Ferguson AG, Morris CN, Kariuki CW. Using diaries to measure parameters of transactional sex: an example from the Trans-Africa highway in Kenya. Culture Health Sexuality 2006;8:175–85.
10. Allen CF, Lees SS, Desmond NA, Der G, Chiduo B, Hambleton I, et al. Validity of coital diaries in a feasibility study for the Microbicides Development Programme trial among women at high risk of HIV/AIDS in Mwanza, Tanzania. Sexually Trans Infect 2007;83:490–6; discussion 6–7.
11. Atlantas E, Sullivan T. Bidirectional association between depression and sexual dysfunction: A systematic review and meta-analysis. J Sexual Med 2012;9:1497–507.
12. Johannes CB, Clayton AH, Odom DM, Rosen RC, Russo PA, Shifren JL, et al. Distressing sexual problems in United States women revisited: Prevalence after accounting for depression. J Clin Psychiatry 2009;70:1698–706.
13. Burke LE, Sereika SM, Music E, Warriski M, Styn MA, Stone A. Using instrumented paper diaries to document self-monitoring patterns in weight loss. Contemp Clin Trials 2008;29:182–93.
14. Jiang H, Han J, Zhu Z, Xu W, Zheng J, Zhu Y. Patient compliance with assessing and monitoring of asthma. J Asthma 2009;46:1027–31.
15. Shay LE, Seibert D, Watts D, Sbrocco T, Pagliara C. Adherence and weight loss outcomes associated with food-exercise diary preference in a military weight management program. Eating Behav 2009;10:220–7.
16. Rosen R, Brown C, Heiman J, Leiblum S, Meston C, Shabsigh R, et al. The Female Sexual Function Index (FSFI): A multidimensional self-report instrument for the assessment of female sexual function. J Sex Marital Therapy 2000;26:191–208.
17. Wiegel M, Meston C, Rosen R. The female sexual function index (FSFI): Cross-validation and development of clinical cutoff scores. J Sex Marital Therapy 2005;31:1–20.
18. Meston CM. Validation of the Female Sexual Function Index (FSFI) in women with female orgasmic disorder and in women with hypoactive sexual desire disorder. J Sex Marital Therapy 2003;29:39–46.
19. Rellini A, Meston C. The sensitivity of event logs, self-administered questionnaires and photoplethysmography to detect treatment-induced changes in female sexual arousal disorder (FSAD) diagnosis. J Sexual Med 2006;3:283–91.
20. Derogatis LR, Rosen R, Leiblum S, Burnett A, Heiman J. The Female Sexual Distress Scale (FSDS): initial validation of a standardized scale for assessment of sexually related personal distress in women. J Sex Marital Therapy 2002;28:317–30.
21. Hamilton M. A rating scale for depression. J Neurol Neurosurg Psychiatry 1960;23:56–62. Bradford A. Listening to placebo in clinical trials for female sexual dysfunction. J Sexual Med 2013;10:451–9.
22. Holmberg D, Blair KL. Sexual desire, communication, satisfaction, and preferences of men and women in same-sex versus mixed-sex relationships. J Sex Res 2009;46:57–66.
23. Mark KP, Jozkowski KN. The mediating role of sexual and nonsexual communication between relationship and sexual satisfaction in a sample of college-age heterosexual couples. J Sex Marital Therapy 2013;39:410–27.
24. Ahlborg T, Dahlof LG, Hallberg LR. Quality of intimate and sexual relationship in first-time parents six months after delivery. J Sex Res 2005;42:167–74.
25. Byers ES. Relationship satisfaction and sexual satisfaction: A longitudinal study of individuals in long-term relationships. J Sex Res 2005;42:113–8.
26. Owen JJ, Rhoades GK, Stanley SM, Markman HJ. The role of leaders’ working alliance in premarital education. J Family Psychol 2011;25:49–57.
27. Marci R, Graziano A, Piva I, Lo Monte G, Soave I, Giugliano E, et al. Procreative sex in infertile couples: The decay of pleasure? Health Quality Life Outcomes 2012;10:110.
28. Piva I, Lo Monte G, Graziano A, Marci R. A literature review on the relationship between infertility and sexual dysfunction: Does fun end with baby making? Eur J Contracept Reprod Health Care 2014;19:231–7.
29. Basson R, McInnes R, Smith MD, Hodgson G, Koppiker N. Efficacy and safety of sildenafil citrate in women with sexual dysfunction associated with female sexual arousal disorder. J Women Health Gender-based Med 2002;11:367–77.
30. Berman JR, Berman LA, Toler SM, Gill J, Haughie S, Sildenafil Study G. Safety and efficacy of sildenafil citrate for the treatment of female sexual arousal disorder: A double-blind, placebo controlled study. J Urology 2003;170(6 Pt 1):2333–8.
31. Bradford A, Meston C. Correlates of placebo response in the treatment of sexual dysfunction in women: A preliminary report. J Sexual Med 2007;4:1345–51.
32. Bradford A, Meston CM. Behavior and symptom change among women treated with placebo for sexual dysfunction. J Sexual Med 2011;8:191–201.
33. Bradford A, Meston CM. Placebo response in the treatment of women’s sexual dysfunctions: A review and commentary. J Sex Marital Therapy 2009;35:164–81.
34. Caspi O, Bootzin RR. Evaluating how placebos produce change. Logical and causal traps and understanding cognitive explanatory mechanisms. Eval Health Professions 2002;25:436–64. Stewart-Williams S. The placebo puzzle: Putting together the pieces. Health Psychol 2004;23:198–206.
35. Sarwer DB, Durlak JA. A field trial of the effectiveness of behavioral treatment for sexual dysfunctions. J Sex Marital Therapy 1997;23:87–97.
36. Gonzalez M, Viafara G, Caba F, Molina E. Sexual function, menopause and hormone replacement therapy (HRT). Maturitas 2004;20:411–20.
37. Jamison RN, Raymond SA, Levine JG, Slawsby EA, Nedeljkovic SS, Katz NP. Electronic diaries for monitoring chronic pain: 1-year validation study. Pain 2001;91:277–85.
38. Johannes C, Woods J, Crawford S, Cochran H, Tran D, Schuth B. Electronic versus paper instruments for daily data collection. Ann Epidemiol 2000;10:457.

Supplementary material available online

Supplementary Appendix to be found online at http://informahealthcare.com/doi/abs/10.3109/13625187.2015.1074676.