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A Review of Mindfulness-Based Sex Therapy Interventions for Sexual Desire and Arousal Difficulties: From Research to Practice

Sara J. S. Mize[1]

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Abstract Published articles and case studies on mindfulness-based interventions (MBIs) to treat sexual desire and arousal dysfunctions were reviewed. Only publications utilizing clinical samples (which are the majority of the literature) were included, resulting in 12 empirical papers and 5 case studies. There is preliminary empirical evidence for the effectiveness of MBIs in enhancing sexual desire, arousal, lubrication, orgasm, ejaculatory latency, perceived sexual arousal, sexual satisfaction, and decreasing sexual distress. However, most of the research has been conducted on women in groups. There are many populations that remain underrepresented in the literature (e.g., men, people of diverse race/ethnicity/sexual orientation/gender identity, the aging). Online interventions and body-based approaches show some promise, but more empirical research is needed. Research on mindfulness-based couples groups are in progress.

Keywords Mindfulness · Mindfulness-based intervention · MBI · Mindfulness-based cognitive therapy · MBCT · Sexual desire · Sexual arousal · Sensorimotor psychotherapy · Sex therapy · Body · Online intervention · Couples intervention · Yoga

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✉ Sara J. S. Mize
smize@umphysicians.umn.edu

[1] Program in Human Sexuality, Department of Family Medicine and Community Health, University of Minnesota Medical School, 1300 South Second Street, Suite 180, Minneapolis, MN 55454, USA

Introduction

Overview

This paper is a review of the published literature on the use of mindfulness-based interventions (MBIs) for treating sexual desire and arousal difficulties in sex therapy. It is designed for clinicians who want to use research on MBIs to inform their work. The reader will be directed to the latest research, newest approaches, and particular authors who describe their interventions well. Finally, limitations in the literature and suggestions for future research will be offered with an eye to what might be particularly useful for those with "boots on the ground."

Article Selection

Only published articles and case studies using clinical samples and MBIs to treat sexual desire and arousal dysfunctions were included in this paper. Because detailed reviews of the use of MBIs with sexual pain disorders (especially provoked vestibulodynia) [1, 2] already exist in the literature and there were no studies found that focused on orgasm difficulties, these disorders were not discussed here. This resulted in the identification of 12 empirical papers and 5 case studies.

Definitions of Mindfulness

Mindfulness can be conceptualized as awareness of the present moment with curiosity, acceptance, and non-judgment [3, 4]. In the Buddhist tradition where it originated, mindfulness is developed through meditation and involves cultivating an ability to be non-reactive to thoughts, feelings, and body sensations. It encourages a detached awareness of our human tendency to grasp for positives and avoid negatives which is believed to be

a root cause of suffering. This seems immediately useful in the treatment of sexual dysfunctions where individuals and couples often present with a societally enforced, goal-oriented approach to sexual behaviors resulting in striving for certain experiences (e.g., erection, orgasm, intercourse) and avoiding others (e.g., erectile dysfunction, pain) often suffering along the way. Bringing mindfulness to sex requires a paradigm shift and some authors have proposed clinical interventions that can facilitate this change [5••, 6].

Langer and her colleagues at Harvard have been working with a Western definition of mindfulness and a practice of it that does not require meditation but is very functional and seems especially well-suited to enhancing sexual and relationship satisfaction and communication [7]. She proposes four qualities believed to be associated with mindful thinking: novelty seeking, engagement, novelty producing, and flexibility. "An individual who seeks novelty perceives each situation as an opportunity to learn something new. An individual who scores high in engagement is likely to notice more details about his or her specific relationship with the environment. A novelty producing person generates new information in order to learn more about the current situation. Flexible people welcome a changing environment rather than resist it" (www.ellenlanger.com). Developing skills at mindfulness can lead to being open to new ideas, decreased judgment of self and others, and a deepening understanding of another's behaviors/thoughts/feelings and seems immediately applicable to the treatment of individuals and couples with sexual dysfunctions.

Mindfulness and Sexual Issues

Kabat-Zinn [8] originally developed mindfulness-based stress reduction (MBSR) to treat chronic pain, and since that time, it has been modified and shown to be successful in treating a vast array of physical conditions and chronic diseases [9] and numerous psychological and behavioral problems, many of which can have an impact on sexual health (e.g., depression [10], substance abuse [11], depression relapse [12], mood and anxiety disorders [13]). MBSR was combined with cognitive therapy to create mindfulness-based cognitive therapy (MBCT) [10], which has been extensively used to treat psychological issues, but it was not until relatively recently that empirical studies were conducted using it to treat sexual issues [14]. Although they did not label it mindfulness, Masters and Johnson (15, p. 74) were certainly accessing an aspect of the same construct when they developed sensate focus exercises for couples as part of their treatment of sexual dysfunctions. Although the original sensate focus phase I instructions seem to direct the giver to touch the receiver with the goal of giving pleasure [16], Weiner and Avery-Clark (both of whom studied with Masters and Johnson) clarified that in fact, the purpose of these exercises is to take the focus *off of creating pleasure* and *off of the partner* [16]. The toucher is to touch her partner for herself, for the purpose of attending to her own sensations and without trying to please the partner *or* please herself. This approach is much more in alignment with a definition of mindfulness that supports present moment awareness, attending to what *is*, *without trying to achieve* (or avoid) a certain state, all with an attitude of non-judgment, acceptance, and curiosity.

Mindfulness and Sexual Desire and Arousal Difficulties in Women

Women with Cancer

The vast majority of the publications on mindfulness in sex therapy are interventions designed for women. There is growing evidence for the effectiveness of MBCT interventions in the treatment of sexual desire and arousal in women. Clinical case reports suggest individual and couples therapy with a mindfulness-based approach can improve sexual desire [17–19] and arousal [18]. Brotto and colleagues have spearheaded the research in this area and initially focused their work on women with cancer. In 2007, they studied women with histories of radical hysterectomy due to cervical or endometrial cancer who reported sexual arousal issues [14]. They administered three 90-min individual psychoeducational sessions that included sexuality education, cognitive therapy, behavioral therapy, relationship exercises, pelvic floor muscle strengthening, and mindfulness. The authors briefly presented their qualitative data in this comment paper and found that women reported improvement in body image, increased ability to pay attention to sexual arousal that they thought had disappeared after their hysterectomies, and increased mindfulness in their outside lives. Women unanimously reported that the most helpful component of the intervention was mindfulness. Brotto, Heiman, Goff, Greer, Lentz, Swisher, Tamimi, and Van Blaricom [20] studied women with early-stage gynecologic cancer and sexual arousal concerns. They administered three 1-h individual sessions combining CBT with sexuality education and mindfulness training and reported significant improvement in desire, arousal, orgasm, satisfaction, sexual distress, depression, and overall well-being in addition to a trend towards increased actual genital arousal as measured by vaginal photoplethysmograph and perceived genital arousal. In fact, mental sexual excitement and self-reported genital tingling/throbbing increased post-treatment. In what may have been the first published article comparing a mindfulness-based intervention to a control group, Brotto, Erskine, Carey, Ehlen, Finlayson, Heywood, Kwon, McAlpine, Stuart, Thomson, and Miller [21••] studied women who had a history of hysterectomy due to cervical or endometrial cancer who were

experiencing distressing sexual desire and/or arousal difficulties that they attributed to their cancer treatment. Investigators found significant improvements in almost all domains of sexual response (desire, arousal, lubrication, orgasm, satisfaction), overall sexual functioning, and sexual distress. These improvements were maintained at 6-month follow-up. There was no impact on sexual pain. Women's perception of sexual arousal during an erotic film increased despite the fact that the objective measure of physiological sexual arousal (as measured by vaginal photoplethysmograph) did not (see section "Mindfulness and Women's Awareness of Sexual Arousal" for more discussion of this phenomenon).

Bober, Ricklitis, Bakan, Garber, and Patenaude [22] studied the impact of a MBCT sexual health intervention for women with *BRCA1/2* mutations and a history of risk-reducing salpingo-oophorectomy (RRSO; risk-reducing surgical removal of the fallopian tubes and ovaries). This surgery leads to premature menopause and often results in sexual dysfunction. An inclusion criterion was reporting at least one distressing symptom of sexual dysfunction. The intervention was a 3.5-h group psychoeducational session with three modules: (1) psychoeducation about RRSO-associated sexual problems and improving vaginal health, (2) relaxation training and body awareness, and (3) MBCT (e.g., identifying and managing negative cognitions about sexual self-esteem and self-image). Two individual telephone counseling sessions were given 2–4 weeks after the intervention. They found improvements in overall sexual functioning, desire, arousal, satisfaction, pain, sexual self-efficacy (i.e., confidence in managing sexual side effects), and sexual knowledge. Women were very satisfied with the content of the intervention and reported that they used their new skills to manage their sexual dysfunction. The mindfulness components of the intervention were not well described.

Women Without Cancer

Brotto, Basson, and Luria [23] tested a mindfulness psychoeducation intervention on women without cancer who had sexual desire and arousal complaints. The intervention consisted of three 90-min group sessions, and the authors found significant improvement in sexual desire and sexual distress, increased perceived genital wetness despite little or no change in objective physiological arousal, and a slight improvement in self-reported physical arousal during an erotic stimulus. Later, they compared women with and without a sexual abuse history and found that women with a history of sexual abuse improved significantly more than those without on self-reported psychological sexual excitement, genital tingling/throbbing, arousal, overall sexual function, sexual distress, and on negative affect while viewing the erotic film. In addition, they found a trend for more improvement on depression scores among those with a sexual abuse history. Women's feedback after the intervention was that the most helpful part of the protocol was mindfulness. Other authors have found similar results in that subjects mention the mindfulness modules were some of the most useful aspects of the program [14, 24••, 25•]. A manualized protocol is available upon request from Dr. Brotto (www.brottolab.com).

In one of the first studies designed to compare the effectiveness of different treatment approaches, Brotto, Seal, and Rellini [26••] conducted a pilot study comparing a two-session CBT group intervention to a two-session mindfulness-based group intervention for women with sexual difficulties, sexual distress, and histories of CSA. An inclusion criterion was that the women must have primarily attributed their current sexual issues to their history of sexual abuse. The outcome variables were sexual distress and concordance between subjective and objective measures of genital sexual arousal.

This intervention was based on a psychoeducational treatment manual developed by the authors for women with hypoactive sexual desire disorder [23]. The CBT and MBI groups shared content in session 1 that included information on prevalence rates of sexual dysfunctions, "discussion of predisposing, precipitating, perpetuating, and protective factors of participants' sexuality" (p. 9), and education about the female sexual response cycle [27]. The CBT intervention included discussion of the CBT model (i.e., demonstrating the relationship between thoughts, feelings, and behaviors), biased thinking that occurs in sexual situations, education about challenging negative thoughts using thought records which they practiced in session, and in-session practice with diaphragmatic breathing and progressive muscle relaxation. The MBI included an introduction to mindfulness and review of the benefits, in session practice of mindful breathing, and a body scan exercise. The subjects were given daily assignments which included evaluating the components that contribute to their sexual experiences, writing out their own sexual response cycle, and practice of mindfulness skills in nonsexual and sexual situations. The CBT group homework was to challenge irrational thoughts, and the MBI group homework was to mindfully observe body sensations. Two weeks later in session 2, the group facilitators reviewed the information from session 1 as well as the homework and helped the subjects problem solve issues that came up when doing the homework. At the end of the session, they were invited to continue practicing their skills in nonsexual and sexual situations on a daily basis.

The authors found that both CBT and MBIs were correlated with decreased sexual distress, and there was no difference between groups. The authors note that their two-session interventions were associated with reductions in sexual distress that were at least as big or bigger than those obtained by 24 weeks of treatment with flibanserin in another study [28]. However, women who received the MBI demonstrated a

significant increase in concordance between genital and subjective arousal when comparing pre-treatment to post-treatment, and they showed a greater increase in concordance than women who received the CBT intervention. Interestingly, as seen in previous studies, the level of objective genital arousal (genital engorgement) did not change from pre-test to post-test, but the women in the MBI reported greater subjective sexual arousal. The authors hypothesize that using mindfulness to tune into their body sensations without judgment or "negative cognitive chatter" and with acceptance of whatever emotions/thoughts came up promoted increased tolerance of a range of stimuli instead of a focus on negative stimuli only, allowing the women to perceive more arousal.

In one of her first published studies using a quantitative measure of mindfulness, Brotto and Basson [5••] compared the impact of a MBCT sex therapy group intervention for women's desire and arousal concerns to a 3-month delayed treatment control group. There were two pre-treatment baseline assessments followed by four 90-min group sessions of mindfulness meditation, cognitive therapy, sex therapy, and psychoeducation followed by a 6-month follow-up. Compared to the control group, they saw significant increases in sexual desire, sexual arousal, lubrication, sexual satisfaction, and overall sexual functioning. In addition, there were improvements in mental sexual excitement, genital tingling, and ratings of genital pleasure. Improvements in sexual desire were predicted by increases in mindfulness and decreases in depressive symptoms.

Because of its strong clinical relevance and the fact that it is one of the most advanced and empirically studied MBIs for the treatment of sexual issues, an overview of the four session intervention from Brotto and Basson's 2014 paper [5••] will be summarized here in Table 1. A number of the elements presented are similar across Brotto's interventions (e.g., in session mindfulness practice, home mindfulness practice, home sex therapy exercises, in-depth review of homework assignments, in session psychoeducation about sexuality, the women's sexual response cycle, mindfulness and CBT, and the complementary relationship between these two approaches). This can give the clinician with some background in mindfulness a sense of the specific interventions that might be useful to start in individual work.

Mindfulness and Women's Awareness of Sexual Arousal

When presented with sexual stimuli, compared to men, women are significantly more likely to report feeling unaroused even when there is physical evidence of physiological arousal [33]. This is even more prevalent in women with a diagnosis of female sexual arousal disorder [27]. However, mindfulness interventions have proven effective in increasing concordance of physiological and perceived sexual arousal in women [14, 34].

Compared to controls, Silverstein, Brown, Roth, and Britton [34] found improvement in awareness of physiological activation in response to sexual slides in university subjects after a 30-h mindfulness meditation program. The levels of awareness for women were similar to those of men after the intervention. They also found improvements in three areas that significantly impact sexual functioning (attention, self-judgment, and clinical symptoms, in particular, depression and anxiety). Brotto [35] reports they will soon publish results demonstrating significant improvement in congruence between subjective awareness of genital arousal and objective physiological arousal measured by vaginal photoplethysmography (Brotto, Chivers, and Millman, manuscript under review) after a four-session group MBCT intervention for women with desire and arousal concerns.

The effectiveness of mindfulness in increasing awareness of sexual arousal has been clinically reported as well. In a case study, Brotto and Woo [19] instructed a client with desire disorder to arouse her body (with erotica or a vibrator) and then practice mindfulness immediately afterwards. She was able to notice signs of arousal in her body which increased her perceived excitement and helped her to feel like her body was not "broken." All in all, having mindfulness skills may enhance women's ability to notice physiological sexual arousal. In clinical practice, this author has found that even psychoeducation about the discordance between perceived and actual arousal can be therapeutically useful. A client will often realize that there is nothing wrong with her body, that it is functioning properly, and that her job is simply to pay attention to it.

Mindfulness and Body-Based Interventions

Mize and Iantaffi [25•] describe the first sensorimotor psychotherapy intervention for the treatment of women's sexual concerns. Sensorimotor psychotherapy is a trauma treatment approach that was originally developed by Ogden, Minton, and Pain [36]. It is a body-oriented therapy that integrates body processing with cognitive and emotional processing, but uses the body as the primary access route for healing [36]. The group therapists (not the authors) administered traditional sex therapy and group therapy interventions as well as sexuality psychoeducation and homework to women with various sexual dysfunctions (e.g., hypoactive sexual desire disorder, sexual arousal disorder, orgasmic disorder, vaginismus) and other psychological diagnoses (e.g., PTSD, depression, social anxiety). Once a month for 6 months, the authors administered a 2-h long sensorimotor psychotherapy session. Psychoeducation about mindfulness was administered, mindfulness skills were taught, and practice was incorporated into each session. Exercises incorporating the body and movement

Table 1 Overview of the contents of Brotto and Basson's [5••] four-session MBCT group intervention for women with sexual interest and arousal disorders

Session	In-session meditation	Group discussion	Psychoeducation	Homework
1	•Seeing meditation •Body scan (20 min)	•How might MF be useful for your issues with desire and arousal?	•Prevalence and etiology of sexual desire and arousal difficulties •Review of research on effects of MF on brain function	•Daily MF practice •Monitor sexual beliefs •Worksheet on contributors to sexual desire/arousal complaints •Body image worksheet
2	•MF of breath and body (20 min)	•In-depth review of HW	•Sexual anatomy and physiology •Basson's [29–31] circular SRC •Responsive desire and influence of previous sexual encounters on motivation	•MF of breath and body •Body scan with attention to genitals with compassion and non-judgment •As part of body scan, view own genitals with hand-held mirror •Complete own SRC with motivations to be sexual and list of stimuli that might enhance desire/arousal
3	•MF of sounds and thoughts	•In-depth review of MF and HW	•Gottman and Silver's [32] principles for satisfying relationships •Intro to CBT model with sexual situation to show relationship between thoughts, emotions, and behavior •How MF and CBT might complement one another (i.e., MF allow increased awareness of negative thoughts) •Description of how to challenge thoughts (although less time spent on this than on MF practice and rationale)	•Body scan with attention to genitals, include light touch to focus on sensations. Not a masturbation exercise, but an exercise in MF and non-judgmental awareness of genitals. Not meant to cause sexual arousal
4	•None reported	•In-depth review of home MF and HW	•Sensate focus to be used at home with partner •Incorporating tools to enhance arousal (e.g., fantasy, erotica, vibrators) during MF practice •Strategies for ongoing progress and practice and potential barriers •Emphasized that these sessions are an intro to practices that improve "mind skills" and are only the beginning. Continued practice could increase the benefit	

MF mindfulness, *HW* homework, *SRC* sexual response cycle, *CBT* cognitive behavioral therapy

were used to explore concepts and practice skills taught in the three modules that formed the basis of the intervention: mindfulness, affect regulation, and boundaries. A thorough description of the intervention is in preparation and will be presented in an upcoming paper. Pre- and post-test assessments were made of changes in sexual functioning, mindfulness, body connection, and sexual distress. Focus groups designed to collect qualitative data about the experience of the intervention were held 1 month after the end of the formal intervention. There was significant improvement in overall mindfulness scores at post-test, but no effect on body awareness as measured quantitatively, although qualitative data suggested increased body awareness. All participants found the mindfulness components of the intervention to be particularly useful and transferable to their sexual lives. Six themes emerged from the focus groups: increased skills at mindfulness and observing/non-reactivity, more self-compassion/kindness, increased body awareness, improved sexual functioning, and a sense that this intervention was different from what they had experienced in therapy previously. Participants indicated that they enjoyed and benefited from actively incorporating their bodies in their therapy. Mindfulness is often viewed as an internal process of the mind, but this intervention actively promoted women's mindful connection with their physical selves. Improvements in sexual functioning and sexual distress were also found and will be presented in another paper (Nabar, Iantaffi, and Mize 2015, manuscript under review).

In one of the few mind-*body* interventions for sexual health that also includes a couple's component, Baker and Absenger [37] proposed a modified mind-body skills group called SWEET (Sexual Wellness Enhancement and Enrichment Training). Their proposed intervention has many traits in common with other approaches such as group support, mindfulness meditation, mindful eating, conscious breathing, CBT, psychoeducation about sexual response cycles, sexual anatomy and physiology, and sexual functioning. However, the authors also propose some more unique body-focused interventions such as movement exercises (e.g., yoga, aerobic exercise), biofeedback (which they did not fully describe), as well as partnered exercises (e.g., partnered progressive muscle relaxation, alternate breathing, synchronized breathing, eye gazing). They also discuss the use of self-hypnosis and guided imagery. Although this is a description of a proposed intervention and not an empirical study, the protocol is mentioned here because it is one of the few mindfulness and body-based interventions for couples in the literature.

Mindfulness and the Treatment of Men with Sexual Dysfunctions

There is anecdotal evidence for the effectiveness of mindfulness in therapy to treat men with premature ejaculation (PE) [35], ejaculatory inhibition [6, 35], low sexual desire [35], erectile dysfunction [17, 35], and male pelvic pain [38], but to my knowledge, there are no empirical studies testing MBIs with men in the literature. The studies that come closest to this involve yoga.

Yoga and Sexual Functioning

Yoga, although not a formal sex therapy intervention, will be included here because of its use of mindfulness and its focus on the body. Yoga is a standard component of the traditional MBSR curriculum [8]. Brotto, Mehak, and Kit [39] conducted a review of yoga and sexual functioning. There is some evidence for improvements in PE [40], sexual desire, satisfaction with intercourse, performance, confidence, partner synchronization, erection, ejaculatory control, and orgasm in men [41]. Makwana and Patil [42] found a yoga program to be more effective than the stop-start technique for treating PE. Other authors, however, have found no effect of a yoga intervention on PE in men [43]. The studies in the literature on women and the impact of yoga have been conducted with nonclinical samples so they will not be reviewed here.

Mindfulness Interventions for Couples with Sexual Concerns

More research is needed on MBIs for couples with sexual issues. Inclusion of partners is notably missing from most studies. Rullo (2015, personal communication) at the Mayo Clinic Women's Health Clinic in Rochester, MN is currently conducting a randomized-controlled trial comparing a couples mindfulness group intervention for women who meet the criteria for sexual interest/arousal disorder (SIAD) to a usual care group. The usual care group receives a pamphlet on stress management, a pamphlet on sexual health, and a DVD on maintaining intimacy. After 3 months, the usual care group will cross over to the intervention group. The intervention consists of two 90-min groups: (1) a sexual health group that receives education (sexual response cycle, biopsychosocial model of sexual functioning, basic sex education, and couples communication) with some CBT and (2) a mindfulness group based on Dr. Amit Sood's Intention and Interpretation Therapy (http://stressfree.org/). Rullo and colleagues note that the strength of this approach is that it can be done throughout the day during normal activity instead of having to begin a dedicated meditation practice. They believe this is the perfect intervention for women who feel like sex is "just one more thing on the to-do list."

In a case study, McCarthy and Wald [6] propose treating couples using a combination of mindfulness and the Good

Enough Sex (GES) model [44], positing that they are complementary approaches that help couples break out of an achievement, performance, and goal-orientation and instead help them embrace a new definition of healthy couple sexuality organized around desire, pleasure, eroticism, and satisfaction. In their "intimate team" approach to the treatment of a man with ejaculatory inhibition, they prescribe psychosexual exercises done in mindfulness all within the context of the GES model.

The emphasis of GES on variable, flexible, pleasure-oriented sexual response especially in what the authors call asynchronous encounters (i.e., "sexual encounters that involve one partner experiencing desire, pleasure, eroticism, and satisfaction while the other partner may not experience any, or just one or two, dimensions") is very consistent with Langer's [7] definition of a mindful approach (e.g., seeking novelty, embracing the opportunity to learn something new, noticing details, generating new information in order to learn more, and being flexible and welcoming a changing environment instead of resisting it.)

Online Mindfulness Interventions

Online interventions are becoming increasingly popular, but there are few for treating sexual dysfunctions. Hucker and McCabe [24••, 45•] designed pursuing pleasure (PP), which is the first online, MBCT intervention for women with sexual difficulties and their partners and the first to incorporate an online chat group with a therapist for support. They were interested in testing the impact of the intervention on relationship functioning (in particular, sexual intimacy, emotional intimacy, communication) and relationship satisfaction. They recruited women with desire, arousal, orgasm, and/or sexual pain who were in a stable heterosexual relationship and had no significant psychological or relationship issues. *An inclusion criterion was that their partners were also willing to participate*. This is an important requirement and one that future studies might consider. The intervention consisted of sensate focus exercises, communication exercises, mindfulness exercises, unlimited email contact with a therapist, and online chat groups. There were six modules each containing (1) psychoeducation and CBT exercises designed to help identify and challenge the women's negative thoughts; (2) handouts for partners that addressed female sexuality, female sexual problems, related relationship issues, and explanations of the exercises; and (3) communication exercises and sensate focus exercises requiring partner participation. Nonsexual mindfulness exercises were taught first through assignments such as meditating on the breath and mindfulness of thoughts. Participants were encouraged to practice for 5 min each day of the program. Exercises included mindful eating, mindful movement, and mindful showering or bathing, then mindfulness during sexual exercises such as sensate focus. The online chat groups ran for 1 h each every 2 weeks and were facilitated by a therapist using mindfulness and CBT techniques to explore the causal and maintaining factors of participants' sexual problems and to examine barriers to change and identify solutions. The authors include a thorough detailed description of their intervention in their paper.

Compared to a wait list control group, the authors found women who completed the intervention to have improved sexual intimacy, emotional intimacy, and communication. There were no differences between groups on overall relationship functioning, and they attributed this to the fact that their intervention did not address the issues measured on a subscale of one of the instruments used. In their second study when the wait list control group received the intervention, they found significant improvements again in sexual intimacy and communication, but not in emotional intimacy. They faulted a small sample size for this lack of significance. At 3-month follow-up, the improvements were maintained for study 2, but for study 1, only improvements in emotional intimacy and communication, but not for sexual intimacy were maintained.

In another paper from the same study [45•] Hucker and McCabe present their findings on sexual functioning. Compared to the wait list control group, women who received the intervention showed improvement in desire, arousal, lubrication, orgasm, and satisfaction and decreased sexual distress and sexual difficulties, and all of these gains were maintained at 3-month follow-up. However, sexual pain was not impacted. In an interesting addition, they also compared the sexual functioning of the male partners of women in the intervention group and the wait list control group and found improvements in some areas such as erectile function, sexual desire, and overall sexual satisfaction and trends towards improvements in orgasmic functioning and premature ejaculation. Gains were maintained at 3-month follow-up for erectile dysfunction, sexual desire, and premature ejaculation. Even though the men were not administered an intervention designed to address male sexual functioning, there was a positive impact of them participating in the intervention designed to address their female partner's sexual concerns. The authors propose that improvements in one partner are related to improvements in the other due to the interdependent nature of sexual dysfunctions within a couple. In addition, there is significant overlap between the treatments for male and female sexual dysfunctions (e.g., sensate focus, communication exercises) from which the male partners could have benefited. Male partners were not required to do the mindfulness exercises, although it is not clear why. Perhaps this would have helped improve the results for male sexual functioning had they participated in that aspect of the study as well.

The authors asked the subjects what were the most beneficial aspects of the intervention, and they were told that the

mindfulness exercises, the communication exercises, and the online chat group experiences were particularly helpful. The authors propose that an online intervention with chat room support might be an effective way to reach women who are geographically isolated, unable to attend sessions in person, seeking anonymity in their treatment, very self-motivated to engage in exercises on their own, and women who have cooperative and supportive partners and less severe sexual issues.

In this author's clinical experience, apps like *Headspace* (www.headspace.com), *Room to Breathe*, and *Stop*, *Breathe*, *Think* have been helpful to clients in incorporating mindfulness meditation into their daily lives in a convenient and non-intrusive manner. A mindfulness-based sex therapy app would be a unique and accessible intervention.

Conclusions

There is growing evidence for the effectiveness of brief MBCT interventions to treat women's sexual desire and arousal difficulties. Currently, most of the interventions are being conducted in groups with participants reporting mindfulness skills and group support as two of the most helpful components. Online group interventions, couples group interventions, and body-based interventions are novel in the field and show promise, but need more empirical support for their efficacy. Future research should include couples, nonclinical samples, men, people of diverse race/ethnicity/sexual orientation/gender identity, and the aging as these populations are markedly underrepresented in the literature. In addition, interventions focused on orgasm disorders are seemingly nonexistent. Although the interventions for desire and arousal difficulties sometimes improve ability to orgasm, no intervention specifically designed for orgasm disorders was found. Finally, clinicians would benefit from the publication of more manualized treatment protocols for freer access to exercises and more empirical research directly comparing different treatment approaches (e.g., MBCT vs. traditional sex therapy; MBCT vs. mindfulness and body-oriented therapy; groups for individuals vs. groups for couples) for sexual desire, arousal, and orgasm difficulties.

In summary, there is a surge of research on mindfulness in the field of sexuality, and the efficacy of group interventions for women with sexual desire and arousal difficulties has some strong empirical support. There is an intense need for future research on MBIs to treat sexual issues in males, couples, LGBT populations, persons of diverse races/ethnicities, and the aging as well as studies focusing on other dimensions of sexuality such as orgasm and sexual satisfaction. It will be exciting to see how MBIs can be adapted and applied to a larger diversity of clients struggling with a broader range of sexual issues.

Compliance with Ethics and Guidelines

Conflict of Interest Sara J.S. Mize declares that she has no conflict of interest.

Human and Animal Rights and Informed Consent This article does not contain any studies with human or animal subjects performed by the author.

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- •• Of major importance

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