




Mindfulness-Based Interventions in the Treatment of Female Sexual Dysfunction: A Systematic Review

Kadında Cinsel İşlev Bozukluğunun Tedavisinde Bilinçli Farkındalık Temelli Müdahaleler: Sistematik Bir Derleme

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Abstract

Female sexual health has become a growing field of research and focus of clinical practice in the last 10-15 years. Mindfulness-based interventions, which emphasize the focus of attention on here and now experiences without being judgmental but with an accepting attitude, have emerged as a promising treatment option for women with sexual dysfunction. In this context, the purpose of this review is to evaluate the usability and effectiveness of mindfulness-based psychological interventions in women having difficulty at various stages of sexual functioning. In line with this purpose, several databases were searched with the keywords of "sexual dysfunction AND mindfulness", "sexual desire AND mindfulness", "sexual arousal AND mindfulness", "sexual pain AND mindfulness", and "orgasm disorder AND mindfulness". Based on PRISMA decision criteria, 13 research article published between 2000 and 2017 have been identified. The findings indicated that both individual and group-oriented mindfulness-based therapies significantly improved sexual dysfunctions in various aspects of the sexual response cycle and these improvements were maintained in the long term. Besides the primary outcomes related to sexual functioning, it appears to cause positive changes in many areas such as depression, anxiety, couple harmony, and communication as well.

Keywords: Mindfulness, cognitive-behavioral therapy, treatment

Öz

Kadın cinsel sağlığı son 10-15 yılda giderek gelişen bir araştırma alanı ve klinik uygulamaların odağı haline gelmiştir. Yargılayıcı olmadan ve kabulleni bir tutumla dikkatin anlık deneyimlere odaklanmasını vurgulayan bilinçli farkındalık temelli müdahaleler, cinsel işlev bozukluğu yaşayan kadınlar için umut verici bir tedavi seçeneği olarak ortaya çıkmaktadır. Bu bağlamda bu derleme çalışmasının amacı, cinsel işlevselliğin çeşitli aşamalarında sorun yaşayan kadınlarda bilinçli farkındalık temelli psikolojik müdahalelerin kullanılabilirlik ve etkililiğini değerlendirmektir. Bu amaç doğrultusunda, çeşitli veri tabanları "sexual dysfunction AND mindfulness" ("cinsel işlev bozukluğu" ve "bilinçli farkındalık"), "sexual desire AND mindfulness" ("cinsel istek" ve "bilinçli farkındalık"), "sexual arousal AND mindfulness" ("cinsel uyarılma" ve "bilinçli farkındalık"), "sexual pain AND mindfulness" ("cinsel ağrı" ve "bilinçli farkındalık"), ve "orgasm disorder AND mindfulness" ("orgazm bozukluğu" ve "bilinçli farkındalık") anahtar kelimeleri ile taranmıştır. PRISMA karar kriterlerine bağlı kalınarak yapılan tarama 2000 ve 2017 yılları arasında yayınlanmış 13 araştırma makalesi tespit edilmiştir. Bulgular, hem bireysel hem de grup odaklı bilinçli farkındalık temelli terapilerin cinsel tepki döngüsünün çeşitli boyutlarında yaşanan cinsel işlev bozukluklarında anlamlı düzeyde iyileşme sağladığını ve bu iyileşmelerin uzun dönemde korunduğunu göstermiştir. Cinsel işlevsellelikle ilgili birincil sonuçların yanında, depresyon ve kaygı, çift uyumu, iletişim gibi pek çok alanda da olumlu değişime yol açtığı görülmektedir.

Anahtar sözcükler: Farkındalık, kadında cinsel işlev bozukluğu, tedavi

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FEMALE sexual dysfunction is characterized by one or more impairment in the areas of sexual function such as sexual desire, arousal, orgasm and dissolution, and marked subjective distress caused by disturbances in the diagnosis and quantified Diagnostic and Statistical Manual of Mental Disorders (DSM-5; APA 2013). Female sexual dysfunctions are examined under three main headings in DSM-5: sexual interest/arousal disorder, sexual organs-pelvic pain/ penetration disorder and female sexual arousal disorder. It is also indicated to be among the most common psychological disorders. In a study of 1749 women between the ages of 18-59 representing the American population, 43% of women reported experiencing a type of sexual dysfunction. This study shows that sexual dysfunction is more common in anxiety, mood and substance abuse disorders (Laumann et al. 1999). Prevalence rates vary due to the use of different age groups, differences in the definition of functional disorders, duration, severity and possible socio-cultural differences. However, it is stated that the prevalence rates are increasing as the age increases. However, significant differences are observed in terms of lifetime prevalence among sexual dysfunctions: hypoactive sexual desire disorder is the most common disorder (16 percent); orgasm disorders (4%), and dyspareunia (3%) in the prevalence is lower (Simons and Carey 2001). In our country, studies on female sexual dysfunction increases gradually, but there is not enough evidence about the frequency of disorders in the literature. In one study, the incidence of vaginismus in women was 15.3% and the rate of orgasm was 5.3% (Yılmaz et al. 2010). In another study, vaginismus (41%) and inability to orgasm (17%) were the most common sexual dysfunction in female patients who applied to the clinic (Yıldırım et al. 2011). Research in our country shows that vaginismus is the most common in women who seek treatment due to sexual dysfunction (e.g. Dogan 2009).

Female sexual dysfunction causes beliefs about the past to the present is seen to change. In particular, Masters and Johnson's studies in the 1970s revealed the importance of psychological factors. Today, biopsychosocial model is adopted and it is accepted that biological (e.g. medical diseases, menopause, alcohol, drug use), psychological (e.g. sexual knowledge, stress, depression/anxiety, sexual abuse and/or rape exposure), interpersonal (e.g. poor communication, quality of relationship, sexual problems of partner), and cultural factors (e.g. attitudes towards sexuality, myths and religious values) causes and perpetuates sexual disorders (Lewis et al. 2010, Lamont et al. 2012). For instance, in traditional societies where sexuality is perceived as taboo and a standard sexual education is not given, sexual reluctance and vaginismus in women can be seen more widely (Yasan and Gürgen 2008). In addition to causative factors, approaches to the treatment of male and female sexual dysfunction have also shown a dramatic change over time. With Freud's psychoanalytic approach in the 1950s, he focused on solving the underlying conflicts in the treatment of sexual dysfunction. In the 1960s, behavioral approach advocated that people learned to respond incorrectly to sexual stimuli, and based on learning principles, behavioral therapy practices such as muscle relaxation and systematic desensitization have come to the fore. Masters and Johnson (1970)'s studies about sexuality as a result of the modern approach were laid the foundations of sex therapy. As a result of direct observation of sexual response on sexual response excitement, plateau, orgasm occurs in four phases and in the form of relief have argued that, as a reaction to performance anxiety and sexual dysfunction are described. In addition to being based on behavioral approach, partners have also demonstrated the importance of factors such as the

relationship between partners and the way they communicate. The intervention involves behavioral exercises such as psychoeducation, counselling, sensate focus, and is primarily aimed at reducing performance anxiety and re-experiencing sexual pleasure. In the 1980s, sexual dysfunction was defined as a biological problem and medical treatment was highlighted (Tiefer 2006).

Today, behavioral therapy methods are used and it is accepted that both psychological and biological factors play a role in the etiology of sexual dysfunctions. Therefore, a holistic approach is used by combining different treatment approaches. One of the most common and widely used approaches to the treatment of sexual dysfunction is cognitive-behavioural therapy (CBT) (ter Kuile et al. 2010). The aim of CBT is to teach correct responses to sexual stimuli instead of false responses. In this context, interventions target cognitive factors (e.g. myths about sexuality, negative thoughts, beliefs, sexual self schemas, feelings) and/or behavioral factors (e.g. avoidance from sexual activity, poor communication) that initiate and maintain sexual dysfunctions. In this context, many techniques such as psychoeducation, cognitive restructuring, communication reinforcement, masturbation training, relaxation training and sensate focus exercise are used in CBT (e.g. Hucker and McCabe 2014, Weiner and Avery-Clark 2014). In the relevant literature, there are empirical studies showing that CBT is effective in the treatment of sexual dysfunctions (Frühaufl et al. 2013). However, although CBT is widely used in research and clinical applications, it is emphasized in the current literature that there are also limitations. These limitations include the lack of evidence-based and structured CBT treatment for certain types of female sexual dysfunctions (e.g. dyspareunia, vaginismus, sexual arousal disorder), a small number of studies to determine which component of the CBT is more effective, and the need to have a sexual partner in many treatment components (e.g. sensate focus) (ter Kuile et al. 2010, Pyke and Clayton 2015).

In recent years, mindfulness-based therapies used as an alternative to CBT or integrated with CBT for the treatment of female sexual dysfunction (Hucker and McCabe 2014, Paterson et al. 2017). Mindfulness is defined as directing the attention of the individual to the flow of spontaneous experiences without judgment (Kabat-Zinn 2005). It is produced from Buddhist and Hindu philosophy and meditation practice and is one of the types of meditation in insight (vipassana). Insight means realizing something at the exact moment and looking at it in depth. Although the concept of mindfulness is rooted in meditation practices applied in the East, it is known that psychotherapy approaches applied in the East for many years are similar to mindfulness-based therapies (Kabat-Zinn, 2000, 2003). In psychotherapy approaches in the West, mindfulness has been used for nearly 30 years (Kabat-Zinn 1982, Hayes et al. 1999, Barnhofer et al. 2009, Piet et al. 2010). Although different definitions of mindfulness are included in the literature, focus on the present moment, attention, internal observation, non-judgement and acceptance can be found in the literature. Non-judgement means that an individual approaches his or her own experience without reference to existing knowledge, observing experiences objectively without criticism (Shapiro et al. 2006). Everything that is experienced is categorized by the mind and this classification is done according to the understanding that is uploaded to the experience (Matchim et al. 2011). Therefore, being in a relationship with experience based on classification and judging is seen as a source of distress. The aim here is to realize that experiences are temporary and should not be judged and thus to accept and release experiences (Çatak and Ögel 2010).

Mindfulness-based therapy approaches differ from traditional CBT approaches in many aspects, such as theory and practice. To illustrate, CBT focuses on changing thought content, negative emotions, and behaviors; mindfulness-focused therapies include recognizing and accepting the present experience in all aspects without judging it (Bishop et al. 2004). While therapeutic methods (e.g. systematic desensitization) for direct reduction of negative mood (e.g. anxiety) in the CBT are at the forefront, the emphasis is on being open to and accepting all aspects of the current experience of negative emotions such as anxiety or sadness in mindfulness-based therapies. In addition, while cognitive restructuring and emotional state monitoring methods are used to detect, evaluate and change negative beliefs in CBT, more emphasis is placed on experiential knowledge and attention training by consciously focusing attention on physical senses, breath, etc. in mindfulness-based therapies (Kabat-Zinn 2003, Stephenson 2017). When the relevant literature was reviewed, it was observed that empirical studies were being conducted in the treatment of female sexual dysfunctions based on mindfulness-based psychological interventions (Brotto et al. 2008a). However, no current systematic review study has been found to evaluate these interventions. The purpose of the current systematic review is to provide an integrative framework for mindfulness-based interventions aimed at reducing problems related to female sexual function and to inform the effectiveness or effectiveness of these interventions. In addition, ideas on empirical research to be carried out in the following years and methods of intervention will be developed.

Table 1. General characteristics of studies

Study	Participants	Sample Size	Average Age	Treatment Strategies	Duration of Intervention
Bober et al. (2015)	Women who have a high risk of ovarian cancer, who have at least one symptom of sexual dysfunction	N _{Treatment} =37 N _{Dropout} =6	44.4	Sexual health education, body awareness and relaxation training, and mindfulness-based cognitive therapy strategies, telephone counseling.	3 module group session each of which lasts 3,5 hours + 2 sessions of telephone counseling
Brotto and Basson (2014)	Women experiencing difficulties due to low sexual desire and arousal	N _{Total} =115 (N _{Treatment} = 67; N _{Wait list} = 48) N _{Dropout} =2	Treatment Group = 40.8; Waiting List Control Group= 42.2	Cognitive Psychotherapy Components including Sexual Response and Mindfulness Practices, Mindfulness Practices, Sensate Focus Exercise	Four 90-minute mindfulness-based group intervention spaced two weeks apart
Brotto et al. (2008)	Women with sexual desire and/or sexual arousal disorder	N _{Treatment} =26	37	Psychoeducation, CBT, Sex Therapy, Relationship Therapy, Components of Mindfulness Practice, Homework Exercises	Three 90-minute group sessions every 2 weeks
Brotto et al. (2015)	Women with a diagnosis of provoked vestibulodynia (PVD)/Vulvar vestibulitis	N _{Total} =85 (N _{Treatment} = 62; N _{Wait list} = 23 N _{Dropout} =12	Treatment Group = 39; Waiting List Control Group = 40	Psychoeducation, Components of CBT, Progressive Muscle Relaxation, Mindfulness Skills	Four sessions group treatment every 2 weeks
Brotto et al. (2016)	Women who experience	N _{Treatment} =79 N _{Dropout} =38	40.8	Psychoeducation, Sex Therapy, Mindfulness	Four 90-minute sessions group

	sexual desire and /or arousal difficulties			Skills, Homework Exercises	treatment and each session occurred every two week
Brotto et al. (2017)	Women with sexual dysfunction who had received cancer treatment (gynecological, colorectal and other)	$N_{\text{Treatment}} = 46$ $N_{\text{Dropout}} = 27$	55	Information about sexuality and prevalence of sexual dysfunction, examination of factors causing and maintaining sexual dysfunction. Sexual beliefs, psychoeducation, mindfulness of bodily sensations and thoughts, relationship satisfaction and communication, enhancing sexual arousal, thought records, and relapse prevention	Twelve weekly 60-minute sessions
Brotto et al. (2008)	Women who have a history of either cervical or endometrial cancer and meet the diagnostic criteria for sexual arousal disorder in DSM-IV	$N_{\text{Treatment}} = 22$ $N_{\text{Dropout}} = 11$	49.4	Discussion of vulnerability factors, triggering, maintaining and protective factors about sexual difficulties, prevalence of sexual dysfunction, challenging maladaptive beliefs, discussion of the association between body image and sexuality, enhancing sexual arousal, mindfulness exercises, psychoeducation about sensate focus,	Three 60-minute sessions spaced four weeks apart
Brotto et al. (2012)	Women who are survivors of gynecologic cancer and have sexual dysfunctioning	$N_{\text{Total}} = 31$ ($N_{\text{Treatment}} = 22$; $N_{\text{Wait List}} = 9$) $N_{\text{Dropout}} = 7$	54	Psychoeducation, cognitive therapy techniques, body perception and mindfulness exercise, sensate focus, integration of mindfulness into sexual exercise	Three 90-minute individual sessions
Brotto et al. (2012)	Women who experience sexual difficulties, anxiety and distress during sexual activity in relation to a history of childhood sexual abuse.	$N_{\text{Total}} = 20$ ($N_{\text{BDT}} = 8$; $N_{\text{Mindfulness}} = 12$) $N_{\text{Dropout}} = 38$	35.8	CBT= Presentation of CBT model, discussion of irrational thoughts, challenging irrational beliefs, diaphragmatic breathing and progressive muscle exercise Mindfulness Based Intervention =definition of mindfulness, benefits of mindfulness for sexual or nonsexual issues, mindfulness skills practices, mindful breathing exercise, and body scan exercise	Two sessions spaced two weeks apart (The first session: 120 minutes; the second session: 60 minutes)

Hucker and McCabe (2014)	Women who reporting difficulties with sexual desire, arousal, orgasm, and/or pain	<u>Çalışma 1</u> N _{total} = 57(N _{Treatment} = 26; N _{Wait list} = 31) N _{Dropout} =7 <u>Çalışma 2</u> N _{Wait list} =15 N _{Dropout} =7	Treatment Group = 33.31; Control Group=31.94 (Study 1) 30.75 (Study 2)	Psychoeducation, sensate focus, communication exercise, cognitive therapy exercises, unlimited contact with therapist via e-mail, online chat groups, mindfulness education and exercises	Six module (minimum 11 weeks) Chat groups lasting a hour and occurred every two weeks
Hucker and McCabe (2015)	Women experiencing sexual difficulties (sexual desire, arousal, orgasm, and/or pain)	N _{total} = 57(N _{Treatment} = 26; N _{Wait list} = 31) N _{Dropout} = 32	Treatment= 33.31 Control= 31.94	Psychoeducation, sensate focus, communication exercise, cognitive therapy exercises, unlimited contact with therapist via e-mail, online chat groups, mindfulness education and exercises	Six module (minimum 11 weeks) Chat groups lasting a hour and occurred every two weeks
Hocaloski, et al. (2016)	Women with multiple sclerosis (MS) or spinal cord injury (SCI)	N _{Treatment} =6 N _{Dropout} =6	47.9	Psychoeducation, Kegel exercises, beliefs, thoughts, and behaviors regarding sexuality, body image, mindfulness exercise, sensate focus, mindfulness thoughts, body scan exercises, body mapping exercises, observing judgments	Five 90-minute sessions spaced two week apart
Paterson, et al.(2017)	Women with sexual desire and arousal disorder	N _{Treatment} =26 N _{Dropout} =3	43.9	Meditation, psychoeducation, mindfulness-based sexual therapy components, mindfulness exercises and meditations, progressive mindfulness-based body scan exercises	Eight weekly 2.25-hour group sessions

Method

The study was conducted in accordance with the decision criteria for PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), which provides a detailed guide for reporting systematic review and meta-analysis studies (Liberati et al. 2009, Shamseer et al. 2015). This checklist consists of the following: structured summary, introduction, methods used to review evidence, details of included and excluded research, findings of systematic review, discussion, results and resources (<http://www.prisma-statement.org/>). APA, PubMed and Web of Science databases were used for the study. Each keyword that represents female sexual dysfunction with medical subject headings (MeSH) selected in accordance with mindfulness combined with the use of the Word Scan reviewed. When screening “sexual dysfunction AND mindfulness” (“cinsel işlev bozukluğu” ve “bilinçli farkındalık”), “sexual desire AND mindfulness” (“cinsel istek” ve “bilinçli farkındalık”), “sexual arousal and mindfulness” (“cinsel uyarılma” ve “bilinçli farkındalık”), “sexual pain AND mindfulness” (“cinsel ağrı” ve “bilinçli farkındalık”), and “orgasm disorder AND mindfulness” (“orgazm bozukluğu” ve “bilinçli farkındalık”) key words were used. Since mindfulness-based treatment practices do not have an old history, screening was limited to research in English language

between 2000 and 2017. A total of 133 studies were conducted in the PubMed (46 results) and web of science (87 results) databases and no results were found in the APA database. When the results obtained from PubMed and web of science databases are examined, it was found that 34 studies were repeated. After the repeated studies were removed, the title and abstracts of the articles were examined by taking into consideration the criteria for inclusion into the study. If the title or abstract is not clear enough to understand the purpose of the study, the study has been examined as a full text in order to determine its appropriateness to the compilation criteria.

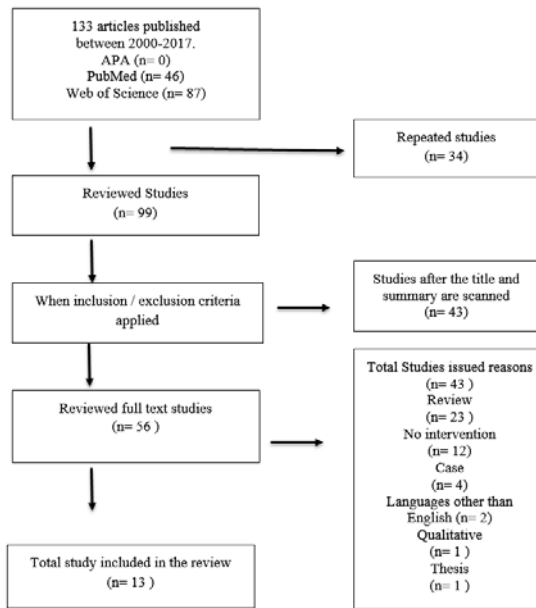


Figure 1. PRISMA flow chart

Inclusion criteria to the study are; (1) having been diagnosed with any sexual dysfunction, or marked significant distress in the various stages of sexual function, (2) being female participants, (3) participating in the intervention programs, (4) taking pre-and post-intervention measurements, and (5) taking at least one quantitative measure of improvement in sexual function in the result measurement. Compilation Studies, Non-Intervention Research, case studies, non-English language studies and thesis studies are not included in the present study. As a result of the screening, a total of 13 studies were found appropriate to be included in the collection (Figure 1).

Results

The 13 studies determined within the framework of the methodological criteria were evaluated in terms of the characteristics of the participants, the treatment and treatment outcomes applied to the participants (See Table 1). Moreover, findings of studies (type of treatment, frequency of measurement, outcome measures and results) were indicated in the Table 2.

Table 2. Results of studies

Study	Type of Treatment	Frequency Measures	Outcome Measures	Results
Bober et al. (2015)	Psychosexual Group Intervention: Relaxation Training Body Awareness Mindfulness-Based Cognitive Therapy	Baseline and 2-months after intervention;	FSFI, BSI-18, SSES, SKS, PS	Increase in overall sexual functioning, sexual desire, arousal and satisfaction; decrease in psychological distress Decrease in somatization and anxiety; improvement of sexual self efficacy and the level of sexual knowledge
Brotto and Basson (2014)	Mindfulness-Based Cognitive Behavioral Sex Therapy	Pre-treatment 2-4 weeks post-treatment, 6-month follow-up	SIDI, FSDS, FSFI, DASA, BDI, DAS, FFMQ	Increase in the level of sexual desire in treatment group Improvements in sexual functioning and sexual arousal in the treatment group The improvements are maintained at follow-up
Brotto et al. (2008)	Mindfulness-Based Group Psikoeducational Intervention (PED)	Pre-treatment and post-treatment	FSFI, FSDS, SIDI, DASA, DAS, BDI, FS	Beneficial effect on sexual desire and arousal More improvement in sexual arousal, overall sexual functioning, and sexual distress among women with a history of sexual abuse compared to women without a history of sexual abuse.
Brotto et al. (2015)	Mindfulness-based Group Therapy	Pre-treatment, post-treatment, 6-month follow-up	CSE, PISES, PCS, PVAQ, FSDS, FSFI, BDI, STAI, FFMQ	Improvements in allodynia, pain self-efficacy, pain catastrophizing, and pain hypervigilance, and sexual related distress A meaningful difference between treatment group and waiting list group
Brotto et al. (2016)	Mindfulness-Based Sex Therapy(Group)	Pre-treatment, post-treatment, 6-month follow-up	VP, A, FM, FSFI, SIDI, FSDS	Significant increase in concordance between genital and subjective arousal No impact of mindfulness on genital or sexual response separately
Brotto et al. (2017)	Online Individual Intervention Involving Mindfulness-Based Components	Pre-treatment, Post-treatment, 6-month follow-up	SBIQ-R, FSDS, FSFI, DAS, BDI	Significant improvements in sexuality related distress, all domains of sexual functioning, and total sexual function and decrease in depression. The results were maintained at follow-up
Brotto et al. (2008)	Mindfulness Based Psychoeducational Intervention (PED)	Pre-treatment and post-treatment	DASA, FSFI, SFQ, SBIQ, DAS, BDI, SF-36, FS	Positive impact on sexual desire, arousal, orgasm, satisfaction, sexual distress, depression and psychological well-being Improvements in physiological genital arousal, and perceived genital arousal
Brotto et al. (2012)	Mindfulness Based Cognitive Behavioral Individual Intervention	Pre-treatment, one month post-treatment, and 6-month follow-up	FSFI, FSDS, SFQ, BDI, VP, FS	Improvements in sexual distress, all domains of sexual dysfunction(except pain) and overall sexual functioning Improvements in perceived genital arousal
Brotto et al. (2012)	Group CBT or Mindfulness-based Group Therapy	Pre-treatment and post-	FSDS, FSDI, VP	Compared to CBT group, improvements in concordance between genital and subjective sexual arousal women who took mindfulness based therapy at post-

		treatment		treatment Higher level of subjective sexual arousal in the group receiving mindfulness-based psychotherapy.
Hucker and McCabe (2014)	“Pursuing pleasure” (PP) Online CBT Chat groups Mindfulness Education	Pre-treatment, post-treatment, and 3-month follow-up	SFS, PAIRS,FSI, FSDS-R	According to the results of Study 1, compared to wait-list group significant progress in communication, emotional and sexual intimacy Improvements in emotional intimacy, communication, and relationship satisfaction is maintained In Study 2 examining the control group receiving the treatment, significant improvements in communication and sexual intimacy.
Hucker and McCabe (2015)	“Pursuing pleasure” (PP) Online CBT Chat groups Mindfulness Education	Pre-treatment, post-treatment, and 3-month follow-up	FSFI, FSDS-R	In the treatment group, increase in the level sexual desire, sexual arousal, lubrication, orgasm, satisfaction; decrease in the sexual distress and frequency of sexual difficulties Improvements in sexual functioning, decrease in the sexual distress and frequency of sexual problems is maintained at follow-up
Hocaloski et al. (2016)	Psychoeducational Individual Intervention consisting of a combination of Cognitive Behavioral Therapy, Mindfulness Based Skills, and Psychoeducation	Pre-treatment, post-treatment, and 6-month follow-up	FSDS, FSFI, DASA, DAS, FFMQ, PDSBE	No change in sexual distress; significant impact on sexual functioning No significant change in lubrication, orgasm, sexual satisfaction, and pain but improvement is sexual desire and arousal
Paterson, et al. (2017)	Mindfulness-Based Cognitive Therapy Adapted for Women with Low Sexual Desire (MBCT-5)	Pre-treatment, and post-treatment,	SIDI, FSDS-R, FSFI, FFMQ, SCS, MAIA, BDI-II, RRS, ASI-3	Improvements in mindfulness, four domains of interoceptive awareness (i.e., not distracting, attention regulation, self-regulation, and body listening), depression, rumination, anxiety sensitivity (but not statistically significant) The moderator role of interoceptive awareness on sexuality related distress Finally, the mediator role of change in interoceptive awareness in sexual desire; the mediator role of mindfulness in overall sexual functioning

A: Arousemeter, ASI-3: Anxiety Sensitivity Index-3, BDI: Beck Depression Inventory, BDI-II: Beck Depression Inventory- II, BSI-18: Brief Symptom Inventory-18, CSE: Cotton Swab Exam, DAS: The Dyadic Adjustment Scale, DASA: Detailed Assessment of Sexual Arousal, FFMQ: Five Facet Mindfulness Questionnaire, FM: The Film Scale, FSDS: Female Sexual Distress Scale, FSDS-R: Female Sexual Distress Scale-Revised, FSFI: Female Sexual Function Index, MAIA: Multidimensional Assessment of Interoceptive Awareness, PAIRS: The Personal Assessment of Intimacy in Relationships Scale, PCS: Pain Catastrophizing Scale, PDSBE: Physical Disability Sexual and Body Esteem Scale, PISES: Painful Intercourse Self-Efficacy Scale, PS: Participant Satisfaction, PVAQ: Pain Vigilance and Awareness Questionnaire, RRS: Ruminative Responses Scale, SBIQ: The Sexual Beliefs and Information Questionnaire, SBIQ-R: The Sexual Beliefs and Information Questionnaire-Revised, SIDI: Sexual Interest/Desire Inventory, SCS: Self-Compassion Scale, SFQ: Sexual Function Questionnaire, SFS: Sexual Function Scale, SSES: Sexual Self-Efficacy Scale, SKS: Sexual Knowledge Scale, STAI: State-Trait Anxiety Inventory, VP: Vajinal Fotopletismograf.

In the review study, firstly, the studies related to the efficacy of Mindfulness-Based Individual Interventions related to sexual dysfunctions were examined. First, Brotto et al. (2012) conducted a study to evaluate the effectiveness of a mindfulness-based cognitive behavioral intervention in women who reported sexual dysfunction and who suffered from gynecological cancer who reported distress with low sexual desire or low sexual arousal. When the treatment results were examined, the intervention was found to cause improvement in all aspects of sexual dysfunction, sexual functioning (excluding pain) and general sexual functioning. Although there was no change in the physical measurements of sexual stimulation after treatment, there was a significant change in the perception of

genital stimulation. In other words, although there was no change in physical stimulation in the treatment group, it was found that the perception of sexual arousal increased significantly. When the results of the treatment were compared with the results of the 6-month follow-up study, it was observed that all aspects of sexual functioning (sexual desire, sexual arousal, orgasm, lubrication, pain and satisfaction) and improvement in overall sexual functioning and the level of distress related to sexuality were preserved.

Hocaloski et al. (2016) have conducted a pilot study to examine the effects of an individual intervention combined with cognitive behavioral therapy, mindfulness-based skills, and psychoeducation on women patients, characterized by multiple sclerosis (MS; inflammation, demyelination and neurodegeneration in the central nervous system, progressive neurological symptoms and attacks), or spinal cord injury (Sky, spinal cord injury due to any trauma) According to the findings, there was no significant change in the level of distress associated with sexuality before and after treatment. However, it has been observed that the treatment has a significant effect on sexual function. While a significant improvement is observed in the sub-dimensions of sexual functioning, sexual desire and sexual arousal; a dramatic change in the dimensions of pain, lubrication, orgasm, sexual satisfaction has not been found. There was no significant improvement in the lower dimensions of the relationship satisfaction in terms of bilateral reconciliation, bilateral saturation, bilateral adjustment and expression of emotions. It has also been observed that there has been significant progress in the sub-dimension of mindfulness “not judging the inner experience”.

In addition to face-to-face individual interventions, it is seen that it has gained importance in online therapies in recent years. In this context, Brotto et al. (2017) evaluated the effectiveness of online psychoeducational therapy which covers mindfulness-based components for people with sexual dysfunction who had previously received gynecological cancer treatment. According to the findings, a significant improvement was observed in sexuality related distress before and after treatment. Significant improvements were observed in all sub-dimensions of sexual function, general sexual functioning and depression. These results were continued in the 6-month follow-up study.

In their study of Hucker and McCabe (2014), the first online treatment program, which uses online chat groups, examined the usability of online mindfulness-based CBT for the treatment of female sexual dysfunction, called Pursuing Pleasure (PP). The program includes sensate focus, communication exercises and mindfulness exercises, as well as unlimited e-mail contact with the therapist. In this study, the treatment group and the waiting list group were compared, and in the second study, the results obtained after the application of the program in the waiting list group were investigated. According to the results of the first study, compared with the pretest and posttest measurements, significant improvement was observed in the communication, emotional closeness and sexual closeness of the group receiving treatment compared to the waiting list group. However, there was no significant differentiation in relation satisfaction. The results of the posttest and 3 month follow-up were compared; emotional intimacy, communication and levels of relationship satisfaction did not differ, while sexual intimacy improvements were not sustained. In the second study, there were significant improvements in communication and sexual intimacy level, while there was no change in relationship satisfaction and emotional intimacy level. When the continuation of the treatment results is evaluated, it is observed that the measurement of all variables in the posttest and follow-up study did not differ significantly. In another study, Hucker and McCabe (2015) examined the

effect of the same online intervention method on sexual desire, arousal, orgasm and/or pain. As a result of research compared to the control group, intervention group, sexual desire, arousal, lubrication, orgasm, a further increase in the level of satisfaction; there appeared to be a further reduction in the incidence of sexual difficulties and distress. Improvements in sexual function, a reduction in the incidence of sexual problems and distress at follow-up was maintained.

In addition to individual and online interventions for sexual dysfunctions, there are many studies investigating the effectiveness of mindfulness-based group therapies. It has been observed that psychoeducational components are very important in group intervention programs based on mindfulness for sexual dysfunction. In this context, Bober et al (2015) investigated the effect of mindfulness-based psychosexual intervention on sexual dysfunction and psychological distress in women undergoing salpingo-oophorectomy (removal of ovaries and tubes) to reduce the risk of ovarian cancer. Psychological intervention, according to research findings, increases the overall sexual function, sexual desire, arousal and satisfaction, while reducing psychological distress. However, women reported decreased somatization and anxiety; sexual self-sufficiency and sexual knowledge developed. This study suggests that psychoeducation intervention, which includes components of shorter, less intensive and different treatment methods, may have a positive effect on sexual function compared to previous sexual health interventions.

In their study, Brotto et al. (2008a) adapted the already existing mindfulness-based psychoeducation intervention (PED) to group format for women with sexual desire and / or sexual arousal disorder. The purpose of group therapy is to increase the applicability of the intervention, to reach more women and to benefit from the therapeutic effect of group sharing and support. As a result of the study, it was observed that the intervention consisting of psychoeducation had a positive effect on sexual desire and arousal. Although physiological arousal did not change, it was found that there was a significant increase in the perception of this response and subjective arousal during erotic stimulation. Furthermore, women with a history of sexual abuse had more improvement than those who had no history of sexual abuse in terms of sexual arousal, general sexual functioning, and sexual distress.

In another study, Brotto et al (2015) examined the efficacy of 4-Session group therapy, which includes some parts of psychoeducation and cognitive therapy, in which mindfulness skills are presented to women who are diagnosed with vulvar vestibule. The results showed a significant improvement in allodynia, pain-related self-efficacy, pain catastrophizing, rumination, desperation, enlargement, pain sensitivity and sexual function in the treatment group, both pre and post-treatment and 6 month follow-up measurements. In the treatment group at the depression level, the decrease was observed after the treatment and this decrease was maintained in the follow-up study. The difference between the control group and the treatment group was found in the evaluations of the treatment before, after, and follow-up studies at mindfulness level. There were significant improvements in the treatment group in terms of observation of sensations.

In the relevant literature, it is stated that the compatibility between the sexual arousal and psychophysiological response reported by the participants themselves may also be one of the necessary components for healthy sexual function. In this context, in their study, Brotto et al (2016) investigated the effect of mindfulness-based group sexual therapy on the compatibility between genital sexual response and subjective sexual arousal.

Results showed that along with the change in the subjective sexual arousal which is a predictor of concurrent genital sexual arousal, genital-subjective sexual arousal was found to increase significantly after the intervention of alignment. It has been observed that the treatment with mindfulness has an effect on compliance, but it has no effect on genital or subjective sexual response. This may indicate that intervention contributes to women's ability to aware of and integrate their sexual arousal experiences.

In the pilot study conducted by Paterson et al (2017), they aimed to investigate the usability and effectiveness of the enhanced Mindfulness-Based Group Cognitive Therapy (MBCT) program for sexual desire and arousal difficulties. The program was adapted for the treatment of sexual desire and arousal disorders by the inclusion of sexual therapy exercises in the content of MBCT's protocols for the treatment of depression and anxiety. The primary results of the study showed significant improvement in sexual desire, overall sexual function, and sexual distress as medium and large as the size of the effect. In addition, other than painful sexual penetration, sexual arousal, lubrication, orgasm and overall sexual function has been improved in all dimensions. When compared with the results of pre-treatment measurements, mindfulness and mindfulness of internal stimuli were observed in four dimensions (distracting, organizing attention, self-regulation and listening to the body) as well as improvement in sensitivity to depression, rumination and anxiety. However, at the level of self-compassion and other dimensions of mindfulness (not to be concerned, awareness, emotional awareness and trust) of the participants, there were no significant differences in the measurements taken before the intervention. In addition to these results, mindfulness of internal stimuli has been shown to play a moderator role in the change in sexual desire. Depressive mood, the level of mindfulness of internal stimuli, and age associated with sexuality in the change in distress has been seen to play a regulatory role. Finally, while the change in the level of awareness of inner stimuli mediated the change in the level of sexual desire; level of awareness, depressive mood, and self-compassion mediated the change in the level of general sexual function.

In another study (Brotto et al. 2012), the effect of CBT and mindfulness-based intervention on compatibility between genital and subjective sexual arousal and sexual distress in women was compared. As a result, there was a significant change in the compatibility between genital and subjective sexual arousal in women with mindfulness-based therapy compared to women in CBT group. More subjective sexual arousal was observed in the group receiving mindfulness-based intervention. There was no difference in the compatibility between genital and subjective sexual arousal in CBT group compared to pre-intervention. After treatment, sexual distress decreased in both groups.

In Brotto and Basson (2014)'s study, the effectiveness of Mindfulness-Based Cognitive Behavioral Sexual Therapy, based on 4 sessions and each session lasted 90 minutes, was examined on women seeking treatment for low sexual desire and arousal. According to the results of the study, the level of sexual desire was changed in the treated group and no significant change was observed in the control group. Both the treatment and the control group have been observed to have decreased sexual distress. When the results of sexual function were examined, the treatment group showed significant improvement in the level of arousal, lubrication, and overall sexual function compared to the control group. In terms of sexual arousal, mental excitement, genital tingling and sexual pleasure levels in the treatment group have also improved significantly. After the control group received the treatment, all participants' treatment results were evaluated by measure-

ments before, after, and 6 months after the treatment. The results showed that improvements continue in the follow-up study.

Brotto et al. (2008b) examined the efficacy of their own 3-session psychoeducational intervention (PED) in sexual dysfunction due to early cervical cancer or endometrial cancer (hysterectomy), followed by sexual arousal disorder diagnosis criteria in DSM-IV. The results of the study showed that psychoeducation intervention had a significant positive effect on sexual desire, arousal, orgasm, satisfaction, sexual distress, depression and general well being and physiological genital arousal and perceived genital arousal significantly improved. Moreover, the participants stated that mindfulness education is more beneficial because it increases the sensitivity to genital stimulation.

Discussion

Research on the intervention methods based on the principles of mindfulness and awareness has evolved over the past 15 years and has gained momentum. Mindfulness can be defined briefly as a mind and body practice that involves focusing on here and now, focusing attention on instant subjective experiences, and observing internal experiences. The main components are acceptance, non-judgement and observation. It is noted that studies evaluating the utility of mindfulness-based therapies in terms of female sexual dysfunction have increased in recent years. In this systematic review study, we reviewed the effects of intervention methods developed based on mindfulness principles and practices for female sexual dysfunction. 13 researches determined in accordance with the PRISMA criteria have been examined in detail.

According to the findings obtained from the review study, mindfulness-based therapies were individually (Brotto et al. 2012b, Brotto and Basson 2014, Hocaloski et al. 2016, Brotto et al. 2017) or in groups (Brotto et al. 2008a, Bober et al. 2005, Brotto et al. 2015, Brotto et al. 2016, Paterson et al. 2017) when applied, it has been observed that after treatment according to pre-treatment situation, sexual function has improved significantly in various areas. When the results obtained from individually applied mindfulness-based interventions were examined, the intervention was seen to improve overall sexual function, sexual desire, arousal, and sexual distress. Group-oriented interventions overall sexual functionality, sexual desire, arousal, sexual distress, satisfaction, genital-subjective sexual arousal and sexual pain, that leads to positive changes on the perception of the harmony of revealed. In addition, in studies where both individual and group-focused components were integrated into mindfulness-based CBT (PP) therapy (Hucker and McCabe 2014, Hucker and McCabe 2015), significant improvements in communication, emotional closeness and sexual affinity level were observed in the treatment group respectively. The protection of these developments in follow-up studies also proves that PP can be useful for women who report having difficulties with sexual desire, arousal, orgasm, and/or pain.

When the sample characteristics of the studies were reviewed, it was observed that some studies targeted women who had sexual dysfunction (N= 5; Brotto et al. 2012a, Brotto et al. 2012b, Hucker and McCabe 2014, Hucker and McCabe 2015, Brotto et al. 2017); women with specific sexual desire/arousal difficulties (N= 5; Brotto et al. 2008a, Brotto et al. 2008b, Brotto and Basson 2014, Brotto et al. 2006, Paterson et al. 2017) and women with vulvar vestibulitis (Brotto et al. 2015). On the other hand, one study included women who had undergone cancer (gynecological, colorectal) treatment, and

had hysterectomy for cervical or endometrial cancer; one study included women who had a high risk of ovarian cancer. These studies indicate that mindfulness-based therapies are effective on experienced problems such as general sexual function, sexual desire, arousal, satisfaction, psychological distress, which arise as a result of cancer and/or treatment. However, no definite conclusions can be made about the effect of mindfulness-based psychoeducation interventions on cancerous individuals carried out individually (e.g. Brotto et al. 2012b, Brotto et al. 2017) or group (e.g. Bober et al. 2015). It is noteworthy that none of these studies used the control group and that group and individual interventions are not studied comparatively.

Another important result from the researches examined is that compared to women without a history of sexual abuse, women with a history of sexual abuse benefit more from mindfulness-based group psychoeducation intervention and their sexual functioning has developed (Brutto et al. 2008a). Similarly, it has been observed that the compatibility between genital and subjective sexual arousal of women with a history of sexual abuse has improved with mindfulness-based group therapy rather than CBT (Brotto et al. 2012). It is known that women with a history of sexual abuse have decreased attention and the development of sexual function in relation to mindfulness can be explained by increasing arousal of attention. In addition, CBT focuses on changing irrational thoughts and emotions; in the mindfulness-based approach, it is important to accept negative thoughts and emotions rather than suppression or avoidance of them, and this approach may increase the focus of individual's attention on sexual sensations. Based on these studies, conducting randomized controlled studies in the future can provide more relevant information.

It is not possible to make any definite conclusions about which component of the interventions applied in the research discussed in the review provides more benefit to sexual function. However, it seems that the mindfulness component contributes to the treatment results. Therefore, it is possible to draw a summary of how mindfulness is integrated. In interventions, mindfulness is often first introduced by some form of meditation or body scan (Brotto and Basson 2014, Hucker and McCabe 2014, Brotto et al. 2015, Brotto et al. 2016, Paterson et al. 2017). The women's focus on a specific area of their bodies, their senses, and their subsequent mental events (e.g. thoughts, feelings, behavior) are provided to notice. Women are encouraged to perform daily body scan practices, one of the basic exercises in mindfulness-focused interventions (Brotto and Basson 2014, Hucker and McCabe 2014, Brotto et al. 2015, Hucker and McCabe 2015, Brotto et al. 2016, Paterson et al. 2017). Then, vision meditation, breathing and body focus exercises, genital region focusing on the body screening, observation exercises are given. These exercises can follow non-masturbation, touch exercises focused on recognizing genital senses (Brotto and Basson 2014, Brotto et al. 2016, Paterson et al. 2017). In later stages, more sexual-oriented mindfulness and sensory focusing exercises come into play (see Hucker and McCabe 2014, Hucker and McCabe 2015, Paterson et al. 2017). Based on this knowledge, mindfulness skills show that while directing individuals to the present experience, negative thoughts are not to be focused, but to be observed mental events.

Mindfulness-based therapies, appears to be a promising treatment for female sexual function disorders. However, more research needs to be done, and some limitations should be taken into account. Studies mindfulness implemented as both individual and group-based interventions show effectiveness, although individual and group therapy in

the treatment of female sexual dysfunction from these studies that it is more effective to reach a conclusion which it is not. For this reason, studies comparing individual and group therapy are needed in the mindfulness-based treatment of sexual dysfunction. In addition, the number of participants in the studies (ranging from 6 to 115) (e.g. Brotto et al. 2012a, Hocaloski et al. 2016) and the participants with a history of cancer (e.g. Brotto et al. 2012b, Brotto et al. 2017), or in addition, MS and SKY (Hocaloski et al. 2016) are selected from the specific population is difficult to generalize results.

In five studies in the review, (Brotto et al. 2008b, Brotto et al. 2012, Bober et al. 2015, Hocaloski et al. 2016, Brotto et al. 2017) the sample consisted of participants with medical history. Although it is known that both physical and psychological factors have serious effects on the sexual function of women in chronic diseases such as cancer and MS, it is often difficult to differentiate these factors that cause sexual dysfunctions. For example, gynecological cancer symptoms such as severe menstruation, malaise and abdominal pain affect diagnosis and pre-treatment sexual functionality (Stead et al. 2007), cancer treatment, vaginal shortening, vaginal flexibility and decrease in secretion (Bergmark et al. 1999), and sexual response, and changes in the level of stimulation and stimulation (Stead et al. 2007). In addition, it is thought that interventions such as hysterectomy (surgical removal of the uterus) may negatively affect sexual functioning because it leads to the termination of personal control over sexual identity, body functions and reproductive capacity. In addition, it was thought that emotional reactions such as depression, anger, depression and anxiety may indirectly affect women's sexuality (Brotto et al. 2008b). It has been shown that surgical menopause to prevent ovarian cancer has similarly worsened sexual function (Robson et al. 2003). Neurological consequences caused by chronic MS disease have also been seen to affect sexuality in many ways and in many levels. The neurophysiological effects of the disease caused by changing sexual satisfaction anorgasmia, and decreased biological desire was observed, while fatigue, pain, medication side effects, for reasons such as, changes in sexual function in patients can be observed. In addition, native social stereotypes on "sexuality" and "disability" are thought to cause changes in the image of the body and bring about problems related to sexuality (Ashtari et al. 2014). In summary, the effects of chronic diseases and treatment on women's sexuality should be examined from a multi-faceted perspective, both with deteriorating physiological functions and with the effects of body perception, social beliefs and psychological factors. In this context, more studies evaluating the effectiveness and applicability of interventions related to sexual dysfunction related to cancer and treatment will be carried out and a more specific examination of the sample will be carried out in future studies, including only chronic diseases.

Another point is that the studies in the review study differ from one another in methodological ways. For example, in some studies, the intervention used was evaluated by comparing the treatment group and the control group (e.g. Brotto and Basson 2014, Huckler and McCabe 2014, Brotto et al. 2015, Huckler and McCabe 2015); in some studies, only repeated measures of the intervention group were obtained (e.g. Brotto et al. 2008, Brotto et al. 2012b, Bober et al. 2015, Brotto et al. 2017, Paterson et al. 2017). In addition, there are also differences between the periods of application of mindfulness-based interventions in the studies. E.g., Paterson et al (2017) examined the effect of 8-week group therapy on treatment of sexual desire and arousal disorder, and Brotto et al (2012) evaluated a three-session mindfulness-based intervention in which each session lasted 90 minutes. In another study (Bober et al.2015) The group psychoeducation ses-

sion, which lasted 3.5 hours, was conducted and sexual function improvements were observed as a result of this intervention, which was shorter and less intensively compared to previous sexual health interventions.

In this review, only one study (Brotto et al. 2012a) was found to compare mindfulness-based treatment with different types of treatment (e.g. CBT). However, more studies are needed to compare these interventions with different types of therapies and active controls in order to say that mindfulness-based interventions in sexual dysfunctions are an effective treatment option. In addition, mindfulness-based interventions were evaluated by comparing pre- and post-treatment measurements. However, it is not possible to conclude from which of the findings of the study which combination of intervention is effective in the treatment of female sexual dysfunctions. E.g., Brotto and Basson (2014), although the results of cognitive behavioral sexual therapy have been found to be effective in the treatment of low sexual desire and arousal, it is unclear whether the intervention is associated with more mindfulness-related or cognitive-behavioral factors. In contrast, in some studies, mindfulness was reported by participants as the most effective component of treatment (Brotto et al. 2008a). However, these evaluations need to be tested with further studies that may elicit the potential mechanisms of change and the mediator and regulatory variables in the intervention. Has the treatment been effective because of common therapeutic factors? The answer to this question cannot be answered within the framework of the studies discussed in the review.

The present study is important in terms of impartially presenting the literature on mindfulness-based interventions for female sexual dysfunction. Research shows that online interventions, which are more short-term, both group and individual-oriented, come to the fore. Hence the development or adaptation of the intervention to be made in our country in the research of these features to be taken into account very common among women may contribute to the treatment of sexual problems. In addition, the factors related to the relationship and sexual function of women significantly affect the knowledge of the future studies of partners involved in the intervention will be beneficial. Mindfulness-based, more practice-based methods can increase treatment gains by experiencing applications with existing partners.

Conclusion

In general, it can be deduced that mindfulness-based therapies, which are covered differently in all studies (e.g. duration, method), are effective on different types of female sexual dysfunctions. Mindfulness based online interventions are observed to be effective in improving the level of general sexual functioning, the frequency of sexual problems and the level of sexual distress (e.g. Hucker and McCabe 2014, Hucker and McCabe 2015). Therefore, there may be a promising treatment alternative for women who are not comfortable about face-to-face therapy due to the emergence of effective mindfulness-based online therapies in the coming years, people who cannot reach treatment, or because of resistance or shame.

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