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## FEMALE SEXUAL FUNCTION

## Feasibility of a Brief Online Psychoeducational Intervention for Women With Sexual Interest/Arousal Disorder

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## ABSTRACT

**Background:** Low sexual desire and arousal are the most common sexual concerns in women, but most women lack access to effective treatment such as cognitive behavioral therapy. Web-based psychological interventions, which are economical, private, easily accessible, and potentially effective, may increase the reach of evidence-based treatment.

**Aim:** To determine the feasibility of translating cognitive behavioral therapy for the most common female sexual dysfunction, Female Sexual Interest/Arousal Disorder, into an online format. The present study examined the feasibility of an introductory psychoeducational module of *eSense*, an online program currently being developed that is based on existing empirically supported in-person treatments, which delivers content to the user in a visually appealing and interactive manner.

**Methods:** Sixteen cisgender women (*M* age = 31.9) with female sexual arousal/interest disorder worked through a pilot module of *eSense* inperson at a sexual health laboratory.

**Outcomes:** Qualitative semistructured interviews and online questionnaires were used to assess participants' experiences of usability of the platform, clarity/relevance of the content, satisfaction with the experience, and any changes in clinical outcomes of sexual function and distress.

**Results:** Participants reported a high level of satisfaction with the website's functionality and presentation. They reported greater knowledge, felt validated and more hopeful, and were eager to continue the remaining modules. Participants also reported notable prepost improvements in sexual desire, arousal, and satisfaction.

**Clinical Implications:** Initial user-experience assessment may represent a method of simultaneously improving online interventions and providing therapeutic education to participants.

**Strengths & Limitations:** This is one of the first studies, to our knowledge, to test a graphics-rich, interactive online intervention for sexual difficulties that does not require direct contact with expert providers or support groups. Limitations include the high level of education, motivation, and technical fluency of the sample and the potentially confounding effect of the researcher's presence during interviews. Because this was a feasibility study, the sample size was small, and no control group was included, limiting conclusions about efficacy and generalizability.

**Conclusion:** The format of *eSense* appears to be feasible and usable, lending support to the growing evidence that it is possible to take in-person therapeutic interventions online. **Zippan N, Stephenson KR, Brotto LA, Feasibility of a Brief Online Psychoeducational Intervention for Women With Sexual Interest/Arousal Disorder. J Sex Med 2020;17:2208–2219.**

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**Key Words:** Psychoeducation; CBT; Female Sexual Dysfunction; Sexual Interest/Arousal Disorder; Internet Interventions; Online Therapy; eHealth; Telehealth

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## INTRODUCTION

Female sexual dysfunction (FSD; frequent and long-lasting problems in the areas of desire, arousal, orgasm, or pain, accompanied by clinically relevant levels of personal distress<sup>1</sup>) may affect of up to 20% of women worldwide.<sup>2,3</sup> FSD is thought to be caused by interdependent biopsychosocial factors<sup>4</sup> and is associated with outcomes such as depression, emotional distress, interpersonal conflict, worse physical health, and reduced quality

of life.<sup>4–6</sup> The most common subtype of FSD is problems with sexual desire/arousal, delineated in the fifth edition of the Diagnostic and Statistical Manual of Mental Disorder (DSM-5)<sup>1</sup> by Female Sexual Interest/Arousal Disorder (FSIAD). 15–30% of women across age ranges report low sexual desire and arousal.<sup>7–9</sup>

Psychosocial interventions have generally been found to improve sexual function in women.<sup>5,10,11</sup> 2 methods have received the most consistent empirical attention and support: cognitive behavioral therapy (CBT) and mindfulness-based therapy (MBT). CBT for sexual dysfunction can include cognitive restructuring, systematic desensitization, exposure, behavioral activation, communication skills training, sensate focus, directed masturbation, the use of vibrators, and working with sexual fantasies.<sup>5,12</sup> MBT for FSD includes guided meditations meant to increase women's awareness and acceptance of their thoughts, feelings, and sensations related to sexual activity, their bodies, and sexual response.<sup>13</sup> Both CBT and MBT have been shown to improve female sexual response and well-being in a number of studies.<sup>14–18</sup>

Although CBT and MBT are likely efficacious interventions for FSD, most women who could benefit from these treatments do not receive them. Indeed, multiple studies have suggested that only 19–32% of women with sexual concerns receive any professional help<sup>8,19–21</sup> and quality of treatment can be inconsistent. Barriers include emotional factors (ie, anxiety, embarrassment, stigma) as well as cost, geographical location, and/or lack of available expertise.<sup>22–24</sup> One method of addressing many of these barriers is to translate existing treatments so they can be delivered primarily or entirely online.

Online therapeutic interventions have been developed and tested for a wide range of mental health concerns,<sup>25,26</sup> and research generally supports their efficacy.<sup>27,28</sup> Users are typically guided by automated programs to engage in therapeutic activities, with level of therapist involvement ranging from none, to minimal contact, to on-demand support via phone or e-mail.<sup>29</sup> Computer-aided psychotherapy can reach people who might otherwise not receive assistance, overcoming many traditional barriers to care. It is increasingly becoming a regular care option when demand for help exceeds affordable supply<sup>30</sup> and can be essential during public health emergencies that limit face-to-face contact such as the COVID-19 pandemic of 2020. It can be used either as a stand-alone intervention or to augment traditional sex therapy, for example, by providing additional resources and structure for at-home practice. For all these reasons, web-based treatment may be well suited to sexual problems.<sup>31–34</sup> In addition, online programs allow expertise from a small number of sex therapists to be widely disseminated at a low cost (and updated as knowledge advances). This is particularly relevant as sex therapy is a specialty rarely pursued by mental health professionals.<sup>24</sup>

Initial studies have suggested that online treatment may be a viable adjunct or alternative to traditional sex therapy for both female and male sexual dysfunction in some cases.<sup>35–37</sup> The

earliest studies in this area assessed treatments involving simple translation of the therapeutic relationship to e-mail.<sup>38,39</sup> More recent research has focused on self-guided interventions housed on a website. For example, Jones and McCabe<sup>32</sup> created the *Revive* program to treat FSD using cognitive behavioral tools. The program included communication skills training, sensate focus exercises, and e-mail contact with a therapist. *Revive* significantly improved sexual functioning and relationship satisfaction vs a wait-list control group.<sup>32,40</sup> A second study assessing the program also found significant reduction in frequency of sexual difficulties and reduction in associated distress.<sup>31</sup> A subsequent program from the same research team, *Pursuing Pleasure*, was the first to combine Internet-based CBT, mindfulness training for FSD, and online chat groups.<sup>36</sup> Women who completed the program reported significant improvements in sexual function, emotional intimacy, and communication with partner (vs a wait-list control group).<sup>36</sup>

These studies highlight the promise of online programs for FSD. However, there are still questions in this area that remain unanswered. For example, most of the studies in this area have included direct online contact with expert licensed providers and/or chat rooms for participants to communicate with one another. However, both of these options can be problematic. Communication with an expert provider necessitates their availability, which can increase cost and reduce access. Chat rooms require multiple women to engage in direct communication, possibly maintaining barriers for individuals with high levels of embarrassment and/or those with limited availability owing to scheduling constraints or inconsistent Internet access. Recent research on online interventions in other areas of psychopathology has suggested that direct communication with experts and/or support chat groups may be unnecessary for a program to demonstrate efficacy. In fact, contact with a non-expert “coach” or “navigator” may be sufficient.<sup>26,28,30,41,42</sup>

In addition, past programs in this area have consisted primarily of text (M. McCabe, personal communication, May 3, 2017). However, modern online platforms create the potential to maximize engagement and impact through the use of multimedia and interactive activities in instructional design. Previous research has suggested that the use of images and videos can optimize the delivery of such programs.<sup>43–45</sup>

To explore these issues, an online program called *eSense* was created to deliver evidence-based psychotherapeutic content to women with sexual concerns. *eSense* includes text, images, video clips, and other engaging content and does not require direct contact with licensed providers or use of chat rooms. The first phase of this work entailed feasibility testing of an introductory segment of the program that included current psychoeducational content about FSD. A small sample of women who were identified as meeting the DSM-5 criteria for FSIAD interacted with this module while “thinking aloud” in real time regarding their experience.<sup>46</sup> This process had the potential to achieve multiple goals simultaneously:

A



eSense



COGNITIVE-BEHAVORIAL THERAPY



**Treatment for sexual dysfunction: Cognitive Behavioral Therapy**

Now that we have covered some of the important background on how common sexual concerns are and what the main causes are, we can turn our attention to treatment. The approach used here is called Cognitive Behavioral Therapy (CBT). You may have heard of CBT before as it is a popular treatment approach for anxiety and depression.

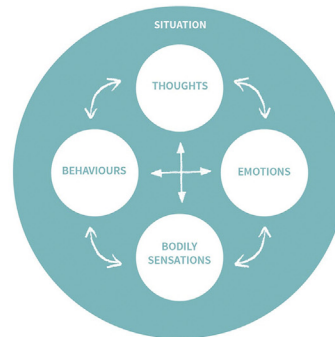
**CBT rests on two basic ideas:**

**1. Emotions and behaviors are caused by our thoughts and how we interpret the world around us (not necessarily what is objectively happening).**

When our interpretations are inaccurate or unhelpful, we often experience distress, and can start engaging in behaviors that seem like a good idea in the moment, but can actually make the problem worse in the long run.

An example would be a fear of public speaking due to a concern that others will judge you negatively.

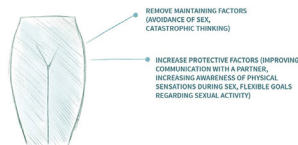
As a result of that fear, you may avoid all public speaking invitations. As a result, you do not benefit from practice in public speaking. Eventually, when you "give in" and speak publicly, you trip over your words (due to lack of practice), and seem to confirm your original beliefs that you are a terrible public speaker.



**HOW TO PUT OUT A FIRE**



**HOW TO RESOLVE SEXUAL PROBLEMS**



**2. Unhelpful emotions are maintained by current thinking patterns and behaviors (regardless of how they started in the past).**

In other words, if you can disrupt or change psychological and behavioral processes in the present, the problem will tend to naturally fade on its own. This idea means that it's not essential to know exactly what caused the problem in the first place to effectively treat it in the here and now. Instead, it's essential to understand the perpetuating factors.

A useful metaphor is to think about how you would put out a fire. You can't go back in time and stop the fire from happening in the first place. It's already burning, so energy spent investigating the initial cause probably won't help you put it out. What you can do is deprive it of fuel (e.g., wood/oxygen). In other words, you can remove the perpetuating factors. At the same time, you can spray it with water. In other words, you could increase protective factors.

In the same way, CBT for sexual difficulties focuses primarily on current thoughts ("cognitions") and current behaviors that women engage in that keep sexual problems locked in place. You're probably starting to see how the Cognitive Behavioral Model of sexual problems ties in here. This model identifies the perpetuating factors that can be addressed by treatment.

< PREV

NEXT >

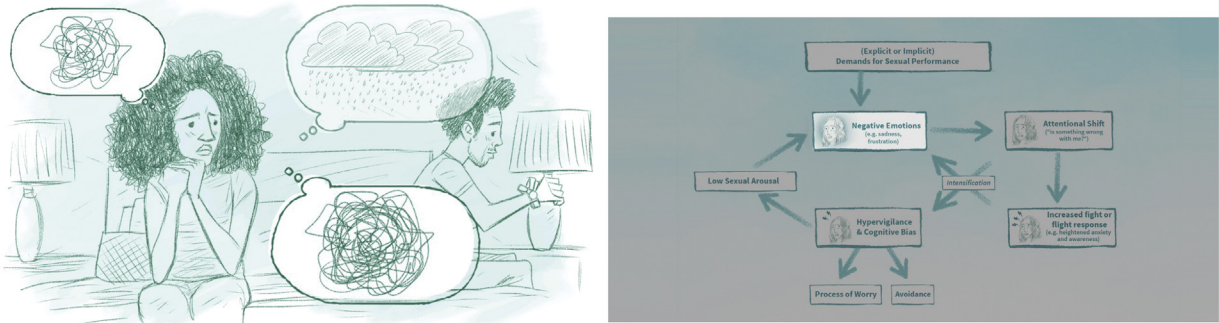
Figure 1. Screenshots of eSense. Figure 1 is available in color online at [www.jsm.jsexmed.org](http://www.jsm.jsexmed.org).



**B**

← eSense

Then, you may start feeling negative emotions like anxiety, frustration, or sadness.  
You expect that sex will go badly, and feel powerless to make things go better.



Humans usually focus on what we expect to see (you've probably heard the phrase "self-fulfilling prophecy"). In other words, your attention is likely to be drawn to things that line up with your expectations.  
So, if you're expecting sex to go poorly, you'll probably be on high alert for any sign that things going poorly. Focusing on the potential negatives will make them stand out even more.

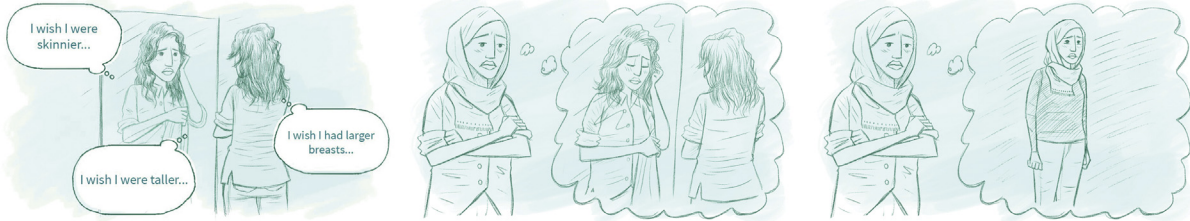
PREV are a lot of things that could draw your attention in this way. For example, you may not be feeling as aroused as you hoped you would be, so you fo NEXT >

**C**

← eSense

# PREDISPOSING FACTORS

Shelina has always struggled with poor body image. She has internalized standards of beauty from the media, which makes her feel unattractive.  
Shelina was also sexually abused as a child. This experience made her uncomfortable with her own sexual response, and it created a negative association with sex.  
Shelina has been cheated on in the past, which has contributed to negative beliefs about herself as a partner.



All of these factors working together put Shelina at higher risk for sexual dysfunction. This risk was then "activated" by precipitating factors.

PREV NEXT >

Figure 1. (continued).

1. Assess the functionality of the online platform.
2. Assess the feasibility of providing treatment using the online platform.
3. Assess the relevance and clarity of the content while gathering valuable user feedback.
4. Assess User Satisfaction and Possible Therapeutic Impact.

We predicted that users would find the platform relatively easy to navigate, that the content would be rated as clear and relevant, and that participants would report improvements in sexual function, satisfaction, and distress after using the first *eSense* module.

## MATERIALS AND METHODS

### Module Content

Content was adapted from existing in-person treatments developed over numerous in-person focus groups and studies including women with FSD over the last 15 years,<sup>14,16,47</sup> as well as from literature reviews.<sup>48–50</sup> Material was organized and rephrased for online delivery (eg, shorter sentences, defining or replacing technical terms, providing concrete examples), and fictional case studies were created to illustrate concepts.

The *eSense* website was built using an eLearning platform designed by instructional, graphic, and web designers for

maximum usability and visual appeal. The layout optimized readability and comprehension, with language at a high-school reading level. Text was interspersed with pictures, diagrams, videos, and moving graphics (ie, GIFs) to keep users engaged (see [Figure 1](#)). The focus in the present study was on the first module that provided education and an introduction to the general rationale of treatment. The full 8- module includes additional cognitive behavioral content, including guidance to engage with focused cognitive restructuring, behavioral experiments, and so on.

For users, *eSense* began with an introductory video from one of its creators, an outline of the entire program, and what was expected of participants. The first module, “Definitions and Causes of Sexual Dysfunction,” included an introduction to sexual function, causes of sexual dysfunction, theoretical models of sexual dysfunction (Basson<sup>50</sup> and Barlow<sup>51</sup>), and a brief overview of CBT treatment for FSD.

### Participants

Participants were recruited from the laboratory’s in-house registry of women who provided consent to be contacted for future studies, as well as those who had seen the study advertised online. Inclusion criteria encompassed cis-gendered women and trans-gendered women aged 19–65 years who appeared to meet

**Table 1.** Semistructured interview questions and Likert items regarding usability of e-Sense (in-laboratory session)

Factor	Interview questions
Overall impressions of treatment section	<i>What were your overall impressions of the content you just covered?</i> <i>What content did you find most interesting?</i> <i>Was there any content that you found uninteresting or unhelpful?</i>
Relevancy of content	<i>To what extent do you think this content addressed issues relevant to you and women with similar problems?</i> <i>What areas do you think were covered particularly well?</i> <i>Were there any areas you thought were not covered well or anything that should have been included that was missing?</i>
Organization of content	<i>Did the order of topics make sense? Is there anything you would change?</i> <i>How would you rate the overall organization of content?</i> 1 – extremely confusing; 10 – extremely clear and logical
Website functionality	<i>Was it easy to navigate within and between pages? Did you experience any difficulties?</i> <i>How would you rate the ease of navigating the website?</i> 1 – extremely difficult or impossible; 10 – extremely easy <i>Did you notice the videos, moving images and pictures? Were they relevant? Were they helpful? Were they distracting?</i> <i>Did you like the look of the site? Did it feel appropriate to the subject matter? Is there anything you would change about the website?</i>
Clarity of homework instructions	<i>How clear were the instructions for homework assignments?</i> 1 – extremely confusing and unclear; 10 – extremely clear and helpful <i>Do you have any additional questions about the assignments?</i>
Learning and final feedback	<i>Is there anything you have learned from eSense that you did not know before? If so, what did you learn?</i> <i>Is there anything I haven’t asked you about that you would like me to know about your experience with eSense so far?</i>

criteria for FSIAD, having 3 or more of the following symptoms with significant clinical distress, for a period of 6 months or more: reduced or no interest in sexual activity; lack of sexual thoughts or fantasies; lack of initiation and receptivity to sexual activity; reduced or no sexual pleasure during sexual activity; inability for sexual stimuli to trigger desire; and impaired or absent physiological arousal during sexual activity.<sup>1</sup> In addition, as per the DSM-5 criteria, participants had to self-report that their symptoms were not attributable to severe relationship conflict, significant stressors, a non-sexual mental disorder, the effects of a substance or medication, or to another medical condition.<sup>1</sup> Participants had to be fluent in English, have consistent access to the Internet, and possess basic competency in using online platforms (all self-assessed).

Asexuality was an exclusion criterion given that, by definition, asexuality is not a sexual dysfunction.<sup>1</sup> Women with provoked vestibulodynia or vulvodynia were also excluded, along with those whose low desire was largely or fully accounted for by their pain. However, those with comorbid self-reported vulvovaginal atrophy were included given that it is a common condition among perimenopausal and postmenopausal women. Participants also could not have any visual impairments or disability that would make it difficult for them to read and interact with online materials.

Of 44 potential participants, 19 candidates met criteria, and 17 of these completed consent forms and were scheduled for laboratory sessions. We predicted that we would reach saturation of themes in terms of qualitative feedback (ie, no new problems regarding usability identified) after approximately 8–10 participants.<sup>46</sup>

## Measures

### Quantitative Measures

The pretest baseline measures included a demographics questionnaire, the Female Sexual Distress Scale-Revised<sup>52</sup> and the Female Sexual Function Index,<sup>53</sup> of which desire and arousal subscales, as well as a single item from the satisfaction subscale, were selected as the primary outcomes of interest. We focused on the satisfaction item—“How satisfied have you been with your overall sex life?”—given that this item did not depend on the presence of a sexual partner.

The post-test questionnaires included the Female Sexual Distress Scale-Revised, the Female Sexual Function Index subscales, and items aforementioned (with modified instructions to rate sexual experiences over the previous week). In addition, a selection of items from the Erectile Dysfunction Inventory of Treatment Satisfaction scale,<sup>54</sup> adapted for use with a female sample, and a selection of items from the Homework Rating Scale<sup>55</sup> were included to assess participants' satisfaction with the intervention and experience with homework assignments.

### Qualitative Measures

After completing the module, a post-intervention face-to-face interview was conducted with participants. The interview included open-ended questions about the website as a whole, as well as specific questions and (verbally assessed) Likert scale items about its content, relevancy, clarity, organization, aesthetics, navigation, and functionality (see Table 1). One week later, after participants had completed the recommended homework exercises, they took part in a second telephone-based interview with the same researcher. Interviewees were asked to rate the clarity and difficulty of the homework, as well as indicate whether anything might make it easier to accomplish. They were also asked what content they found most memorable, whether they were doing anything differently as a result of participating in the study, what the most important takeaway was, and if they had any final suggestions for improvement.

### Procedure

Potential participants were scheduled for a 20-minute phone screen to determine their eligibility and were asked to abstain from any other treatment for their sexual difficulties for the timeframe of the study. If the interviewee met all eligibility criteria, she was sent a link to complete the preintervention measures online via Research Electronic Data Capture and booked for a laboratory session.

Usability sessions averaged 2 hours in duration—approximately 90 minutes to navigate through the *eSense* module and 30 minutes for the interview. The study coordinator sat in the room with the participant in a non-obtrusive location, explaining that her task was to record any issues with the Website and its content, which users were asked to report in real time. Owing to the sensitive nature of the content, participants were also given the choice at the start of the session to work through the intervention on their own if they preferred (2 chose this option). Afterward, participants completed the semi-structured interview with the researcher (see Table 1).

Participants were then sent home with a user login to *eSense* and instructed to complete 3 homework assignments within the following week. A week later, participants completed a 10-minute follow-up phone interview with the researcher. In addition, they were sent a link to complete the same validated measures from preintervention again at postintervention.

Participants were compensated \$10 for answering the baseline questionnaire, \$10 for the single in-laboratory session, and \$5 for answering the postintervention questions (\$25 total). Participants were also promised free access to the full *eSense* program upon completion. This study was approved by the Behavioral Research Ethics Board at the University of British Columbia as well as the Vancouver Coastal Health Research Institute research ethics board.

**Table 2.** Participant Demographic Information

Characteristics	<i>N</i> = 17
Age ( <i>M</i> , <i>SD</i> )	31.94 (7.30)
Gender identity ( <i>N</i> , %)	
Woman	15 (88.2%)
Non-binary	1 (5.9%)
Prefer not to answer	1 (5.9%)
Sexual orientation ( <i>N</i> , %)	
Heterosexual	7 (41.2%)
Bisexual	6 (35.3%)
Demisexual	2 (11.8%)
Pansexual	1 (5.9%)
Other	1 (5.9%)
Self-identified ethnicity ( <i>N</i> , %)	
Arab	1 (5.9%)
Chinese	3 (17.6%)
Hispanic/Latina	2 (11.8%)
Indigenous (First Nations)	1 (5.9%)
South Asian	1 (5.9%)
Caucasian	10 (58.8%)
Education ( <i>N</i> , %)	
Attended some college	2 (11.8%)
Graduated 2-y college	2 (11.8%)
Graduated 4-y college	5 (29.4%)
Postgraduate degree	8 (47.1%)
Occupational status ( <i>N</i> , %)	
Employed full-time	11 (64.7%)
Employed part-time	4 (23.5%)
Self-employed	4 (23.5%)
Unemployed	2 (11.8%)
On disability	2 (11.8%)
Student	2 (11.8%)
Religious affiliation ( <i>N</i> , %)	
None	11 (64.7%)
Christian (Protestant)	2 (11.8%)
Christian (Catholic)	2 (11.8%)
Muslim	1 (5.9%)
Other	1 (5.9%)
Relationship status ( <i>N</i> , %)	
Single	4 (23.5%)
Dating	2 (11.8%)
Married	7 (41.2%)
Common-law	4 (23.5%)
Other	1 (5.9%)

## RESULTS

### Demographic Information

The final sample consisted of 17 participants (Table 2) with an age range of 23–54 years ( $M = 31.94$ ,  $SD = 7.30$ ). One participant did not attend her session after completing baseline measures, and one did not complete the quantitative post-test measures (but did complete the postintervention interview). Half of the sample (8 of 16) reported having received unwanted sexual contact, 7 of them (90%) as an adult, and 3 (40%) as a child.

### Quantitative Results

For ease of interpretation, we present the median score of each item of the Erectile Dysfunction Inventory of Treatment Satisfaction Scale utilized (ie, can interpret the integer as a specific typical response). Overall satisfaction was rated as a 4/5 (“somewhat satisfied”), intervention meeting expectations was rated 3/5 (“halfway”), likelihood of continuing to use the intervention was rated 5/5 (“very likely”), and ease of using the intervention was rated 4/5 (“moderately easy”).

### Assessment of Homework

For ease of interpretation, we present the median score of each item of the Homework Rating Scale used. Participants reported attempting “all” homework assignments on average (5 of 5) and rated the quality of their work on assignments as “very good” (4 of 5). Assignments were rated as “somewhat difficult” (2 of 5), obstacles were reported to have interfered “somewhat” with assignment completion (2 of 5), and participants “very” much understood the instructions (4 of 5). The rationale for the assignments was rated as “very” clear (4 of 5), guidelines for assignment completion were rated as “very” specific (4 of 5), and match with the overall goals of the intervention was rated as “very” good (4 of 5). Participants “moderately” enjoyed the assignments (3 of 5), and the assignments “somewhat” or “moderately” helped them gain a sense of control over their problems (2.5 of 5).

### Pre-post Changes in Sexual Desire, Arousal, Distress, and Satisfaction

Repeated measure analyses of variance were used to assess pre-post changes in outcomes. Given the small sample and low statistical power, the primary results of interest were indices of effect size (partial eta squared and Cohen’s  $d$ ). For each factor of interest, 2 models were assessed. In the first, only data from participants who provided responses at before and after intervention were included (ie, completer analysis). In the second, pre-intervention scores were carried forward for participants who did not provide post-intervention responses (ie, intent-to-treat analyses).

Descriptive statistics of variables and model results can be found in Table 3. Sexual desire and distress exhibited improvements with moderate effect sizes ( $d = 0.41 - 0.74$ ). As expected, based on the small sample, these changes were not statistically significant. However, sexual arousal and sexual satisfaction exhibited improvements with large effect sizes ( $d = 1.15 - 1.77$ ), and these changes were statistically significant ( $P < .05$ ). The pattern of results did not differ between completer and intent-to-treat analyses.

### Qualitative Responses

Qualitative feedback on the intervention was organized by 6 factors: (i) overall impressions of the intervention; (ii) relevancy of content; (iii) website functionality; (iv) organization of



**Table 3.** Pre-intervention (Pre) and post-intervention (Post) measures of sexual desire, arousal, distress, and satisfaction

Variable	Pre		Post		F (df)	p	$\eta^2$	Cohen's d
	M	SD	M	SD				
Sexual desire	3.53	1.91	3.75	1.77	2.05 (1, 15)	0.17	0.12	0.74
Sexual desire ITT			4.12	2.29	2.04 (1, 16)	0.17	0.11	0.7
Sexual arousal	10.81	4.37	13.11	5.04	6.24 (1, 8)	<b>0.04</b>	0.44	<b>1.77</b>
Sexual arousal ITT			12.31	5.17	4.91 (1, 15)	<b>0.04</b>	0.25	<b>1.15</b>
Sexual distress	31.35	9.01	29.38	8.78	0.63 (1, 15)	0.44	0.04	0.41
Sexual distress ITT			29.82	8.70	0.63 (1, 16)	0.44	0.04	0.41
Sexual satisfaction	1.88	0.93	2.56	1.15	7.74 (1, 15)	<b>0.01</b>	0.34	<b>1.44</b>
Sexual satisfaction ITT			2.71	1.26	7.54 (1, 16)	<b>0.01</b>	0.32	<b>1.37</b>

ITT = intent-to-treat.

Bolding indicates effects that were statistically significant.

Possible ranges: sexual desire, 2–10; sexual arousal, 4–20; sexual distress, 0–52; sexual satisfaction, 1–5.

Data presented are means and SDs.

content; (v) clarity of homework instructions; and (vi) learning. Follow-up qualitative feedback was organized by 3 factors: (i) clarity and ease of homework; (ii) personal changes; and (iii) memorable content and suggestions for improvement. The data will be presented as per these factors, and names have been changed to preserve confidentiality.

### Overall Impressions of the Intervention

The most frequent feedback given was that *eSense* was well produced, comprehensive, informative, and helpful. One participant commented that it covered the “complexity of what it is to be a sexual female.” Another woman stated that the program facilitated discussion with partners, removing “some of the educational load from you as an individual.”

Some of the participants were already familiar with the content but said that *eSense* helped to organize and reframe it. One participant said that having scientific terms to explain how she was feeling, with “approachable explanations and real-life examples” was very helpful; it “unlocked everything she knew, but didn’t *know*.”

The case studies resonated for almost all of the women ( $n = 15$ ), who saw different aspects of their experience represented. Some commented that the portrayals were very inclusive (eg, included women of different ages, ethnicities, and sexual orientations).

In terms of user experience, participants said that *eSense* was nicely designed, interactive, and easy to navigate, with one commenting: “I liked how it seemed friendly and fairly upbeat considering the heavy nature of the subject.”

Overall, women found the module affirming and reassuring, as well as therapeutic. Many said it helped them feel that they were not alone: “Just hearing that you can be a very sexual person, and have that change drastically, was valuable.” Most participants stated that it was as if the creators personally knew them and their particular issues.

### Relevancy of Content

#### Areas that Were Covered Well

Almost all participants stated that the content was very comprehensive and highly relevant. Users also said that the content was extremely clear. One participant said that she felt like she was “being taught, rather than told.”

#### Areas that Were Not Well Covered or Missing

Very few women thought that anything was missing. However, 2 participants felt that adult sexual trauma should have been included in the case studies, as well as more depictions of younger and unpartnered women. Also mentioned was more inclusion of partners as a factor, so a woman does not feel that it is “just her problem.” One heterosexual participant said that it would be good to address “ways in which men are unconsciously perpetuating (FSD):” those who are not “bad partners” but still might be “part of the problem.”

### Organization of Content

All participants said that the order and flow made sense, that each section built off the last, and that the organization aided in comprehension. The summaries at the end were cited as useful. One participant noted that it “broke things down in a very meaningful, thoughtful way.” On average, women rated the overall organization of the content at 9.09 of 10.

### Website Functionality

Participants experienced a few technical issues with graphic load times and some reload errors. However, these technical problems did not prevent them from completing the module.

#### Ease of Website Navigation

All participants ( $n = 16$ ) reported that *eSense* was easy to navigate and very well designed. Suggestions to improve

navigation included the addition of a progress bar and for the navigation buttons at the bottom of each page to be bigger or clearer. The average rating for ease of navigating the website was 8.94 of 10.

#### Feedback on the Value of the Graphics

Most participants felt that the visuals added value to the content, except in the case of the moving graphics, which most users found distracting. One participant said that providing visuals of the women's stories "helped to get the story across as well as allowing (users) to see themselves in it." A few of the women ( $n = 3$ ) said that they would have liked more video content to further explain what was written.

#### Aesthetics and Suitability of Site Appearance

All of the women said that they liked the look of the site, that it was comfortable and inviting, and appropriate to the subject matter. Comments included that it was "clean and professional but not totally corporate," "not too sterile or medical textbook," and "welcoming" rather than clinical. Participants liked the color scheme, citing that it was soothing, positive and "not hyperfeminine."

#### Homework Instructions

The average rating for clarity of the homework instructions was 9.13 of 10. Very few women had additional questions.

#### Learning and Additional Feedback

Most participants were unfamiliar with the content and learned a great deal. Many were heartened to know that sexual desire is not spontaneous for many women. Some participants ( $n = 5$ ) mentioned that having the vocabulary to explain what they were experiencing was valuable. Participants also appreciated the privacy of being able to do it on the computer at home, rather than going to couples' counseling and having a third party "hear all your dirty secrets." 2 participants said that they would like to have been able to discuss the content with other people through the intervention, either peers or clinicians. And, 2 others asked for content around how to deal with their partners, particularly if their partners also had sexual problems.

#### Post-homework Feedback

##### Clarity and Ease of Homework

The average Likert rating for clarity of presentation of homework assignments was 8.06 of 10, and the average rating for difficulty was 8.82 of 10. The main issue cited was finding the time to do it. Participants were also asked if there was anything that would make the homework easier to accomplish or more helpful. 2 participants said that they would have liked to have a navigator to follow up with for accountability or guidance, particularly because they found some of the content distressing.

#### Personal changes

Most participants said that *eSense* helped them to feel more normalized, affirmed, validated, confident, and encouraged. Some said that their distress lessened because they no longer felt like their sexual issues were their fault. A few women cited a change in their mindset as the biggest difference:

My attitude has improved and I am telling myself more positive things like "this is okay" and "my situation can improve." So I am not exactly "doing" anything differently, but I am thinking differently and in a more positive and healthy manner than before. (Sarah, age 33 years)

In terms of more concrete changes, one participant said that *eSense* spurred her to finally follow up with some counseling referrals, whereas others said that they were able to be more open and playful with their sexual partners. A few of the women said that *eSense* enabled them to share their sexual difficulties with their partners, so that addressing issues might be more of a "team effort."

## DISCUSSION

The overall goal of the present study was to assess the feasibility and usability of the pilot module of *eSense*: a new online intervention for women with FSIAD. All participants found *eSense* to contain valuable information that was highly relevant, and suggestions for changes to content were very minor. Qualitative feedback highlighted feelings of normalization, gratitude for treatment, a greater sense of self-efficacy, reduction of distress, and increased optimism. Thus, the pilot module was found to be highly feasible. The most notable difficulty reported by participants was having limited time in which to complete the homework, with a small number also requesting individualized guidance.

Quantitative results suggested pre-post improvements in sexual function and distress. Although formal hypothesis testing was considered exploratory given the small sample size and low statistical power, the fact that there were large changes in sexual arousal and satisfaction, and that these changes attained statistical significance, is notable. The few studies that have formally assessed the impact of psychoeducation suggest that it may be a helpful adjunct to other treatments.<sup>56–58</sup> The current results provide tentative evidence that it may even have some impact as a stand-alone intervention. If these beneficial effects are replicated, such content might serve as a useful active control in future research.

Although the current findings are a first step in an ongoing line of research, they do have a number of implications in and of themselves. First, they replicate previous research<sup>31,32,59</sup> suggesting that it is possible to translate existing, effective, face-to-face treatments for FSD and deliver them online, enabling them to reach many more women at low cost. It is also noteworthy that, although a few of the women said that contact with

a treatment navigator would be useful, all participants felt they were able to understand (and benefit) from relatively dense content (including theoretical models of sexual dysfunction and complex topics such as sexual schemas and gene-environment interactions) on their own. Although these results require replication, they indicate that online treatment for FSD may be helpful in some cases, even without the guidance of a licensed therapist. These results mirror past research on self-help interventions for sexual dysfunction,<sup>60–62</sup> as well as a growing body of literature from other areas of mental health.<sup>27,63–66</sup> Future studies will be needed to assess the relative effects of such interventions with and without support by both experts and non-experts (eg, how much additional benefit is provided by direct contact with a sex therapist?), along with the relative cost-effectiveness of these different approaches.

The present study had a number of important limitations. First, as in similar studies,<sup>16,32</sup> some of the positive outcomes may be attributed to the motivation of the sample and associated placebo effect, rather than the specific content of the intervention delivered. Simply knowing there was a treatment, increased hope, and destigmatization may have been non-specific beneficial factors. Participants had also suffered for some time with their sexual issues (an average of 6 years) and were highly motivated, which may not be representative of the broader population of women with FSD. In addition, the presence of a researcher who was able to answer questions and listen with empathic concern may have also contributed to observed improvements in clinical outcomes (and socially desirable responding, for the qualitative data).

The sample was also highly technologically fluent, which may have contributed to their ease in using eSense. Some additional steps (eg, having technical support for the initial sessions) may be needed for users with less technological acumen. Third, the sample was very well educated, all of them having completed some postsecondary education, and half of them with a postgraduate degree, possibly limiting our ability to evaluate the suitability of content for the average reader or those from lower socioeconomic backgrounds. Given the requirement that women attend the in-laboratory session, this advantaged women who were located in a large metropolitan center and able to commute to our laboratory. Finally, it is important to note that treatment outcomes may differ for those with comorbid psychological disorders,<sup>67</sup> and this population was not well represented in our sample.

## CONCLUSIONS

Despite these limitations, the present study was a promising first step in a larger line of research. An initial module of eSense seems clear, usable, and helpful. Our results suggest that, in the course of creating more accessible treatments for FSD, it may be useful to adopt methodology used in the broader area of online programs, including iterative feedback from potential users.<sup>68,69</sup> Such methods of treatment translation can be helpful in quickly

identifying usability issues of online platforms, as well as clarity and relevance of content. While providing useful feedback, participants in such research may also experience some therapeutic effects—a clear win-win for both clinical scientists and research volunteers.

More broadly, while traditional, face-to-face treatment facilitated by expert sex therapists is ideal, it is clear that more scalable and accessible options are needed. Such options may be of particular importance during public health crises that further limit access to traditional treatment. Our findings, along with other research across the field of clinical psychology,<sup>70,71</sup> suggest that high-quality self-guided programs may not require direct expert guidance to elicit some benefit. If such programs produce even a fraction of the effects of traditional therapeutic methods, they could have a significant impact across the population of women experiencing FSD.

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## STATEMENT OF AUTHORSHIP

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