Feasibility and Acceptability of a Web-Based, Gender-Specific Intervention for Women with Substance Use Disorders

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Abstract

Background: Women face unique issues related to their substance use. Treatment programs that incorporate gender-specific components can lead to enhanced outcomes for women with substance use disorders (SUDs). Nevertheless, most women receive treatment in mixed-gender SUD treatment programs that lack women-specific components. Programs cite lack of expertise and staff time as barriers to providing gender-specific care. Leveraging technology can address some of the challenges of providing gender-specific care in a mixed-gender setting by offering an accessible, cost-effective alternative to in-person services.

Materials and Methods: We developed a gender-specific, web-based, psychoeducational intervention for women with SUDs as an addition to treatment as usual in a mixed-gender SUD treatment program. Next, we examined the feasibility and acceptability of this single-session intervention in a prepilot study with 30 women with SUDs. Based on these data, we refined the intervention and tested feasibility and acceptability with 60 women with SUDs.

Results: Participants indicated a high level of satisfaction with the intervention. Satisfaction did not significantly differ by level of care (inpatient, partial hospitalization, or outpatient) or age, and was not associated with the number of previous treatment episodes. Participants highlighted the importance of addressing co-occurring disorders, trauma, and sexual abuse in SUD treatment for women.

Conclusions: Women in this study found this web-based gender-specific intervention relevant regardless of their previous experience in treatment. Delivery of this intervention is feasible and has the potential to be a highly sustainable strategy for increasing exposure to gender-specific SUD components of care.

Keywords: women, substance use disorders, technology, gender-specific

Introduction

THERE ARE SIGNIFICANT sex differences in the epidemiology, physiology, and treatment course of substance use disorders (SUDs).¹⁻⁴ Given these differences, there has been a growing interest in gender-specific treatment for women with SUDs.⁵ The term “gender-specific” refers to treatment that incorporates factors that are more prevalent in women that may affect their treatment outcomes, including trauma, co-occurring psychiatric disorders, relationships with children and intimate partners, and physical health issues.^{6,7}

The literature on gender-specific treatment is mixed. Quasiexperimental research has found that compared with mixed-gender treatment, single-gender treatment for women with SUDs is associated with lower criminal activity and incarceration,⁸⁻¹⁰ lower rates of substance use,^{9,11} and increased continuity of care following discharge.¹² Of note, single-gender treatment may not necessarily include gender-specific program elements beyond the women-only environment, and some evidence suggests that a single-gender environment in the absence of gender-specific content is not sufficient to affect treatment outcomes for women.¹³

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Randomized controlled trials (RCTs) have examined gender-specific treatments for subpopulations of women with SUDs, including, women with co-occurring disorders,^{14,15} women in the criminal justice system,¹⁶ and women with children.¹⁷ The majority of these studies have been small pilot studies with a standard treatment comparison group,^{15–17} with only one study finding an effect of the treatment on substance use.¹⁷ Larger RCTs have compared gender-specific treatment with gender-focused psychoeducation¹⁴ and gender-neutral treatment,¹⁸ with both studies finding equivalent substance use outcomes for treatment and control groups.¹⁸

The only study that has not focused on a subpopulation of women is the Women's Recovery Group (WRG) study. The WRG is a gender-specific group treatment for women with SUDs designed for women heterogeneous with respect to their substance of use, and demographic and clinical characteristics, to reflect the diverse characteristics of treatment-seeking women with SUDs.¹⁹ The WRG was examined in two RCTs (a stage I and a multisite stage II trial)^{20,21} in comparison with mixed-gender group drug counseling (GDC). In both trials, women in the WRG and GDC demonstrated clinically relevant reductions in substance use after 12 weeks of group treatment.^{20,21} In the stage I trial, only the women in the WRG continued to show these reductions in substance use 6 months posttreatment.²⁰

A review of SUD treatment programs in the United States found that only 31% have gender-specific components.²² Women-only treatment programs are more likely to include gender-specific components^{6,23}; however, these programs are limited in number, and the majority of women receive treatment in mixed-gender settings.^{5,24} To address this important issue, the Substance Abuse and Mental Health Services Administration (SAMHSA) created recommendations for including gender-specific components of care in mixed-gender settings.²⁵ However, the impact of existing gender-specific treatments is restricted by in-person delivery requiring intensive clinician training thereby limiting dissemination and implementation. Fewer women relative to men in mixed-gender settings can be an additional barrier. There is a paucity of research demonstrating effective strategies to implement this care for women in mixed-gender settings.

Digital interventions have the potential to address some of the treatment challenges of providing gender-specific care in a mixed-gender setting by offering an accessible, cost-effective alternative to in-person services.²⁶ Web-based interventions can be widely disseminated and used in a number of treatment settings, as well as home or public settings with an internet connection.^{27,28} Digital interventions are also a helpful solution for women who lack childcare or transportation, have scheduling conflicts with outpatient services, or are not ready to seek traditional services due to stigma or social anxiety.²⁸ Digital interventions can be customized to meet the needs of users and offer an individualized experience that could offset the heavy reliance on group treatments that often dominate SUD treatment programs.²⁹

Several studies support the effectiveness of digital interventions for SUDs.^{30–34} There is also evidence that women seek out health-related information on the internet more than men^{35,36}; thus, a digital intervention may be particularly appealing for women. In support of this, when gender differences were examined in a study of a computer-assisted intervention for SUDs,³⁷ results showed that although gender

did not moderate treatment outcome, women had higher acceptability ratings of the intervention than men; in turn, acceptability was positively associated with abstinence in women, but not men. Research in digital interventions with women-only samples is limited to a series of studies of a computerized screening and brief intervention (e-SBI) targeting postpartum women who self-reported illicit drug use.^{38–40} Although results supported short-term efficacy on postpartum drug use, this e-SBI was not designed to address a treatment population of women with SUDs.

One promising enhancement to treatment is the use of psychoeducational material as a low-cost, nonburdensome, effective add-on component. There is some evidence to support the use of women-specific psychoeducational material. Women in the WRG rated the gender-specific information that they received in group as "very helpful".²¹ In a large multisite trial, women's health psychoeducation delivered in group format performed as well as trauma-focused behavioral therapy in reducing posttraumatic stress disorder (PTSD) symptoms for women with co-occurring SUDs and PTSD.¹⁴ However, these results need to be interpreted with caution because of the lack of a no-treatment or minimal-treatment control group. In addition to therapist-delivered models, studies have demonstrated the feasibility of delivering psychoeducation for a variety of mental health problems in a digital format.^{41–43} For example, digital platforms of psychoeducation have been effective in reducing symptom severity in individuals with borderline personality disorder⁴¹ and mental health symptoms in women veterans,⁴² and in symptom and knowledge improvement for individuals with schizophrenia.⁴³

The goal of this study was to develop a web-based, gender-specific intervention (GSI) as an addition to treatment as usual for women with SUDs. In a prepilot study, we examined feasibility and acceptability of the GSI for women enrolled in mixed-gender inpatient treatment for SUDs. These data were used to refine the GSI, which was then tested in a pilot study for women enrolled in various levels of mixed-gender treatment for SUDs (inpatient, partial hospitalization, and outpatient). In both studies, we assessed attitudes regarding the importance of gender-specific topics, satisfaction, and the relevance of content areas included in the GSI.

Materials and Methods

Overview

The prepilot and pilot studies used the same measures and general procedures. Modifications were made to the GSI from the prepilot to pilot study based on participant feedback.

Procedure

The protocols for both studies received approval from the Partners HealthCare Institutional Review Board, and written informed consent was obtained from participants. All participants were recruited from McLean Hospital's Alcohol and Drug Abuse Treatment Program (Belmont, MA). When introducing the study to eligible participants, the research assistant (RA) explained that the study was assessing the feasibility and satisfaction of a new digital program for women with SUDs. Women who enrolled in the study met with the RA to complete study procedures, including, baseline

assessments, the GSI, and postintervention questionnaires on an iPad.

The GSI was designed as a single-session intervention; however, we allowed participants to complete it in two visits if needed. Two participants (one prepilot, one pilot) needed to complete the GSI in two sessions due to competing treatment demands (*e.g.*, meetings with treatment providers or groups). Participants recruited from inpatient completed the GSI while in treatment on the inpatient unit, which has an average stay of 4 days. All inpatient participants were required to have been on the inpatient unit for >24 hours before the RA approached them about the study. Participants recruited from partial hospitalization or outpatient treatment could complete the study at any point during their treatment. The average length of stay in partial hospitalization is 2 weeks. We did not collect information on how long participants had been in outpatient treatment when they completed the study.

Participants were compensated with a \$25 gift card upon completion of the study. Participants who completed the study across two visits were compensated a \$10 gift card at their first visit and a \$15 gift card upon completion of their second visit. Participants were informed during the consent process that they could discontinue the study at any time and they would be compensated for the portion of the study they completed.

Materials

GSI development. In the initial development, psychoeducational material from three modules of the WRG^{19–21} was modified from a group therapy format to a patient-centered, web-based format. Material from the WRG is based on cognitive behavioral principles and relapse prevention. Three topics from the WRG that are of key relevance to women with

SUDs were chosen for adaptation to a digital platform: (1) The Effect of Drugs and Alcohol on Women's Health, (2) Managing Mood, Anxiety, and Eating Problems without Using Substances, and (3) Women and their Partners. Each topic was converted into one module of the GSI. In the WRG, these topics are presented in group format by the therapist in an interactive style with open discussion among women participants. Modifications for the web-based format focused on presenting materials in an engaging style that could be understood by women of varying literacy levels. Each module begins with an overview of the content, provides visual and text information on the topic, and includes "Knowledge Check" questions to keep participants engaged with the material (Fig. 1). Each module ends with "Take-Home Messages" that summarize key concepts (Fig. 2).

Measures

Basic demographic information was collected Pre-intervention in the prepilot and pilot studies. Additional questions regarding primary substance of use, treatment history, and psychiatric problems were collected in the pilot study only. Both the prepilot and pilot studies otherwise used the same measures.

The gender-specific program assessment, adapted for this study based on a measure that has been previously used to determine the level of gender-responsivity in mixed-gender programs,^{5,10} was completed preintervention to measure participants' ratings of the importance of the inclusion of 10 gender-specific topics as part of SUD treatment. Ratings were assessed with a Likert scale of 0–4 (0 = not at all important; 4 = extremely important). Examples of items include: "sexual abuse," "the role of co-occurring psychiatric disorders in recovery," and "community support for women."

FIG. 1. Screenshot of knowledge check question in the gender-specific intervention (GSI).

FIG. 2. Screenshot of take-home message in the GSI.

Participants were given the option to list additional topics of importance for treatment for SUDs.

The Relevance Questionnaire was developed to assess participants' perceptions of how relevant 15 content areas of the GSI were to their recovery. Post-intervention, participants rated each item using a Likert scale of 0–4 (0 = not at all relevant; 4 = extremely relevant). Sample items include: “the effects of substance use on self-care” and “the influence of a partner on recovery.” Participants were also asked to list additional topics of relevance.

A modified version of the Client Satisfaction Questionnaire (CSQ)^{20,44} was administered postintervention to measure participants' satisfaction with features of the GSI. The CSQ contains 10 items, which are summed with scores ranging from 0 to 40, with 40 being the most satisfied. A sample item includes: “Were you satisfied with the type of information you received regarding women and substance use problems,” which was answered on a four-point Likert scale of “very satisfied” to “quite dissatisfied.” Five additional items were added to this questionnaire: four to assess satisfaction with the technological components of the intervention, and one to ask participants if they would make any changes to the GSI. For example, participants answered the question “How visually appealing was the computerized program” on a four-point Likert scale from “extremely visually appealing” to “not at all visually appealing.” Frequencies were used to examine the results of these additional five questions.

Qualitative feedback

Qualitative feedback on the GSI was collected from responses to open-ended items on the questionnaires, as well as verbal comments made during the intervention. On the Relevance Questionnaire, participants were asked to “list any additional topics that you think would be helpful to include in a computerized program for women with substance use disorders.” On the CSQ, participants were instructed to “provide additional comments or suggestions on the topics you reviewed or your experience with the computerized program.” In addition, participants who responded “yes” to an item on the CSQ asking if they would make any changes to the GSI, were asked to explain what changes they would make. Lastly, the RA wrote down any verbal comments that the participants made as they were completing the GSI.

Prepilot Study

Methods

Participants. Participants ($n=30$) for the prepilot study were recruited from an inpatient detoxification unit that offers mixed-gender treatment for individuals with SUDs, including, group therapy, individual counseling, and medical detoxification. The inpatient treatment program does not currently have a gender-specific component of care. Women were eligible to participate if they were 18 years of age or older. Women were excluded from the study if they (1) had

an acute psychiatric or medical condition that would impair them from giving informed consent and completing study procedures, and (2) were admitted to the unit involuntarily. Fifty women were identified by clinicians as eligible for the study during the recruitment period. Of those 50, 30 (60%) were enrolled, 14 (28%) were discharged before the RA could approach them, 5 (10%) said they were too busy to participate in the study, and 1 (2%) was not interested in participating.

Results

Demographics and background characteristics. Table 1 provides a summary of the demographic characteristics for the sample, which was predominantly white and well educated. Half of the sample had children, with an average of 2.1 children (standard deviation [SD]=1.3; range 1–4). Thirteen women (43%) reported that they had a current intimate partner that used alcohol or drugs. Few participants had ever participated in a women-only treatment program for SUDs (23%); however, 50% of participants had attended women-only self-help meetings.

Gender-specific program assessment. Before engaging with the GSI, the three components that were rated highest in importance for an SUD program to address were: the role of co-occurring psychiatric disorders in recovery, trauma and PTSD and sexual abuse (Table 2). With the exception of one

component (spiritual needs, mean=2.9, SD=1.0), average ratings for all topics were above 3 (*i.e.*, “very important”).

Completion and satisfaction. All the women who participated in the prepilot study completed all three modules of the GSI and accompanying assessments. Time spent on each module ranged from 6.2 minutes (SD=3.9; Managing Mood, Anxiety and Eating Disorders) to 7.7 minutes (SD=3.8; The Effects of Drugs and Alcohol on Women’s Health); the average total completion time for the GSI was 26.6 minutes (SD=14.2). Each of the content areas were rated as above average in relevance with the mean ranging from 2.5 to 3.7 (Table 3). The top three rated content areas were: the effects of substance use on self-care, the link between substance use and other mental health problems, and the symptoms of depression. The lowest rated content area was the effects of marijuana on women’s health, with 40% of participants rating it as “neutral,” “a little,” or “not at all” relevant.

The mean satisfaction score on the CSQ was 34.8 (SD=4.4; range 22–40) out of 40, indicating that participants were highly satisfied with the intervention. Of note, 97% of participants indicated that the gender-specific information was “extremely” (60%), “very” (30%), or “a little” (6.7%) helpful. With regard to technological aspects, 93% of participants rated the GSI as “extremely easy to use,” and all participants rated the GSI as “somewhat” to “extremely” visually appealing. Moreover, 97% of participants reported

TABLE 1. PREPILOT AND PILOT SAMPLE DEMOGRAPHIC CHARACTERISTICS

	Prepilot (n=30)	Pilot (n=60)
Age, years, mean (SD)	39.2 (13.9)	39.7 (15.0)
Range	20–68	18–74
Race, <i>n</i> (%)		
White	29 (96.7)	55 (91.7)
Black or African American	1 (3.3)	0
Asian	1 (3.3)	2 (3.3)
American Indian/Alaskan Native	0	1 (1.7)
Ethnicity, <i>n</i> (%)		
Not Hispanic or Latino	27 (90.0)	56 (93.3)
Marital status, <i>n</i> (%)		
Married/living with partner	5 (16.6)	19 (31.6)
Widowed	1 (3.3)	2 (3.3)
Divorced/separated	9 (30.0)	13 (21.7)
Never married	15 (50.0)	26 (43.3)
Educational attainment, <i>n</i> (%)		
High school or less	5 (16.6)	7 (11.7)
Some college or more	25 (83.3)	53 (88.3)
Occupational status, <i>n</i> (%)		
Employed full time	6 (20.0)	15 (25.4)
Employed part time	3 (10.0)	13 (22.1)
Unemployed	12 (40.0)	20 (33.9)
Retired	0	6 (10.0)
Disability	8 (26.7)	4 (6.7)
Student	1 (3.3)	1 (1.7)
Sexual orientation, <i>n</i> (%)		
Heterosexual/straight	25 (83.3)	54 (90.0)
Bisexual	4 (13.3)	4 (6.7)
Questioning/unsure	0	1 (1.7)

SD, standard deviation.

TABLE 2. IMPORTANCE OF ADDRESSING GENDER-SPECIFIC TOPICS IN TREATMENT FOR SUBSTANCE USE DISORDERS, MEAN (SD)

	Prepilot (n = 30)	Pilot (n = 60)
The role of co-occurring psychiatric disorders in recovery	3.7 (0.5)	3.6 (0.6)
Trauma and posttraumatic stress disorder	3.6 (0.7)	3.2 (1.0)
Sexual abuse	3.6 (0.7)	3.1 (1.2)
Counseling about healthy relationships	3.5 (0.5)	3.4 (0.7)
Family violence	3.5 (0.8)	3.0 (1.2)
Community support for women	3.4 (0.7)	3.2 (0.9)
The role of parenting/caretaking in recovery	3.3 (0.7)	3.2 (1.0)
Housing needs	3.1 (1.1)	3.0 (1.2)
Women's sexuality and substance use	3.1 (1.0)	2.8 (1.3)
Spiritual needs	2.9 (1.0)	2.6 (1.1)

that the knowledge check questions were helpful, with 40% indicating they helped "somewhat" and 57% endorsing that they helped "a great deal." Forty-three percent of participants reported that they would have liked more interactive questions throughout the GSI.

Qualitative feedback from participants. Seventeen participants (57%) provided qualitative feedback during the prepilot study, with some providing feedback at multiple points: 7 participants (23%) provided topic suggestions on the Relevance Questionnaire, 6 participants (20%) included additional comments/suggestions on the CSQ, 7 participants (23%) explained changes they would make to the program on the CSQ, and 11 participants (37%) made verbal comments during completion of the GSI. Responses were reviewed independently by the principal investigator (PI) and RA and grouped by "comments" or "suggestions," and each group was reviewed for themes. The PI and RA reviewed the themes together and either differentiated them further or grouped them according to commonalities. Quotes were se-

lected that best highlight the given theme. Three themes emerged from the comments, including:

- (1) The importance of learning the gender-specific information:

"...just learning all of this information is crucial for all women. I was unaware of a lot of it."

- (2) Relating to the information in the GSI:

"I feel like [the] survey was right on and explained my problem as a woman with addiction to the T."

- (3) Delivery of the information:

"It is really helpful to see the information in this way. In groups, it is great to be able to discuss these things with other people but it is easy to miss something, so having it all laid out on an iPad like this is really helpful to remember everything and also see it visually."

Suggestions for changes to the program were categorized into four themes: (1) adding information on trauma, (2) providing more in-depth information on depression, (3) expanding on the role of relationships in recovery, and (4) increasing the visual/aesthetic elements of the GSI.

TABLE 3. RELEVANCE OF CONTENT AREAS OF THE GENDER-SPECIFIC INTERVENTION, MEAN (SD)

	Prepilot (n = 30)	Pilot (n = 60)
The effects of substance use on self-care	3.7 (0.5)	3.4 (0.8)
The link between substance use and other mental health problems	3.6 (0.6)	3.6 (0.7)
The symptoms of depression	3.6 (0.6)	3.4 (0.9)
The symptoms of anxiety	3.5 (0.9)	3.6 (0.7)
The influence of a partner on recovery	3.5 (0.5)	3.4 (1.0)
Information on how to cope with other mental health problems	3.4 (0.7)	3.4 (0.8)
The symptoms of substance use problems	3.3 (0.8)	3.4 (0.8)
The effects of alcohol on women's health	3.3 (1.0)	3.4 (0.9)
The telescoping course of substance use for women	3.2 (0.8)	3.1 (0.9)
How the absence of a partner can influence recovery	3.2 (1.2)	2.9 (1.3)
The effects of stimulants on women's health	3.1 (1.2)	2.7 (1.5)
The effects of tobacco on women's health	3.0 (1.2)	2.8 (1.4)
The effects of opioids on women's health	2.8 (1.5)	2.7 (1.6)
The symptoms of eating problems	2.8 (1.5)	2.6 (1.5)
The effects of marijuana on women's health	2.5 (1.3)	2.5 (1.5)
How to manage feelings and consequences of experiences of abuse without using substances	—	3.4 (1.0)
The importance of physical safety in relationships	—	3.1 (1.3)
How the role of caretaker (or caregiver) impacts recovery	—	3.1 (1.2)
The pros and cons of the caretaking (or caregiving) role	—	3.0 (1.1)

Summary of pre-pilot results

Results indicate that the intervention was acceptable and feasible for women in inpatient treatment for SUDs. Participants found gender-specific topics important to address in SUD treatment and rated the topics in the GSI as relevant. Women also reported high satisfaction with the intervention and suggested that improvements could be made by expanding the topics, adding additional “knowledge check” questions to enhance the interactivity, and increasing the visual appeal of the intervention.

Pilot Study

Methods

Participants. Participants for the pilot study ($n = 60$) were recruited using the same inclusion/exclusion criteria described above; however, recruitment was expanded to include women in inpatient, partial hospital, and outpatient treatment programs. Women in the outpatient program have the option of attending the in-person WRG; therefore, any women who were enrolled in this group were excluded from the pilot study, as they were already familiar with the material presented. Eighty-nine women were identified by clinicians as eligible for the study during the recruitment period: 60 (67%) were enrolled, 17 (19%) were not interested, too sick, or did not have time, 6 (7%) were interested, but unable to schedule, 4 (4%) were discharged before the RA could approach them, and 2 (2%) were deemed ineligible (*e.g.*, enrolled in WRG; unable to comprehend written material).

Intervention. Based on data from participants in the pre-pilot study, we made modifications to the GSI to expand the content and enhance interactivity. First, we added a module: Violence and Abuse: Getting Help. This change was made to address women's interest in receiving more information on trauma. At the end of the study, participants were also given a handout with resources on domestic violence and information on women and substance use. Second, we added a module: Women as Caretakers: Taking Care of Yourself While You are Taking Care of Others, to provide information on self-care and the role of relationships with others in recovery. We also infused information on depression into these two new modules to address participants' interest in having more information on depression and co-occurring psychiatric disorders. In addition, we increased the interactivity of each module by adding more “knowledge-check” and interactive questions (Fig. 3) throughout the GSI. Lastly, Living Stills (*i.e.*, animated photos) of nature images were added to the conclusion of each module to increase visual appeal. The final revised GSI consisted of five modules in total.

Results

Demographics and background characteristics. The demographic characteristics for the pilot sample were very similar to the pre-pilot sample (Table 1). Fifty-eight percent of women were recruited from the inpatient detoxification unit, 22% from partial hospitalization, and 20% from outpatient treatment. Just under half the sample had children (47%), with an average of 2.0 children ($SD = 0.9$, range 1–4). Nineteen women (32%) reported that they had a current intimate partner that used alcohol or drugs.

Table 4 provides information on psychiatric and substance use characteristics of the pilot sample. The most common co-occurring psychiatric problems experienced by participants in the past year were anxiety, depression, and PTSD; the most commonly reported substances of use were alcohol, tobacco, and opioids. Although 41% of the sample indicated that this was their first treatment episode, there was a wide range of previous treatment episodes. Very few women had ever participated in a women-only program for SUDs (13%), but over half (58%) had attended women-only self-help groups.

Gender-specific program assessment. Table 2 shows the ratings of importance for the 10 gender-specific topics assessed preintervention. As with the pre-pilot phase, the role of co-occurring psychiatric disorders in recovery and trauma and PTSD were rated highly. In addition, all participants rated counseling about healthy relationships as “very” (47%) or “extremely” (53%) important.

Completion and satisfaction. All the women completed all five modules of the GSI and accompanying assessments. On average, participants completed the GSI in 41.1 minutes ($SD = 16.1$); time spent per module ranged from 4.2 minutes ($SD = 2.5$; Violence and Abuse: Getting Help) to 8.3 minutes ($SD = 4.1$; The Effects of Drugs and Alcohol on Women's Health). Mean ratings of the content areas ranged from 2.5 to 3.6 on a scale of 0–4 (Table 3), indicating that each of the topics were rated as above average in relevance. The top two content areas were: the link between substance use and other mental health problems and the symptoms of anxiety; the lowest rated content area was the effects of marijuana on women's health.

Satisfaction with the intervention was high, with a mean of 34.5 ($SD = 4.7$, range = 22–40, maximum score = 40), and did not differ by the level of care women were receiving ($F = 1.2$, $df = 2$, $p = 0.3$) or prior experience in treatment ($t = 0.1$, $df = 57$, $p = 0.9$), and was not correlated with age ($r = -0.1$, $p = 0.5$). The majority regarded the intervention as “somewhat” (5%) or “extremely” (91.7%) easy to use and “somewhat” to “extremely” visually appealing (98.3%). All the women rated the gender-specific information as “a little” (10%), “very” (31.7%), or “extremely” (58.3%) helpful.

Qualitative feedback from participants. Thirty-seven participants (62%) provided qualitative feedback during the pilot study, with some providing feedback at multiple points: 11 participants (18%) provided topic suggestions on the Relevance Questionnaire, 6 participants (10%) included additional comments/suggestions on the CSQ, 9 participants (15%) explained changes they would make to the program on the CSQ, and 30 participants (50%) made verbal comments. Qualitative analyses followed the same procedures previously described for the pre-pilot study and responses were again grouped into “comments” or “suggestions.” With regard to comments, four themes emerged:

- (1) Learning new information: the most typical comment from participants was that the material was “interesting” or “helpful” because they learned new information.

What can you do?

Examine your past and present intimate partner relationships by asking yourself the following questions:

Do you have a current intimate partner? <small>* must provide value</small>	☐ Yes ☒ No
1. Did a past partner use alcohol or drugs?	☐ No ☒ Yes
2. Did your partner support your treatment?	☒ No ☐ Yes
3. Did your partner invite, or insist that, you use drugs or alcohol with him/her?	☐ No ☒ Yes
4. Did your partner supply the alcohol or drugs?	☐ No ☒ Yes
5. Were there difficulties in the relationship that contributed to your own distress that presented high risk situations for you and trigger you towards relapse?	☐ No ☒ Yes
6. If your partner used, was he or she willing to give up their own substance use?	☒ No ☐ Yes ☐ My partner did not use drugs
7. Was your partner willing to make your home an alcohol or drug free zone?	☒ No ☐ Yes
8. Was your partner willing to engage in some form of treatment either with you or on his/her own?	☐ No ☒ Yes
How many of your answers reflected positive answers?	<input type="text" value="1"/>
How many of your answers reflected negative answers?	<input type="text" value="7"/>

FIG. 3. Screenshot of interactive questions in the women and their partners module of the GSI.

“Very user friendly and I learned a lot of facts that will enable me to recover better both in treatment and after discharge and beyond.”

- (2) Relating to the information in the GSI: Similar to the prepilot study, women in the pilot study expressed a connection with the material. For example, while completing the module on Women and their Partners, one participant stated that “this was her.” Another woman wrote:

“Beautiful...this hit home like no other program.”

- (3) The importance of the gender-specific information:
 “[I] was surprised to learn about the telescoping effect. If women knew more about this effect, it might alleviate shame and guilt.”

- (4) The visual appeal of the GSI: several women commented that they thought the GSI was visually pleasing. In particular, women described the Living

Still images at the end of the modules as “beautiful” and “relaxing.” One participant noted that she is a very visual person and “really liked learning through this program.”

Three participants (5%) expressed negative comments, including: the GSI was not geared for people who do not identify as someone with a SUD, not believing the information on marijuana was accurate, and not relating to the information on drug use (participant reported alcohol as the only problematic substance).

Suggestions for change were divided into three themes: (1) topic suggestions, (2) visual elements, and (3) technology solutions. Suggested topics included: age and isolation, problems with communication, navigating treatment while working, and changes in sexual drive that women experience in recovery. An additional suggestion was to include pets in

TABLE 4. PILOT SAMPLE PSYCHIATRIC AND SUBSTANCE USE CHARACTERISTICS

	n = 60
Psychiatric problems, past year, <i>n</i> (%)	
Anxiety	54 (90.0)
Depression	50 (83.3)
Posttraumatic stress disorder	25 (41.7)
Attention deficit disorder	23 (38.3)
Eating disorder	10 (16.7)
Obsessive compulsive disorder	10 (16.7)
Bipolar disorder	10 (16.7)
Borderline personality disorder	7 (11.7)
Substances of use, lifetime, <i>n</i> (%)	
Alcohol	45 (75.0)
Tobacco	24 (40.0)
Opioids	23 (38.3)
Cocaine/crack	16 (26.7)
Sedatives	14 (23.3)
Cannabis	10 (16.7)
Hallucinogens, Phencyclidine (PCP)	6 (10.0)
Stimulants	6 (10.0)
Type of substance that has caused the most problems, past year, <i>n</i> (%)	
Alcohol	34 (56.7)
Drugs	18 (30.0)
Alcohol and drugs	7 (11.7)
First treatment episode for drugs or alcohol, <i>n</i> (%)	24 (40.7)
Number of previous treatment episodes for alcohol problems, mean (SD)	2.0 (4.6)
Range	0–28
Number of previous treatment episodes for drug problems, mean (SD)	2.5 (7.5)
Range	0–40

the Women as Caretakers module and provide in-depth information for those that want to learn more about each topic. Suggestions for visual element changes included bigger font and less text. Technology solution suggestions were to include an audio option to listen to the information and to allow users to connect directly from the GSI to resources on the internet.

Summary of pilot results

Results show that the five-module GSI was acceptable and feasible for women receiving SUD treatment across inpatient, partial hospitalization, and outpatient settings. Participants emphasized co-occurring psychiatric disorders, trauma, and relationships as important topics to address, and rated the topics in the GSI as relevant. Women suggested that the intervention could be enhanced by expanding the range and depth of the content, as well as providing alternative ways to engage with the GSI (*i.e.*, audio, print).

Discussion

This study provides preliminary support that a gender-specific, web-based intervention is acceptable to women with SUDs and can be implemented in mixed-gender treatment settings at a range of levels of care. These results suggest that the intervention is applicable to women regardless of their

age or previous experience in treatment and has the potential to be a highly sustainable strategy for increasing implementation of gender-specific treatment components across multiple levels of care.

Digital interventions have the potential to address some of the barriers of delivering gender-specific care in mixed-gender SUD treatment programs. Given that there are more men than women in SUD treatment programs,⁴⁵ it is often difficult and costly to implement women-only groups. Inpatient programs provide an additional level of difficulty due to the short length of stay. The technological aspects of the GSI in both the prepilot and pilot studies were overwhelmingly rated as easy to use, visually appealing, and helpful, supporting the feasibility of delivering gender-specific psychoeducation in SUD treatment using a web-based platform.

Women in both samples expressed the importance of SUD treatment programs addressing co-occurring psychiatric disorders, trauma, and abuse. Moreover, the elements of the GSI that related to co-occurring mental health problems and the link between substance use and mental health problems were consistently rated as highly relevant. These findings are not surprising given the documented literature on the increased prevalence of co-occurring psychiatric disorders in women with SUDs, and the association of co-occurring disorders with treatment outcomes.^{2,46} The importance of integrated treatment that addresses both mental health and SUDs is also highlighted in the SAMHSA's guidance document for supporting women in co-ed settings.²⁵

Although we did not quantitatively measure knowledge gained from the GSI, several women mentioned in their qualitative feedback that the information in the GSI was new to them. Given that most of the participants had been in treatment before participating in the study, it is significant that many of them had never received gender-specific information regarding their SUD. Moreover, the women indicated that learning the information would be helpful to their recovery.

This study is unique in that it is the first to examine gender-specific content in the absence of a single-gender environment. There is evidence that women in single-gender treatment environments report feelings of enhanced comfort, support, affiliation, and safety^{47,48}; however, research also indicates that the single-gender environment alone was not sufficient to affect outcome.¹³ Given that most women are seeking care in mixed-gender treatment programs, it is essential to determine if gender-specific content delivered outside of the context of a single-gender environment is effective. This study shows that the gender-specific content was feasible to deliver *via* a web-based platform and women indicated that the GSI was helpful to them. The focus of these pilot studies was on feasibility and satisfaction; therefore, we did not investigate the effect of the GSI on substance use outcomes. It would be an important next step for future research to examine the effect of this intervention on women's engagement in treatment and treatment outcomes, including retention in treatment and substance use reductions.

There are several limitations to this study. First, the sample was racially and ethnically homogeneous, with the majority identifying as white and non-Hispanic or Latino. However, the clinical characteristics of the study participants are consistent with treatment-seeking women with SUDs with regard to substance use history, psychiatric comorbidity, and

partnered and parenting status. In the pilot sample, anxiety, depression, and PTSD were the most commonly endorsed psychiatric problems, which is consistent with the literature on women with SUDs.^{2,7} Both study samples were also relatively well educated. It is possible that satisfaction ratings and experience of the GSI would differ in a sample with lower educational attainment, especially given the reliance on text-based information in the GSI. Further modifications should focus on reducing the amount of text and examining the GSI in a more diverse sample. A second limitation is the lack of data on participants who were eligible for the study but did not participate (40% in prepilot and 33% in pilot study). We do not have demographic data to compare characteristics based on participation status. Thus, it is possible that the sample who participated in the study are not representative of the general population of women in treatment for SUDs. Third, qualitative information was derived from survey questions plus verbal comments; however, we do not have qualitative data from all participants. To investigate the possibility that women who were more satisfied with the GSI were more likely to provide qualitative feedback, we compared satisfaction scores of participants who provided qualitative feedback to those who did not. No significant differences were found between these two groups in the prepilot or pilot studies. We also compared CSQ scores of participants based on whether or not they endorsed making changes to the GSI and found no significant differences in satisfaction in either study. Despite these limitations, the results of this study are promising for the feasibility of implementation and level of participant satisfaction with this gender-specific, web-based intervention for women with SUDs.

Conclusions

This brief gender-specific, web-based intervention has the potential to be a sustainable strategy for increasing exposure to a GSI across multiple levels of SUD treatment, even in settings with limited staff and financial capacity to offer specialty services.

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