

# Online expressive writing intervention for the psychosexual well-being of women with a history of childhood sexual abuse: a randomized clinical trial

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## Abstract

**Background:** Sexual schema expressive writing that addresses nonconsensual sexual experiences has demonstrated initial support for improving psychosexual well-being for women with childhood sexual abuse (CSA) histories and is easily modifiable to an online modality for accessibility and scalability.

**Aim:** The current study aimed to assess the online efficacy of a 5-session sexual schema expressive writing intervention against a daily events writing condition and an assessment-only condition for women with CSA histories.

**Methods:** Women were initially randomized to 1 of the 2 active writing conditions (sexual schema,  $n = 73$ ; daily events,  $n = 71$ ); then, to minimize awareness of anticipated results, an assessment-only condition was recruited ( $n = 22$ ). Outcomes were measured at baseline (T1), 3 weeks after baseline/posttreatment (T2), and at 1-month follow-up (T3). Additionally, participant-perceived change in sexual and psychological functioning across the course of the study was assessed at T2 and T3.

**Outcomes:** Outcomes included posttraumatic stress symptoms, sexual functioning, global self-esteem, and sexual self-concept.

**Results:** Mixed effects linear regression models controlling for participant age demonstrated significantly greater rates of change in sexual functioning and sexual self-concept for both active writing conditions (sexual schema and daily events) in comparison with the assessment-only condition, with no differences across conditions in posttraumatic stress symptoms or self-esteem. Furthermore, analyses of variance controlling for age indicated that women in the sexual schema writing condition reported significantly greater perceived change in sexual well-being and psychological well-being than the assessment-only condition, though the daily events writing condition reported significantly greater perceived change only in psychological well-being as compared with the assessment-only condition.

**Clinical Implications:** The current study provides evidence for the use of online modalities for expressive writing for women with CSA histories and supports the use of sexual schema writing paradigms for improving sexual well-being in this population.

**Strengths and Limitations:** The study is strengthened by its ecologically valid and diverse community sample and its rigorous multisession treatment protocol. The study is limited by being underpowered for some of its analyses. Additional research is needed on the daily events writing condition and ways to target more psychological outcomes in combination with sexual outcomes in online writing treatments.

**Conclusions:** Online expressive writing paradigms that allow for guided reflection and space on how individuals' nonconsensual sexual experiences have affected their sexuality may be a fruitful strategy for many women to begin to achieve sexual recovery following sexual trauma.

**Keywords:** sexual abuse; sexual dysfunctions; posttraumatic stress disorder; internet-based intervention; clinical trial.

Approximately 1 in 5 women have experienced childhood sexual abuse (CSA) in their lifetime.<sup>1,2</sup> CSA histories have consistently been implicated in long-term decrements in psychological and sexual well-being and are associated with increased risk of further sexualized violence experiences,<sup>3–6</sup> and these experiences disproportionately affect individuals with lower socioeconomic status and elevated barriers to care (eg, cost, transportation).<sup>7–9</sup> Despite CSA being an indisputable public health concern that exacerbates health disparities in underserved communities, no scalable and easily accessible interventions exist for the psychological and sexual well-being of women with CSA histories. As such, the current study examines an online expressive writing intervention for the psychosexual well-being of self-identified women with histories of CSA.

Empirically supported treatments that target the psychological and sexual well-being of individuals with CSA

histories are largely nonexistent. CSA-related sexual concerns are often treated with trauma-informed sex therapy models (eg, emotion-focused couples therapy for sexual trauma survivors,<sup>10</sup> modified sensate focus therapy,<sup>11</sup> cognitive behavioral sex therapy<sup>12</sup>), while CSA-related psychological concerns are often addressed with trauma-focused treatments, such as prolonged exposure therapy<sup>13</sup> or cognitive processing therapy.<sup>14</sup> Notably, one study utilizing a sexual schema expressive writing therapy yielded promising results for improving psychological and sexual well-being.<sup>15</sup> Expressive writing—a writing-based therapy strategy that involves writing reflectively about thoughts and feelings with respect to a personal experience for 15 to 30 minutes at a time—has been associated with numerous health benefits, self-awareness, and emotional clarity.<sup>16</sup>

This expressive writing study consisted of women with CSA histories—defined as unwanted touching, fondling, oral sex,

or penetration of the vagina or anus by digits, objects, or genitals by the age of 16 years—who took part in 1 of 2 active writing conditions: a sexual schema writing or trauma writing condition.<sup>15</sup> The sessions were 5 in-person sessions that included a 30-minute writing period once or twice a week across two to three weeks. Participants met with a trained study therapist before and after each session for rationale review, instructions, a brief assessment, and debriefing of the writing. The sexual schema condition encouraged women to reflect on how their CSA experiences influenced their sexual thoughts, feelings, and beliefs (the same writing prompts were used in the current study; see supplementary materials). The trauma condition writing prompts had women reflect and write about a trauma that affected them deeply, considering the impact on the 5 common themes of trauma-related difficulties: safety, trust, esteem, intimacy, and power and control. Results indicated that while there were improvements in both conditions, there was significantly greater and faster improvement in sexual well-being (eg, diagnosed sexual dysfunctions such as desire and arousal disorders) for those in the sexual schema writing condition as compared with the trauma writing condition and the same level of improvement across both conditions for psychological well-being (eg, depression and trauma symptoms). Notably, these improvements lasted through a 6-month follow-up. Evidently, further research into expressive writing interventions for this population is warranted and may provide a fruitful modality for accessible intervention development.

Indeed, writing interventions have continued to receive attention over the past decade, including Pennebaker and Beall's<sup>17</sup> original expressive writing intervention and modifications to this paradigm,<sup>18</sup> King's<sup>19</sup> best possible selves writing intervention,<sup>20</sup> and exposure-based writing therapies such as Sloan and Marx's written exposure therapy.<sup>21,22</sup> Yet much of this work has focused on trauma-specific outcomes, psychopathology broadly, and physical health outcomes. Additionally, writing interventions have most frequently and traditionally been delivered in an in-person modality, making them susceptible to the same barriers to treatment access as traditional psychotherapy (eg, cost, time, childcare, transportation). Notably, some writing interventions have been applied in modalities more accessible than in research or clinical settings, such as self-help books<sup>23</sup> and online writing modalities.<sup>24</sup> While online interventions may better serve to ameliorate some burdens of treatment seeking and access due to their accessibility and scalability, many of the online paradigms that have been researched include therapist involvement, which has implications for program scalability and sustainability.

In contrast to writing interventions, schema therapy—a foundation of the sexual schema writing condition in the Meston et al study<sup>15</sup>—has not received much attention in recent years. Schemas have been defined as underlying cognitive phenomena that help organize the stimuli of the world around us to make meaning of our world and self, guiding future behaviors, thoughts, and emotions.<sup>25</sup> Young's schema theory extends this by suggesting that early life experiences build out schemas, which serve to create pervasive patterns in thoughts, feelings, and bodily responses and that these schemas, if maladaptive, contribute to psychopathology and difficulty in adulthood in how we interact with the world, other people, and our selves.<sup>26,27</sup> While most cognitive therapies incorporate schema modification as important targets for symptom reduction (eg, cognitive behavioral therapy<sup>28</sup> or

cognitive processing therapy<sup>29</sup>) or consider schema change as a mechanism of action (eg, cognitive therapy for obsessive-compulsive disorder<sup>30</sup> or depression<sup>31</sup>), schema therapy based on Young's early maladaptive schemas<sup>32</sup> has historically been used with individuals with Axis I disorders that are nonresponsive to traditional cognitive therapy<sup>33</sup> and in the treatment of Axis II personality disorders.<sup>34</sup> Additionally, one study found that schema therapy outperformed cognitive behavioral therapy for posttraumatic stress disorder (PTSD) and that changes in maladaptive schemas accounted for 26.3% of the variance in symptom reduction.<sup>35</sup> Notably, sexual trauma histories are associated with maladaptive self and sexuality schemas,<sup>5,29,36</sup> which have been associated with a range of psychosexual decrements.<sup>37-39</sup> As such, interventions that target improvement in maladaptive schemas (eg, schema-focused writing) may be particularly fruitful in leveraging improvement in psychological and sexual well-being. Furthermore, the work that has been done on schema therapy describes a time-intensive, in-person psychotherapy process that is not accessible to many of the individuals who may benefit from it.

The current study extends the prior investigations into schema-focused expressive writing therapy for psychological well-being (ie, traumatic stress) and sexual well-being (ie, sexual functioning) in an online modality to further investigate the expressive writing paradigm for this population and explore it as an accessible and scalable online intervention. The study is a 3-arm randomized controlled trial of the active treatment sexual schema writing group in comparison with an active control group (ie, daily events writing) and an assessment-only control group at 3 time points (baseline, posttreatment, and 1-month follow-up) for assessment of efficacy across indicators of sexual functioning, posttraumatic stress symptoms, and nonclinical wellness indicators (global self-esteem and sexual self-concept). We also assess group differences in posttreatment and follow-up participant-perceived changes in psychological and sexual well-being.

**Hypothesis 1:** The sexual schema writing condition will outperform the daily events writing group and the assessment-only condition on (a) sexual functioning, (b) posttraumatic stress symptoms, and (c) nonclinical indicators (global self-esteem and sexual self-concept).

**Hypothesis 2:** The sexual schema writing condition will report more perceived change in (a) sexual and (b) psychological well-being at posttreatment and follow-up than the daily events writing condition and the assessment-only condition.

## Methods

### Operationalization of CSA

CSA has been defined in varying ways across research studies and state laws. The primary components of a CSA definition involve identification of what is considered *childhood* and what is considered *sexual abuse*.<sup>40</sup> In the current study, we use a broad and inclusive definition of *sexual abuse* and align *childhood* with the common legislative “age of consent” (ie, 16 years). As such, CSA is operationalized in the current study as any sexual activity (contact or noncontact) that involves a child aged ≤16 years that occurs with an adult, older peer, or someone in a position of power or authority or alternatively with a same-aged peer when executed against the child's will (eg, with coercion, force).

## Participants

### Recruitment

Self-identifying women with a history of CSA were recruited from across the United States and Canada via online posting methods including Reddit boards, Craigslist, Facebook forums, Twitter, and Instagram, as well as targeted Facebook advertisements. Interested women then contacted the laboratory to schedule a phone screening, which was a brief (~10 minute) assessment of eligibility for study participation.

### Inclusion and exclusion

The study consisted of self-identifying women—including transgender women, nonbinary persons, and gender-nonconforming individuals—who had experienced CSA before their first consensual activity and were a maximum age of 16 years at the time of the CSA. CSA was defined as either forced or coerced sexual activity—defined as oral, anal, or vaginal intercourse; penetration of the vagina or anus with objects or digits; genital touching or fondling; exposure to another's genitals; or inclusion in pornographic materials—or any sexual activity with a person at least 5 years older, an authority figure, or a family member. Additionally, women needed to self-identify their CSA experiences (as detailed previously) as “sexual abuse,” “sexual assault,” or “rape.” Other inclusion criteria were age  $\geq 18$  years, residence in Canada or the United States, and ability to read and write in the English language, as well as endorsement of current sexual distress, dissatisfaction, or dysfunction. Exclusion criteria were as follows: currently in an abusive relationship, had experienced sexual trauma in the past year, experienced any DSM-5 criterion A trauma in the past 3 months, received a diagnosis of a severe mental illness, endorsed suicidal or homicidal intent in the last 30 days, reported a current or recent (past 6 months) substance dependence or abuse concern, and were attending psychotherapy at the time of the study for CSA-related psychological or sexual concerns. Notably, a severe mental illness was defined as schizophrenia, schizoaffective, schizotypal, other psychotic disorder, or bipolar disorder that was not stabilized by medication for a minimum of 12 months or an experience of mania or hallucinations in the last 12 months.

### Sample characteristics

A total of 543 women were screened for eligibility, and of those 220 were eligible for enrollment, although 54 were lost to follow-up (ie, multiple contact attempts by study staff via phone and email) prior to completing their first assessment. The final study sample retained for analyses were the 166 women who completed the first assessment and were randomized into their respective active condition or enrolled into the assessment-only condition. This included 73 women in the sexual schema writing group, 71 in the daily events writing group, and 22 in the assessment-only group. Participant flow through the study is depicted in Figure 1.

The final sample ( $N=166$ ) ranged in age from 18 to 67 years (median, 26 years), and the majority self-identified with the gender identity of woman (95.78%,  $n=159$ ). Just over half the sample identified as White (59.04%,  $n=98$ ) and 15.06% as Hispanic or Latina/x ( $n=25$ ). Over half the sample reported an income  $\leq \$50\,000$  (57.83%,  $n=96$ ). Additionally, 47.59% identified as heterosexual/straight ( $n=79$ ),

followed by bisexual (21.08%,  $n=35$ ). Full demographic information for the whole sample and by treatment condition is reported in Table 1.

## Measures and materials

### Demographic survey

The demographic survey was an author-developed inventory of items to assess the sociodemographic makeup of the sample, as reported in Table 1.

### Nonconsensual Sexual Experience Inventory

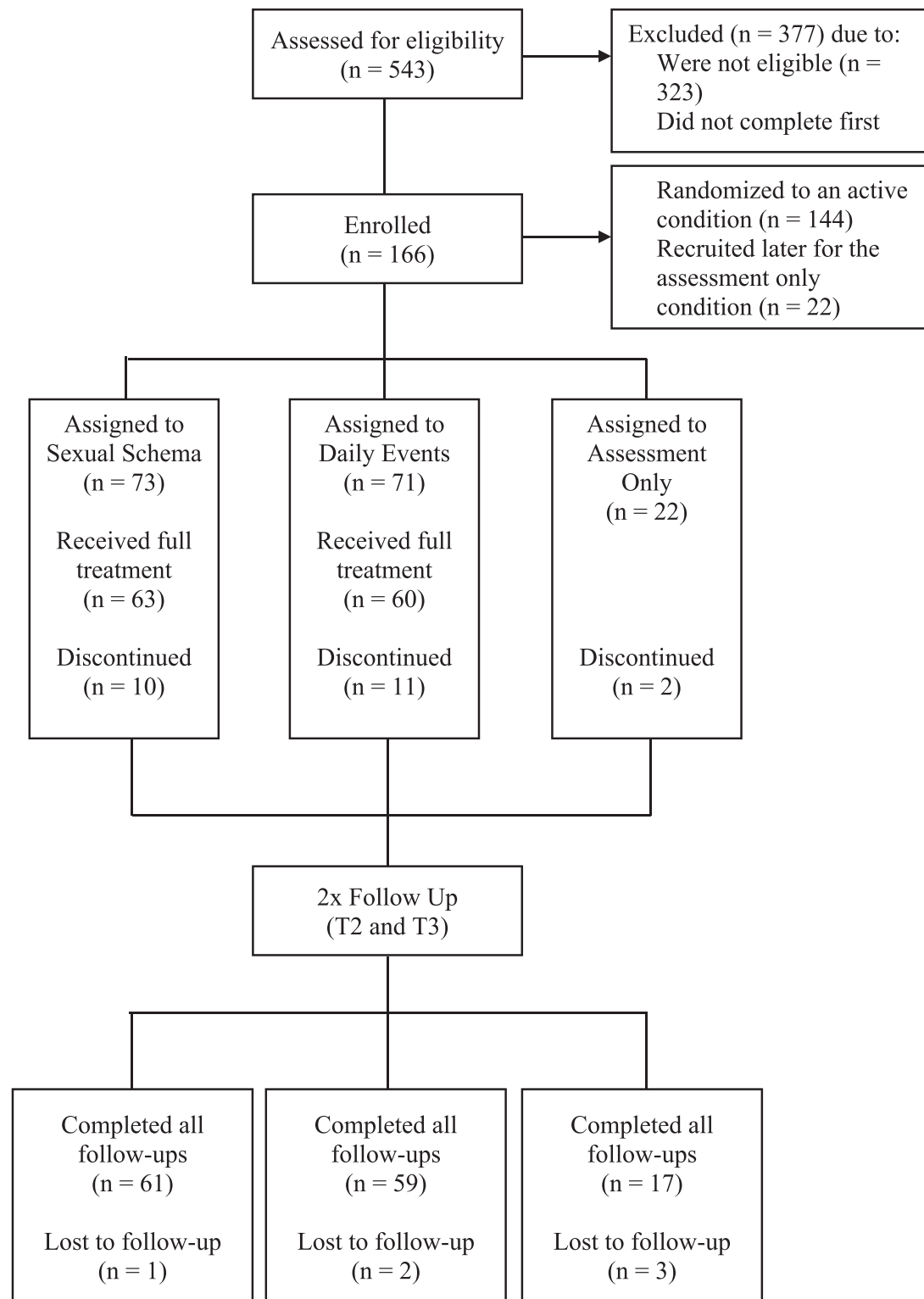
The Nonconsensual Sexual Experience Inventory (NSEI)<sup>37</sup> is a measure of individuals' nonconsensual sexual experiences across the life span, with behaviorally descriptive items assessing various forms of sexual violence experiences. Each item is framed as “Has anyone ever ... against your will?” assessing for experiences of vaginal or anal penetration, oral sex, genital or breast fondling, and any other experiences (ie, “Other than the events already mentioned, are there any other sexual experiences that occurred against your will?”). Items are answered on a *yes/no* response set, and although these data were not analyzed in the current study, items endorsed as *yes* are followed by additional items to assess characteristics of the experiences (eg, age of onset, chronicity, relationship to perpetrator, subjective trauma level). In the current study, the NSEI was used to confirm the CSA history of the participants and gain more descriptive information about their abuse experiences.

### Posttraumatic stress symptoms

The Posttraumatic Diagnostic Scale for DSM-5 (PDS-5) is a 26-item PTSD assessment based on 2 items requesting that participants indicate their trauma history and index trauma (ie, the trauma to which PTSD symptoms are attributed), 20 symptom items, and 4 additional items (distress, interference, onset, and duration).<sup>41</sup> In the current study, participants were directed to respond to PDS-5 based on their most distressing CSA experience, and no index trauma assessment item was used. For the symptom items, participants were asked to respond to how frequent and how upsetting each symptom was over the last month (eg, “unwanted upsetting memories about the trauma”) on a scale ranging from 0 (*not at all*) to 4 (*6 or more times a week/severe*). An average of the 20 symptom items was used in the current study to assess posttraumatic stress, with higher scores indicating greater posttraumatic stress.

### Sexual functioning

The Female Sexual Function Index (FSFI) is a 19-item measure of women's sexual functioning across the domains of desire, arousal, lubrication, orgasm, satisfaction, and pain.<sup>42</sup> Women respond to the items indicating the degree to which they have experienced sexual difficulty in that area in the past 4 weeks using varying response sets. Notably, the FSFI was considered valid only for women who were sexually active in the past 4 weeks of the assessment time point,<sup>42,43</sup> and this ranged from 73.3% to 76.1% of the sample across the 3 time points when the FSFI was administered. Participants were considered missing data for that time point if they were not sexually active in the 4 weeks prior to that assessment. An average of the participants' FSFI items was used in the current study to assess sexual functioning, with higher scores reflecting better sexual functioning.



**Figure 1.** Participant flow diagram from screening through follow-ups.

### Nonclinical indicators

As the recruited sample was not a clinical sample, we aimed to assess nonclinical indicators of well-being for a psychological and sexual outcome. For this purpose, the Rosenberg Self-esteem Scale (RSE)<sup>44</sup> was used in the current study. The RSE is a 10-item measure of global self-esteem that includes positive and negative feelings about the self, in which participants

report their degree of agreement with each statement on a scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). An average of the 10 RSE items was used to assess global self-esteem, with higher scores indicating more positive self-esteem. Additionally, 3 subscales (sexual esteem, sexual schemata, and sexual anxiety) from the Multidimensional Sexual Self-concept Questionnaire (MSSCQ)<sup>45</sup> were used as a

**Table 1.** Demographic information for the whole sample and by condition.

	Whole sample (N = 166)	Sexual schema (n = 73)	Daily events (n = 71)	Assessment only (n = 22)
<b>Continuous variables, mean (SD)</b>				
Age, y (range, 18-67)	28.38 (9.66)	28.50 (10.14)	28.10 (9.45)	28.90 (9.15)
Age of first sex, y (range, 11-30)	17.22 (2.86)	16.94 (2.22)	17.52 (3.53)	17.25 (2.65)
<b>Same gender<sup>a</sup> (range, 1-5)</b>				
Attraction	3.89 (1.12)	4.01 (0.92)	3.75 (1.27)	3.95 (1.17)
Behavior	4.26 (1.16)	4.37 (0.96)	4.14 (1.30)	4.27 (1.32)
<b>Categorical variables, No. (%)</b>				
<b>Sexual orientation</b>				
Asexual	5 (3.01)	1 (1.37)	2 (2.82)	2 (9.09)
Bisexual	35 (21.08)	20 (27.40)	14 (19.72)	1 (4.55)
Gay/lesbian	12 (7.23)	2 (2.74)	8 (11.27)	2 (9.09)
Heterosexual/straight	79 (47.59)	35 (47.95)	34 (47.89)	10 (45.45)
Pansexual	14 (8.43)	7 (9.59)	4 (5.63)	3 (13.64)
Queer	7 (4.22)	2 (2.74)	2 (2.82)	3 (13.64)
No label	7 (4.22)	3 (4.11)	3 (4.23)	1 (4.55)
Other	7 (4.22)	3 (4.11)	4 (5.63)	0 (0.00)
Missing	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
<b>Relationship status</b>				
Single	45 (27.11)	20 (27.40)	20 (28.17)	5 (22.72)
Committed	59 (35.54)	26 (35.62)	25 (35.21)	8 (36.36)
Cohabiting	23 (13.86)	9 (12.33)	10 (14.08)	4 (18.18)
Married	39 (23.49)	18 (24.66)	16 (22.53)	5 (22.73)
Missing	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
<b>Race and ethnicity</b>				
Asian	9 (5.42)	4 (5.48)	4 (5.63)	1 (4.54)
Black/African American	18 (10.84)	10 (13.70)	5 (7.04)	3 (13.64)
Hispanic/Latina/x	25 (15.06)	9 (12.33)	12 (16.90)	4 (18.18)
Middle Eastern	2 (1.20)	0 (0.00)	2 (2.82)	0 (0.00)
Native American/American Indian	3 (1.81)	2 (2.74)	1 (1.41)	0 (0.00)
Pacific Islander/Hawaiian Native	1 (0.60)	0 (0.00)	1 (1.41)	0 (0.00)
White	98 (59.04)	43 (58.90)	41 (57.75)	14 (63.64)
Mixed race	9 (5.42)	4 (5.48)	5 (7.04)	0 (0.00)
Other	1 (0.60)	1 (1.37)	0 (0.00)	0 (0.00)
Missing	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
<b>Annual income, \$</b>				
<25 000	56 (33.73)	30 (41.10)	20 (28.17)	6 (27.27)
25 000-50 000	40 (24.10)	13 (17.81)	22 (30.99)	5 (22.73)
>50 000-75 000	21 (12.65)	11 (15.07)	6 (8.45)	4 (18.18)
>75 000	47 (28.31)	19 (26.03)	21 (29.58)	7 (31.82)
Missing	2 (1.20)	0 (0.00)	2 (2.82)	0 (0.00)
<b>Any psychological diagnosis</b>				
No	30 (18.07)	14 (19.18)	14 (19.72)	2 (9.09)
Yes	136 (81.93)	59 (80.82)	57 (80.28)	20 (90.91)
Missing	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
<b>Country of residence</b>				
Canada	16 (9.63)	7 (9.59)	8 (11.27)	21 (95.45)
US	149 (89.76)	66 (90.41)	62 (87.32)	1 (4.54)
Missing	1 (0.60)	0 (0.00)	1 (1.41)	0 (0.00)

<sup>a</sup>Same-gender attraction and behavior were measured on a Likert-type scale ranging from 1 (*exclusively same-gender partners*) to 5 (*exclusively other-gender partners*).

composite score to assess sexual self-concept. The MSSCQ is a 100-item scale that assesses self-concept across 20 domains. Each of the 3 selected subscales from the MSSCQ are composed of 5 items (total of 15 for the current study). The sexual esteem items assess one's capacity to engage in and activity joy sexual. The sexual schemata items assess one's tendency to positively evaluate one's sexual self. The sexual anxiety items (reverse scored) assess one's tendency to feel uncomfortable with one's sexual self. The 15 items had strong internal reliability in the current sample ( $\alpha = 0.91$ ; 95% CI, 0.89-0.93). An average of the 15 items was used to assess sexual self-concept for the current study, with higher scores indicating more positive sexual self-concept.

### Perceived Change Inventory

Modified from the Patient Global Impressions of Change (PGIC) scale,<sup>46</sup> the Perceived Change Inventory asked participants 2 questions: "Since beginning this intervention, how would you describe the change (if any) in your sexual functioning and well-being?" and "Since beginning this intervention, how would you describe the change (if any) in your psychological functioning and well-being, or overall mental health?" Participants were provided with a response set that ranged from 1 (*deterioration*) to 6 (*complete recovery*). Both items were assessed separately, and no composite score was used. The Perceived Change Inventory was used in the current study as a check of clinically meaningful change in women's

**Table 2.** Descriptive information for outcome variables by the whole sample and by condition for each time point.

Variable	Whole sample (N = 166)			Sexual schema (n = 73)			Daily events (n = 71)			Assessment only (n = 22)		
	Mean (SD)	95% CI		Mean (SD)	95% CI		Mean (SD)	95% CI		Mean (SD)	95% CI	
		LL	UL		LL	UL		LL	UL		LL	UL
Time 1												
FSFI	23.78 (5.65)	22.78	24.78	24.25 (5.90)	22.71	25.77	23.16 (5.63)	21.58	24.74	24.01 (4.93)	21.67	26.35
PDS-5	35.85 (18.62)	32.92	38.78	35.64 (19.78)	30.87	40.41	34.53 (18.15)	30.28	38.78	41.47 (15.83)	34.35	48.59
RSE	2.46 (0.47)	2.39	2.53	2.45 (0.51)	2.33	2.57	2.50 (0.46)	2.39	2.61	2.36 (0.34)	2.21	2.50
MSSCQ-SS	2.74 (0.93)	2.60	2.88	2.81 (1.04)	2.57	3.05	2.63 (0.82)	2.44	2.82	2.88 (0.87)	2.52	3.24
Time 2												
FSFI	24.33 (6.43)	23.10	25.56	25.05 (6.69)	23.16	26.94	23.74 (6.36)	21.84	25.64	23.69 (5.87)	20.62	26.76
PDS-5	32.38 (18.05)	29.14	35.62	31.32 (18.68)	26.29	36.35	32.10 (17.62)	27.31	36.89	37.57 (17.52)	28.39	46.75
RSE	2.61 (0.58)	2.51	2.71	2.66 (0.58)	2.52	2.80	2.63 (0.60)	2.48	2.78	2.40 (0.48)	2.19	2.61
MSSCQ-SS	3.03 (1.05)	2.86	3.20	3.08 (1.12)	2.81	3.35	2.99 (1.02)	2.73	3.25	2.97 (0.93)	2.56	3.38
Time 3												
FSFI	25.15 (6.58)	23.89	26.41	25.87 (6.73)	23.97	27.77	25.32 (6.26)	23.45	27.19	21.98 (6.64)	18.37	25.59
PDS-5	28.03 (18.73)	24.64	31.42	26.40 (17.63)	21.51	31.29	27.40 (19.74)	22.09	32.71	36.21 (17.80)	26.89	45.53
RSE	2.62 (0.58)	2.52	2.72	2.67 (0.57)	2.53	2.81	2.64 (0.61)	2.48	2.80	2.39 (0.44)	2.18	2.60
MSSCQ-SS	3.07 (0.99)	2.90	3.24	3.07 (1.08)	2.79	3.35	3.09 (0.96)	2.85	3.33	2.98 (0.72)	2.64	3.32

Abbreviations: FSFI, Female Sexual Function Index; LL, lower limit; MSSCQ-SS, Multidimensional Sexual Self-concept Questionnaire–Sexual Self composite; PDS-5, Posttraumatic Diagnostic Scale for DSM-5; RSE, Rosenberg Self-esteem Scale; UL, upper limit.

psychosexual well-being (ie, that women actually feel that they improved).

### Expressive writing intervention prompts

All writing prompts and rationales for the utility of the writing exercises are included in the online supplementary materials and were taken from the original study on sexual schema writing for women with CSA histories.<sup>15</sup> Notably, the sexual schema writing prompts ask women to reflect on how their nonconsensual sexual experiences have influenced their thoughts and feelings around sexuality and their sexual self. The daily events writing prompts asks women to focus on the present moment, reflecting on their needs and wants over the past 24 hours without getting drawn into the past. While the sexual schema prompts change slightly across the 5 writing sessions, the daily events writing prompts remain stable across all writing sessions except for session 5. In both writing conditions, session 5 asks the women to pull together their reflections from the prior weeks and identify key takeaways and goals.

Descriptive information for all self-report survey measures is reported in Table 2.

### Procedure

Interested women were assessed for eligibility following a phone interview that assessed the inclusion and exclusion criteria noted. Eligible participants were then emailed their first individualized link to the consent form and the first assessment measures. The NSEI in this first assessment was reviewed by study personnel to confirm eligibility based on the study's operationalization of CSA history. Notably, no women reported discrepancy in CSA history on the NSEI from their phone interview CSA histories. Eligible and consenting women were then randomized into 1 of the 2 writing conditions. After recruitment of the 2 active conditions was completed, a smaller assessment-only condition was recruited. The daily events writing group was not told that its writing prompts were considered a control condition but was instead instructed that daily mindful writing may be beneficial. We

recruited the assessment-only condition after the recruitment of the writing conditions to ensure that the women in the assessment-only condition were not aware of expected outcomes (ie, no change) for their condition in comparison with a treatment condition.

After group assignment, participants were contacted through email with the links to the assessments and writing sessions. Following the baseline assessment (T1), participants in the active conditions were emailed the link to their expressive writing condition every 3 to 4 days for a 3-week period for a total of 5 writing sessions. Participants were provided with the second assessment (T2) following the writing sessions if they were in the active condition or 3 weeks following T1 if they were in the assessment-only condition. All primary outcomes (posttraumatic stress, sexual functioning, global self-esteem) were assessed at baseline (T1), T2 (median, 24 days since T1), and T3 (median, 31.5 days since T2). The secondary outcome of participants' perceived change was assessed only at T2 and T3.

All 3 conditions were provided with the writing prompts to both writing conditions at the end of the study. Women were compensated for their participation in the study with \$10 (Canadian or US dollars per their country of residence) in e-money transfers or prepaid Visa cards emailed to them following the completion of the T1 and T2 assessments and then \$20 following the completion of the T3 assessment. As such, each woman had the potential to be compensated up to \$40. All procedures were reviewed and approved by the institutional review board of the University of Texas at Austin.

### Data analyses

All data analyses were conducted in RStudio.<sup>47</sup>

### Missing data

Other than missing data due to study dropout or not being sexually active in the 4 weeks prior to a time point, missing data across variables at the 3 time points ranged from 0 to 16 missing observations, with a median number of 1 missing observation. Participants who were missing  $\leq 10\%$  of their

data from a given scale within a time point (eg, missing only 1 of 10 items) were included in the scale total scores (ie, averages based on available data). As the remaining missing data for each scale were minimal, no missing data procedures were used (ie, estimation or imputation procedures).

### *Intent-to-treat analyses*

All women who completed the first assessment, regardless of full study completion, were included in the data analyses. Differences were assessed between those who did and did not drop out by chi-square tests of independence and independent samples *t*-tests on baseline levels of posttraumatic stress, sexual functioning, self-esteem, and key demographic variables (ie, age, mental health diagnosis [yes/no]). We also assessed differences in the rates of the dropout across the 3 conditions. There were no significant differences between those who did and did not drop out in their age, whether they had a mental health diagnosis, or their baseline levels of the outcome variables ( $P = .193-.999$ ). There were also no significant differences in rates of dropout across the 3 conditions ( $\chi^2 = 0.64$ ,  $df = 2$ ,  $P = .725$ ).

### *Mixed effects linear regression models*

To address the first hypothesis of the current study, mixed effects linear regression models with random slopes and intercepts were used to examine change in individuals' posttraumatic stress symptoms, sexual functioning, self-esteem, and sexual self-concept over time differentially between conditions. The lme4 R package was used for all mixed effects models.<sup>48</sup> For each of our dependent variables (PDS-5, FSFI, RSE, MSSCQ-SS), 3 models were run to compare across our 3 groups via contrast codes (linear and quadratic) for between-group comparisons. Independent variables in the models included study day (date of completion of the assessment by a given participant), age (to control for the wide age range in our participants and as a general proxy for time since abuse), the linear contrast code (−1, 0, +1), the quadratic “completeness” contrast code (−1, −1, +2), and the interaction between study day and both contrast codes (eg, outcome ~ study day + age + linear code + quadratic code + linear code × study day + quadratic code × study day).

### *Analyses of variance*

With the stats package in R,<sup>47</sup> 4 analyses of variance were run to examine average differences in participants' perceived change across the 3 conditions (independent variable: condition) in sexual well-being (dependent variable: PGIC sexual well-being) and psychological well-being (dependent variable: PGIC psychological well-being) at T2 and T3. Age was included in all models to control for the wide age range in the sample. Tukey honestly significant difference multiple comparisons were done to assess mean differences (MDs) between the specific conditions.

### *Power analysis*

As this study was conducted as part of a funded dissertation study, resources (eg, time and money) were more heavily weighted in determining the target study sample size over power. Instead of a priori power analyses, post hoc power analyses were used to determine how much power we had to detect the observed effects for each interaction term of the linear contrast code × study day in the mixed effects linear models based on the collected sample size. We specifically

assessed for these effects, as they require the most power to detect of all the effects in the models and these were the primary effects of interest. Power analyses were conducted in R via the simr package<sup>49</sup> across 100 simulations per effect.

## **Results**

### **Hypothesis 1: change in outcomes over time by condition**

Information for all of the effects of interest for hypothesis 1 (ie, the interaction terms between the linear contrast effects for condition and the study day variable) is reported in Table 3. Full information from the mixed effects linear regression models is reported in the Table S1.

#### *Hypothesis 1a: differences in change of sexual functioning*

Mixed effects linear regression with random slopes and intercepts indicated that women in the sexual schema writing condition improved in sexual functioning (as measured by the FSFI) over and above any improvements in an assessment-only condition ( $B = -0.004$ ,  $SE = 0.002$ ,  $t = -2.45$ ,  $P = .014$ ), but there were no significant differences in change in sexual functioning between the schema condition and the daily events condition. Notably, there was a significant difference in the rate of change in sexual functioning for the daily events condition from those in the assessment-only condition ( $B = 0.006$ ,  $SE = 0.002$ ,  $t = 3.11$ ,  $P = .018$ ).

#### *Hypothesis 1b: differences in change of posttraumatic stress*

There were also no significant differences among the 3 conditions in the change in posttraumatic stress symptoms over time as measured by the PDS-5.

#### *Hypothesis 1c: differences in nonclinical indicators*

While there were no significant differences among the 3 conditions in the change in global self-esteem over time as measured by the RSE, there were significant differences in sexual self-concept as measured by the 3 MSSCQ subscales. The daily events condition ( $B = 0.004$ ,  $SE = 0.002$ ,  $t = 2.12$ ,  $P = .034$ ) and the sexual schema condition ( $B = -0.004$ ,  $SE = 0.002$ ,  $t = -2.06$ ,  $P = .040$ ) demonstrated significantly greater improvement in sexual self-concept over time in comparison with the assessment-only condition. There was no significant difference between the sexual schema condition and the daily events condition.

### **Hypothesis 2: group differences in perceived change in psychological and sexual well-being**

Full information for the analysis of variance models for hypothesis 2 is reported in Table 4.

#### *Hypothesis 2a: differences in perceived change in sexual well-being*

The analysis of variance models for between-condition differences in perceived sexual well-being change as measured by the modified PGIC demonstrated that there were significant differences between conditions when controlling for age at T2 ( $F_{2,135} = 5.78$ ,  $P = .004$ ) and T3 ( $F_{2,128} = 3.88$ ,  $P = .034$ ) such that women in the sexual schema condition reported significantly greater perceived improvement in sexual well-being than did the assessment-only condition at T2 (MD, −0.76; 95% CI, −1.38 to −0.34;  $P = .013$ ) and T3 (MD, −0.81;

**Table 3.** Effect estimates for the interaction terms of the linear contrast effect of condition by study day for all models.<sup>a</sup>

DV: interaction term	B	SE	t value	P value
PDS-5				
Schema to assessment (linear) × study day	0.00	0.00	1.49	.136
Daily to assessment (linear) × study day	−0.00	0.00	−0.84	.400
Daily to schema (linear) × study day	0.00	0.00	0.10	.317
FSFI				
Schema to assessment (linear)	−0.00	0.00	−2.45	.014
Daily to assessment (linear) × study day	0.01	0.00	3.11	.002
Daily to schema (linear) × study day	0.00	0.00	1.05	.292
RSE				
Schema to assessment (linear)	−0.00	0.00	−1.74	.081
Daily to assessment (linear) × study day	0.00	0.00	1.22	.222
Daily to schema (linear) × study day	−0.00	0.00	−0.84	.402
MSSCQ-SS				
Schema to assessment (linear)	−0.00	0.00	−2.06	.040
Daily to assessment (linear) × study day	0.00	0.00	2.12	.034
Daily to schema (linear) × study day	0.00	0.00	0.08	.933

Abbreviations: DV, dependent variable; FSFI, Female Sexual Function Index; MSSCQ-SS, Multidimensional Sexual Self-Concept Questionnaire–Sexual Self composite score; PDS-5, Posttraumatic Diagnostic Scale for DSM-5; RSE, Rosenberg Self-esteem Scale. <sup>a</sup>Interaction terms are from the 12 models that address hypothesis 1. The full model information for these models is provided in Table S1.

95% CI, −1.51 to −0.11;  $P = .19$ ). However, there were no significant differences between the schema condition and the daily events condition or between the daily events condition and the assessment-only condition at either time point.

### *Hypothesis 2b: differences in perceived change in psychological well-being*

The analysis of variance models for between-condition differences in perceived psychological well-being change as measured by the modified PGIC demonstrated that there were significant differences between conditions when controlling for age at T2 ( $F_{2,135} = 7.73$ ,  $P < .001$ ) such that the sexual schema condition (MD, −0.98; 95% CI, −1.63 to −0.32;  $P = .002$ ) and the daily events condition (MD, −0.95; 95% CI, −1.61 to −0.29;  $P = .003$ ) reported significantly greater perceived improvement in psychological well-being at T2 than did the assessment-only condition. There were no significant differences between the daily events and sexual schema conditions. Additionally, there were no significant differences reported in perceived change in psychological well-being at T3.

### *Post hoc power*

Given the limits to our sample size and the small observed effects in our models, we were underpowered to detect most of our effects. Notably, we had low power for the effects found to be nonsignificant (power estimates ranged from 13% to 40%). In contrast, the effects that were significant had moderate to high power (power estimates ranged from 60% to 90%). As such, our results, particularly our null effects, should be considered with caution as we may not be detecting all true effects.

## **Discussion**

CSA has significant long-term impacts on individuals' sexual well-being (eg, sexual dysfunction) and psychological well-being (eg, PTSD).<sup>3-6</sup> While treatments exist for PTSD and separately for sexual dysfunction, few interventions are available to target the traumatic sexualization that occurs in CSA, often resulting in psychological trauma and sexual dysfunction.

Additionally, CSA is often experienced at higher rates in underresourced communities with significant barriers to accessing care (eg, work schedules, cost, transportation).<sup>7-9</sup> Therefore, the current study examined an online 5-session expressive writing intervention for women with CSA histories to expand the literature on accessible and scalable intervention development for this population and its sexual and psychological well-being and further the research on expressive writing paradigms for CSA. This 3-arm randomized controlled trial examined the efficacy of a sexual schema writing condition in comparison with a daily events writing condition and an assessment-only condition across measures of sexual functioning, sexual self-concept, posttraumatic stress symptoms, and self-esteem. While we had hypothesized that the sexual schema writing condition would outperform the daily events writing condition and the assessment-only condition in all 4 outcomes, our results indicated that both active writing conditions demonstrated improvement in sexual functioning and sexual self-concept over and above the assessment-only condition, while there were no differences across any of the conditions in the rate of improvement of posttraumatic stress and self-esteem.

In previous research on the sexual schema expressive writing program for women with CSA histories, Meston and colleagues<sup>15</sup> found that the sexual schema writing condition and a trauma-focused writing condition demonstrated improvements in PTSD and depression symptoms, though only the sexual schema condition showed improvement in the number of women meeting diagnostic criteria for sexual dysfunction (ie, hypoactive sexual desire disorder, female sexual arousal disorder, or female orgasmic disorder). While the current study found similar evidence for use of the sexual schema expressive writing paradigm for improving sexual functioning, there were no significant differences in PTSD symptoms in either of the active writing conditions in comparison with an assessment-only condition. Notably, while the current study used a self-report measure of PTSD symptoms specific to the CSA experiences, the Meston et al study used the Clinician-Administered PTSD Scale<sup>50</sup> for assessment of PTSD symptoms for the most significant trauma as reported in the Trauma History Questionnaire. As such, the lack of

**Table 4.** Group differences in perceived change in psychological and sexual well-being at T2 and T3.<sup>a</sup>

						95% CI	
	<i>df</i>	MS	<i>F value</i>	<i>P value</i>	$p\eta^2$	LL	UL
DV: T2 perceived change in sexual well-being							
Age	1	3.60	3.53	.062	0.025	0.00	0.10
Condition	2	5.90	5.78	.004	0.077	0.01	0.16
Residuals	135	1.02					
					95% CI		
					MD	LL	UL
							Adj <i>P value</i>
Post hoc multiple comparisons with Tukey HSD test							
Sexual schema vs assessment only				−0.76	−1.38	−0.13	.013
Daily events vs assessment only				−0.42	−1.04	0.21	.260
Daily events vs sexual schema				0.34	−0.10	0.78	.159
					95% CI		
	<i>df</i>	MS	<i>F value</i>	<i>P value</i>	$p\eta^2$	LL	UL
DV: T3 perceived change in sexual well-being							
Age	1	10.19	9.12	.003	0.065	0.01	0.16
Condition	2	3.88	3.47	.034	0.050	0.00	0.13
Residuals	128	1.12					
					95% CI		
					MD	LL	UL
							Adj <i>P value</i>
Post hoc multiple comparisons with Tukey HSD test							
Sexual schema vs assessment only				−0.81	−1.51	−0.11	.019
Daily events vs assessment only				−0.53	−1.23	0.17	.177
Daily events vs sexual schema				0.28	−0.18	0.75	.321
					95% CI		
	<i>df</i>	MS	<i>F value</i>	<i>P value</i>	$p\eta^2$	LL	UL
DV: T2 perceived change in psychological well-being							
Age	1	1.66	1.41	.237	0.010	0.00	0.07
Condition	2	9.10	7.73	<.001	0.101	0.02	0.19
Residuals	135	1.18					
					95% CI		
					MD	LL	UL
							Adj <i>P value</i>
Post hoc multiple comparisons with Tukey HSD test							
Sexual schema vs assessment only				−0.98	−1.63	−0.32	.002
Daily events vs assessment only				−0.95	−1.61	−0.29	.003
Daily events vs sexual schema				0.03	−0.44	0.49	.991
					95% CI		
	<i>df</i>	MS	<i>F value</i>	<i>P value</i>	$p\eta^2$	LL	UL
DV: T3 perceived change in psychological well-being							
Age	1	7.89	6.25	.014	0.046	0.00	0.13
Condition	2	2.72	2.15	.120	0.032	0.00	0.10
Residuals	127	1.26					
					95% CI		
					MD	LL	UL
							Adj <i>P value</i>
Post hoc multiple comparisons with Tukey HSD test							
Sexual schema vs assessment only				−0.77	−1.52	−0.02	.043
Daily events vs assessment only				−0.53	−1.27	0.22	.219
Daily events vs sexual schema				0.24	−0.26	0.74	.486

Abbreviations: Adj, adjusted; DV, dependent variable; HSD, honestly significant difference; LL, lower limit; MD, mean difference; MS, mean squared;  $p\eta^2$ , partial eta squared; UL, upper limit. <sup>a</sup>*P* values were adjusted for multiple comparisons per Tukey HSD tests.

observed change in the current study may be due to self-report measures of abuse-specific trauma symptoms or that the online modality of the writing had less effect on PTSD symptoms. Furthermore, while the Meston et al study had a clinical

sample assessed for sexual dysfunction and PTSD in inclusion, the current study had a community sample recruited with self-reported sexual distress. As such, it may be that the sexual schema writing condition is more useful for clinical levels of

PTSD than subclinical trauma-related symptoms, though still beneficial for clinical and subclinical sexual functioning and sexual self-concept.

As opposed to using a trauma-focused active writing comparison condition, the current study implemented a daily events writing condition in which participants reflected on their needs and wants of past 24 hours with a focus on remaining in the present moment, as well as an assessment-only nonwriting condition. Notably, both active conditions differed from the assessment-only condition, which may suggest that this is not just time or placebo effects but instead that sexual schema and daily events expressive writing can result in sexual improvements for women with CSA histories. Indeed, the writing prompts for both conditions suggest distinct potential mechanisms of action to support this. In the sexual schema condition, the targeted change was schema change, and though this is not directly assessed in the current study, the prompts direct individuals to reflect on the domains of schema (eg, self, others, global concept) in relation to sexuality. Indeed, women in the schema condition wrote about their sexual schemas:

I'm definitely looking at sex and intercourse with a whole new light. I feel like I respect myself more, I am able to control thoughts and urges that used to run my life. I've been feeling so much less dirty from these things that have happened to me that I had no control over. I am completely astonished by how much these writing assignments have helped me. (27-year-old woman)

In contrast, the daily events writing prompts focused on the present moment, encouraging individuals to reflect on their needs and wants of the day without drifting into the past. Women in this condition wrote about the value of staying anchored in the present moment: "Now, instead of withdrawing into my head, I bring myself into the present. I see my lover in front of me and I focus on loving her and bringing her pleasure. It erases all thoughts of shame. I found my own sexual desires, long buried by traumatized thinking" (31-year-old woman). As such, the daily events writing condition may have inadvertently been a mindfulness, needs-based writing intervention. In line with this, mindfulness-based sex therapy has consistently been demonstrated as highly effective in treating sexual dysfunction in women,<sup>51</sup> including improving sexual distress and concordance in those with CSA histories.<sup>52</sup>

While the online expressive writing intervention did not show improvement in the posttraumatic stress symptoms or global self-esteem of women over time beyond what was also observed in the assessment-only condition, it did demonstrate significant effects in sexual well-being indicators (eg, sexual functioning, sexual self-concept). As such, this paradigm may be an important avenue for developing accessible interventions for individuals who are unable to access traditional sex therapy due to treatment barriers (eg, time commitment, cost, childcare) or those who are subclinical and desire a less resource-intensive first step into sex therapy. Further research into the efficacy of integrating the trauma-focused writing prompts of the original Meston et al study<sup>15</sup> into the sexual schema writing prompts may aid in the development of a more holistic intervention that can be used for the psychological and sexual well-being of women with CSA histories.

While this study is strengthened by its ecologically valid community sample that is ethnically, sexually, and financially

diverse and its rigorous multisession treatment protocol, it is not without its limitations. Notably, the sample from Canada was substantially smaller than the sample from the United States, limiting the geographic representation in the sample. The sample was primarily homogenous in gender identity and as such may not generalize to other individuals with CSA histories (eg, cisgender men, transgender persons, and gender-diverse individuals). Similarly, the study was not inclusive to all ages of onset for nonconsensual sexual experiences and therefore may not generalize to individuals with other forms or later experiences of sexual trauma in the absence of CSA histories. The sample was also a community-collected sample that was not clinically assessed or limited by diagnostic criteria for sexual or psychological disorders. Thus, the findings are relevant only to community samples and not to clinical samples, which may have more severe symptom presentations across sexual dysfunction and posttraumatic stress.

Due to the potential mindfulness-based impact of the daily events writing condition, the current study is without an active placebo control condition, and we cannot fully rule out time or placebo effects. The assessment-only condition, while a nonactive control condition, was substantially smaller than the active intervention groups—this was based on the decision to use the limited resources for the study to support offering the intervention to a larger number of individuals. Similarly, while there were benefits to not randomizing the assessment-only condition (ie, ensuring that the participants were blind to the researchers' hypotheses), the lack of randomization for that condition may have introduced unobserved confounds into our results. An additional limitation of the current study is that the compensation for participation and research follow-up minimizes the validity of the retention rates that may be yielded from a more natural implementation study. Future researchers may want to examine how adding in more guided reflection on psychological-specific impacts into the schema prompts may help generalize the impact of the program onto more psychological well-being indicators. Finally, the sample size was limited by the time and resources available for this study, which was conducted as part of a dissertation. This resulted in some of our analyses being underpowered to detect the observed effect sizes, indicating that some of our null results (eg, nonsignificant change in PTSD symptoms for our active writing conditions as compared with the assessment-only condition) should be further evaluated in larger samples before being ruled as truly null findings.

## Conclusion

While the limitations of the study suggest cautious interpretation of the results, the notable improvement in sexual well-being for women with CSA histories via a highly accessible and scalable modality to sex therapy is promising. Indeed, the development of sex therapy tools that can increase individuals' access to healing while overcoming some common treatment barriers is critically needed, and this may be especially true for individuals with sexual trauma histories who often face additional treatment barriers (eg, difficulties with trust, shame). The current study provides evidence for the use of online modalities for expressive writing for women with CSA histories and supports the use of sexual schema writing paradigms for improving sexual well-being. Online expressive

writing paradigms that allow for guided reflection and space on how individuals' nonconsensual sexual experiences have affected their sexuality may be a fruitful strategy for many women to begin to achieve sexual recovery following sexual trauma.

## Author contributions

C.D.K.: conceptualization-equal, data curation-lead, formal analysis-lead, funding acquisition-equal, investigation-equal, methodology-equal, project administration-lead, resources-supporting, software-supporting. C.M.M.: conceptualization-equal, data curation-supporting, formal analysis-supporting, funding acquisition-equal, investigation-equal, methodology-equal, project administration-supporting, resources-lead, software-lead, supervision-lead.

## Supplementary material

Supplementary material is available at *The Journal of Sexual Medicine* online.

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## Conflicts of interest

None declared.

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