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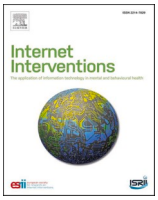

# Development and feasibility pilot of Considering PTSD Treatment: An online intervention with peer support

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ABSTRACT

Considering PTSD Treatment is an online program adapted from the National Center for PTSD's *AboutFace* website. Developed to help veterans overcome barriers to seeking treatment for posttraumatic stress disorder (PTSD), the program features videos of veterans describing PTSD and what treatment was like. Peer specialists are available at the beginning and end to chat with participants. We describe initial pilot feasibility data in 50 veterans recruited through online ads who screened positive for PTSD and were not currently in treatment. Eighty percent of participants who consented enrolled in the program and 64.0 % completed all modules. On average, participants rated the program at least "moderately" helpful and over 90 % reported feeling more knowledgeable about PTSD and PTSD treatment. Of the 21 participants who completed the one month follow-up, 52.4 % said they had talked to or were assessed by a provider and 61.9 % said they started treatment. There was not a significant change in stigma scores from baseline to follow-up. Results provide initial support for the feasibility, acceptability, and effectiveness of Considering PTSD Treatment for increasing treatment seeking readiness and support the need for a larger randomized controlled trial.

## 1. Introduction

A recent nationally representative sample of over 3000 U.S. veterans surveyed in 2019–2020 reported 5 % past month prevalence of PTSD (Wisco et al., 2022). Prevalence rates were higher in certain subgroups. For instance, women veterans in that sample were almost three times more likely to meet criteria for PTSD than men (11 % and 4 %, respectively), and prevalence was highest (14 %) among combat veterans of the wars in Iraq and Afghanistan (Na et al., 2023). PTSD is associated with high rates of psychiatric comorbidity, increased suicide risk, and deficits in social/occupational and physical functioning (Ahmadian et al., 2019; Forehand et al., 2022; Vogt et al., 2017; Walter et al., 2018). Despite high levels of distress and impairment, rates of treatment seeking are surprisingly low among both civilians and veterans with PTSD. In a very large nationally representative sample of over 50,000 civilians and veterans, between a half and two thirds of those with lifetime PTSD ever sought help from a counselor or therapist, and the delay to seeking help was longest for male veterans who waited an average of 10 years (Lehavot et al., 2018).

Stigma has been found to be a major barrier to seeking mental health treatment (Schnyder et al., 2017). Stigma may be especially salient for veterans due to the military cultural values around "toughness" and "self-reliance" (Krill Williston et al., 2019), in addition to specific concerns that mental illness could damage veterans' military career. One study of US service members from a combat infantry unit meeting screening criteria for a mental health disorder found that 65 % were concerned that others would see them as weak, 63 % were concerned that leadership would treat them differently, and 59 % were concerned that members of their unit might have less confidence in them (Hoge et al., 2004). The service members who met screening criteria for a mental health disorder were significantly more concerned about stigmatization than those who did not meet these criteria, highlighting the

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need for de-stigmatization efforts targeting veterans with mental health symptoms (Hoge et al., 2004).

Two strategies recommended to reduce stigma are education and contact with individuals who have mental illness (Corrigan et al., 2001). Peers, especially those who have a PTSD diagnosis, may be particularly well-suited to deliver educational interventions targeting stigma to Veterans with PTSD. These peers are considered trustworthy sources of information and can speak about similar lived experiences (Greden et al., 2010). Peers are well positioned to challenge misconceptions about mental illness and treatment in a personally engaging, non-threatening, and lay-friendly way. Additionally, peers can help veterans feel more empowered and confident (Resnick and Rosenheck, 2008). These interactions can motivate interest in learning more about PTSD and demystify the treatment process, resulting in increased treatment readiness and initiation (Naslund et al., 2016).

Interventions using veteran peer specialists have been shown to reduce stigma (Lucksted et al., 2011), improve recovery attitudes (Jain et al., 2016), and reduce dropout from PTSD treatment (Goetter et al., 2018; Hernandez-Tejada et al., 2017; Hernandez-Tejada et al., 2020). Accessing peers online (vs. in person or by phone) may have unique advantages. People with PTSD often feel socially isolated and may avoid in-person interactions, and/or are afraid to reach out for traditional face-to-face help due to concerns about how others will perceive them. However, online support is anonymous, discrete, and easily accessible from home, and therefore may be less intimidating and anxiety-provoking than in-person interactions. To date, the majority of peer interventions rely on in person, specially trained peers. However, this approach requires significant resources to manage, and thus, can be difficult to scale and sustain. In contrast, online support offers a scalable, cost-efficient, and accessible approach.

The *AboutFace* website, developed by the National Center for PTSD, presents information about PTSD and treatment, with a video gallery of veterans with PTSD sharing their personal stories about PTSD, the treatment process, and how treatment has impacted their lives. The veterans in the videos assume the role of a peer and speak directly to viewers as if they are engaged in an intimate conversation. A recent randomized controlled trial examined treatment initiation in veterans who had recently attended an assessment appointment in a specialized PTSD outpatient clinic. Veterans were randomized to receive either *AboutFace* or an educational brochure following their intake appointment. Preliminary results from this trial showed high rates of treatment seeking in both groups, likely because they had already made the decision to seek help (Grubaugh et al., under review).

In the current pilot study, we aim to test the effects of a web-based program called Considering PTSD Treatment (adapted from content from the *AboutFace* website), in veterans from the community who screened positive for PTSD but who had not taken steps towards seeking treatment. The current study expands on prior work related to *AboutFace* in three important ways. First, participants in the pilot had not taken the step of initiating services for PTSD. Second, to enhance the interactive and peer component of the program, we added synchronous peer chat as part of the program; veterans had the option to chat with a peer on the website through direct messaging both before and after completing the intervention. Third, using videos from the *AboutFace* website, we created a linear intervention that guides veterans through a series of select web pages in order to ensure that all participants were exposed to the same content (rather than the flexible browsing approach that *AboutFace* allowed), and that participants accessed the content we believed would have maximum benefit. The main goals of this pilot were 1) to examine the feasibility of study methods (e.g., feasibility of recruiting veterans from the community into the Considering PTSD Treatment program, 2) to determine rates of program completion, 3) to obtain feedback on the intervention; and 4) to obtain estimates of variability in outcomes (i.e., attitudes about treatment seeking and treatment readiness) to inform research design decisions in preparation for a future randomized controlled trial on the efficacy of the program for increasing readiness for PTSD treatment.

## 2. Material and methods

### 2.1. Participants

Fifty veterans who screened positive for PTSD were enrolled in this trial from May to October in 2022. Specific inclusion criteria included 1) identifying as a veteran, 2) scoring 25 or more on the PCL-5, and 3) reporting no current engagement in PTSD treatment. The majority of participants identified as male (75.4 %) and White (53.1 %). See Table 1 for all participant characteristics.

### 2.2. Measures

#### 2.2.1. Primary care PTSD screen for DSM-5 (PC-PTSD-5; Bovin et al., 2021)

The PC-PTSD-5 is a 5-item screen designed to identify individuals with probable PTSD in primary care settings. Participants in the study completed the screen to assess potential eligibility. This measure begins with one item assessing lifetime exposure to traumatic events, followed by five additional questions (if a traumatic event is endorsed) about how that trauma exposure has affected them over the past month. This measure has demonstrated good diagnostic utility among veterans (Bovin et al., 2021).

**Table 1**
Participant characteristics and baseline measures.

| Variable | Variable subcategory | Mean (*SD*) or % |
|---|---|---|
| Age (in years) | | 50.51 (14.30) |
| Gender | | |
| | Female | 24.49 % |
| | Male | 75.41 % |
| Racial/ethnic identity | | |
| | White | 53.06 % |
| | Black | 32.65 % |
| | Hispanic | 8.16 % |
| | Other | 4.08 % |
| | Native American | 2.04 % |
| Marital status | | |
| | Married | 42.86 % |
| | Divorced | 24.49 % |
| | Never Married | 18.37 % |
| | Separated | 6.12 % |
| | Other | 6.12 % |
| | Widowed | 2.04 % |
| Employment | | |
| | Employed Full-Time | 42.86 % |
| | Disabled | 24.49 % |
| | Not employed | 16.33 % |
| | Retired | 14.29 % |
| | Employed Part-Time | 2.04 % |
| Combat exposure | | 46.94 % |
| Theaters | | |
| | N/A | 51.02 % |
| | OEF/OIF (Iraq War/Afghanistan) | 24.49 % |
| | Desert Storm | 16.33 % |
| | Other | 8.16 % |
| PTSD Checklist-5 (range 0–80) | | 54.26 (11.00) |
| Stigma (range 8–40 for all subscales) | | |
| | Beliefs about Mental Illness | 14.28 (4.52) |
| | Beliefs about Mental Health Treatment | 17.44 (6.08) |
| | Beliefs about Seeking Treatment | 16.96 (8.66) |

*Note.* OEF = Operation Enduring Freedom, OIF = Operation Iraqi Freedom, PTSD = Posttraumatic Stress Disorder.

#### 2.2.2. The PTSD checklist-5 (PCL-5; Weathers et al., 2013)

The PCL-5 was used to confirm eligibility during the baseline assessment. The PCL-5 is a 20-item self-report measure of PTSD symptoms based on DSM-V criteria. Total scores on the PCL range from 0 to 80 and higher scores reflect greater PTSD severity. The PCL-5 has good internal consistency (0.96), test–retest reliability (r 0.84), and convergent and discriminant validity (Bovin et al., 2016). Participants had to score 25 or higher on the PCL-5 to enroll in the study. All participants who scored positive on the PC-PTSD screen met this criterion.

#### 2.2.3. Endorsed and anticipated stigma inventory (EASI; Vogt et al., 2014)

The EASI was used to assess attitudes and barriers towards seeking mental health services at post-intervention and one month follow-up. The EASI was developed to assess different dimensions of stigma-related beliefs about mental health among military personnel and veterans. Three subscales were used: beliefs about mental illness, beliefs about mental health treatment and beliefs about seeking treatment. Each subscale ranges from 8 to 40, and is comprised of eight items scored on a 5-point Likert scale ("strongly disagree" to "strongly agree"), with higher scores indicative of greater stigma. Psychometric properties of the EASI suggest that it demonstrates good internal consistency reliability, content validity, and convergent and discriminant validity (Vogt et al., 2014).

#### 2.2.4. Considering PTSD Treatment helpfulness scale

Directly following the intervention, participants were asked six questions, developed for this study, on a 5-point scale: "not at all helpful" (0), "a little helpful" (1), "moderately helpful" (2), "quite a bit helpful" (3), or "extremely helpful" (4).

#### 2.2.5. Self-reported PTSD treatment seeking readiness

PTSD treatment seeking readiness was measured at post-intervention and one month follow-up with six yes/no questions developed for this study. These items assessed three stages of change consistent with the transtheoretical model of change: contemplation, preparation, and action (DiClemente and Prochaska, 1998). Two items assessed contemplation: felt more knowledgeable about PTSD and PTSD treatment and thought about seeking help. Two items assessed preparation: talked to someone about what you learned in the program and accessed online resources. Finally, two items assessed actions participants could take to initiate treatment: had an assessment and started treatment.

#### 2.2.6. Observed treatment information/support seeking

Observable indices of information and support seeking included whether participants initiated a post program chat with a peer specialist and/or reviewed any of the resources made available at the end of the Considering PTSD Treatment program. These variables were captured on the Vets Prevail platform.

### 2.3. Intervention

The Considering PTSD Treatment program consists of 6 online modules that broadly address what PTSD is and how treatment can help (see Table 2 and supplemental materials for a brief overview of content by module). The program is heavily weighted towards videos, but also contains written information (see Fig. 1). The videos are all drawn from the educational campaign *AboutFace* (*www.ptsd.va.gov/aboutface*), a web-based video gallery of veterans with PTSD who share their personal stories about PTSD, the treatment process, and how treatment has turned their lives around. Developed by the National Center for PTSD, this award-winning educational campaign has reached tens of thousands of veterans.

Considering PTSD Treatment takes approximately 30 min to complete. Participants are encouraged to view it in one sitting, but can start and stop as needed over a two-week period. The program is linear, with an approachable structure that guides participants from the beginning to the end. This is different from *AboutFace*, which is intentionally unstructured, allowing visitors complete freedom to view any videos of interest in any preferred order. The Considering PTSD Treatment program also offers a built-in, synchronous peer chat feature, available typically from early morning through midnight. If a peer is not available, the participant must try again at a later time. Peer specialists reach out to participants through direct message chat at the beginning of the program to share their own experiences and describe how a program like Considering PTSD Treatment would have been useful to them. They are also available at the end of the program to offer additional support and resources.

**Table 2**
Overview of Considering PTSD Treatment.

| Module | Content |
|---|---|
| 1. Do I have PTSD? | Veterans share examples of the 4 different symptom clusters that comprise PTSD |
| 2. How does PTSD affect people you love? | Family members describe what it is like to live with someone with PTSD |
| 3. How can treatment help? | Veterans explain the ways in which PTSD treatment helped them learn to cope, improved their relationships, and feel more confident and hopeful |
| 4. What is treatment like? | Veterans talk about how therapy and medications have helped them with their PTSD. A clinician talks about how to know if someone is ready for PTSD treatment |
| 5. Our advice to you – treatment works | Veterans provide advice on what they wish they knew about PTSD treatment |
| 6. What's next? | A list of links to educational PTSD resources are provided as well as information about how to find a therapist |

### 2.4. Procedure

All study procedures were approved by the Ralph H. Johnson Research & Development Office (R&D) and the institutional review board of the Medical University of South Carolina. Participants were recruited through online advertisements (e.g., Facebook, Google ads) that connected to the Vets Prevail website where users learned more about the study and could opt in to complete a brief screening survey for the purpose of determining study eligibility. If a participant screened positive (i.e., endorsed 3 out of 5 items on PC-PTSD-5) and confirmed they were not currently in PTSD treatment, they were asked to provide their name and telephone number so that a study team member could reach them to tell them more about the study and, if willing, complete a baseline assessment which included informed consent.

Interested participants were first assessed with the PCL-5 to determine if their PTSD symptoms met the threshold for probable PTSD (i.e., a score above 25). If eligible, the study coordinator administered the remaining assessment battery and entered the participants' baseline data directly onto the Vets Prevail dashboard. After completing the baseline assessment, the study coordinator instructed the participant how to log back into the Vets Prevail platform so they could access the Considering PTSD Treatment program.

Upon logging into the program, a peer specialist immediately reached out via chat to connect with the participant. Participants were required to answer the chat to move forward but were given the option to let the peer specialist know they were not interested in chatting. After contact with the peer specialist, participants could begin the program and the first module was unlocked. Subsequent modules would only open when the prior one was completed. Participants had two weeks to complete the 30-min program. The study coordinator could track progress through the program and would call and text participants as needed to encourage participation during the 2-week active intervention phase.

Immediately upon completing the program, or at the end of two-week program availability window (whichever came first), the post

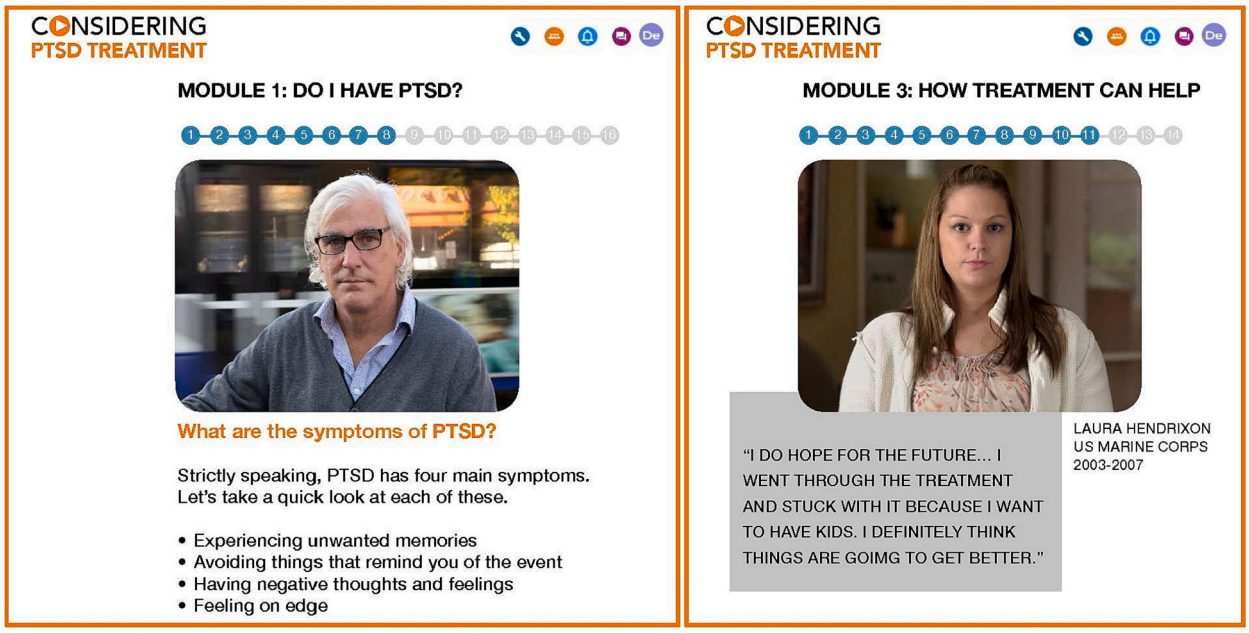


**Fig. 1.** Screen shots from the Considering PTSD Treatment program.

assessment window opened. Participants would then receive a text and a call from the study coordinator asking them to complete the post assessment online through the Vets Prevail platform. One month later, participants were again texted and called as a reminder to complete the one month assessment. Participants received $15.00 for completing the baseline assessment, $15.00 for completing the post assessment, and $15.00 for completing the one month follow-up assessment for a combined possible total of $45.00. They were emailed an Amazon gift card from Vets Prevail after completion of each study component.

### 2.5. Data analytic plan

First, we assessed feasibility with descriptive analyses demonstrating how helpful veterans found the program. We also sought to describe the extent to which veterans engaged in additional information/support seeking after completing the program. Next, we characterized variability/change in stigma-related beliefs and treatment seeking from baseline to post-intervention and/or one month follow-up using descriptive statistics and paired *t*-tests. Stigma-related beliefs and treatment seeking readiness were assessed at three time points (i.e., baseline, post-intervention, and at one month follow-up); thus, we used paired t-tests to examine both changes from baseline to post-intervention, as well as from baseline to one month follow-up for these outcomes. Data are reported separately for the portion of participants that completed the outcome assessments as well as for the total sample. For the post-intervention assessment, 29 of the 30 participants completed all of the program modules. For the follow-up assessment, 20 of 21 participants completed all of program modules.

## 3. Results

### 3.1. Recruitment

Over a three month period 116 referrals were received. We were able to contact 56 (48.3 %) of these individuals. Two participants declined, two were ineligible because they did not meet criteria for PTSD, and two did not complete the baseline. Thus, 50 participants enrolled in the study.

### 3.2. Program engagement

Of the 50 consented participants, 40 (80.0 %) enrolled in the program, 38 (76.0 %) initiated the program and 32 (64.0 %) completed it. Twenty-one participants completed the one month follow-up assessment. The pre-program chat required of all participants had an average of 17.9 messages per chat session and a duration of 10:57 min.

### 3.3. Program feedback on helpfulness

On average, participants reported that they found the program

**Table 3**
Helpfulness feedback, N = 30.

| Variable | Mean | SD | Percent of participants rating item at least "Quite a Bit" helpful |
|---|---|---|---|
| How helpful was the Considering PTSD Treatment program? | 2.87 | 1.07 | 70.0 % |
| Did the Considering PTSD Treatment program help you better understand your PTSD symptoms? | 2.97 | 1.25 | 70.0 % |
| Did the Considering PTSD Treatment program help you better understand the impact of PTSD on your family or loved ones? | 2.97 | 1.22 | 70.0 % |
| Did the Considering PTSD Treatment program help you better understand your treatment options? | 2.73 | 1.14 | 57.0 % |
| Did the Considering PTSD Treatment program encourage you to take steps towards getting treatment for PTSD? | 2.80 | 1.24 | 66.7 % |
| If your friend or someone you knew had PTSD, or was in need of PTSD treatment, would you recommend this program to them? | 3.10 | 1.09 | 70.0 % |

Note. Helpfulness was rated on 5-point scale: "not at all helpful" (0), "a little helpful" (1), "moderately helpful" (2), "quite a bit helpful" (3), or "extremely helpful" (4).

"moderately" to "quite a bit" helpful. See Table 3 for expanded detail on each item assessing perceived helpfulness of the program.

### 3.4. Additional information/support seeking

Seven of the 32 completers chose to click a link to obtain additional information after completing the program. Of the nine links presented, the most clicked were videos of additional veterans sharing longer stories about their PTSD treatment experiences (six participants) and the PTSD Treatment Decision Aid, an online tool to compare different effective treatments (three participants). One participant chose to view pages about veterans' experiences with three different treatments, one went to the National Center for PTSD website, and one clicked on information about how to find a therapist. No participants clicked on the *AboutFace* homepage link.

Ten participants chose to engage in the post-program chat with an average of 31.8 messages per chat session and a duration of 22:48 min. On a scale from 1 to 5, participants rated the peer specialists 4.67 on helpfulness and 4.67 on supportiveness.

### 3.5. Self-reported PTSD treatment seeking readiness

Of those who completed the one month follow-up, almost everyone endorsed that they felt more knowledgeable about PTSD and thought about seeking mental health treatment after completing the program. Just over half took preparation steps to further their knowledge and half discussed with a family member what they had learned. Just over half of the participants talked to or were assessed by a provider and slightly more reported they started treatment. See Table 4 for expanded detail.

### 3.6. Stigma-related beliefs

For the 31 participants who completed the post-intervention stigma-related beliefs measure, "Beliefs about mental illness" stigma increased significantly from baseline ($M = 14.81$, $SD = 4.78$) to post-intervention ($M = 16.39$, $SD = 5.54$; t-statistic $= -2.07$, df $= 30$, $p = .047$, 95 CI $= -3.14$ to $-.02$). "Beliefs about mental health treatment" and "Beliefs about seeking treatment" did not change significantly from baseline to post-intervention.

For the 20 participants who completed the one month follow-up stigma-related beliefs measure, none of the stigma subscales significantly changed from baseline to follow-up (t-statistics from −0.66-1.03, $ps > 0.31$).

## 4. Discussion

In the current feasibility pilot study, we investigated the effects of the Considering PTSD Treatment program among veterans from the community who screened positive for PTSD but who had not taken steps towards seeking treatment. This study expanded upon prior work in that it focused on participants who had not initiated any steps towards treatment; additionally, the program tested was enhanced from previous versions by the addition of synchronous peer chat and the presentation of linear content that encourages participants to complete all sections to ensure exposure to content believed to be most effective from the intervention.

We found that it was feasible to recruit participants from this population, and that the majority of participants who initiated the program completed it. Additionally, we found that participants on average found the program "moderately" to "quite a bit" helpful, and that almost all participants reported that, following the program, they felt more knowledgeable about PTSD and thought about seeking mental health treatment. Of those who completed measurement, about half self-reported taking preparation steps to treatment, and just over 60 % reported that they had started treatment a month after completing the program. Our data are consistent with results from Stecker et al. (2014), which showed that one month after a one-session CBT intervention to increase PTSD treatment initiation, 21 % of participants had started PTSD treatment as compared to 12 % in the control group. In the current study, we found that an even larger proportion of participants initiated PTSD treatment one month following the intervention which is highly encouraging given that this online intervention requires fewer resources than an intervention requiring a phone call from a trained staff member.

Unexpectedly, we found that stigma-related beliefs did not decrease. Stigma-related beliefs were low for this sample at baseline (subscales on average ranged from 14.28 to 17.44 on a scale from 8 to 40); thus, stigma may have been too low to be significantly decreased by the intervention. Additionally, some stigma items on the EASI may not necessarily reflect maladaptive biases but rather legitimate concerns

**Table 4**
Percent of participants who self-reported PTSD treatment seeking readiness.

| | Participants with measurement | | Total sample ($N = 50$) | |
|---|---|---|---|---|
| Variable | Post-treatment (N = 30) | 1-month assessment ($N = 21$) | Post-treatment | 1-month post-treatment |
| Contemplation | | | | |
| Since enrolling in the Considering PTSD Treatment program, have you thought about seeking mental health services or finding a provider? | 93.3 | 85.7 | 56.0 | 36.0 |
| Since enrolling in the Considering PTSD Treatment program, do you feel more knowledgeable about PTSD and PTSD treatment than you did before the program? | 93.3 | 90.5 | 56.0 | 40.0 |
| Preparation | | | | |
| Since enrolling in the Considering PTSD Treatment program, did you access any online resources to learn more about PTSD and PTSD treatment? | 46.7 | 66.7 | 28.0 | 28.0 |
| Since enrolling in the Considering PTSD Treatment program, did you talk to anyone else about what you learned from the intervention such as a spouse, family member etc.…? | 50.0 | 52.4 | 30.0 | 22.0 |
| Action | | | | |
| Since enrolling in the Considering PTSD Treatment program, did you talk to a healthcare provider about whether you have PTSD or did you complete a formal PTSD assessment? | 43.3 | 52.4 | 26.0 | 22.0 |
| Since enrolling in the Considering PTSD Treatment program, did you start any type of mental health services treatment? | 30.0 | 61.9 | 18.0 | 26.0 |

communicated by other members of the military or the veteran's larger social environment. As such, these items may be less modifiable than others further minimizing change on this measure post intervention given our sample's low baseline scores on this measure. While stigma has been found to impact PTSD treatment decisions (GAO report, 2011; Brown et al., 2011), more recent research suggests that other factors, such as problem recognition, symptom severity, avoidance, and beliefs about the effectiveness of treatment, impact treatment seeking decisions more than stigma (Harpaz-Rotem et al., 2014; Johnson and Possemato, 2021; Stecker et al., 2014; Stecker et al., 2013). Thus, this program may have helped increase veterans' problem recognition and their beliefs in the effectiveness of treatment, which may have led to the increased PTSD treatment readiness effects obtained in the current study.

This study had several key limitations. Because this was a feasibility study, it was not designed to evaluate the efficacy of the program. It had an uncontrolled design, a small sample size, and relatively brief follow up period. Another limitation is that we were unable to control for the effects of the interpersonal contact with the study coordinator that took place during the initial assessment and follow up telephone calls. However, now that we have confirmed that we can successfully recruit veterans from the community to take part in the intervention, and that once enrolled, they will likely complete it, the next step is to conduct a randomized controlled trial comparing the effects of this program to a control condition to better assess program efficacy.

Overall, we found support for the feasibility and acceptability of the Considering PTSD Treatment program; the majority of veterans reported that the program was helpful, and a majority of participants who completed the follow-up assessment, self-reported that they had started treatment a month after completing the program. These results are encouraging in that they demonstrate that this brief program can be helpful in connecting veterans with PTSD to appropriate treatment. Future randomized controlled trials are needed to further test the efficacy of this program. If proven efficacious a modified version of the Considering PTSD Treatment program would be made available on the U.S. Department of Veterans Affairs' (VA) National Center for PTSD website. That version would not require logging in to the Vets Prevail platform but would also not offer the online peer chat. Within VA, currently existing, trained peer specialists might be able to take the place of the online peer chat feature in supporting veterans in using the program to get connected to PTSD treatment.

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## Declaration of competing interest

None.

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