



## Physical activity promotion in women with PTSD: What we need for progress



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### ABSTRACT

**Objectives:** Researchers explore considerations for studying exercise promotion in women with post-traumatic stress disorder (PTSD).

**Design:** Researchers evaluated current studies on exercise promotion and PTSD.

**Method:** Presents critical reflections on (1) the underrepresentation of women in health promotion and PTSD research, and (2) the impact women's trauma histories may have on exercise behavior.

**Results:** The underrepresentation of women in exercise trials leaves unanswered questions as to the generalizability of findings in women. Feasibility and acceptability of these programs among women with PTSD remains untested. Preliminary data indicate unique considerations may exist across the design and implementation domains.

**Conclusions:** Increased studies examining population-specific considerations for women with PTSD are needed.

### 1. Introduction

Post-traumatic stress disorder (PTSD) is a mental health condition that can result from a traumatic event. Research suggests women experience the highest rates of PTSD, with women veterans experiencing the highest prevalence (13.4%), followed by women civilians (8.0%), male veterans (7.7%), and male civilians (3.4%) (Lehavot, Katon, Chen, Fortney, & Simpson, 2018). PTSD is associated with adverse physical and psychological health conditions including cardiometabolic disease, impaired physical functioning, and depression and anxiety (Dedert, Calhoun, Watkins, Sherwod, & Beckham, 2010; Ginzburg, Ein-Dor, & Solomon, 2010). Individuals with PTSD also engage in less physical activity than persons without PTSD (van den Berk-Clark et al., 2018). Women diagnosed with PTSD are less likely to participate in exercise and more likely to be obese than their male counterparts, making physical activity promotion in this population a public health priority. (Leardmann et al., 2011; Vujanovic, Farris, Harte, Smits, & Zvolensky, 2013). Exercise in this population has been shown to effectively decrease depressive symptoms while also improving comorbid health conditions (Rosenbaum, Sherrinton, & Tiedmann, 2015). However, women are vastly underrepresented in this research.

### 2. Health promotion research in PTSD: Women are vastly underrepresented

Despite the high prevalence of PTSD in women, most of the work on PTSD, health status, and health promotion has been conducted on predominately male samples. In studies that do include women, gender differences in the uptake or response to the exercise program are rarely explored. A recent meta-analysis found that over half (62%) of the studies examining aerobic fitness and PTSD in veterans used all male samples. Of the few studies that include women veterans, they make up a small percent of the total sample (< 20%), and gender analyses are not reported (Whitworth & Ciccolo, 2016). Another review exploring physical activity behaviors in adults with PTSD reported greater representation in published studies, with 6 of the 15 studies reporting study samples of ≥ 45% women. Despite increased numbers of women involved, only 4 reported gendered effects (Hall, Hoerster, & Yancy, 2015).

Underrepresentation of women in this area of research is due in large part to targeting occupations with high exposure to trauma, such as first responders and military veterans, which are male-dominated. Thus, we acknowledge that enrolling a gender-balanced study population in PTSD in sufficient numbers to provide sub-group analysis by gender is a challenge, and increases the cost and duration of clinical

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trials. With women's participation in the military rapidly increasing, and recent efforts to coordinate recruitment of women veterans for clinical research across VHA facilities, progress is being made.

Although gendered effects may be a challenge to compute with lower levels of female participation in these studies, gendered feasibility and acceptability data are important, and accessible information to report. To our knowledge, no mixed-gender trials of exercise and PTSD to date have reported feasibility and acceptability rates by gender. In the absence of gendered feasibility and acceptability data, it is not clear if tailored programs for women are needed, or what strategies to increase female enrollment and participation are impactful. Without targeted recruitment efforts to include greater numbers of women and/or more fully report process and efficacy outcomes by gender, identifying gender-specific outcomes and responses to exercise will not be possible, maintaining the current gendered outcome disparity.

Exercise trials targeting women with PTSD have several shortcomings. These trials often utilize yoga (n = 2; Mitchell et al., 2014; Kolk et al., 2014) and aerobic exercise such as walking and biking (n = 2; Fetzner & Asmundson, 2015; Shivakumar, Anderson, Suris, & North, 2017) as the primary modes of activity. None of these studies have offered a multi-component exercise intervention. Half of these studies used non-controlled study designs. Outcomes in these studies are exclusively mental health. Only 1 study of walking in women veterans with PTSD explored changes in the physical health domain, citing patient-reported improvements in energy, stamina, and pain symptoms after a 12-week walking intervention (Shivakumar et al., 2017). Impacts these programs have on clinical health indicators, physical performance measures, and patient-centered health outcomes in this population is unknown, representing a significant research gap and public health priority. Finally, this small literature suffers from a lack of diversity; across race/ethnicity, age, geographic region, and education and socioeconomic status. Although this is a criticism that applies to clinical trials more broadly, studies of exercise and PTSD in diverse samples (of women) are needed, and would make a significant contribution to the field (Arnett, 2008; Henrich, Heine, & Norenzayan, 2010).

### 3. Women's trauma histories may impact exercise behavior

Female service members are more likely to be exposed to multiple traumas and to develop PTSD from childhood sexual or physical abuse or military sexual trauma (MST) (Freedly et al., 2010). This trend is mirrored in the general population, with women experiencing high rates of sexual traumatization (Stein, Walker, & Forde, 2000). PTSD stemming from sexual trauma in women may manifest itself differently than PTSD stemming from combat-related or assaultive trauma in men. This may, in turn, affect health behaviors and attitudes toward exercise.

Long-term consequences of sexual violence include those reported in assaultive PTSD. Sexual trauma involves additional consequences that may operate as barriers to health-promoting behaviors. These include eating disorders, distrust, dissociative episodes, shame, avoidance, low self-esteem and self-image, among others (Rape, Abuse & Incest National Network, 2015). New research also suggests a relationship between PTSD, fibromyalgia, and chronic pain in women, making the decision to become physically active not only psychologically aversive, but also physically challenging (D'Aoust et al., 2017). Considering the high prevalence of sexual trauma linked to PTSD in women, it is important to consider how these distinct aspects of trauma type and PTSD symptomology affect enrollment and attrition in physical activity promotion programs. It is not clear to what extent, if at all, these factors have been integrated into recruitment and enrollment strategies or for interventions targeting PTSD.

For instance, gender-specific options for PTSD treatment are essential for some women (Kimerling et al., 2015). This may have implications for the setting in which activity programs are delivered.

Qualitative data from a walking study in women veterans with PTSD suggests that the gym environment and study staff are important programmatic considerations in this population (Shivakumar et al., 2017). Participants stated, "I absolutely didn't want to be around a bunch of men," and "didn't want to be there by myself with the guys." This indicates that population-specific considerations such as same-gendered exercise staff are significant, and may affect adherence and acceptability rates. Clearly more work is needed in developing tailored programs and effective implementation strategies for this population.

### 4. Conclusion

PTSD prevalence is dramatically higher in women than in men, yet we have shown that trials of PTSD and exercise are primarily tested in men. The underrepresentation of women, and a lack of gender diversity in general, are not unique to PTSD and exercise trials (Martin, Beard, Cissold, Androas, & Curret, 2017; Vancampfort, Rosenbaum, Ward, & Stubbs, 2015). This is a limitation of exercise and mental health research more broadly that warrants further consideration. As such, results from these studies only apply to similar individuals, and are not generalizable to women (and other underrepresented groups). This report is meant to highlight the existing and pervasive disconnect between study designs and the populations these therapeutic interventions are meant to treat. The current lack of knowledge of women's perceptions and completion of exercise interventions makes it nearly impossible to develop and implement tailored programs for women with PTSD that take into consideration the distinct characteristics of women with this condition. Preliminary data indicate unique considerations may exist across the design and implementation domains. Placing women with PTSD in stakeholder positions to inform study design, outcomes, and implementation is one practical strategy for increasing the reach and relevance of these trials. This report calls for increased qualitative studies to examine population-specific programmatic considerations for women with PTSD, increased reporting of gendered feasibility and acceptability rates, and intentional recruitment of women with PTSD to exercise trials.

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### Conflict of interest

The views expressed in this article are those of the authors and do not necessarily represent the views of the Department of Veterans Affairs. None of the authors have any conflicts of interest to report.

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