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Trauma, PTSD, and Self-Efficacy: Predictors of Reproductive Healthcare
Utilization in Sexual Violence Survivors

by

Lillian Bengtson, M.S.

A dissertation
submitted in partial fulfilment
of the requirements for the degree of
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Sincerely,

Ralph Baergen, PhD, MPH, CIP

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List of Abbreviations

ACE	Adverse childhood experience
ACS	American Cancer Society
CDC	Center for Disease Control and Prevention
CSA	Childhood sexual abuse
CSE-T	Trauma Coping Self-Efficacy Scale
HPSA	Health Professional Shortage Area
HSC	Human Subjects Research Committee
LEC-5	Life Events Checklist for the DSM-5
PCL-5	PTSC Checklist for the DSM-5
PCP	Primary care provider
PSBQ	Pap Smear Belief Questionnaire
PTSD	Posttraumatic stress disorder
MTurk	Amazon Mechanical Turk
SES-SFV	Sexual Experiences Survey – Short Form Victimization
STI	Sexually transmitted infection
TCSE	Trauma coping self-efficacy

Trauma, PTSD, and Self-Efficacy: Predictors of Reproductive Healthcare Utilization in Sexual Violence Survivors

Dissertation Abstract – Idaho State University (2023)

Sexual violence is highly prevalent in the United States and is associated with a host of negative physical and mental health outcomes. Specifically, sexual violence is associated with increased rates of cervical cancer, one of the most common cancers found in women. Furthermore, sexual violence survivors report reduced participation in preventive healthcare behaviors such as Pap tests which may reduce individuals' risk of developing reproductive health conditions such as cancer. Sexual violence exposure is also associated with increased symptoms of posttraumatic stress disorder (PTSD) and reduced trauma coping self-efficacy (TCSE), two factors which may impact trauma-exposed individuals' level of avoidance of cervical cancer screens. Current research on the connection between sexual violence and reproductive healthcare often fails to examine potential underlying mechanisms behind this association, nor does it account for confounding factors such as healthcare accessibility and need. Accordingly, the present study applied a moderated mediation model to explore the association between sexual violence and cervical cancer screening participation, including analysis of the indirect effect of TCSE and potential moderation of this effect by PTSD symptoms. Participants were 554 participants who reported experiences of sexual violence on Amazon's Mechanical Turk (MTurk). Severity of sexual violence was significantly associated with reduced likelihood of participation in recommended cervical cancer screening. TCSE did not mediate nor PTSD moderate this association. Findings of this study suggest that individuals' reproductive healthcare behaviors are influenced by their experiences of sexual trauma, as well as by structural factors

such as insurance and income. Limitations, directions for future research, and clinical implications of study findings are discussed.

Key Words: sexual violence, trauma, PTSD, women's health, cervical cancer

Introduction

Experiences of sexual violence are highly prevalent in the United States, especially among women, transgender, and nonbinary individuals, and have been found to be associated with a variety of health risk behaviors and negative health outcomes (Jina & Thomas, 2013; Mahoney et al., 2019). For individuals with cervixes, negative reproductive health outcomes such as increased rates of sexually transmitted infections (STIs) and cervical cancer are especially associated with sexual violence (Cesario et al., 2015). However, in spite of their increased risk for these negative outcomes, survivors of sexual violence often report lower rates of utilization of reproductive healthcare services such as cervical cancer screenings (Jina & Thomas, 2013). Personal experience of sexual violence is further associated with high rates of posttraumatic stress disorder (PTSD), a trauma-related disorder characterized by intrusive thoughts and avoidance behaviors which may motivate sexual violence survivors to avoid the potentially re-traumatizing experience of cervical cancer screening (Edmonds et al., 2021; Guina et al., 2018). However, individuals who have high confidence in their ability to manage symptoms of posttraumatic stress may not display this same pattern of reproductive healthcare avoidance; this protective factor is known as trauma coping self-efficacy (TCSE; Benight & Bandura, 2004; Cavallieri et al., 2019). Accordingly, the present study evaluated sexual violence, PTSD, and TCSE as predictors of sexual violence survivors' participation in cervical cancer screenings in order to shed more light on the relation between sexual trauma and health behaviors.

Sexual violence in vulnerable populations

Results of a 2019 study by the U.S. Department of Justice suggest that, on average, 463,634 people experience sexual violence every year in the United States (Morgan et al., 2019).

This translates to roughly one instance of reported sexual violence every 68 seconds. Given significant rates of underreporting of sexual violence in the United States, the actual prevalence of sexual violence may be even higher than this estimate, with even further elevated rates of sexual violence for individuals belonging to marginalized identity groups who experience higher rates of victimization (e.g., indigenous people, people with disabilities, etc.; Armstrong et al., 2018).

The definition of sexual violence varies significantly across contexts, and often overlaps to varying degrees with labels including sexual assault, sexual abuse, rape, sexual victimization, partner violence, sexual harassment, and interpersonal violence. Historically, narrow definitions of sexual violence have focused exclusively on nonconsensual vaginal penetration; however, this definition is inclusive neither of the wide range of genders who experience sexual violence, nor of the variety of nonconsensual sexual experiences which a given individual may consider traumatic (Armstrong et al., 2018). Accordingly, within the current study, sexual violence is broadly defined as any sexual act committed against a person who cannot or does not consent (Armstrong et al., 2018). Furthermore, while sexual violence affects people of all gender identities, it is important to note that the majority of past research on sexual violence tends to focus on cisgender individuals (i.e., people who identify with their sex assigned at birth). Accordingly, in discussions of previous literature on gender and sexual violence in this document, use of the terms “women,” “female,” “men,” and “male” may be assumed to be referencing primarily cisgender individuals unless otherwise specified. Compared to men, women are significantly more likely to experience a wide variety of traumatic sexual experiences (Portnoy et al., 2018). Decades of research estimate that 30-50% of women experience sexual harassment in their lifetimes, 7-27% experience sexual assault, and roughly 19% experience

childhood sexual abuse (Farley et al., 2002; Mahoney et al., 2019). Additionally, women tend to experience trauma at an earlier age than men, a finding which is especially significant given the lasting effects of traumas experienced during sensitive periods of development such as childhood and adolescence (Olf, 2017).

Feminist theories highlight the importance of societal power and control in perpetuating cycles of violence against women, who typically wield significantly less social power and possess fewer social resources compared to cisgender men (Brubaker, 2021; Jasinski, 2001). This unequal distribution of power typically results in the disproportionate victimization of women by men, thereby reinforcing the structure of male cultural dominance (Jasinski 2001). Furthermore, not only does this power structure place women and other marginalized gender groups at greater risk of victimization, but it also may render them more vulnerable to negative outcomes associated with experiences of gender-based violence, as they have access to fewer resources to cope with the effects of violence (Brubaker 2021).

While much of the research on demographic characteristics associated with risk for sexual violence has focused on differences between cisgender men and women, and 95% of participants in this study identified as cisgender women, it is important to note that these identities are not the only ones which may be associated with increased risk of sexual violence victimization. Past research has found differences in sexual violence prevalence related to gender, sexuality, race, ability status, urban versus rural residency, education, income, age, and more (Armstrong et al., 2018; Basile et al., 2016; Edwards et al., 2015). Furthermore, these identities may interact to uniquely impact individuals' risk for experiencing this particular type of violence. For example, past researchers have noted that women with a sexual minority identity (e.g., homosexual, bisexual, etc.) may be more at risk for experiencing sexual violence compared

to men with sexual minority identities (Edwards et al., 2015). Pegram and Abbey (2019) reported differences between African American and White women in the connections between sexual violence severity, depression, and physical health, such that depression mediated the relationship between sexual violence and physical health only for African American women participants. While the bulk of this project focuses on the effects of sexual violence on individuals with cervixes (the majority of whom are women), it is essential to note that intersections between identities such as gender, race, ability, and more may all uniquely influence an individual's risk of experiencing trauma, as well as their ability to cope with the effects of this trauma.

Effects of sexual violence

Health risk behaviors

Personal experience of trauma is associated with a broad variety of risky health behaviors, ranging from increased rates of smoking and heavy drinking to reduced likelihood of wearing seatbelts while in a car (Lang et al., 2003). Increased health risk behaviors are not only related to trauma in general, but are also specifically related to sexual trauma (Noll et al., 2019; Rodgers et al., 2003). The experience of sexual abuse is significantly associated with increased reliance on prescription medication, unhealthy eating habits, and increased rates of substance use (Jina & Thomas, 2013). These increased health risk behaviors have been found in women survivors of sexual abuse, and may be especially prevalent in survivors of childhood sexual abuse (CSA; Ackerson, 2012).

One category of behavior in which trauma survivors may present especially elevated risk is that of sexual health risk behaviors. Experience of physical and sexual interpersonal violence is associated with increased sexual risk-taking behaviors such as inconsistent condom use, transactional sex, and substance use during sex (Coker, 2007; Jina & Thomas, 2013; Pengpid &

Peltzer, 2020). Authors of a study of 18,000 university students in multiple countries found that participants who had experienced sexual violence or interpersonal violence were significantly more likely to participate in specific sexual risk behaviors, such as alcohol use during sex, compared to peers without sexual violence histories (Pengpid & Peltzer, 2020). Additionally, survivors of childhood sexual abuse (CSA) may be more likely to engage in sexual activities with higher-risk partners, such as individuals who are HIV-positive or who use intravenous drugs, compared to individuals with no history of sexual violence (Noll et al., 2019). A meta-analysis of CSA and risky sexual behaviors further found that risky sexual behavior in adulthood was 1.59 times more common for survivors of CSA (Abajobir et al., 2017). Interestingly, the magnitude of this effect was greater for women (OR = 2.72) than for men (OR = 1.69), suggesting that while CSA may predict sexual risk behaviors for men and women, it may be a more robust predictor of these behaviors for women.

Physical health

The physical health effects of sexual violence range from short-term acute need to long-term inequalities in health outcomes compared to individuals without experiences of sexual violence. Immediately following an experience of sexual violence, individuals may report an increased need for acute healthcare to manage the effects of their experiences, especially as relates to any physical injuries sustained during the event (Jina & Thomas, 2013). In the long term, Jina & Thomas (2013) reported that sexual violence may be associated with increased gastrointestinal distress, abdominal pain, nausea, diarrhea, weight changes, and chronic health problems in women. These authors also found increased rates of cardiopulmonary and neurological symptoms in survivors of sexual violence compared to women without experiences of sexual violence, including chest pain, heart palpitations, asthma, insomnia, and fatigue. A

2005 multinational study by the World Health Organization found that women who had ever experienced sexual violence were significantly more likely to report either poor or very poor physical health compared to women who had never experienced sexual violence (Garcia-Moreno et al., 2005). Specifically, women sexual violence survivors were more likely than their non-sexual violence-exposed peers to experience problems walking and carrying out daily activities, and to report significant daily pain, memory problems, and dizziness. Survivors of sexual violence also report significantly increased rates of somatic symptoms compared to women who have not experienced sexual violence, a finding which is especially relevant given the high prevalence of highly stigmatized somatic conditions in women compared to men (e.g., fibromyalgia, chronic fatigue; Ko et al., 2022; Rodgers et al., 2003). This connection between trauma and increased rates of somatic symptom reporting has also been found in transgender and nonbinary communities (Scheer et al., 2020),

Reproductive health. Ultimately, the increased risk of sexual and general health risk-taking in trauma-exposed individuals places survivors at increased risk of negative reproductive health outcomes (e.g., Priester et al., 2016). Women with experiences of sexual violence report increased rates of gynecological illnesses, including excessive menstrual bleeding, sexual dysfunction, painful menstruation, and absence of sexual pleasure (Priester et al., 2016). Furthermore, compared to women without experiences of interpersonal violence, women who have experienced interpersonal violence report higher rates of sexually transmitted infections (STIs) and abnormal results from pap smears, a gynecological test often used to identify STIs and cervical cancer in women (Cesario et al., 2015; Jina & Thomas, 2013). Furthermore, interpersonal violence-exposed women also demonstrate poorer follow-up upon receipt of abnormal pap test results, a finding which perhaps connects back to the increased prevalence of

sexual health risk behaviors within this population (Cadman et al., 2012; Cesario et al., 2015). Sexual violence is also associated with unique physical and behavioral risks for pregnant women, including increased odds of preterm labor, low gestational weight gain, and delayed entry into prenatal care (Priester et al., 2016). Considered together, these findings suggest that women sexual violence survivors may have increased need for reproductive healthcare services, as a function of their increased risk of both high-risk sexual behaviors and negative reproductive health outcomes.

Healthcare utilization for sexual violence survivors

Cervical cancer in the United States

Cervical cancer accounts for around 270,000 global deaths every year, translating to approximately one death every two minutes (Gaffney et al., 2018). In the United States, roughly 13,000 new cases of cervical cancer are diagnosed every year, with 4,000 deaths from this disease annually (Centers for Disease Control and Prevention, 2022a). Accordingly, the American Cancer Society (ACS) and the Centers for Disease Control and Prevention (CDC) recommend that all people with cervixes complete pap smear screenings for cervical cancer every three years, beginning at age 21 or 25 and continuing until age 65 (National Cancer Institute, 2020; CDC, 2021). In spite of the significant burden of cervical cancer on mortality in the United States, researchers estimate that between 15 to 36% of people in the United States do not complete cervical cancer screenings as recommended by the ACS and CDC (Farley et al., 2002; MacLaughlin et al., 2019). Additionally, participation in cervical cancer screenings declined for all age groups between the years 2003 and 2014, suggesting increasing risk of screening nonparticipation at a national level (Gaffney et al., 2018). Women aged 21-29 report the lowest rates of screening participation by age bracket (53.8%). Utilization of cervical cancer

screening services is also significantly impacted by demographic and identity factors, with reduced rates of healthcare utilization found in individuals who are low-income, lacking health insurance, or members of marginalized racial groups. For example, one past study found that African American and Asian women reported lower rates of cervical cancer screening compared to White women, and another study found that health insurance status significantly predicted participation in cervical cancer screening (Cowburn et al., 2013; MacLaughlin et al., 2019). These findings are especially alarming given recent research reporting that over 50% of new cervical cancer cases annually are estimated to be due to insufficient screening (Biddell et al., 2020). Researchers in a 2021 study identified that among women diagnosed with cervical cancer, 50-70% had not completed a cervical cancer screening within the past 5 years, if ever (Ackerson, 2012). Relatedly, an English study found that only 29% of cervical cancers occurred in people who were up to date on their screenings (Cadman et al., 2012).

Medical professionals usually conduct cervical cancer screenings via completion of a Papanicolaou test (often referred to as a “Pap smear” or “Pap test”), a procedure which typically requires a patient to lie on their back on an exam table while the medical professional inserts a speculum into their vagina and uses a small, sterilized spatula to collect a sample of cells from the patient’s cervix (Sachan et al., 2018). This procedure is typically a component of a broader pelvic exam, which is a general examination of the apparent health of a patient’s vagina, vulva, and pelvic region. Regardless of trauma history, many individuals may find this exam to be uncomfortable, invasive, and anxiety-inducing. As such, they may seek to avoid routine pelvic exams. Authors of a recent study of women aged 18-25 at reproductive health centers in the United States found that 28% of participants preferred to avoid pelvic exams, and 13% of

participants had avoided going to the clinic out of a desire to avoid completing a pelvic exam (Holt et al., 2021).

Sexual violence survivors and cervical cancer screenings

Physical discomfort. Considering the urgency of participation in cervical cancer screenings for all cervix-possessing individuals, it is essential to explore the ways in which participation in these screenings may be especially difficult for survivors of sexual violence. Gynecology patients with a history of sexual violence tend to report greater pain with speculum insertion compared to those without sexual violence history, a finding which may be related to previously referenced research on increased experience of gynecological pain in sexual violence survivors (e.g., Priester et al., 2016; Weitlauf et al., 2008). In a qualitative study of women with trauma histories who were concurrently experiencing homelessness, researchers found that study participants reported significant discomfort during Pap smears and felt that this procedure was unnecessarily invasive (Kohler et al., 2021). Researchers conducting a similar study in a sample of women veterans found that women with lifetime sexual assault histories were significantly more likely than women without these experiences to report avoiding pap tests due to pain associated with the procedure (Edmonds et al., 2021).

Psychological discomfort. Beyond physical discomfort, sexual violence survivors often report significant negative emotional and psychological experiences during Pap smear procedures. In the previously referenced study on women experiencing homelessness, participants reported that they perceived their position during the Pap exam to be humiliating and embarrassing, they disliked being touched during this procedure, and the experience reminded them of past traumatic experiences (Kohler et al., 2021). Additionally, investigators on a recent study of female veterans found that women with lifetime sexual violence histories were

significantly more likely than those with no past sexual violence to report feeling out of control of their body, embarrassed, and uncomfortable during pelvic exams (Edmonds et al., 2021).

Other studies support the finding that gynecological exams can be associated with feelings of loss of control and stress for sexual violence survivors and are often associated with high levels of fear and distress before, during, and after the procedure (Cadman et al., 2012; Kohler et al., 2021; Weitlauf et al., 2010). Pelvic exams may also trigger intrusive thoughts, flashbacks, and dissociation in patients with sexual violence histories, suggesting a significant mental connection between the experience of this exam and patients' prior experiences of sexual assault (Weitlauf et al., 2010).

These negative experiences during cervical cancer screenings may contribute to individuals' avoidance of pelvic exams, as they often represent a significantly unpleasant and/or upsetting experience for sexual violence survivors. The experience of pain and distress during cervical cancer screenings may motivate people with sexual violence histories, especially those who experience PTSD symptoms such as intrusive thoughts and dissociation, to avoid participation in future exams (Weitlauf et al., 2008). In 2022, Danan and colleagues' study of female veterans identified that women with sexual violence histories were twice as likely not only to report high discomfort and anxiety associated with pelvic exams when compared to women without sexual violence histories (22% vs 11%), but also that they were also almost twice as likely to report having delayed participating in a pelvic exam due to that same discomfort and anxiety (21% vs. 12%; Danan et al., 2022). Furthermore, sexual violence survivors in another related study were more likely to have maladaptive beliefs about the safety and necessity of cervical cancer screenings, likely leading to reduced motivation to participate in future screenings (Weitlauf et al., 2010). Essentially, while research suggests that women with

sexual violence histories have higher reproductive healthcare needs, research also suggests that these same women may be more hesitant in seeking this specific type of healthcare.

Trauma and reduced healthcare utilization

Sexual violence survivors' hesitance to seek reproductive healthcare services may generalize into a larger connection between experiences of trauma and reduced utilization of preventive healthcare services, including cervical cancer screenings, primary care checkups, and more (Jina & Thomas, 2013). Alcala and colleagues (2021) identified that adverse childhood experiences (ACEs) are associated with reduced odds of having a primary care provider and reduced odds of receiving a checkup in the past year (Alcala et al., 2021). These findings were significant even when controlling for confounds which may affect healthcare utilization such as educational attainment, insurance status, and lifetime receipt of cancer diagnoses. These same researchers further identified that childhood sexual abuse was associated with reduced odds of a past-year checkup even when controlling for all other ACEs, with an adjusted odds ratio of .86. In a review of research on relations between trauma, trauma sequelae, and healthcare utilization, Lee and Park (2018) note that research on these topics has historically been unclear due to a failure to separate the constructs of trauma and PTSD. The authors note that past studies indicate both that greater cumulative traumatic experiences predict poorer health behaviors, and that greater PTSD symptoms also predict poorer health behaviors. Lee and Park also point out that multiple studies have found that experience of trauma significantly predicts reduced health screening participation even when PTSD symptoms are controlled for, suggesting that the experience of trauma may impact behavior even independently from specific posttraumatic stress symptoms.

Sexual trauma also specifically may predict reduced participation in preventive healthcare practices in general (Jina & Thomas, 2013). For example, Farley and colleagues (2002) found that women who were out-of-date with their recommended mammography screenings reported greater rates of lifetime traumatic events, domestic violence, and sexual assault compared to up-to-date women. Additionally, research by Alcala and colleagues (2021) identified that sexual assault history was associated with lower odds of current compliance with mammogram, breast self-exam, and pap smear recommendations for women. Researchers leading a 2009 study of 6,200 women found a significant decrease in likelihood of completion of cervical cancer screening both for women who had experienced violence in the past year, and for women who had reported safety concerns within the past year (ORs = .58, .68; Cronholm & Bowman, 2009). Finally, Garzon (2021) identified a significant negative relation between both general trauma and specifically interpersonal trauma as predictors of pelvic exam participation. Considered together, these findings suggest that experience of past trauma, especially sexual trauma, may be associated with reduced participation in preventive healthcare, especially preventive reproductive healthcare such as cervical cancer screenings.

Sexual violence and reproductive healthcare utilization. Interestingly, these findings regarding trauma and reproductive healthcare utilization appear to be relatively unique to individuals who have experienced explicitly *sexual* trauma, as opposed to other forms of trauma (e.g., physical abuse, natural disasters, etc.). Researchers on one study identified reduced likelihood of participation in cervical cancer screenings for women with histories of CSA, but not for women with histories of nonsexual childhood abuse or neglect (adjusted OR=.56; Farley et al., 2002). These results remained significant even when controlling for participant demographics, PTSD, attitudes towards cervical cancer screenings, and accessibility of medical

clinics for participants. Similarly, in a study of young women at reproductive health centers in the United States, women who had previously experienced sexual assault, but not women who had experienced physical or verbal abuse, reported higher odds of delaying visits to the reproductive health clinic (OR = 3.10), as well as higher odds of preferring to avoid pelvic exams (OR = 2.91) compared to women without a history of sexual assault (Holt et al., 2021). Finally, researchers in the previously referenced qualitative study on sexual violence survivors experiencing homelessness found that multiple participants noted that their sexual trauma was directly related to their avoidance of cervical cancer screenings (Kohler et al., 2021). Participants reported that their trauma significantly impacted their decisions on whether or not to get screened, suggesting that the specific nature of sexual trauma may have direct effects on individuals' willingness to participate in cervical cancer screening.

Conflicting results

While many studies support the connection between sexual violence and reduced utilization of reproductive healthcare services, some past research suggests that sexual violence may be associated with increased healthcare utilization in specific circumstances. In a 2017 study by Alcala and colleagues, ACEs were generally associated with reduced odds of having a primary care provider (PCP), but CSA was associated with *higher* odds of having a PCP (Alcala et al., 2021). However, these researchers also identified that both ACEs overall and CSA specifically were associated with reduced odds of receiving a checkup in the past year, suggesting that there may be a distinction between participant willingness to engage with the medical system (e.g., having a PCP) versus actually participating in suggested health behaviors (e.g., attending routine checkups). Another study found that women with lifetime trauma histories were more likely to use general healthcare services compared to those without trauma

histories, but that CSA specifically was not associated with an increase in healthcare use (Coles et al., 2015). The results of this study also indicated that a history of CSA was associated with a significant decrease in participants' satisfaction with their healthcare services, which may be associated with later reduction in voluntary healthcare practices such as preventive screenings.

Specifically exploring the relationship between sexual violence and cervical cancer screening, Danan and colleagues (2022) identified no significant differences in screening participation between women veterans with and without sexual assault histories. These researchers did find that sexual violence survivors were twice as likely to report high or moderate levels of distress associated with pelvic exams, and that they were also twice as likely to delay pelvic exams due to this discomfort, when compared to women without sexual violence histories. However, this study used a binary predictor variable for participants (sexual violence or no sexual violence), which may have limited the depth of data available associated with severity of sexual violence experience. Finally, Lang and colleagues (2003) observed that sexual violence history was associated with increased preventive healthcare use, including pap smears and breast self-exams, but that this history was also associated with increased odds of participants receiving abnormal pap smear results. Receipt of abnormal pap smear results necessitates the completion of follow-up pap smear appointments and may also increase individuals' awareness of the function and importance of preventive healthcare. Accordingly, increased healthcare use in this instance may be directly reflective of the connection between this variable and participants' increased receipt of abnormal test results. Furthermore, Lang and colleagues (2003) also found a possible interaction between sexual violence and PTSD in predicting breast self-exams, as women with sexual violence histories and no PTSD were more likely to complete self-exams, but women with PTSD were less likely, suggesting that mental

health may be a significant variable which affects the connection between sexual violence history and reproductive healthcare utilization.

Sexual violence and PTSD

PTSD is a trauma-related disorder which can be diagnosed following an individual's experience of a qualifying traumatic event, defined by the DSM-5-TR as exposure to actual or threatened death, serious injury, or sexual violence to oneself or a loved one, or witnessing such an event occur to another person (American Psychiatric Association, 2022). DSM-5 diagnostic criteria for PTSD further specify multiple symptom categories an individual may experience following exposure to a traumatic event. The first category is characterized by intrusive symptoms associated with the event, such as recurrent memories of the event, dissociative reactions, or intense distress associated with cues related to the trauma. The second category is focused on avoidance of stimuli associated with the traumatic event, including avoidance both of memories or external reminders of the event. Finally, the last symptom category deals with negative alterations in cognitions and mood associated with the event, potentially including symptoms such as negative beliefs about self and others, feelings of detachment, anhedonia, or inability to remember aspects of the event.

Theoretical explanations of PTSD tend to emphasize the importance of both behavioral and cognitive components in both the origins and the maintenance of posttraumatic stress symptoms. Cognitive theories emphasize the role of maladaptive appraisals of traumatic events (Bryant, 2021). For example, a trauma survivor may generalize their upsetting experiences into a belief that the world is inherently dangerous, thereby increasing the perceived level of threat the individual experiences on a daily basis. These maladaptive or inaccurate thoughts may be connected to behavioral symptoms such as avoidance, as they can skew one's ability to

differentiate between safety and danger (Bryant, 2021). From a behavioral standpoint, trauma survivors with PTSD may have learned to connect reminders of their trauma (e.g., specific locations, sensations, etc.) with danger, often resulting in a fear response which then leads to avoidance of these trauma reminders (Bryant, 2021). This avoidance is then linked with a reduction of the person's distress, thereby reinforcing their decision to avoid these often entirely safe stimuli.

Experience of sexual violence may be one of the strongest predictors for the development of PTSD (Guina et al., 2018; Mahoney et al., 2019). Rates of PTSD for sexual violence survivors are estimated to fall between 30 to 94%, and research indicates that sexual violence may be a stronger predictor of PTSD than physical attacks, robberies, and natural disasters (Jina & Thomas, 2013). In fact, in a multi-country review of mental health surveys administered by the World Health Organization, Kessler and colleagues (2017) found that intimate partner sexual violence accounted for 42% of all person-years with PTSD; that is, of all the combined years individuals spent experiencing PTSD, 42% of those years were PTSD associated with intimate partner sexual violence. There are a variety of proposed reasons for the robustness of the connection between sexual violence and PTSD, including increased intensity of PTSD symptoms for sexual violence survivors compared to other trauma survivors, higher instances of other comorbid psychopathology in sexual violence survivors, and increased prevalence of avoidance behaviors, which have been shown to be especially associated with maintenance of PTSD symptoms over time (Bryant, 2021; Müller et al., 2018). Interestingly, a 2006 analysis of data from the National Violence Against Women Survey found that both lifetime sexual violence victimization and female gender were significant predictors of PTSD symptoms, but that the significant effect of female gender disappeared when considered in a model alongside lifetime

sexual violence victimization (Cortina & Kubiak, 2006). These findings suggest that, while sexual violence is especially common in women, it is likely more the nature of this traumatic experience which leads its association with PTSD, rather than the gendered characteristics of those who most frequently experience sexual violence. Furthermore, these findings suggest the importance of attending to trauma and PTSD in transgender and nonbinary communities, as these individuals also represent a group at increased risk of sexual violence compared to cisgender men (Martin-Storey et al., 2018).

Intrusive memories

Individuals with histories of sexual violence may experience especially strong memories of stressful life events, a factor which may increase vulnerability for the intrusive traumatic memories associated with PTSD. In one study focusing on memory in female sexual violence survivors, researchers identified that women with sexual violence histories reported memories of stressful life events as significantly stronger than women without sexual violence histories and were more likely than non-exposed women to see traumatic events in their mind and recall specific details (Millon et al., 2018). These findings suggest that the experience of sexual violence may increase the strength of stressful memories, a finding which is especially significant given the prevalence of intrusive memories in individuals diagnosed with PTSD. Another study focusing on intrusive memories in PTSD explored differences in intrusive memories following exposure to upsetting imagery, with analyses exploring differences not only between sex groups, but also between individuals depending on their trauma exposure and PTSD status (Hsu et al., 2018). Researchers found significant main effects of sex and of PTSD, such that women reported more intrusive memories than men, and trauma-exposed individuals with PTSD reported more intrusive memories than individuals with no PTSD from either the trauma-

exposed or the non-exposed group. Interestingly, a significant interaction was found between sex and PTSD status, such that within the trauma-exposed PTSD group and within the trauma-exposed non-PTSD group, women reported more intrusive memories than men. No differences were found between men and women in the trauma non-exposed group. These findings suggest that sex and PTSD may interact to predict a unique vulnerability for intrusive memories following trauma exposure.

Intrusive memories and healthcare utilization. Intrusive memories are especially relevant when considering reproductive healthcare, as the experiences of pelvic exams and pap tests can contain imagery and sensations which may remind individuals of experiences of sexual violence. In the previously referenced qualitative study on pelvic exams in women experiencing homelessness who had histories of traumatic experiences, multiple participants endorsed experiencing flashbacks to sexual trauma during pap tests, and considered the screening to be a trigger for their traumatic memories (Kohler et al., 2021). Furthermore, a healthcare provider interviewed in this same study noted that they had experienced multiple instances of sexual violence survivor patients describing pap tests as re-traumatizing. These results are supported by findings from a study by Weitlauf et al. (2008), which indicated that distress during pelvic exams was highest for women with both sexual violence histories and PTSD diagnoses, second highest for women with sexual violence histories but no PTSD, and lowest for women with neither sexual violence histories nor a PTSD diagnosis. These findings suggest that while sexual violence may be a significant predictor of individuals' experiences and motivations surrounding pelvic exams, PTSD may significantly impact the degree to which these exams are distressing for sexual violence survivors.

Avoidance behaviors

Avoidance behaviors may be connected to increased development of PTSD symptoms following trauma, as attempting to avoid or deny a traumatic experience may ultimately result in increased intrusive thoughts or recollections of that same traumatic event (Thompson et al., 2018). In contrast, resilience after trauma, also understood as one's ability to cope with stress following trauma, negatively correlates with avoidance, meaning that individuals who experience more avoidance tend to also experience decreased post-trauma resilience (Thompson et al., 2018). In a study on approach-avoidance conflict in individuals with PTSD, researchers found that participants with a PTSD diagnosis showed increased task performance compared to a control group when avoidance of trauma-related images was advantageous, whereas the PTSD group showed comparatively reduced task performance when avoidance was maladaptive (e.g., less likely to result in a reward; Weaver et al., 2020). These results suggest that PTSD may significantly affect individuals' functioning in situations where avoidance is counterproductive.

Next, compared to survivors of other types of trauma, sexual violence survivors are more likely to experience conscious avoidance of trauma reminders (Guina et al., 2018). Increased prevalence of avoidant coping is related to both increased severity of CSA and to women's experiences of interpersonal trauma, suggesting a significant connection between interpersonal/sexual violence and problematic avoidance behaviors (Ackerson, 2012; Weiss et al., 2019). Additionally, Donovan (2009) found that women with a history of sexual abuse were more likely to use problem avoidance and social withdrawal coping strategies compared to women without sexual abuse histories, suggesting that sexual violence may be uniquely connected to the avoidant behaviors seen in PTSD. Interestingly, researchers on one study of women experiencing intimate partner violence identified that avoidant coping moderated the

relationship between CSA and sexual risk behavior, such that the association between CSA and sexual risk behavior was only significant for women with higher levels of avoidant coping (Weiss et al., 2019). These results suggest that individuals' specific responses to trauma, here manifested as avoidant coping, may uniquely predict individual health behaviors.

Avoidance and healthcare utilization. Within the context of reproductive healthcare, avoidance may manifest as failing to participate in recommended screenings due to the upsetting and/or triggering nature of these screenings. A study by Farley and colleagues (2002) found that avoidant coping styles were associated with decreased health promotion behaviors, including preventive screenings, in a sample of women members of a large health maintenance organization. Other research suggests that sexual violence history is associated with avoidance of gynecological visits, reduced attendance at routine gynecological follow-ups, and participant report of an awkward or negative relationship with one's gynecologist (Edmonds et al., 2021; Razi et al., 2021). These results indicate that PTSD, especially symptoms related to avoidance, may impact the ways in which sexual violence-exposed individuals participate in reproductive healthcare behaviors.

Trauma coping self-efficacy

Definition

While many individuals who experience traumatic events may develop post-traumatic stress symptoms, this response is not universal. Individuals regularly have widely varied responses to trauma, often due to resilience factors which impact the ability to cope with traumatic stress (Benight et al., 1999). A variety of factors other than the nature of one's traumatic experience may influence the effect that this experience has on their functioning, including individuals' social setting, access to resources, and internal coping mechanisms

(Campbell et al., 2009). The internal element of self-efficacy, or one's confidence in their ability to effect change in their life, is held as a critical factor in human motivation (Benight & Bandura, 2004). Benight and Bandura (2004) state that strong self-efficacy beliefs are associated with increased resilience. According to this theory, an individual with strong self-efficacy beliefs is less likely to perceive potential stressors as threatening and more likely to mobilize effective coping strategies in the face of stressors, thereby reducing the effect these stressors have on their wellbeing (Benight & Bandura, 2004). In contrast, an individual with lower self-efficacy might experience more fear and anxiety surrounding the uncontrollability of their life, thereby reducing their focus on actionable items which might improve their situation.

One specific manifestation of self-efficacy is trauma coping self-efficacy (TCSE), broadly defined as a cognitive appraisal of one's own ability to regulate stress arising from a traumatic experience (Mahoney et al., 2019). Put simply, TCSE is one's confidence in their ability to cope with the effects of trauma. This construct is highly related to one's ability to self-regulate and has a significant impact on how individuals perceive potential threats. A person with high coping self-efficacy is likely to persevere under stress and demonstrate reduced reactivity to stress compared to an individual with lower confidence in their ability to cope with stressors (Benight et al., 1999). TCSE affects the degree to which individuals perceive a traumatic event as threatening, as well as the degree to which they perceive initial PTSD symptoms as stressful (Bosmans et al., 2015). Furthermore, TCSE is also associated with individuals' motivation to apply coping strategies, and the relative adaptiveness of the coping strategies individuals use to deal with stress (Bosmans et al., 2015). Individuals with high TCSE may be expected to employ both greater quantity and quality of coping skills when managing stressful and/or traumatic experiences.

TCSE and trauma responses

TCSE has been found to predict posttraumatic outcomes following a variety of traumatic experiences, including CSA, domestic violence, combat, hurricanes, and terrorist attacks (Benight et al., 2015). Early researchers exploring this construct identified that TCSE was the strongest predictor of both general distress and trauma-related distress following traumatic experiences, and that TCSE mediated the relationship between loss of resources and trauma-related distress (Benight et al., 1999). These findings suggest that individuals who lose access to resources as the result of a traumatic event (e.g., a natural disaster) may experience a reduction in their confidence surrounding their ability to cope, thereby predicting increased distress surrounding the trauma. In addition, TCSE is a strong predictor of PTSD symptom course over 12 months, with higher TCSE predicting lower initial symptoms and a steeper decline in symptoms over time (Bosmans et al., 2015). Robust connections exist between TCSE and responses specifically to sexual trauma, indicating that nonconsensual sexual experiences may be associated with both reduced TCSE and increased PTSD symptoms (Mahoney et al., 2019). A study of female undergraduate students found that TCSE mediated the relation between lifetime sexual trauma and current PTSD symptoms, with increased trauma predicting reduced TCSE, which in turn predicted increased PTSD symptoms (Mahoney et al., 2019).

TCSE and avoidance. One specific mechanism through which TCSE may impact individuals' ability to adapt following traumatic experiences is through a reduction in maladaptive avoidant coping, a behavior characteristic of PTSD. In one study focused on avoidance and self-efficacy, Benight and Bandura (2004) found reduced avoidant coping in women residing in a domestic violence shelter who participated in a therapeutic group targeting self-efficacy. Relatedly, Benight and Bandura (2004) also describe a study of women

participating in a self-defense program where researchers found an inverse relationship between avoidant behavior and individual self-efficacy, such that individuals tended to demonstrate less avoidance when their self-efficacy increased (Ozer & Bandura, 1990). In this study, perceived self-efficacy to protect oneself may have been associated with reduced feelings of vulnerability, and thereby reduced motivation to avoid situations which may or may not have been dangerous. Given that avoidant coping is a significant symptom of PTSD, it is also essential to consider this behavior in relation to broader psychopathology. In a study focused on pregnant people, PTSD symptoms correlated negatively with obstetric care self-efficacy, such that patients with higher self-efficacy to communicate with their obstetricians also reported lower intensity of PTSD symptoms (Stevens et al., 2017). Here, PTSD (which, for many, includes components of avoidance) was inversely associated with self-efficacy in a medical setting. These results suggest that interactions between PTSD and TCSE may affect the ways in which patients relate to reproductive healthcare providers.

Association with health behaviors

Broadly, sexual violence and PTSD may be associated with reduced utilization of reproductive healthcare services such as preventive cervical cancer screening (Alcalá et al., 2021; Edmonds et al., 2021; Jina & Thomas, 2013; Razi et al., 2021). In contrast, self-efficacy may be associated with improved health behaviors for individuals (Cavallieri et al., 2019). Researchers have found positive correlations between self-efficacy and health information-seeking, as well as between self-efficacy to communicate with physicians and healthcare utilization (Cavallieri et al., 2019; Shieh et al., 2010). Furthermore, self-efficacy to communicate with physicians may mediate the relationship between participant experiences of discrimination and their utilization of healthcare services, suggesting that self-efficacy aids in individuals'

overcoming perceived barriers to participating in recommended preventive healthcare behaviors (Shieh et al., 2010). In a study validating a measure which assessed predictors of compliance for 12 mainstream health practices (e.g., healthy eating, seatbelt use, cervical cancer screening), researchers found that self-efficacy significantly predicted likelihood of participating in all 12 behaviors, including cervical cancer screening (Guvenc et al., 2011). These results suggest that self-efficacy may be meaningfully associated with individuals' health behaviors, a finding which is especially significant given the concurrent associations between TCSE and post-trauma adaptation (Bosmans et al., 2015). In their review of trauma-related predictors of health behaviors, Lee and Park (2018) note that self-efficacy beliefs are a significant predictor of individual engagement in preventive health behaviors, including physical activity, healthy diet, and medical screenings. Seven of the studies evaluated within this review specifically focus on cervical cancer screenings, suggesting that this health behavior may be studied in a manner similar to other more frequently researched health behaviors such as physical exercise and diet.

Summary: trauma-related predictors of healthcare utilization

Broadly, individuals who have experienced sexual trauma may be at higher risk for a myriad of negative health effects, including reproductive health problems (Priester et al., 2016; Cesario et al., 2015). In spite of this vulnerability to negative reproductive health outcomes, sexual violence survivors may also be less likely to participate in recommended reproductive healthcare screenings (Jina & Thomas, 2013). Sexual violence survivors often report physical and psychological discomfort during pelvic exams and Pap tests, which may result in avoidance of these procedures in spite of healthcare provider recommendations (Danan et al., 2022; Holt et al., 2021). These findings appear to be specific to survivors of sexual violence as compared to survivors of other types of traumatic events, suggesting that there may be a unique connection

between sexual violence and reproductive healthcare behaviors which is not explained solely by the broader variable of trauma exposure (Holt et al., 2021).

Sexual violence is linked to higher rates of PTSD than other traumatic events, a finding which is of marked relevance given PTSD's association with increased intrusive memories and avoidance behaviors (Guina et al., 2018; Millon et al., 2018; Weiss et al., 2019). Given the potential similarities in physical sensations and experiences between sexual violence and pelvic exams or Pap tests, it is critical to understand the possible role of intrusive PTSD symptoms when considering connections between sexual violence and reproductive healthcare participation (Kohler et al., 2021). Experience of these intrusive thoughts may motivate more avoidance behaviors in sexual violence survivors experiencing PTSD, resulting in delay of receipt of healthcare services (Edmonds et al., 2021; Farley et al., 2002). Experiences of sexual violence and PTSD may also interact, such that distress during pelvic exams may be increased for women who have experienced sexual violence and also have PTSD (Weitlauf et al., 2008). There also may be gender differences in both intrusive memories and avoidance in PTSD symptoms, such that women may experience these symptoms more frequently than men (Hsu et al., 2018; Weiss et al., 2019). These findings are especially relevant given that women comprise the majority of individuals receiving pelvic exams, and also represent a demographic group at elevated risk for experiencing sexual violence (Portnoy et al., 2018).

One possible protective factor in the relationship between sexual violence, PTSD, and reproductive healthcare is TCSE. TCSE has been associated with improved responses to trauma, including reduced PTSD symptom severity, reduced avoidance behaviors, and reduced trauma-related distress (Benight & Bandura, 2004; Bosmans et al., 2015; Mahoney et al., 2019). Broad self-efficacy has also been connected to improved preventive health behaviors, including

participation in cervical cancer screening (Cavallieri et al., 2019; Guvenc et al., 2011).

Considered together, these findings suggest that TCSE may mitigate some of the negative effects of PTSD on reproductive healthcare utilization in sexual violence survivors.

Current study

The present study assessed sexual violence experiences, PTSD symptoms, and TCSE as predictors of individuals' participation in recommended cervical cancer screenings. Research on the relation between experience of sexual violence and reproductive healthcare utilization has yielded mixed results in the past, and often fails to distinguish between healthcare *need* and healthcare *utilization* (e.g., Lang et al., 2003). Without making this distinction, it is difficult to determine whether differences in sexual violence survivors' utilization of services are due to increased prevalence of reproductive health issues (which necessitates greater healthcare utilization), or trauma-related avoidance of healthcare services independent of individual medical need. Accordingly, this study explored the relation between sexual violence and cervical cancer screening participation while controlling for cumulative reproductive healthcare conditions, in order to shed greater light on sexual violence survivors' potential avoidance of participation in cervical cancer screenings. The present study also accounted for other demographic and economic variables which may impact individuals' access to or utilization of healthcare (e.g., age, race, income, insurance), as well as for the potential impact of cumulative trauma, rather than only sexual violence, in reducing healthcare utilization.

Furthermore, the present study contributes to the literature surrounding mechanisms which may influence the connection between sexual violence and differing patterns of reproductive healthcare utilization. Past research has often explored the connection between trauma experience and health behaviors, but studies examining the mechanisms behind these

connections are relatively infrequent (Lee & Park, 2018; López-Martínez et al., 2018). Existing research suggests that PTSD symptoms may be related to these behavioral differences in reproductive healthcare utilization, as sexual violence survivors with PTSD may experience increased intrusive memories during pap tests, resulting in increased avoidance of these procedures (Edmonds et al., 2021). Accordingly, this study explored the degree to which PTSD symptoms predicted individuals' participation in recommended cervical cancer screenings through interactions with sexual violence severity and TCSE.

Finally, while past research has often included PTSD as a predictor of reproductive healthcare utilization, limited research explores the role of TCSE in this relationship (López-Martínez et al., 2018). The present study examined TCSE both as a predictor of cervical cancer screening participation independently, and as a factor which interacts with PTSD to predict screening participation. While PTSD symptoms may increase individuals' likelihood of being distressed by or avoiding the experience of a pap smear, this distress may be tempered by increasing TCSE, as individuals may demonstrate increased confidence in their ability to manage the distress generated by this experience. Thus, this study deepens understanding about potential roles of PTSD symptoms and coping mechanisms for sexual violence survivors within the context of reproductive healthcare.

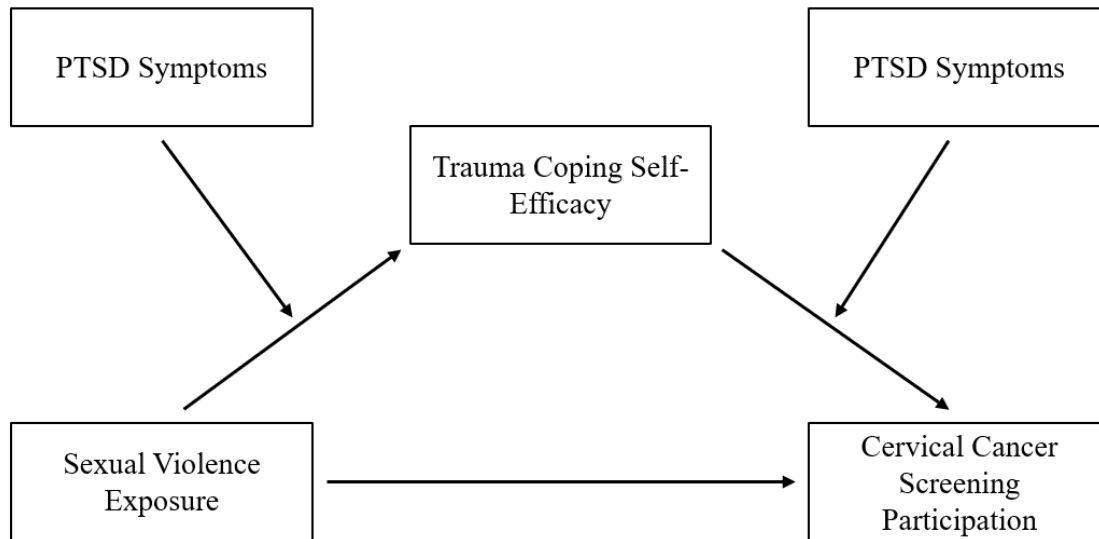


Figure 1. Proposed model of the relations between sexual violence, PTSD, and TCSE in predicting cervical cancer screening participation.

Hypotheses

Hypothesis 1. Participants with greater combined frequency and severity of sexual violence will be less likely to have participated in a cervical cancer screening (i.e., pap test) within the past 3 years compared to participants with lower frequency/severity of sexual violence.

Hypothesis 2. TCSE will demonstrate an indirect effect on the relation between frequency/severity of sexual violence and screening participation. Participants with increased sexual violence experiences are predicted to report lower TCSE, and participants with lower TCSE are in turn predicted to report reduced screening participation.

Hypothesis 3. PTSD will moderate the relation between frequency/severity of sexual violence and TCSE. Specifically, the association between sexual violence and reduced TCSE will be more robust for participants at higher levels of PTSD.

Hypothesis 4. PTSD will also moderate the relation between TCSE and screening participation. Specifically, the relation between reduced TCSE and reduced screening participation will be more robust for participants at higher levels of PTSD.

Exploratory Research Question 5. What patterns of beliefs and experiences surrounding Pap tests and reproductive healthcare appointments are present in a sample of sexual violence survivors?

Method

Participants

This study recruited 601 participants through Amazon’s Mechanical Turk (MTurk), an online crowdsourced data collection platform in which individuals can sign up as “workers” and complete a variety of online tasks in exchange for financial compensation. Typical power analyses cannot be easily computed for logistic regressions utilizing multiple predictor variables; accordingly, empirically derived recommendations are often applied in such cases (Bujang et al., 2018). Researchers exploring sample size guidelines for logistic regressions determined that a sample size of 400-500 participants was sufficient for a logistic regression with up to eight predictor variables and one outcome variable (Bujang et al., 2018). Another guideline for logistic regression sample sizes suggests that the sample should be equal to the number of independent variables, multiplied by 50, plus 100 (Bujang, 2021). According to this rule, an appropriate sample size would be 400 participants for the present study utilizing a logistic regression with six predictor variables (3 primary predictors and 3 covariates).

In order to be eligible for participation in this study, MTurk workers were required to identify themselves as between the ages of 21 and 29 years old, and describe themselves as possessing the necessary anatomy to merit cervical cancer screening (i.e., participants have a

cervix), such that they would fall within an age group for which there is a consistent recommendation to receive one Pap test every three years (CDC, 2021). Furthermore, in order to ensure that participants had experienced sexual violence *prior* to their recommended cervical cancer screening, participants were limited to individuals who had experienced any degree of sexual violence prior to the past three years. This experience was indicated through response to a screener question at the beginning of the survey (i.e., “Have you experienced any unwanted/nonconsensual sexual encounters or sexual contact? When did this experience first occur?”). Regarding MTurk characteristics of participants, MTurk workers were only eligible if they had provided valid responses in at least 95% of their activities on MTurk, as research has indicated that such participants tend to score significantly higher on measures of attention (Chmielewski & Kucker, 2020; Cobanoglu et al., 2021). Furthermore, given variations in national healthcare standards, and per recommendations from previous research, the present sample was restricted to participants residing in the United States (Chmielewski & Kucker, 2020; Cobanoglu et al., 2021).

The 601 accepted participants in the present study represented the total number of valid responses drawn from a total of 2342 submitted responses on Amazon MTurk, amounting to a 25.66% acceptance rate for this sample. In this sample of 601 participants, 47 participants were retroactively excluded from the data for responses which did not meet the initial criteria for compensation on MTurk (i.e., failing attention checks, incomplete or inconsistent responses). The final sample of participants for this study was 554. Participants from this sample required an average of 18.91 minutes to complete the survey, with a standard deviation of 13.20 minutes. Completion times for accepted responses ranged from 5.35 to 138.00 minutes, with 90% of participants ($N = 498$) completing the survey in 32 minutes or less.

Participants reported a wide range of identities, although the majority of respondents identified as White (N = 440, 79.4%) and reported their gender as female (N = 529, 95.5%). Participants also identified as majority heterosexual (N = 372, 67.1%), belonging to a Christian religious group (including Catholic and Protestant, N = 310, 55.96%), and employed full-time (N = 357, 64.4%). The most common form of receiving healthcare coverage was through employers (N = 258, 46.6%) and the most frequent education achieved was a college education (N = 238, 43%). Participants' ages ranged from 21 to 29 years old (M = 25.88, SD = 2.20). For a select few demographic categories, participants were able to select multiple identifiers. Of the 554 valid responses, 13 participants (2.3%) identified with more than one gender identity, and 47 participants (8.5%) identified with more than one racial or ethnic group. Thirteen participants (2.3%) also endorsed more than one religious identity. Of the 554 responses, 32 participants (5.8%) reported that they were pregnant at the time of completing the survey, with 29 of these 32 participants reporting that they were currently attending prenatal medical appointments in accordance with medical recommendations. Complete participant demographics are provided in Table 1.

Table 1
Participant Demographic Statistics

Demographic	N	%	Demographic	N	%
Sex assigned at birth			Annual household income		
Female	551	99.5	Less than \$10,000	30	5.4
Intersex	3	0.5	\$10,000-\$15,000	31	5.6
Gender Identity			\$15,000-\$25,000	66	11.9
Male	11	2.0	\$25,000-\$50,000	168	30.3
Female	529	95.5	\$50,000-\$75,000	141	25.5
Transgender	6	1.1	Over \$75,000	118	21.3
Nonbinary	19	3.4	Employment status		
Agender	1	0.2	Unemployed	67	12.1
Other	1	0.2	Employed part-time	108	19.5
Sexual Orientation			Employed full-time	357	64.4
Heterosexual / straight	372	67.1	Other	22	4.0
Gay / lesbian	22	4.0	Relationship / marital status		
Bisexual	120	21.7	Single	178	32.1
Pansexual	28	5.1	In a relationship	184	33.2
Asexual	6	1.1	Married	183	33.0

Other	6	1.1	Divorced	3	0.5
Race			Separated	4	0.7
White / European American	440	79.4	Widowed	2	0.4
Hispanic / Latinx	61	11.0	Source of healthcare coverage		
African American / Black	59	10.6	Insurance through employer	258	46.6
Asian American / Asian	25	4.5	Insurance bought on own	78	14.1
Native Hawaiian / Pacific Islander	2	0.4	Medicare	71	12.8
			Medicaid / other state program	93	16.8
Native American / American Indian	15	2.7	Alaska Native, Indian Health Service, Tribal Health Services	2	0.4
Middle Eastern / North African	5	0.9	Other	7	1.3
Other	5	0.5	None	45	8.1
Religious affiliation			Highest level of education		
Protestant	43	7.8	Some high school	4	0.7
Catholic	118	21.3	High school	46	8.3
Christian	149	26.9	GED	14	2.5
Buddhist	8	1.4	Technical degree	20	3.6
Hindu	6	1.1	Some college	127	22.9
Jewish	9	1.6	College graduate	238	43.0
Muslim	6	1.1	Some graduate school	38	6.9
Spiritual	70	12.6	Completed a graduate program	67	12.1
None	143	25.8			
Other	15	2.7			

Note. Participants were permitted to select multiple responses for gender identity, race, and religious affiliation, resulting in total percentages over 100%

Measures

Demographics

Demographic information was collected from all participants. Information included age, race/ethnicity, employment status, education level, annual household income, relationship status, health insurance status, religious affiliation, sex assigned at birth, gender identity, and sexual orientation. Participants were also requested to provide information on their state and county of residence in order to determine whether the participant resided in a health professional shortage area (HPSA) for primary care, a variable which may indicate their relative access to healthcare services. However, due to the high prevalence of imprecise responding to this free-response question on the survey (e.g., “USA,” “New Mexico,” etc.), this variable could not be used in any analyses. The demographics questionnaire is available in Appendix A.

Sexual Violence

Sexual violence was measured using the Sexual Experience Scale – Short Form Victimization (SES-SFV; Koss et al., 2007). The SES-SFV is an 8-item measure which assesses unwanted experiences of sexual victimization, including unwanted sexual contact, coercion, and attempted or completed vaginal or oral rape. Each of the 8 core items on the SES-SFV indicates a specific sexual experience, and prompts participants to indicate how many times they have had this experience, as well as what degree of coercion/force was involved in this experience (e.g., threats, physical incapacitation, etc.). For the purpose of this study, participants also indicated at what age they first experienced each reported incident of sexual violence, in order to better establish temporal primacy for sexual violence in relation to participation in cervical cancer screening. In a study exploring nine different methods of scoring the SES-SFV, Davis and colleagues (2014) found strong evidence of convergent validity for a method which involved combining participant frequency and severity rankings for endorsed events. Using this scoring method, participant reported frequency of experiencing a given event (ranging from *zero* to *three or more times*) is multiplied by the severity rank associated with that type of event (0 = no assault, 1 = unwanted sexual contact, 2 = attempted sexual coercion, 3 = sexual coercion, 4 = attempted rape by physical force or incapacitation, 5 = completed rape by physical force or incapacitation). These item scores are then summed to create a total score for each participant, with possible scores ranging from 0 to 312. Compared to simply totaling participant frequency scores, this method more accurately accounts for differences in severity of individual experiences of sexual violence. The full text of the SES-SFV is presented in Appendix B.

In past research, the SES-SFV has demonstrated robust psychometric qualities. Researchers found two-week test-retest reliability equaling .92 for the SES-SFV in a sample of

college students, with 70% of participants reporting identical scores between the two testing intervals (Johnson et al., 2017). Furthermore, within this same study, SES-SFV scores significantly related to trauma-related symptoms such as dissociation, depression, anxiety, and sexual problems, suggesting adequate convergent validity for this measure. The SES-SFV has demonstrated strong psychometric reliability and validity in a variety of populations, including LGBTQ+ women, disabled women, and community samples of men and women (Alcalá et al., 2021; Basile et al., 2016; Canan et al., 2020).

PTSD Symptoms

PTSD symptoms were measured using the PTSD Checklist for the DSM-5, a 20-item self-report inventory anchored in the diagnostic symptoms of PTSD as determined by the DSM-5 (PCL-5; Blevins et al., 2015; Weathers et al., 2013b). In this measure, participants rate how much they have been bothered by a specific symptom of PTSD (e.g., disturbing dreams, negative cognitions, etc.) in the past month. Items are rated on a Likert scale ranging from 0 (*not at all*) to 4 (*extremely*). Total scores are created by summing all 20 individual responses into a total score ranging from zero to 80; total scores above 33 indicate the probable presence of PTSD (Weathers et al., 2013b). PTSD symptoms were measured via PCL-5 total score, to represent the range of PTSD symptoms rather than whether or not participants scored above the cutoff for probable PTSD. In past research, the PCL-5 demonstrated high internal consistency ($\alpha = .94$), one-week test-retest reliability ($r = .82$), and significant correlations with related constructs such as depression, anxiety, and general psychological distress (Blevins et al., 2015; Wortmann et al., 2016). Multiple studies have utilized forms of the PCL-5 in samples of sexual violence survivors, including studies focused on TCSE and/or preventive reproductive healthcare behavior (Lang et al., 2010; Mahoney et al., 2019; Stevens et al., 2017; Weitlauf et al., 2010). Cronbach's α for the

PCL-5 in the present study was equal to .96. The full PCL-5 measure is presented in Appendix C.

TCSE

TCSE was measured using the Trauma Coping Self-Efficacy scale (CSE-T), a nine-item self-report measure evaluating individual perceptions of current TCSE (Benight et al., 2015). On the CSE-T, participants rate how capable they feel to handle an array of specific posttraumatic coping demands (e.g., get life back to normal, be optimistic, etc.) on a seven-point Likert scale ranging from 1 (*not at all capable*) to 7 (*totally capable*). Participant responses are then summed in order to create a total score ranging from 9 to 63, with higher scores indicating greater TCSE. In a measure development study including samples of undergraduate students, trauma patients, and natural disaster survivors, the CSE-T demonstrated high test-retest reliability over intervals ranging from two weeks to three months ($r = .57-.81$), as well as significant correlations with related constructs such as worry, posttraumatic stress, and post-traumatic negative cognitions (Benight et al., 2015). The CSE-T has also been utilized in past research involving sexual violence survivors, where it demonstrated strong internal consistency ($\alpha = .92$) and significantly predicted PTSD symptoms as measured with the PCL-5 (Mahoney et al., 2019). Cronbach's α for the CSE-T in the present study was equal to .91. The full CSE-T is presented in Appendix D.

Reproductive healthcare behavior

Per previous research, participation in preventive reproductive healthcare was measured using a single question where participants indicated length of time since they had last received a Pap test (e.g., Alcalá et al., 2021; Garzon, 2021; Levinson et al., 2016). Given our limited understanding of factors influencing women's decisions to engage in Pap tests, I collected additional descriptive information regarding participants' experiences during and attitudes

towards pap tests (Exploratory Research Question 5), participants also answered questions indicating their access to reproductive healthcare (i.e., transportation, availability of OB/GYN clinic) and completed the Pap Smear Belief Questionnaire (PSBQ; Ackerson & Doane, 2017).

The PSBQ is a 28-item self-report measure designed to evaluate individuals' beliefs and attitudes associated with Pap tests. The full measure contains subscales focused on exam-related factors, perceived benefits of Pap tests, perceived vulnerability to cervical cancer, and perceived individual risk of developing cervical cancer. Items on the PSBQ are rated on a five-point Likert scale, with ratings ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Total scores are created by summing participants' individual item responses, with higher scores indicating more positive attitudes towards Pap tests and pelvic exams in general. Researchers evaluating the psychometric quality of the PSBQ found high internal consistency ($\alpha = .83$) and test-retest reliability ($r = .84$), and further found that this measure was significantly related to individual likelihood of participating in regular cervical cancer screening (Ackerson & Doane, 2017; Garzon, 2021). In the present study, Cronbach's $\alpha = .85$ for the PSBQ. The reproductive healthcare questionnaire for this study is presented in Appendix E, and the PSBQ is presented in Appendix F.

Covariate measures

General trauma. Participants' exposure to general traumatic events (not exclusive to sexual violence) was measured using the Life Events Checklist for DSM-5 (LEC-5; Weathers et al., 2013a). The LEC-5 is a 17-item questionnaire in which an individual indicates whether they have been exposed to any of 16 potentially traumatic events (e.g., serious accident, physical assault), with a 17th item for "any other very stressful event or experience." This scale was initially developed to be used alongside the Clinician-Administered PTSD Scale, and has also

often been used alongside the PCL-5 in past research. The LEC-5 demonstrated strong convergent validity with other measures of potentially traumatic events in past research (Gray et al., 2004). The LEC-5 is presented in Appendix G.

Reproductive healthcare need. Research suggests that sexual violence exposure is linked to increased risk for multiple gynecological health conditions (Priester et al., 2016; Jina & Thomas, 2013). Accordingly, reproductive healthcare need was included as a potential covariate, measured through multiple questions where participants indicated if they have ever received an abnormal pap test result, hysterectomy, treatment for an STI, or experienced abnormal uterine bleeding or pelvic pain. These indicators have been used in past research as a summary of reproductive healthcare needs which may influence individuals' likelihood of receiving cervical cancer screening (Danan et al., 2022). Participant responses to each item were summed to create an indicator of individual reproductive health concerns, with higher scores indicating greater personal reproductive healthcare need.

Procedure

Prior to data collection, all study procedures were approved by the Idaho State University Human Subjects Committee (HSC). Participants were recruited from Amazon MTurk. MTurk samples are typically more demographically diverse than samples recruited from other online sources or from college students (Burnham et al., 2018; Chandler & Shapiro, 2016; Weigold & Weigold, 2022). Furthermore, MTurk samples have demonstrated similar characteristics to undergraduate and community samples in past research on variables such as trauma, PTSD, and TCSE (Engle et al., 2020). MTurk sampling has yielded valid results in studies on sexual health and risk behaviors, further suggesting the appropriateness of this data collection method for the present study (Beymer et al., 2018; Richner & Lynch, 2023; Struckman-Johnson et al., 2020).

In light of the recent rise of nonhuman responding on MTurk and to ensure high quality of participation in this study, specific recommendations regarding MTurk sampling were applied. The study was piloted to a smaller sample of 4 graduate students prior to its larger release to MTurk workers, then with a smaller 25-worker sample on MTurk, and finally was released on MTurk at a larger scale once the survey had been adjusted as a result of the pilot studies (Aguinis et al., 2021; Cobanoglu et al., 2021). In keeping with recommendations on effective strategies to screen out nonhuman respondents on MTurk, two “response consistency” items were included within the survey, requiring participants to provide consistent responses to multiple questions across the survey (e.g., birthdate and current age, etc.; Aguinis et al., 2021; Kennedy et al., 2020). Two open-ended qualitative questions on study-relevant content were also included in the survey, as research suggests that such questions may be more difficult for nonhuman respondents to successfully complete (Aguinis et al., 2021; Kennedy et al., 2020). The survey also included attention checks in order to ensure accurate and honest participant responding, as these methods have been shown to increase validity of results in online data collection (e.g., “Select this response,” “Do not select this response”; Cobanoglu, 2021; Thomas & Clifford, 2017).

After participants submitted their survey on Qualtrics and submitted their task for review on MTurk, responses were reviewed to ensure they passed all validity checks. Each submitted response was first reviewed to check for accurate responding on the two response-consistency items, then on the attention check items. Finally, qualitative responses were reviewed to ensure that participants had submitted a complete, intelligible, relevant, and original (e.g., not copied from elsewhere on the internet) response to the presented question. Participants who failed any of these checks at any point during the response review process, as well as who responded from identical IP addresses, had the same MTurk worker number as someone who already completed

the survey, or who completed the survey unusually quickly (e.g., under 3 minutes), were excluded from the final sample and did not receive compensation for their response (Chmielewski & Kucker, 2020; Cobanoglu et al., 2021). If a participant's response was rejected, they were sent a message explaining the criteria for response acceptance, and encouraging them to reach out to the study director if they had any questions.

Prior to beginning the survey, participants were presented with a statement on the purpose of the study, benefits and risks of participation, freedom to withdraw from the study, and informed consent to participate in this study. Participants answered preliminary questions to confirm eligibility for the study (e.g., U.S. residence, 21-29 years of age, sexual violence experience, and relevant reproductive anatomy). Participants then completed the survey measures through a Qualtrics survey. Questionnaires and attention checks were administered in randomized order, with the exception of the PCL-5, which was always presented immediately after the SES-SFV (as the PCL-5 directly addresses symptoms related to the events reported in the SES-SFV). Compensation for MTurk samples has not been linked to differences in quality of data collection in past research; however, participants for this study were compensated \$.50 for completing the survey, as this rate of pay has yielded quality samples in past research (Tompkins, 2019). Acknowledgment of this low rate of compensation was included in the study consent form, as well as explanation of the rationale for this amount (e.g., budget limitations, etc.). After completing the study, participants were redirected to a debriefing form, which provided them with additional resources related to trauma, mental health, and sexual health.

Data Analyses

Preliminary analyses and covariates

All data for this study were analyzed using IBM SPSS Statistics, Version 26. Prior to completion of the primary analyses, descriptive statistics including means and standard deviations were calculated for all variables. The data were screened for outliers, skew, and kurtosis according to standards set by Tabachnick & Fidell (2018). If skewness or kurtosis z -scores indicate substantial skew or kurtosis (i.e., values > 2.00), transformations were noted and performed in order to increase the normality of the distribution. Any remaining outliers (i.e., values ± 3 SDs from the mean score) were excluded from the data (Cain et al., 2017; West et al., 1995).

Potential covariates to be included in analyses were demographic factors known to be associated with cervical cancer screening participation (i.e., age, race, income, and insurance status), as well as reproductive healthcare need and past general traumatic experiences (Alcalá et al., 2021; Biddell et al., 2020; Cesario et al., 2015; Lemon et al., 2002). Prior to completing the primary analyses for this study, potential covariates were examined in relation to both outcome variables. Any potential covariates which demonstrated a significant relation to the outcome variables were then included as covariates in the primary analyses.

Primary analyses

The present study utilized a binary logistic moderated mediation regression in order to analyze the extent to which sexual violence, PTSD symptoms, and TCSE are associated with participation in cervical cancer screening. Covariates were entered into the regression model first, followed by the main effect of sexual violence (Hypothesis 1), the indirect effect of TCSE

(Hypothesis 2), and double moderation by PTSD (Hypotheses 3 and 4). For all regressions, effect sizes were determined using odds ratios or Cohen's f^2 as appropriate.

Results

Descriptive Statistics

Eleven of the 554 participants were excluded from analyses due to participant responses of "I don't know" regarding the timing of their last Pap test, the primary dependent variable. Means, standard deviations, and ranges for key variables (e.g., SES, CSE-T, etc.) are presented in Table 2.

Table 2

Descriptive Statistics for Study Measures

Measure	M	SD	Min-Max
Sexual violence	42.67	54.62	0-312
PTSD symptoms	33.73	20.72	0-80
TCSE	42.7	11.23	9-63
Cumulative trauma	21.98	13.92	0-71
Pap smear beliefs	88.67	15.55	44-127
Health conditions	.91	1.03	0-5
Barriers to treatment	1.41	1.41	0-7

Note. Sexual violence was measured using the SES-SFV, PTSD symptoms via the PCL-5, TCSE via the CSE-T, cumulative trauma via the LEC, and Pap smear beliefs via the PSBQ.

For the SES-SFV, the measure of sexual violence, 33 participants (6.1%) recorded a score of zero, indicating no unwanted sexual experiences as measured by the included SES-SFV items in spite of their endorsement of past unwanted sexual experiences in the screener questions for the study. The experience reported by the highest proportion of participants was nonconsensual sexual touch by means of lies or pressure ($N = 317$, 58.30%), and the least commonly reported event was attempted anal rape by means of threats ($N = 55$, 10.13%). Participants also reported their first and most recent ages of experiencing each of the seven events included in the SES-SFV. The mean first age of experiencing unwanted sexual contact of any kind was 18.11 years old ($SD = 4.20$), and the mean most recent age of experiencing such

events was 20.56 years old ($SD = 3.94$). Participants reported the lowest average age of first experience for the SES-SFV item addressing unwanted sexual touch (Item 1, $M = 17.46$, $SD = 4.39$), and the highest age of first experience for the item addressing attempted anal rape (Item 7, $M = 21.10$, $SD = 3.73$). The SES-SFV also includes a final item where participants identify whether or not they have “ever been raped,” and 283 participants (52.1%) responded affirmatively to this question. On the PCL, the average score was 33.73 ($SD = 20.72$) and 281 participants (51.75%) reported a total score over 33, indicating the probable presence of PTSD (Weathers et al., 2013b).

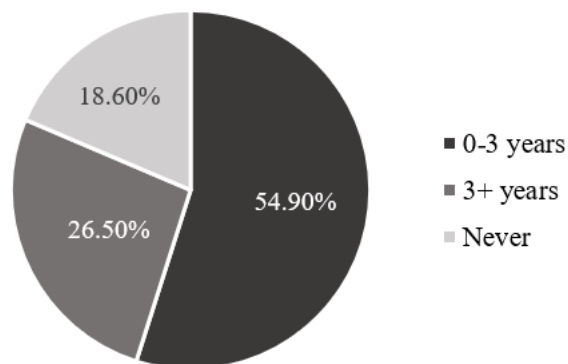


Figure 2. Pap test screening status results.

Just over half of the participants (308, 56.7%) reported receiving a pelvic exam in the past 3 years and 298 (54.9%) reported receiving a Pap test in the past 3 years. Roughly a quarter of participants ($N = 144$, 26.5%) reported having received a Pap test over three years ago, and nearly one in five, or 101 participants (18.6%), reported that they had never received a Pap test. The percent of participants receiving Pap tests are displayed visually in Figure 2.

A number of participants ($n = 237$, 43.6%) reported no reproductive health conditions. The most commonly reported reproductive health conditions were abnormal pelvic pain ($N = 141$, 26.0%) and abnormal bleeding ($N = 120$, 22.1%). A little over one third ($n = 197$, 36.3%) reported having no concerns about barriers to receiving reproductive healthcare. The most commonly reported barriers to care were lack of time to attend an appointment ($N = 161$, 29.7%)

and worry about what might happen at an appointment (N = 150, 27.6%). Full summaries of the participants' responses to these two questions can be found in Table 3.

Table 3

Reproductive Healthcare Statistics

Reproductive Health Concerns	N	%
Abnormal Pap test results	108	19.9
Hysterectomy	27	5.0
Abnormal uterine bleeding	120	22.1
Abnormal pelvic pain	141	26.0
Treatment for an STI	100	18.4
None of the above	237	43.6
Healthcare Barriers		
Lack of transportation to get there	77	14.2
Lack of clinic in area	58	10.7
Lack of time to attend appointment	161	29.7
Lack of insurance coverage	129	23.8
Feeling appointment is not important	97	17.9
Discomfort about visiting a women's health clinic following recall of Roe v. Wade	95	17.5
Worry about what might happen at the appointment	150	27.6
No concerns	197	36.3

Brief Summary of Participants' Qualitative Responses

To gather additional descriptive information about women's reproductive healthcare decisions, and as a component of this study's strategy for filtering out nonhuman respondents on MTurk, two qualitative questions were included in the survey. One question requested participants outline their reasoning for receiving or not receiving the HPV vaccine, and another requested that participants outline factors which influence their decisions to attend or not attend reproductive health appointments. While formal thematic analysis of these responses is beyond the scope of the current project, given the relevance of participants' responses to the study's main hypotheses, it is worth briefly reviewing common themes from these responses.

Regarding reasons why participants attended (or didn't attend) reproductive health appointments, three common themes emerged. The most common theme concerned non-trauma-

related barriers to appointment attendance, including fear of judgment or lack of insurance coverage. A sample of a participant response related to this theme reads, “I attempt to go regularly but lack of insurance is the biggest influence. There have been times when I could not afford visits and did not know the options available.” Another participant noted, “I am a fat, queer person, and I fear mental and emotional abuse from Healthcare professionals.” The second most common theme focused on participants noting that they attended these appointments regularly because they viewed them as essential healthcare, regardless of any emotional difficulty associated with such appointments. One such response notes, “I know its important to go, to protect my health. So I go. It’s not about whether or not it is comfortable; its about taking care of my body.” The final theme in responses to this question was avoidance of appointments explicitly for trauma-related reasons, such as the participant who stated, “It took me a long time before I could get myself scheduled to go to my women’s health appointments due to my past traumatic experiences. I was too anxious that I might remember that past traumatic experience.”

The second qualitative question, related to the HPV vaccine, also yielded a few consistent themes in participant responses. The most common theme in responding was participants having received the HPV vaccine as children simply as a result of doctors’ or parents’ recommendation. For example, one participant noted, “I received the HPV vaccine initially as a child through the encouragement of my mother,” and another stated, “I took it because my doctor recommended it for my age.” Secondly, another reason participants cited for receiving the HPV vaccine was believing in the importance of the vaccine and wanting to protect themselves from future illness. For example, one participant stated, “I have chosen to receive this vaccine because I trust that it is safe and can prevent HPV. If I can prevent something like HPV I don’t know why I wouldn’t.” Among the smaller number of participants who reported not receiving the HPV vaccine, many

participants stated they had not received the vaccine because they did not believe it was necessary or that they were at risk for contracting HPV. One such sample response states, “I have not taken this vaccine because I do not have risky sexual encounters and am monogamous,” and another reads, “Getting HPV is not a concern of mine.” The second most common type of response among this group of participants included concern about the evidence for and side effects associated with the vaccine. For example, one participant stated “I have not chosen to receive this HPV vaccine because I am someone who is generally concerned about potential side effects of new vaccines and how trustworthy the manufacturer is,” and another noted “I would not take this vaccine ... I believe I can handle my own health matters without any shots. My belief is vaccines do more harm than good.”

Preliminary Analyses

Because participants were required to provide responses to every question included in the questionnaire in order to receive compensation for their participation, the final sample for this study included no missing data. No significant outliers (± 3 SDs from the mean) were detected, and therefore the complete sample of 543 participants was retained. Prior to completing the main analyses for this study, the three quantitative variables included in analysis (i.e., SES-SFV, PCL, and CSE-T) were evaluated for skewness and kurtosis. Pap timing was not evaluated in this way, as it is a binary variable. Of the three evaluated variables, the SES-SFV demonstrated a nonnormal distribution with skew and kurtosis values over 2.00 (skew = 2.17, kurtosis = 5.17; Cain et al., 2017; West et al., 1995). A square root transformation was utilized in order to reduce skew in the SES-SFV variable, and following this transformation the SES-SFV displayed skew and kurtosis values within a normal distribution (skew = 0.88, kurtosis = 0.42).

Next, I analyzed potential covariates for relationships to either the CSE-T or the binary Pap timing variable, as these represented the two outcome variables for this study. Variables identified in the literature review as potentially related to TCSE or Pap receipt included age, race, income, insurance status, cumulative life trauma (measured via the LEC), and total number of relevant reproductive health conditions. To generate sufficient cell sizes to run statistical analyses, the three categorical covariates were recoded in order to increase the cell size of each category level within the variable. For race, “Asian / Asian American” and “Native Hawaiian / Pacific Islander” categories were collapsed into one, and the “Other” category was expanded to include participants who identified as Native American and Middle Eastern / North African. For income, the two lowest income brackets included in the survey were collapsed into one category of income less than \$15,000/year. Finally, insurance was recoded into categories of publicly supported insurance (including Medicaid, Medicare, and Alaska Native / Tribal Health / Indian Health Services), private insurance (insurance bought through employer or on one’s own), no insurance, and other. One-way ANOVA analyses were conducted to evaluate relationships between categorical covariates (race, income, and insurance) and TCSE, and chi-square tests of independence were used to explore relations between these variables and Pap receipt. Relations between the continuous potential covariates (age, reproductive health, and cumulative trauma) were explored using Pearson’s correlations with TCSE, and independent samples *t*-tests with Pap receipt.

Three significant relations between potential covariates and study outcome variables emerged following these analyses. In a one-way ANOVA, TCSE was significantly associated with income, $F(4, 542) = 4.733, p = .001$. Follow-up Tukey HSD tests identified that the mean score for TCSE in the lowest income bracket (less than \$15,000; $M = 37.71, SD = 11.97$) was

significantly lower than mean TCSE scores for the \$25,000-\$50,000 ($M = 42.58$, $SD = 10.59$, $M_{\text{difference}} = -4.87$, $SE = 1.69$, $p = .033$, 95% CI [-9.50, -0.25]), \$50,000-\$75,000 ($M = 44.64$, $SD = 11.72$, $M_{\text{difference}} = -6.93$, $SE = 1.73$, $p = .001$, 95% CI [-11.68, -2.19]), and over \$75,000 income brackets ($M = 43.98$, $SD = 10.10$, $M_{\text{difference}} = -6.28$, $SE = 1.78$, $p = .004$, 95% CI [-11.16, -1.39]). No other significant differences were observed between income groups. Next, a chi-squared test of independence indicated insurance status was significantly associated with receipt of Pap tests, $\chi^2(3, N = 543) = 10.92$, $p = .012$. Specifically, participants with private insurance were more likely to be up to date on Pap tests than individuals with publicly-supported or no insurance. Finally, an independent samples t -test yielded a significant association between reproductive health conditions and receipt of Pap tests, such that individuals who were up-to-date on Pap tests reported more reproductive health conditions ($M = 1.02$, $SD = 1.06$) than those who were not up-to-date ($M = 0.79$, $SD = 0.98$), $t(541) = 2.59$, $p = .010$, 95% CI [0.05, 0.40]. Given these findings, income, insurance status, and reproductive health conditions were included as covariates in the main regression analyses for this study.

Primary Analyses

According to recommendations for power analyses provided by Bujang and colleagues (2021), for the present study with three covariates and three predictor variables, a sample size of 400 should yield sufficient power for the present analyses. All analyses were initially conducted with the dataset of the 543 participants, and then were completed again with the exclusion of specific groups of participants whose responses generated some uncertainty surrounding whether they were eligible to receive Pap tests and therefore eligible for the study analyses. These groups were participants who identified as intersex ($N = 3$), and participants who reported having received a hysterectomy ($N = 27$), as individuals of these identities may vary in their

reproductive healthcare needs (American College of Obstetricians and Gynecologists, 2021). Given the very mild skew of the SES-SFV variable, analyses were also completed both with the standard SES-SFV, and with the transformed SES-SFV variable. Participants who identified as trans men assigned female at birth ($N = 6$) were not excluded from analyses, as review of their qualitative responses revealed that all 6 of these participants reported needing to receive Pap tests regularly. Completion of analyses with and without these transformations or participants yielded no differences in the significance of study results, and therefore the results reported here represent those generated from the full, non-transformed sample of 543 participants.

Hypothesis 1

Hypothesis 1 stated that participants with greater cumulative frequency and severity of sexual violence would be less likely to have participated in a cervical cancer screening (i.e., pap test) within the past 3 years compared to participants with lower sexual violence exposure. Using a logistic regression, there was a significant direct effect of combined frequency and severity of sexual violence on cervical cancer screening, $OR = .994$, $SE = 0.002$, $p = .003$, 95% CI $[-0.01, 0.00]$. Specifically, the odds ratio with a value less than one here suggests that as frequency and severity of sexual violence increased, participants' likelihood of being up to date on cervical cancer screening decreased. Participants who were up to date on Pap testing reported a mean SES-SFV score of 36.21, compared to a mean SES-SFV score of 50.51 for participants who were not up to date on Pap testing.

Hypothesis 2

Hypothesis 2 stated that TCSE would demonstrate an indirect effect on the relation between sexual violence experience and screening participation, such that participants with increased sexual violence frequency/severity would report lower TCSE, and participants with

lower TCSE would report reduced screening participation. A linear regression found no significant association between sexual violence and TCSE (*a* path), $b = -0.039$, $SE = 0.026$, $p = .138$, 95% CI [-0.09, 0.01]. Logistic regression analysis of TCSE as a predictor for cervical cancer screening (*b* path) approached significance, $OR = 1.025$, $SE = 0.014$, $p = .067$, 95% CI [-0.001, 0.051]. The OR of 1.025 here suggests that as TCSE increased, likelihood of being up to date on Pap testing also increased. The indirect effect of TCSE on cervical cancer screening was nonsignificant, as indicated by the nonsignificant *a* and *b* paths, and a bootstrap confidence interval from 5000 iterations containing zero for the indirect effect, effect = -0.001, $SE = 0.001$, 95% CI [-0.0005, 0.0001].

Hypothesis 3

Hypothesis 3 stated that PTSD would moderate the relation between sexual violence frequency/severity and TCSE, such that the association between sexual violence and reduced TCSE would be more robust for participants at higher levels of PTSD. The model containing PTSD and sexual violence as predictors of TCSE was significant overall, $F(6, 536) = 7.813$, $p < .001$, $R^2 = 0.08$. A significant amount of the variance within this model was explained by the direct path from PTSD to TCSE, $b = -0.147$, $SE = 0.03$, $p < .001$, $f^2 = .02$, 95% CI [-0.201, -0.090]. The covariate of income was also significantly related to TCSE in this model, $b = 1.178$, $SE = 0.39$, $p = .003$, $f^2 = -3.57$, 95% CI [0.411, 1.945]. The coefficient for the interaction between PTSD and sexual violence was not significant in this model, $b = 0.0008$, $SE = 0.390$, $p = .091$, 95% CI [-0.001, 0.002]. Furthermore, significant variance in TCSE was not explained by the addition of the interaction between sexual violence and PTSD while considering the main effects, $R^2\text{change} = 0.005$, $F(1, 536) = 2.868$, $p = .091$.

Hypothesis 4

Hypothesis 4 stated that PTSD would also moderate the relation between TCSE and screening participation, such that the association between reduced TCSE and reduced screening participation would be more robust for participants at higher levels of PTSD. The overall binary logistic regression model containing sexual violence, TCSE, and PTSD as predictors of cervical cancer screening was significant, $\chi^2(7, N = 543) = 40.5170, p < .001$, Nagelkerke pseudo- $R^2 = 0.0962$. The significant predictors within this model were sexual violence (see Hypothesis 1) and the covariates of insurance status and reproductive health conditions, $OR = 0.691$ $SE = 0.095, p < .001$, 95% $CI (-0.583, -0.157)$; $OR = 1.428$, $SE = 0.0951, p < .001$, 95% $CI (0.170, 0.523)$, respectively. The interaction between sexual violence and PTSD was nonsignificant within this model, $OR = 0.999$, $SE = 0.0004, p = .104$, 95% $CI (-0.001, 0.0001)$. The likelihood ratio test of highest order unconditional interaction between sexual violence and PTSD yielded nonsignificant results, $\chi^2(1) = 2.678, p = .102$. Bootstrap confidence intervals derived from 5000 iterations evaluating the conditional indirect effect of sexual violence on cervical cancer screening via mediation by TCSE and moderation by PTSD all contained zero, indicating no significant moderated mediation within this model. Figure 3 summarizes the significant findings from Hypotheses 1-4.

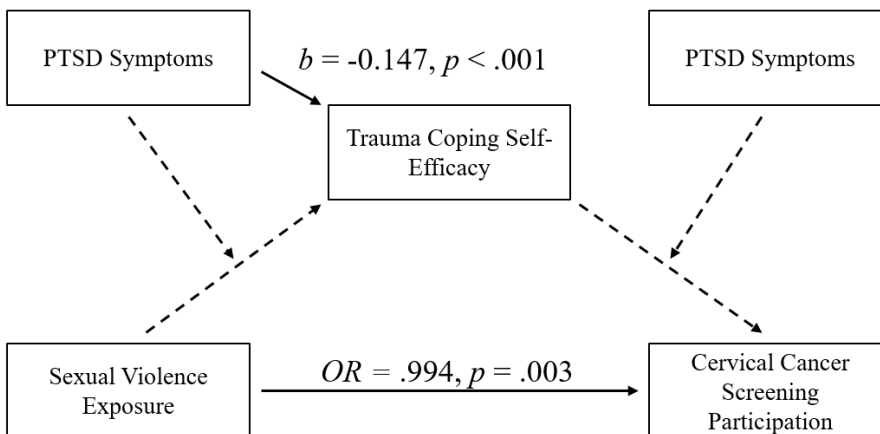


Figure 3. Significant results of primary analyses

Exploratory Research Question 5

Research Question 5 sought to broadly quantitatively explore sexual violence survivors' beliefs and attitudes related to cervical cancer and related exams, and utilized the PSBQ to collect data on this general topic. The average score on the PSBQ was 88.67, with a standard deviation of 15.55. Scores ranged from 44 to 127. In order to better facilitate comparisons between subscales with differing quantities of items, average items scores were calculated for each subscale, with higher average scores indicating more positive views. The highest average item responses were found within the Perceived Benefits of Pap Tests subscale ($M = 3.90$), followed by Perceived Risks and Barriers ($M = 3.46$), Exam-Related Factors ($M = 3.25$), and Perceived Vulnerability to Cervical Cancer ($M = 2.23$). The highest reported item scores (indicating most agreement) on the PSBQ were for questions related to feeling on edge during the vaginal exam (Item 1; $M = 3.44$, $SD = 1.28$), feeling violated by not receiving enough explanation of a vaginal exam (Item 3; $M = 3.28$, $SD = 1.37$), feeling on edge when rushed through a vaginal exam (Item 10; $M = 3.22$, $SD = 1.32$), and preferring female medical providers (Item 14; $M = 3.83$, $SD = 1.30$). Notably high scores ($M > 3.00$) were also reported for all items within the Perceived Benefits of Pap Tests subscale, indicating positive participant perceptions of the benefits of cervical cancer screening. The lowest reported scores on the PSBQ, indicating significant disagreement with the statement, were for items related to believing Pap smear practitioners are rude (Item 8; $M = 1.943$, $SD = 1.16$), and not knowing how to go about getting a Pap smear (Item 25; $M = 1.92$, $SD = 1.24$). Means and standard deviations for each subscale and individual item on the PSBQ are reported in Table 4, with item means reflecting participant scores prior to the reverse-scoring of any PSBQ items.

Table 4
PSBQ Subscale and Item Scores

Subscale / Item	M	SD	Subscale / Item	M	SD
Exam-Related Factors	45.60	12.55	Perceived Benefits of Pap tests	15.58	4.00
1. When the provider performs the vaginal exam, it makes me feel on edge. *	3.44	1.28	15. Having a Pap smear is the best way for me to find early abnormal cervical cell changes.	4.02	1.09
2. I feel like I am being violated when the provider performs the vaginal exam. *	2.84	1.39	16. If I find cervical cancer cells through a Pap smear, my treatment for cervical cancer might not be as bad.	3.70	1.19
3. I feel like I am being violated when the provider does not explain what they are doing during the exam. *	3.28	1.37	17. Having a Pap smear will help me find abnormal cervical cells early.	4.01	1.10
4. I do not trust healthcare providers. *	2.36	1.28	18. Having a Pap smear will decrease my chances of dying from cervical cancer.	3.85	1.17
5. Having a Pap smear is too embarrassing. *	2.68	1.43	Perceived Vulnerability to Cervical Cancer	6.70	3.27
6. My provider asks me personal questions I don't want to think about. *	2.58	1.37	19. I feel I will get cervical cancer sometime during my life.	2.33	1.21
7. When I am lying on the exam table, I remember distressing things that happened to me. *	2.74	1.39	20. It is likely that I will get cervical cancer.	2.25	1.18
8. People doing Pap smears are rude. *	1.93	1.16	21. My chances of getting cervical cancer in the next few years are great.	2.11	1.20
9. I do not trust healthcare providers unless I know them. *	2.60	1.32	Perceived Risks and Barriers	20.79	5.21
10. When the provider rushes through the exam, it makes me feel on edge. *	3.22	1.32	22. I am not at risk for cervical cancer because it does not run in my family. *	2.97	1.30
11. I am afraid to have a Pap smear because I don't understand what will be done. *	2.10	1.30	23. If I take good care of my health by exercising and eating right, I am not at risk for cervical cancer. *	2.67	1.33
12. Having a Pap smear takes too much time. *	2.17	1.25	24. I am not at risk for cervical cancer because I use protection when I have sex. *	2.69	1.31
13. I am afraid to have a Pap smear because I might find out something is wrong. *	2.64	1.42	25. I don't know how to go about getting a Pap smear. *	1.92	1.24
14. I only want to see female providers. *	3.83	1.30	26. I have other problems more important than getting a Pap smear. *	2.62	1.36
			27. I cannot remember to schedule a Pap smear. *	2.35	1.29

Note. Items marked with a * indicate that they were reverse-scored prior to calculation of subscale and total scores

In order to facilitate further exploration of the significance of the PSBQ as related to sexual violence survivors' healthcare behaviors, independent samples *t*-tests were completed to compare PSBQ total and subscale scores between participants who were up-to-date with their cervical cancer screenings and those who were not up-to-date. Significant differences between

up-to-date and not up-to-date participants emerged for all four subscales of the PSBQ, as well as for PSBQ total scores. Compared to not up-to-date participants, individuals who were up-to-date on screening reported higher perceived benefits of Pap tests, reduced perceived risks and barriers to screenings, more positive attitudes towards exams, lower perceived risk of cervical cancer, and higher overall PSBQ scores. Group means and *t*-test results are presented in Table 5.

Table 5
PSBQ and Pap Test Group Comparisons

PSBQ subscale	<i>T</i> -test results	Up-to-date <i>M</i> (<i>SD</i>)	Not up-to-date <i>M</i> (<i>SD</i>)
Perceived Benefits of Pap tests	$t(541) = -6.52, p < .001, 95\% \text{ CI } [-2.82, -1.51]$	16.56 (3.70)	14.39 (4.03)
Perceived vulnerability to cervical cancer	$t(541) = 3.09, p = .002, 95\% \text{ CI } [0.32, 1.42]$	6.31 (3.10)	7.17 (3.42)
Perceived risks and barriers	$t(541) = -9.23, p < .001, 95\% \text{ CI } [-4.68, -3.04]$	22.53 (5.10)	18.68 (4.52)
Exam-related factors	$t(541) = -7.37, p < .001, 95\% \text{ CI } [-9.65, -5.59]$	49.03 (11.91)	41.42 (12.06)
Total score	$t(541) = -10.43, p < .001, 95\% \text{ CI } [-15.18, -10.37]$	94.43 (14.86)	81.66 (13.36)

Discussion

The current study examined how individual experiences of sexual violence influenced survivors' likelihood of participating in cervical cancer screenings. Research on sexual violence and reproductive healthcare suggests that sexual violence survivors likely have higher need for these healthcare services (as demonstrated by higher rates of sexual risk behaviors and reproductive health conditions), but may be less likely to attend these appointments due to the uncomfortable and potentially triggering nature of gynecological exams (Kohler et al., 2021). This study aimed to address gaps in previous literature, including exploring the impact of the

severity of individuals' sexual violence experiences on their healthcare behaviors, accounting for increased rates of reproductive health conditions in sexual violence survivors as a factor which may impact their healthcare use, and exploring the roles of PTSD and TCSE as underlying mechanisms of the connection between sexual violence and reduced reproductive healthcare utilization (Edmonds et al., 2021; Cavallieri et al., 2019).

Within this study, increased severity and frequency of sexual violence significantly predicted reduced likelihood of being up to date on Pap testing. Results did not indicate any significant mediation of this effect by TCSE, nor moderation by PTSD, although increased PTSD symptoms did directly predict reduced TCSE. Furthermore, income, reproductive health conditions, and insurance status all emerged as significant covariates related to either TCSE or cervical cancer screening participation. This study also included an exploratory research question to investigate sexual violence survivors' attitudes towards Pap testing, in order to shed light on beliefs and perceptions which may impact reproductive healthcare utilization within this population. Results indicated high perceived benefits of Pap tests by sexual violence survivors, low perceived risk of contracting cervical cancer, and high concerns about the physical and emotional experience of completing a Pap test. Between-group comparisons also indicated more positive attitudes towards Pap testing overall for individuals who were up-to-date on screening compared to those who were not.

Descriptives

MTurk Participants

This study utilized data collected from 554 Amazon MTurk workers aged 21-29 who reported being assigned female or intersex at birth, and having experienced sexual violence at least 3 years prior to completing the study. Previous research using Amazon Mechanical Turk

has found this platform to yield samples at least as equal as traditional college student convenience samples, and results from this study generally support these findings (Burnham et al., 2018; Chandler & Shapiro, 2016; Weigold & Weigold, 2022). Both in the present study and in past research on MTurk participant demographics, samples tend to be comprised of individuals who are employed full-time, are married or dating, have at least a college degree, and identify as White, heterosexual, and Christian (Burnham et al., 2018; Weigold & Weigold, 2022). While there was not significant racial or religious diversity in this sample overall, it is worth noting that a variety of different identities were represented among participants who did not identify as White or Christian/Catholic. Census data on income suggests that the average household income for individuals aged 15 to 24 years old is roughly \$50,000, and roughly \$74,000 for individuals aged 25-34 years old (Semega & Kollar, 2022). Accordingly, the present study's median income of \$25,000-\$50,000 likely falls at or slightly below the national average for a sample of 21- to 29-year-old participants.

While participants in the present study were required to possess the necessary anatomy to complete a cervical cancer screen, 5.5% of participants in the present study identified within the transgender and nonbinary spectrum. These results align with existing research from the Pew Research Center, which finds that roughly 5% of adults aged 18-29 years old identify with a gender different from that assigned to them at birth (Brown, 2022). Regarding sexuality, participants in this study were notably more diverse than the U.S. population at large. Rates of LGBTQ+ identity in the United States at large are estimated to be around 8%, yet 33% of participants in this study identified with a sexual orientation other than heterosexual (Powell, 2021). However, the high rate of individuals identifying as bisexual in this study is in keeping

with existing census data, which finds that roughly ½ of individuals who broadly identify as LGBTQ+ identify as bisexual (Powell, 2021).

Nonhuman responding. A core issue of concern in this study was ensuring acceptance of human respondents in light of the current nonhuman respondent (“bot”) crisis on MTurk (Kennedy et al., 2020). As previously stated, this study yielded an acceptance rate of 25%, meaning that 75% of the 2342 submitted responses were rejected. Per recent recommendations, this study utilized a variety of methods to screen out nonhuman respondents. While a formal analysis of the efficacy of these methods is outside the scope of the present study, brief discussion of these strategies may shed light on the challenge of distinguishing human from bot responses. The most effective by far was the use of qualitative responses, as bots typically responded to these survey items either with paragraphs copied from the internet (e.g., “The minimum interval is 5 months between the first and second dose. If the second dose is administered after a shorter interval, a third dose should be administered a minimum of 5 months after the first dose and a minimum of 12 weeks after the second dose”), or with irrelevant or unintelligible responses (e.g., “very clean in the every time,” “WOMENS ARE EQUAL TO GOD”).

Study measures

Due to the variety of methods for scoring the SES-SFV, direct comparison of scores from this study with other studies’ findings is difficult (Davis et al., 2014). However, distributions of specific unwanted sexual events can be compared between studies. For example, in a study on sexual violence and TCSE by Mahoney and colleagues (2019), the most commonly reported form of unwanted sexual experience as reported on the SES-SFV was unwanted sexual touch by means of verbal coercion, which aligns with most commonly reported unwanted sexual

experience from the present study. In this same study, which sampled a general undergraduate sample, 30% of participants reported that they had ever been raped, a number which is lower than the reported 50% of participants in the present study. However, the Mahoney et al. (2019) study included participants with no experiences of sexual violence in contrast to the requirement of previous non-consensual contact for this study. The ages at which participants in the present study reported experiencing unwanted sexual events are consistent with research finding that women aged 16-19 years old are at the highest risk for sexual assault compared to other ages or compared to men (Rape, Abuse, & Incest National Network, 2023). It is important to note that 6% of participants in the present study recorded scores of zero on the SES in spite of having reported at least one “unwanted sexual experience” in the screener questions for this study. These findings suggest that the SES-SFV may not fully capture all of the experiences which individuals may consider as related to sexual violence.

Previous studies focused on sexual violence and PTSD, including those which sampled exclusively female-identifying individuals who had experienced sexual violence, have found slightly lower means on the PCL-5 than in the present study (e.g., $M_s = 23-26$, Mahoney et al., 2019, DeCou et al., 2019). Furthermore, while these similar past studies have found roughly 1/3 of participants scoring above the clinical cutoff for PTSD, the present study found that over half of participants’ scores fell above this cutoff (Mahoney et al., 2019; DeCou et al., 2019). However, participants in these two studies were recruited from undergraduate samples with a lower average age than in the present study, suggesting that rates of trauma (and therefore expected related PTSD symptoms) may be lower in these samples simply due to their younger age. Furthermore, online recruiting may allow for inclusion of participants with a wider variety of severity of symptoms than those which would be represented in a sample of individuals

enrolled in a four-year university. In contrast, these same two referenced studies also included measures of TCSE, which yielded similar results to TCSE as measured in the present study, suggesting that while PTSD symptoms may be higher than average in this sample, the CSE-T performed roughly as expected (DeCou et al., 2019; Mahoney et al., 2019).

Slightly more than half of participants in the present sample had received a Pap test in the past 3 years, a rate notably lower than the rate of 71% which has been found for a national population of women aged 21-29 in recent research (Suk et al., 2022). However, the 55% up-to-date screening rate found in the present study roughly aligns with the 50% screening rate found in a recent study of homeless individuals who had experienced sexual violence (Kohler et al., 2021). Interestingly, the present sample yielded a much lower screening rate than a larger study of female veterans (79% up to date); however, only half of participants in the referenced study reported having experienced sexual violence, and all participants were actively involved in the Veterans Health Administration healthcare system at the time of study data collection (Danan et al., 2022). Additionally, data for the present study was collected in 2022, meaning that some participants' healthcare behaviors in the preceding three years may have been significantly impacted by the COVID-19 pandemic, which resulted in notably decreased utilization of routine and preventive healthcare services in the United States (Shukla et al., 2022).

As relates to reproductive health conditions more broadly, results from the present study generally align with national-level statistics on health conditions for women and for sexual violence survivors. Research from the CDC suggests that roughly 20% of individuals experience an STI at some point in their life, findings which corroborate the 18% rate of STIs in the present sample (CDC, 2022b). Interestingly, the national rate for hysterectomies in individuals aged 20-29 years old is estimated to be less than 2%, notably lower than the measured rate of 5% in the

present sample (Adam et al., 2022; CDC, 2022b). However, given past research suggesting higher rates of hysterectomies in populations of sexual violence survivors, the observed rate in the present sample is not far beyond what might be expected (Ryan et al., 2016).

Finally, participants in this sample, especially those who were not up-to-date on Pap testing, reported generally more negative views towards Pap tests and cervical cancer on the PSBQ compared to convenience samples of female college students (Ackerson et al., 2015; Ackerson & Doane, 2017). Validation studies of this measure have previously compared PSBQ scores between college students who were and were not up to date on Pap tests, with the not up to date group generally scoring lower on the PSBQ. Similarly, participants in the present study reported scores lower than the up to date Pap test group in a PSBQ validation study, with scores falling closer to those of individuals who reported being out of date on testing (Ackerson et al., 2017). Given the roughly 50% screening rate found in the present sample, as well as known impacts of sexual violence exposure on beliefs and behaviors surrounding Pap testing, it follows that the results of this study may fall below those found in a convenience sampled group of participants who reported being 100% up to date on Pap tests (Holt et al., 2021; Jina & Thomas, 2013).

Significant Covariates

Covariate analyses in the present study suggested that reduced income was significantly associated with reduced TCSE. In a past study on socioeconomic status and self-efficacy, social capital mediated the relation between socioeconomic status and self-efficacy (Han et al., 2014). In that study, social capital was defined as including dimensions of peer, familial, and community support, and results indicated that increased SES was associated with increased access to interpersonal supports, which were in turn associated with increased self-efficacy for

individuals. In the present study, the significant relation between income and TCSE may support these results, as individuals with lower incomes may struggle to find the support they need, in turn reducing their confidence in their ability to cope with difficult life events. A separate study exploring self-efficacy and health outcomes in Black versus White Americans found that while Black Americans reported lower self-efficacy compared to White Americans, this association was fully explained by differences in education and income (Assari, 2017). These results not only support the idea that income plays a significant role in affecting individual self-efficacy, but also that individuals from marginalized social groups may be disproportionately affected. Individuals with lower incomes also tend to receive lower quality of care following traumatic events, and in turn report more negative outcomes associated with trauma (Abedzadeh-Kalahroudi et al., 2018). If reduced income is associated with increased rates of trauma, poorer trauma-related outcomes, and reduced access to interpersonal support and care, it follows that it may also be associated with reduced confidence in one's ability to cope with trauma. The significance of this covariate in the present study points to the importance of larger structural factors in determining individuals' outcomes following traumatic experiences, especially as relates to intersecting identities (e.g., income, sexuality, race/ethnicity, ability status, etc.).

Two other covariates in the present study were significantly associated with increased likelihood of being up to date on Pap tests: higher rates of reproductive health conditions, and possessing privately-funded insurance. The significance of reproductive health conditions in predicting cervical cancer screening supports the previously mentioned critiques of past research methods which do not draw distinctions between reproductive healthcare need (e.g., presence of health conditions) versus utilization (e.g., attending doctor's appointments). Past research indicates that sexual violence survivors tend to report high rates of reproductive health

conditions, and the findings in the present study support the idea that these conditions may prompt increased utilization of healthcare services such as Pap tests (Priester et al., 2016). As relates to insurance status, the significant relation between privately funded insurance and increased rates of cervical cancer screening also aligns with existing literature. Researchers have found insurance status to significantly predict cervical cancer screening (Cowburn et al., 2013). Much like the significance of income in the relation between race and self-efficacy, past research has also found that connections between cancer screening and ethnicity are no longer significant when insurance coverage (another factor related to SES) is accounted for (Rodriguez, 2005). These findings support the importance of well-funded insurance in ensuring equitable access to healthcare services, as well as the role of socioeconomic inequities in furthering unequal access to healthcare for individuals belonging to marginalized groups.

One final comment related to covariates in this study concerns the relative effect sizes of covariates as compared to main study variables. The effects of insurance and reproductive health conditions on cervical cancer screening were larger than the effect of any key predictor variables in this study. These findings serve to emphasize the importance of non-mental-health related factors, especially those related to broader access to resources, in predicting health outcomes for trauma-exposed individuals. While mental health outcomes such as PTSD and TCSE, or life circumstances such as severity of trauma exposure, are critical components to explore as we work to create more accessible healthcare for trauma survivors, it is essential that research continue to incorporate the importance of socioeconomic factors such as income and insurance in study models.

Hypothesis 1: Sexual violence and Pap testing

The first major focus of this study was to examine the relation between frequency and

severity of sexual violence and participation in recommended cervical cancer screening. In spite of their increased risk for negative reproductive health outcomes, past research suggests that sexual violence survivors may have reduced rates of participation in preventive reproductive health activities such as Pap tests (Jina & Thomas, 2013; Priester et al., 2016). Past research on this topic has yielded somewhat mixed results, which may be partially explained due to methodological limitations such as use of binary sexual violence predictor variables or failure to include relevant covariates (e.g., Danan et al., 2022; Lang et al., 2003). Accordingly, this study hypothesized that individuals with greater severity of sexual violence experiences would report reduced likelihood of having received a Pap test in the past three years.

This hypothesis was supported by the data, which indicated a small but significant effect of sexual violence on cervical cancer screening likelihood. In the present study, as combined frequency and severity of experienced sexual violence increased, participants' odds of being up to date on cervical cancer screening significantly decreased. These results align with past research which has found reduced likelihood of reproductive healthcare utilization for women who had experienced sexual violence as adults, as well as women who had experienced childhood sexual abuse (Farley et al., 2002; Holt et al., 2021; Kohler et al., 2021). Furthermore, while the effect size of the present results is relatively small, this is not out of line with findings from past research, such as in a study on CSA and past-year checkups which yielded an odds ratio of .86 (Alcala et al., 2021). The results of the present study are further supported by participants' responses to the qualitative question asking participants to detail their reasons for or against attending reproductive health appointments. Many participants explicitly mentioned past traumatic experiences as a reason for not attending these appointments, some explicitly citing avoidance of these exams due to their retraumatizing nature. More discussion of these qualitative

responses will be included later in the Discussion section, but a few relevant quotes are included here due to their direct application to the connection between sexual violence and cervical cancer screening:

“It is a scary thought, thinking about someone invading your very personal space. The first time I had a pap smear done I felt very violated and it reminded me of the time I was sexually assaulted. I felt very uneasy and I remember having to hold the nurses hand because I was crying so much.”

“They hurt. They're terrifying ... It's the exact position I was in when I was assaulted, and it's extremely painful because I have a very high cervix, and extremely triggering.”

“Going to a health appointment to check on myself, for myself, does bring up those thoughts and makes me feel vulnerable. Even though it is healing and taking back myself to take care of myself for me, it is a very vulnerable feeling and I try to avoid thinking about the people that have disrespected me in those ways. Avoidance, avoidance, avoidance.”

In these selected responses, study participants directly reference multiple elements theorized to underpin the relation between sexual violence and reduced healthcare utilization, including the experience of strong emotions such as fear and vulnerability associated with reproductive health visits, triggering physical experiences during Pap tests, and the related desire to avoid such experiences when possible (Kohler et al., 2021; Edmonds et al., 2021; Weitlauf et al., 2010). The significance of Hypothesis 1 provides quantitative evidence in support of these qualitative responses, indicating that sexual violence is significantly connected to underutilization of cervical cancer screening, even when accounting for individual variations in income, insurance status, and reproductive health conditions.

While the results of Hypothesis 1 are supported by past studies, they also provide a novel contribution to the literature on this topic. Many previous studies have been focused on comparing the healthcare behaviors of sexual violence survivors with those of individuals not exposed to sexual violence or exposed to other types of trauma (e.g., physical abuse; Holt et al., 2021). While this method of study design is essential in that it allows researchers to isolate the effects of sexual violence as opposed to more general trauma, such studies may not capture the nuances associated with the broad spectrum of experiences which fall under the label of “sexual violence.” By recruiting exclusively individuals who reported some degree of experiences of sexual violence, and utilizing a measure of sexual violence which captures both severity and frequency of violence, the present study provides additional depth to the research on this topic. The significance of Hypothesis 1 suggests that not only is sexual violence linked to reduced utilization of reproductive healthcare services, but also that the severity of this experience matters. The items included on the SES-SFV include a wide spectrum of potentially traumatic sexual experiences, including unwanted sexual touch, attempted rape, and completed rape (Koss et al., 2007). The inclusion of such varied experiences facilitates scoring which incorporates the differences in severity between these different experiences, as well as allows participants to indicate repeated experiencing of one or more events within this general category (Davis et al., 2014).

Furthermore, the utilization of a continuous predictor variable for sexual violence in this study allows for a more inclusive definition of “sexual violence” than may be captured by studies which use a binary, single-question item to determine experience of sexual violence. While participants in the present study were required to positively endorse an item indicating that they had experienced at least one “unwanted/nonconsensual sexual encounter or sexual contact” prior

to gaining access to the complete study, this screener question combined with the SES-SFV in the main study measures provides a much broader definition of sexual violence than the more commonly found binary Yes/No questions utilized in past research. Such questions might take the form of “Has anyone ever had sex with you after you said or showed that you didn’t want them to or without consent?” or “Has a sexual partner ever pressured you to have sex?” (Alcala et al., 2021; Holt et al., 2021). While these questions are broad enough to include many possible unwanted sexual experiences, the definition of “sex” may vary from person to person, and so the present study’s use of words like “sexual encounter,” or behavioral definitions as seen in the SES-SFV, allows for even greater inclusivity and clarity in the assessment of sexual violence.

Finally, the significant results of Hypothesis 1 also contribute significantly to existing literature in that the data included in this study were recruited from a relatively gender-diverse population of individuals. Past research has often failed to account for the diversity of identities of cervix-possessing individuals when recruiting participants for research on reproductive health behaviors related to vaginal or cervical health. In fact, many studies on this topic simply describe participants as “women” without any discussion of the possibility of variances related to gender identity or sex assigned at birth (e.g., Danan et al., 2022; Alcala et al., 2021). While the vast majority (95%) of participants in the present study identified as cisgender women, by focusing on sex assigned at birth rather than on current gender identity, the results of the present study may be generalized to transgender and nonbinary individuals assigned female at birth in a fashion which is not typical for studies within this area. These efforts towards inclusivity are especially essential given the high rates of sexual violence exposure in transgender and nonbinary individuals, as well as the high rates of underscreening for cervical cancer in these individuals (Suk et al., 2022; National Center for Transgender Equality, 2016).

Hypothesis 2: Mediation by TCSE

The second hypothesis in this study was that TCSE would mediate the relationship between sexual violence and cervical cancer screening, such that increased sexual violence frequency/severity would predict reduced TCSE, which in turn would predict reduced likelihood of being up to date on screening. Both the *a* and *b* paths of this mediation were nonsignificant, as was the overall indirect effect of TCSE.

The nonsignificance of the *a* path in this study is in direct contrast with previous research explicitly linking trauma as measured by the SES-SFV to TCSE as measured by the CSE-T (Mahoney et al., 2019). However, the referenced study by Mahoney and colleagues (2019) only considered trauma experienced after age 14, and did not include the same time-related stipulations as the present study, which required that participants have experienced sexual violence at least three years previously in order to participate. These differences may suggest that TCSE is somewhat resilient to traumatic events over time, as the construct was not as related to sexual violence in the present study where participants may have had more temporally distant experiences of trauma. The possibility of more distance in time between experiences of sexual violence and evaluation of TCSE in the present study may have provided for increased opportunity for posttraumatic growth, a construct related to positive psychological change following individual experiences of managing challenging life circumstances (Walker-Williams et al., 2012). Posttraumatic growth has been significantly associated with coping self-efficacy in past research, and may be an important factor to explore in future research on the relationship between sexual violence and health behaviors (Zeng et al., 2021).

The *b* path of the present model was also nonsignificant, in contrast to previous literature finding significant relations between self-efficacy and preventive health behaviors (e.g., Lee &

Park, 2018). One possible implication of the nonsignificance of the *b* path in this model is that mental health factors such as TCSE may not play as significant a role in predicting cervical cancer screening attendance as other more structural factors, such as insurance coverage or accessibility of medical clinics in one's area (Cowburn et al., 2013). After all, confidence in one's ability to cope with the distress of an upsetting pelvic exam may not matter as much when that pelvic exam is financially or geographically inaccessible. Insurance coverage emerged as significant predictor within the present study, suggesting that these relevant socioeconomic factors play a meaningful role in influencing screening attendance, perhaps more so than TCSE.

While the *p* value for the *b* path in the present study did not exceed the .05 cutoff for significance, its observed value of .067 approaches significance. This suggests that, while TCSE was not significant in the present study, it may be a variable worth considering in future research. The questionnaire utilized to evaluate TCSE in this study was relatively brief, and TCSE as a construct is somewhat underexplored in psychological literature (Benight et al., 2015). Given these limitations, the present study was only focused on TCSE as a broad construct, and may not have been able to focus on elements of this construct which are more specifically relevant to the study hypotheses. For example, a core component of the support for TCSE as a mediator in this study concerns the role of TCSE in supporting adaptive coping skills and reducing avoidance behaviors (Benight & Bandura, 2004; Bosmans et al., 2015). Perhaps a more specific measure focusing directly on coping skills or approach versus avoidance behavior would be more directly related to the connection between sexual violence and cervical cancer screening, and yield more significant results (Benight & Bandura, 2004).

Hypotheses 3 & 4: Moderation by PTSD

Hypotheses 3 and 4 for the present study stated that PTSD would moderate both the

relations between sexual violence and TCSE (Hypothesis 3), and between TCSE and cervical cancer screening participation (Hypothesis 4). Neither of these hypotheses was supported by the data.

Regarding Hypothesis 3, researchers have found that sexual violence is associated with reduced TCSE and with increased PTSD symptoms, suggesting that these three constructs may be associated with each other in meaningful ways (Mahoney et al., 2019). Accordingly, the lack of relations between these three constructs in the study exists in contrast to previous findings in the literature. However, no study has yet explored this specific interaction between PTSD and sexual violence in predicting TCSE, suggesting that while perhaps these variables are related, they may not be related exactly as predicted by Hypothesis 3 in the present study. Furthermore, studies often explore either only PTSD or only sexual violence in predicting relevant outcomes, and so it may be that the variance explained by sexual violence-related PTSD in predicting TCSE is better captured within the variable of sexual violence in the present study (Lee & Park, 2018).

While the moderation proposed by Hypothesis 3 was not supported, a significant direct path was found in which increased PTSD significantly predicted reduced TCSE. These findings align with past research on PTSD and self-efficacy within the domain of reproductive healthcare, as a study of pregnant people found a negative correlation between PTSD symptoms and obstetric self-efficacy (Stevens et al., 2017). Other studies have found similar inverse relationships between PTSD and self-efficacy, both broadly and specifically as relates to trauma (e.g., Bosmans et al., 2015; Benight & Bandura, 2004). While the significant path from PTSD to TCSE was not an explicit hypothesis of the present study, the existence of a significant relation between these two variables further underscores the connection between adaptive and

maladaptive trauma-related outcomes. Furthermore, the significance of this path suggests that both PTSD and TCSE may be variables of note in exploring trauma-related outcomes. Research typically does not evaluate severity of sexual violence alongside both PTSD and TCSE, and such study designs may fail to capture the nuances in the relationship between trauma, adaptive and maladaptive coping, and later outcomes.

Hypothesis 4 also yielded no significant results, indicating no significant relation between TCSE and PTSD in predicting cervical cancer screening. These results are in contrast to data suggesting that distress during pelvic exams is higher for sexual violence survivors with PTSD compared to those without PTSD, and that avoidance behaviors (typically associated with PTSD) are associated with reduced preventive health behaviors in general (Farley et al., 2002; Weitlauf et al., 2008). However, researchers rarely explore the relation between PTSD and reproductive healthcare behaviors while also considering sexual violence, and it may be that the variance accounted for by PTSD in this association in prior research may be largely captured by a measure of sexual violence severity (Edmonds et al., 2021; Weitlauf et al., 2008). One review by Lee and Park (2018) noted that experience of trauma predicted reduced health screening participation even when controlling for PTSD symptoms, suggesting that perhaps the influence of PTSD on healthcare behaviors is not an independent predictive factor, but rather one which does not contribute to the equation beyond its direct relationship with severity of traumatic experiences.

In a similar vein, the nonsignificance of these moderation hypotheses may further point to the importance of other variables in predicting preventive healthcare behavior. While the significance of Hypothesis 1 suggests that broad sexual violence experience may influence cervical cancer screening participation, the nonsignificance of PTSD and TCSE in this model

implies that the significant relationship found in Hypothesis 1 may not be adequately explained by broad mental health variables as measured in this study. For example, the PCL-5 captures typical symptoms of PTSD, but past research suggests that specifically intrusive memories and avoidance behaviors may be the most relevant PTSD symptoms when considering impacts on healthcare behaviors for sexual violence survivors (Kohler et al., 2021; Razi et al., 2021). Accordingly, more precise measuring of relevant symptoms might yield different results in future studies. Furthermore, given the significance of insurance and income as covariates in this study, it is essential to consider the impact of non-mental health variables in predicting screening participation. Researchers in one recent study found reduced rates of cervical cancer screening for individuals with marginalized racial or gender/sexual identities, residing in rural areas, or who report a significant lack of knowledge about the importance of this health behavior (Suk et al., 2020). These results are especially important given the fact that sexual violence also tends to disproportionately affect individuals from these same demographic groups, placing these populations at even more increased risk of underscreening (Armstrong et al., 2018). While mental health variables related to sexual violence experience play a crucial role in the relation between sexual violence and healthcare behaviors, these are only one of the many myriad factors which may influence an individual's likelihood of completing a Pap test on time.

Research Question 5: Exploring reproductive health beliefs

Hypothesis 5 in the present study aimed to broadly explore underlying beliefs and circumstances which influence sexual violence survivors' utilization of reproductive healthcare. One notable finding from the administration of the PSBQ in the present study is the high scores on PSBQ items focused on exam-related distress and anxiety. The four items with the highest average scores on the PSBQ in this study all fell within the Exam-Related Distress subscale, with

three of those four items pertaining specifically to experiencing strong negative emotions during vaginal exams. Past studies have found both quantitative and qualitative data in support of these findings, with researchers identifying that sexual violence survivors often report significant physical and emotional distress associated with pelvic exams and Pap tests (e.g., Edmonds et al., 2021; Kohler et al., 2021; Priester et al., 2016). Participants in the present study provided additional qualitative support for the quantitative responses recorded on the PSBQ. In response to the question on factors which influence their appointment attendance, one participant said, “My assault experiences make the thought of attending those appointments especially anxiety-inducing and unpleasant because I don’t want to be reminded of the experiences ... I have a lot of embarrassment thinking about attending even outside of reasons that have to do with my assault experiences – body image, fear of awkwardness, etc.” This response exemplifies the discomfort which many participants reported in this study – discomfort not only related specifically to trauma, but also more broadly to the experience of receiving a pelvic exam in general.

Another notable finding from the PSBQ was that participants generally reported highly positive perceptions of the benefits of receiving a Pap test, as the PSBQ subscale on this topic yielded the highest average item score compared to other subscales. It is possible these high scores were due in part to the structure of the survey, as participants read a paragraph describing the purpose of Pap tests prior to answering questions about their reproductive health. However, another possible explanation may be that while sexual violence survivors typically report negative experiences related to Pap tests, these experiences may not strongly influence their beliefs about the importance of the exam itself. Multiple participants left qualitative responses along this theme, such as “Getting various medical checkups is important and it’s just something I do, like brushing my teeth or showering” and “I know why they are important and get them

done even though they are very uncomfortable.” These findings are in contrast to past studies which have found negative beliefs about the necessity of cervical cancer screenings in populations of sexual violence survivors (Weitlauf et al., 2010). However, in the Weitlauf and colleagues (2010) study, questions about Pap test beliefs were more focused on individual concerns about the exam (e.g., not feeling it is personally necessary at this time, not feeling safe, etc.), not about benefits of the exam more broadly. Furthermore, Alcala and colleagues (2021) found that study participants with a history of CSA were more likely to have a primary care physician, but less likely to have received a checkup in the past year, compared to non-CSA-exposed participants, further suggesting that there may be a difference between willingness to engage with healthcare providers and specific behaviors related to healthcare in sexual violence survivors. Accordingly, the results of the present study may suggest that while sexual violence survivors report a high level of individual-level concern and avoidance surrounding Pap tests, these behaviors may not be the result of incorrect understandings about why Pap tests are important.

In contrast to these high scores about the benefits of Pap tests, participants did report lower scores on items pertaining to perceived risk of contracting cervical cancer. Participants in this study were sampled from an age group at low risk of cervical cancer, as the CDC reports that new diagnoses of cervical cancer are present at a rate of .5 per 100,000 women for 20- to 24-year-olds, and 4.1 per 100,000 women for 25- to 29-year-olds (CDC, 2022a). Accordingly, lifetime risk of being diagnosed with cervical cancer may not be a salient topic for the young adults included in this study. However, research also suggests that survivors of traumatic events may experience skewed perception of risk, a frequent explanation for the higher rates of risky behaviors in these populations (Ben-Zur & Zeidner, 2009). It may be that participants in the

present study underestimated their risk of cervical cancer, a possibility which is further supported by the abundance of participants who qualitatively noted that they did not receive the HPV vaccine due to not seeing themselves as at risk of contracting HPV. For example, one participant reported, “I have not gotten this vaccine because I do not feel like it is as prevalent in life nowadays then it was when I was growing up.” Another said, “Personally, I would not consider getting this vaccine because I have only one sexual partner in a closed relationship.”

Finally, participants in the present study reported a variety of perceived barriers to accessing reproductive healthcare. While they typically disagreed with the PSBQ statement of “I don’t know how to go about getting a Pap smear,” nearly two-thirds of participants endorsed at least one barrier to attending reproductive health appointments. The most reported barrier was worry about what might happen at the appointments, a finding which aligns with both qualitative and quantitative findings discussed previously, as well as with findings of previous research indicating significant anticipatory distress about pelvic exams for sexual violence survivors (Kohler et al., 2021). Participants also reported lack of insurance as a frequent barrier, a theme which was exemplified through the significance of insurance coverage as a covariate, as well as by participants’ qualitative responses. One response on the topic reads, “Healthcare is just too expensive at times. It’s difficult for me to see the value in preventive treatments when it’s preventing me from being able to afford other things.” The high prevalence of structural barriers to healthcare access in this sample is especially notable given the disproportionate distribution of such barriers within marginalized communities – inequitable access to healthcare based on barriers such as lack of transportation or lack of insurance coverage results in inequitable health outcomes for individuals with marginalized social identities, as has been found in numerous past studies on the topic (e.g., Cowburn et al., 2013; MacLaughlin et al., 2019). The present political

climate also influenced participants' perceived barriers – 17.5% of participants noted that the overturn of *Roe v. Wade* influenced their lack of attendance at appointments. Participant responses here underscore the concerns of public health officials who noted that restricting abortion access nationwide might result in limitations of other reproductive healthcare services, as well (Kulczycki, 2022). Overall, participants' reported barriers to attending reproductive healthcare appointments further support not only the significant results of Hypothesis 1 in the present study, but also the critical importance of attending to structural barriers to healthcare access when working with sexual violence survivors of all identities.

Between-groups comparisons further exploring differences in PSBQ scores between study participants who were up-to-date versus not up-to-date on Pap testing revealed overall more positive attitudes towards Pap tests for those who were up-to-date, including higher perceived benefits of Paps, more positive attitudes towards exams, and reduced risks and barriers to screening. These findings are notable in that they suggest a meaningful connection between beliefs about Pap testing and behaviors related to Pap testing. Accordingly, these results suggest that beliefs about Pap testing overall may play a significant intermediary role in the relation between sexual violence exposure and cervical cancer screening. Interestingly, the up-to-date group also reported significantly lower perceived vulnerability to cervical cancer, a finding which is perhaps directly related to their knowledge that they are participating in the recommended healthcare practices for early detection and/or prevention of cervical cancer.

Limitations & Future Directions

While the present study contributes to the literature on sexual violence and reproductive healthcare in numerous ways, these results must be understood within the context of the existing limitations of this study. One important limitation to mention is the limited generalizability of the

participants in this study. While the age range of 21-29 years old was selected for its consistency in cervical cancer screening recommendations, this selection of ages does not represent the full span of individuals who are eligible for Pap tests (MacLaughlin et al., 2019). Individuals within this age range may have unique life circumstances (e.g., attending university, access to parents' health insurance, etc.) which may significantly influence their access to healthcare compared to older individuals. Accordingly, future research should consider recruiting participants from ages 21 to 65 years old, as this represents the full range of individuals for whom cervical cancer screening is currently recommended.

Another limitation of the participant sample in the present study stems from my use of MTurk as a recruitment platform. While the participants in this study are generally as or more diverse than can be expected from MTurk community samples, there are some demographics for which diversity is lacking within this sample (e.g., race/ethnicity, religious background, etc.; Burnham et al., 2018). This lack of demographic diversity limits the degree to which results can be generalized to individuals of all backgrounds, especially given research findings indicating significantly different rates of traumatic experiences and healthcare access for individuals belonging to marginalized social groups (Armstrong et al., 2018; Pegram & Abbey, 2019). Future research should consider utilizing more diverse subject pools in order to generate results which are more readily generalizable. Furthermore, such studies might consider more community-focused data collection, as these results might not only yield more diverse samples of participants, but also would offer the opportunity for researchers to make recommendations specific to a given community based on the results of their study.

The present study was also limited in its ability to explore all variables which may influence healthcare behaviors in sexual violence survivors. Future research may consider

exploring specific components of PTSD and TCSE, such as intrusive thoughts, avoidance behaviors, or coping styles, as these specific constructs may be more relevant and directly related to healthcare behaviors than the broad constructs of PTSD and TCSE themselves. Furthermore, while psychological variables such as PTSD and TCSE were evaluated in this study, we did not look at variables such as mental health treatment, which may significantly impact the ways in which an individual copes with past traumatic experiences. Additionally, while a question regarding location was included in the questionnaire, it was excluded from analyses due to high rates of invalid participant responding. This issue prevented the discussion of participants' physical access to medical facilities, a factor which plays a significant role in determining how well individuals are able to utilize healthcare services (Streeter et al., 2020). Future research should consider a wide array of factors which may influence healthcare behaviors, including participants' utilization of mental healthcare which may reduce discomfort with reproductive healthcare, and participants' physical access to healthcare services in their area.

One final area for future research stemming from the results of this study pertains to Hypothesis 5, which explored participants' views about Pap tests and cervical cancer. This hypothesis was purely exploratory and therefore included few formal statistical or thematic analyses, which may be useful in future research by providing quantitative evidence describing how sexual violence may affect individuals' beliefs about reproductive healthcare. Relating to the physical experience of completing a cervical cancer screening, future research may explore specific sources of exam-related anxiety and distress for sexual violence survivors, as well as factors which may increase individual comfort during reproductive health exams. More broadly, future studies should continue to explore how sexual violence may be connected to maladaptive or inaccurate beliefs about cervical cancer and screenings in survivors, as these beliefs serve as a

larger factor which may result in the noted rates of under-screening in sexual violence survivors (Lee & Park, 2018).

Clinical Implications

One of the goals of the present study was to conduct research which might yield practical suggestions for how healthcare providers and other relevant parties might increase sexual violence survivors' utilization of reproductive healthcare services. Given the high rates of underscreening, and resulting cervical cancer, in this population, evidence-based suggestions for how to address this issue are both timely and highly necessary (Suk et al., 2022; Jina & Thomas, 2013). The significance of insurance as a relevant covariate in the present study suggests that a more large-scale effort to increase healthcare participation within this population must focus on increasing healthcare access more broadly, an intervention which ranges in scale from discussing insurance with clients, to advocating for increased healthcare accessibility and financial support for low-income individuals at a larger legislative level. Additionally, many participants in the present study reported inaccurate perceptions of individual risk of contracting HPV or cervical cancer, suggesting that efforts to increase screening participation may also benefit from including educational content about STIs, cancer risk, and related preventive health behaviors (including, but not limited to, completing regular Pap tests). Past studies have found that increased knowledge about both risk and preventive factors related to cervical cancer increases screening participation in college students, suggesting that health literacy may be an important point of intervention for young adults (Ahmed et al., 2020).

Furthermore, considering the relevance of specifically trauma-related outcomes evaluated in the present study, both physical and behavioral healthcare providers may wish to emphasize the benefits of psychotherapy for sexual violence survivors as a factor which may promote not

only mental health, but also physical health. Based on the results of the present study, behavioral health providers working with sexual violence survivors may wish to focus on factors such as TCSE, approach versus avoidant coping, and emotional regulation in potentially triggering scenarios. While the present study did not focus on all mental health factors which may affect cervical cancer screening participation in sexual violence survivors, psychotherapy may address a variety of cognitive, emotional, or behavioral influences which may impact individuals' likelihood of completing a Pap test.

One especially common theme in qualitative responses in the present study, as well as in past research, was the distress that sexual violence survivors often feel in the exam room (Danan et al., 2022; Weitlauf et al., 2010). Accordingly, medical providers should consider how to implement trauma-informed healthcare practices which will reduce distress and increase comfort in patients who may have histories of trauma. For example, participants reported on the PSBQ that they often felt distressed when healthcare providers rushed through an exam or did not communicate with them. Participants also indicated a strong preference for female providers for pelvic exams. These responses suggest strategies which are supported by past research, in which trauma-informed medical providers emphasize patient-provider communication, collaboration, and safety in medical care (Kohler et al., 2021). Some manifestations of these principles may be consideration of patient preferences regarding the gender of their provider, or provision of detailed explanations of what a Pap test entails both before and during the exam. Furthermore, medical providers may also wish to attend to internal biases which may influence patient care. Research indicates that individuals from marginalized identities (e.g., LGBTQ+, POC, etc.) tend to report significantly lower rates of screening participation, and multiple participants in the present study reported that they felt judged by medical providers either for their physical

appearance, trauma history, or marginalized identities they held (Suk et al., 2022). Guidelines on trauma-informed care often include an emphasis on cultural humility, as respect for and acknowledgment of marginalized identities and relevant systems of power is essential in creating a medical environment in which patients feel safe and supported (Kimberg & Wheeler, 2019).

Conclusion

In spite of higher rates of sexual risk-taking and negative health outcomes, sexual violence survivors report lower rates of participation in important preventive reproductive healthcare procedures. The present study sought to explore the underlying mechanisms of this phenomenon, in order to provide concrete research and clinical recommendations to support evidence-based practices for increasing cervical cancer screening in this underserved group of individuals. We found that increased severity and frequency of sexual violence predicted reduced likelihood of being up to date on Pap testing, and that while PTSD and TCSE were not significant contributors to the study model, income, insurance status, and existing health conditions were. These findings were underscored by participant responses indicating significant distress and fear associated with reproductive healthcare appointments, often directly linked to past traumatic experiences.

This study represents an important contribution towards understanding exactly how sexual violence history influences survivors' participation in and attitudes towards cervical cancer screening. Results indicated that survivors' lower rates of screening were significant independent of health conditions which may push them to be more active in medical appointments in general, as well as insurance and income limitations which may impact the accessibility of medical care. These findings emphasize the importance of considering trauma history when exploring factors which may limit individuals' perceived access to reproductive

healthcare. Furthermore, these results also point to the importance of continuing to explore factors which may underlie this connection, including both mental health and broader structural and sociodemographic factors. At the clinical level, trauma-informed care is an essential component of reducing the barrier that trauma history presents towards reproductive healthcare participation. Adequate healthcare access, especially preventive procedures such as cervical cancer screening, can be lifesaving, and the present study provides further support for the importance of considering sexual violence survivors as a group at increased risk of reduced healthcare utilization.

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Appendix A

Demographics Questionnaire

1. How do you identify your gender? (select all that apply)
 - a. Man
 - b. Woman
 - c. Transgender
 - d. Nonbinary / genderfluid
 - e. Agender
 - f. Other / prefer to self-describe: _____
2. What is your sexual orientation?
 - a. Heterosexual / straight
 - b. Gay / lesbian
 - c. Bisexual
 - d. Pansexual
 - e. Asexual
 - f. Other / prefer to self-describe: _____
3. What is your race or ethnic background? (select all that apply)
 - a. White / European-American
 - b. Hispanic / Latinx
 - c. African-American / Black
 - d. Asian-American / Asian
 - e. Native Hawaiian / Pacific Islander
 - f. Native American / American Indian

- g. Middle Eastern / North African
 - h. Other / prefer to self-describe: _____
4. Highest level of education completed:
- a. Some high school
 - b. Completed high school
 - c. GED
 - d. Technical degree
 - e. Some college
 - f. College graduate
 - g. Some graduate school
 - h. Completed a graduate program
5. What is your religious preference / affiliation?
- a. Protestant
 - b. Catholic
 - c. Christian / non-denominational
 - d. Buddhist
 - e. Hindu
 - f. Jewish
 - g. Muslim
 - h. Spiritual
 - i. Other: _____
 - j. None
6. What is your current employment status?

- a. Unemployed
 - b. Employed part-time
 - c. Employed full-time
 - d. Retired
 - e. Other: _____
7. Which of the following best represents your total household income before taxes in the past year?
- a. Less than \$10,000
 - b. \$10,000 - \$15,000
 - c. \$15,000 - \$25,000
 - d. \$25,000 - \$50,000
 - e. \$50,000 - \$75,000
 - f. Over \$75,000
8. What is your current relationship / marital status?
- a. Single
 - b. In a relationship
 - c. Married
 - d. Divorced
 - e. Separated
 - f. Widowed
9. What is your current state and county of residence? _____
10. What is the primary source of your health care coverage?

- a. A plan purchased through an employer or union (including plans purchased through another person's employer)
- b. A plan that you or another family member buys on your own
- c. Medicare
- d. Medicaid or other state program
- e. Alaska Native, Indian Health Service, Tribal Health Services
- f. Other: _____
- g. None

11. Are you currently pregnant?

- a. Yes
- b. No

12. If yes to 13, have you been attending prenatal doctor's visits as recommended?

- a. Yes
- b. No
- c. I don't know

Appendix B

Sexual Experiences Survey – Short Form Victimization (SES-SFV)

The following questions concern sexual experiences that you may have had that were unwanted.

We know that these are personal questions, so we do not ask your name or other identifying information. Your information is completely confidential. We hope that this helps you to feel comfortable answering each question honestly. Place a check mark in the box () showing the number of times each experience has happened to you. If several experiences occurred on the same occasion—for example, if one night someone told you some lies and had sex with you when you were drunk, you would check both boxes a and c. If this event has happened to you, please also indicate the age at which this event happened *for the first time*, and the age at which this event *most recently happened to you* (these answers may be the same age, if this event has only happened once).

	Never	Once	Twice	Three or more times	<i>Age when this first happened</i>	<i>Age when this most recently happened</i>
1. Someone fondled, kissed, or rubbed up against the private areas of my body (lips, breast/chest, crotch, or butt) or removed some of my clothes without my consent (but did not attempt sexual penetration) by:						
a) Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn't want to.						
b) Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn't want to						

c) Taking advantage of me when I was too drunk or out of it to stop what was happening						
d) Threatening to physically harm me or someone close to me.						
e) Using force, for example holding me down with their body weight, pinning my arms, or having a weapon.						
2. Someone had oral sex with me or made me have oral sex with them without my consent by:						
a) Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn't want to.						
b) Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn't want to						
c) Taking advantage of me when I was too drunk or out of it to stop what was happening						
d) Threatening to physically harm me or someone close to me.						
e) Using force, for example holding me down with their body weight, pinning my arms, or having a weapon.						
3. A person put their penis into my vagina, or someone inserted fingers or objects without my consent by:						
a) Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn't want to.						
b) Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn't want to						
c) Taking advantage of me when I was too drunk or out of it to stop what was happening						
d) Threatening to physically harm me or someone close to me.						
e) Using force, for example holding me down with their body weight, pinning my arms, or having a weapon.						

4. A person put their penis into my butt, or someone inserted fingers or objects without my consent by:						
a) Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn't want to.						
b) Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn't want to						
c) Taking advantage of me when I was too drunk or out of it to stop what was happening						
d) Threatening to physically harm me or someone close to me.						
e) Using force, for example holding me down with their body weight, pinning my arms, or having a weapon.						
5. Even though it did not happen, someone <i>tried</i> to have oral sex with me, or make me have oral sex with them without my consent by:						
a) Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn't want to.						
b) Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn't want to						
c) Taking advantage of me when I was too drunk or out of it to stop what was happening						
d) Threatening to physically harm me or someone close to me.						
e) Using force, for example holding me down with their body weight, pinning my arms, or having a weapon.						
6. Even though it did not happen, a person <i>tried</i> to put their penis into my vagina, or someone tried to stick in fingers or objects without my consent by:						

a) Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn't want to.						
b) Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn't want to						
c) Taking advantage of me when I was too drunk or out of it to stop what was happening						
d) Threatening to physically harm me or someone close to me.						
e) Using force, for example holding me down with their body weight, pinning my arms, or having a weapon.						
7. Even though it did not happen, a person <i>tried</i> to put their penis into my butt, or someone tried to stick in objects or fingers without my consent by:						
a) Telling lies, threatening to end the relationship, threatening to spread rumors about me, making promises I knew were untrue, or continually verbally pressuring me after I said I didn't want to.						
b) Showing displeasure, criticizing my sexuality or attractiveness, getting angry but not using physical force, after I said I didn't want to						
c) Taking advantage of me when I was too drunk or out of it to stop what was happening						
d) Threatening to physically harm me or someone close to me.						
e) Using force, for example holding me down with their body weight, pinning my arms, or having a weapon.						
8. Have you ever been raped?	Yes	No				

Appendix C

PTSD Checklist for the DSM-5 (PCL-5)

Below is a list of problems that people sometimes have in response to a very stressful experience. When answering these questions, please think about the types of experiences discussed in the previous set of questions. Please read each problem carefully and then indicate how much you have been bothered by that problem in the past month as relates to these past unwanted sexual experiences.

In the past month, how much were you bothered by:	Not at all	A little bit	Moderately	Quite a bit	Extremely
1. Repeated, disturbing, and unwanted memories of the stressful experience?					
2. Repeated, disturbing dreams of the stressful experience?					
3. Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?					
4. Feeling very upset when something reminded you of the stressful experience?					
5. Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)					
6. Avoiding memories, thoughts, or feelings related to the stressful experience?					
7. Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?					
8. Trouble remembering important parts of the stressful experience?					

9. Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as : I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)?					
10. Blaming yourself or someone else for the stressful experience or what happened after it?					
11. Having strong negative feelings such as fear, horror, anger, guilt, or shame?					
12. Loss of interest in activities that you used to enjoy?					
13. Feeling distant or cut off from other people?					
14. Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?					
15. Irritable behavior, angry outbursts, or acting aggressively?					
16. Taking too many risks or doing things that could cause you harm?					
17. Being “superalert” or watchful or on guard?					
18. Feeling jumpy or easily startled?					
19. Having difficulty concentrating?					
20. Trouble falling or staying asleep?					

Appendix D

Trauma Coping Self-Efficacy Scale (CSE-T)

The following questions address situations individuals often face after having experienced stressful or upsetting events. Please rate how capable you feel, at this moment, to deal with the following:

How capable to...	1	2	3	4	5	6	7
	Not at all capable						Totally Capable
1. Deal with my emotions (anger, sadness, depression, anxiety) since I experienced my trauma							
2. Get my life back to normal							
3. Not “lose it” emotionally							
4. Manage distressing dreams or images about the traumatic experience							
5. Not be critical of myself about what happened							
6. Be optimistic since the traumatic experience							
7. Be supportive to other people since the traumatic experience							
8. Control thoughts of the traumatic experience happening to me again							
9. Get help from others about what happened							

Appendix E

Reproductive Healthcare Questionnaire

A pelvic exam is a general examination of the health of your vagina, vulva, and pelvic region.

This exam is typically conducted at your medical provider's office. During this exam, a person typically lies on their back on an examination table, with their legs spread apart and their feet resting in supports called stirrups. The medical professional then examines the external appearance of the person's genital region and vulva, and may insert a finger inside the vagina in order to internally examine the health of the vagina.

Please select the best response:

- A. I reviewed and understand this definition of a pelvic exam
- B. I did not review this definition of a pelvic exam
- C. I do not understand the definition
- D. Do not select this response

A Pap test (also called a Pap smear) is a procedure to test for cervical cancer which is often a part of the pelvic exam. A Pap smear involves collecting cells from your cervix – the lower, narrow end of the uterus that's at the top of your vagina. During this test, a person typically lies on their back on an examination table, with their legs spread apart and their feet resting in stirrups. The medical professional then inserts a speculum (a metal or plastic tool) into the vagina, and uses a small tool like a spatula/brush to scrape a small sample of cells from the cervix. This sample is then sent to a lab and tested, and the health care office contacts the person at a later time to inform them of the test results.

Please select the best response:

- A. I reviewed and understand this definition of a Pap test
 - B. I did not review this definition of a Pap test
 - C. I do not understand the definition
 - D. Do not select this response
-
1. How long has it been since you had your last Pap test (e.g., lying down with your legs in stirrups, with the medical provider using a tool to touch your cervix internally)?
 - a. Less than 3 years
 - b. 3 or more years
 - c. I have never had a Pap test
 - d. I don't know
 2. How long has it been since you had your last pelvic exam (e.g., lying down with your legs in stirrups, with the medical provider examining your genital region)?
 - a. Less than 3 years
 - b. 3 or more years
 - c. I have never had a pelvic exam
 - d. I don't know
 3. Please indicate which (if any) of the following reproductive health concerns you have experienced:
 - a. Received abnormal Pap test results
 - b. Received a hysterectomy

- c. Abnormal uterine bleeding, outside of what is typically expected for a regular monthly period
 - d. Abnormal pelvic pain, outside of what is typically expected for a regular monthly period
 - e. Treatment for a sexually transmitted infection (STI)
 - f. I have never experienced any of these
4. Please indicate which (if any) of the following concerns have interfered with your ability to complete a women's health medical appointment (check all that apply):
- a. Lack of transportation to get there
 - b. Lack of a clinic in my area
 - c. Lack of time to attend an appointment
 - d. Lack of insurance coverage
 - e. Feeling that the appointment is not important
 - f. Discomfort with visiting a women's health clinic following the Supreme Court's recall of Roe v. Wade
 - g. Worry about what might happen at the appointment
 - h. I have no concerns that interfere with my ability to complete a women's health appointment

Appendix F

Pap Smear Belief Questionnaire (PSBQ)

The following questions ask you about your opinions and experiences with cervical cancer, Pap tests, and vaginal/pelvic exams at the gynecologist. Please answer each question to the best of your ability.

	1	2	3	4	5
	<i>Strongly Disagree</i>				<i>Strongly Agree</i>
1. When the provider performs the vaginal exam, it makes me feel on edge.					
2. I feel like I am being violated when the provider performs the vaginal exam.					
3. I feel like I am being violated when the provider does not explain to me what they are doing during the exam.					
4. I do not trust health care providers.					
5. Having a Pap smear is too embarrassing.					
6. My provider asks me personal questions that I don't want to think about.					
7. When I am lying on the exam table, I remember distressing things that happened to me.					
8. People doing Pap smears are rude.					
9. I do not trust health care providers unless I know them.					
10. When the provider rushes through the exam it makes me feel on edge.					
11. I am afraid to have a Pap smear because I don't understand what will be done.					
12. Having a Pap smear takes too much time.					
13. I am afraid to have a Pap smear because I might find out something is wrong.					
14. I only want to see female providers.					

15. Having a Pap smear is the best way for me to find early abnormal cervical cell changes.					
16. If I find cervical cancer cells through a Pap smear, my treatment for cervical cancer might not be as bad.					
17. Having a Pap smear will help me find abnormal cervical cells early.					
18. Having a Pap smear will decrease my chances of dying from cervical cancer.					
19. I feel I will get cervical cancer sometime during my life.					
20. It is likely that I will get cervical cancer.					
21. My chances of getting cervical cancer in the next few years are great.					
22. I am not at risk for cervical cancer because it does not run in my family					
23. I am not at risk for cervical cancer because I use protection when I have sex.					
24. If I take good care of my health by exercising and eating right, I am not at risk for cervical cancer.					
25. I don't know how to go about getting a Pap smear.					
26. I have other problems more important than getting a Pap smear.					
27. I cannot remember to schedule a Pap smear.					

Appendix G

Life Events Checklist for the DSM-5 (LEC-5)

Listed below are a number of difficult or stressful things that sometimes happen to people. e. For each event check one or more of the boxes to the right to indicate that: (a) it happened to you personally; (b) you witnessed it happen to someone else; (c) you learned about it happening to a close family member or close friend; (d) you were exposed to it as part of your job (for example, paramedic, police, military, or other first responder); (e) you're not sure if it fits; or (f) it doesn't apply to you. Be sure to consider your entire life (growing up as well as adulthood) as you go through the list of events.

Have you ever experienced:

Event	Happened to me	Witnessed it	Learned about it	Part of my job	Not Sure	Doesn't apply (I have never experienced this)
1. Natural disaster (for example, flood, hurricane, tornado, earthquake)						
2. Fire or explosion						
3. Transportation accident (for example, car accident, boat accident, train wreck, plane crash)						
4. Serious accident at work, home, or during recreational activity						
5. Exposure to toxic substance (for example, dangerous chemicals, radiation)						

6. Physical assault (for example, being attacked, hit, slapped, kicked, beaten up)						
7. Assault with a weapon (for example, being shot, stabbed, threatened with a knife, gun, bomb)						
8. Sexual assault (rape, attempted rape, made to perform any type of sexual act through force or threat of harm)						
9. Other unwanted or uncomfortable sexual experience						
10. Combat or exposure to a war-zone (in the military or as a civilian)						
11. Captivity (for example, being kidnapped, abducted, held hostage, prisoner of war)						
12. Life-threatening illness or injury						
13. Severe human suffering						
14. Sudden violent death (for example, homicide, suicide)						
15. Sudden accidental death						
16. Serious injury, harm, or death you caused to someone else						
17. Any other very stressful event or experience						