

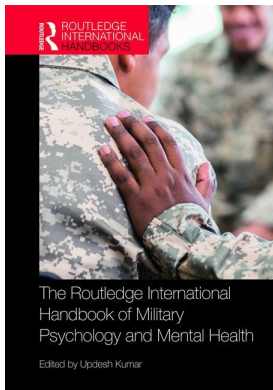
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MILITARY SEXUAL TRAUMA AND SUICIDAL SELF- DIRECTED VIOLENCE

A narrative review and proposed agenda for future research

*Lindsey L. Monteith, Ryan Holliday, Tim Hoyt,
and Nazanin H. Bahraini*

Military sexual trauma (MST) is a term used in the U.S. Department of Veterans Affairs (VA) that refers to psychological trauma resulting from sexual assault (SA) or sexual harassment (SH) occurring during one's military service (U.S. Government, 2014). National VA policy mandates universal MST screening of all veterans who present for healthcare in the Veterans Health Administration (VHA; U.S. Government, 2014). Although the precise wording has evolved over time, the current MST screening questions used in VHA are: "When you were in the military ... (1) did you ever receive unwanted, threatening, or repeated sexual attention (for example, touching, cornering, pressure for sexual favors, or inappropriate verbal remarks)? [SH]; and (2) did you have sexual contact against your will or when you were unable to say no (for example, after being forced or threatened or to avoid other consequences)? [SA]" Veterans who endorse a positive response to either question (i.e., screen positive) are offered the opportunity to discuss potential resources, including free VHA care for MST-related health conditions (Foyne et al., 2018). Implementation of universal MST screening within VHA has been successful, with 98.7% of 5,173,091 veterans screened to date; of those, 29.1% of females and 1.6% of males have screened positive (Department of Veterans Affairs Office of Mental Health & Suicide Prevention, 2018).

While the VA uses the aforementioned definition of MST, the U.S. Department of Defense (DoD) differentiates SH and SA. Specifically, the DoD defines SH as "conduct that involves unwelcome sexual advances, requests for sexual favors, and deliberate or repeated offensive comments or gestures of a sexual nature" when such conduct is made a condition of a person's career, interferes with work performance, or creates a hostile or offensive environment (DoD, 2018a, p. 9). DoD defines SA as "intentional sexual contact characterized by the use of force, threats, intimidation, or abuse of authority or when the victim does not or cannot consent" (DoD, 2017, p. 122). In 2005, the DoD established a Sexual Assault Prevention and Response Office (SAPRO) to curtail instances of SA and increase safety and recourse for service members who experience SA (DoD, 2005). Approximately 4.3% of women and 0.6% of men in the U.S. military report experiencing SA each year, one-third of whom make a formal report of the

incident (DoD, 2018b). DoD reports further indicate that 21.4% of active duty women and 5.7% of active duty men indicate experiencing SH in the previous year (Davis, Grifka, Williams, & Coffey, 2017). The SAPRO has implemented several initiatives aimed at preventing SA, increasing reporting of incidents, and supporting service members in the aftermath thereof; nonetheless, SA continues to pose a significant and persistent problem (DoD, 2018b).

Results from a recent meta-analysis suggest that MST is likely more prevalent than what is suggested by formal reporting statistics (Wilson, 2018). Fear, stigma, avoidance, and concerns about sexuality and masculinity likely deter reporting and disclosure of MST (Andresen & Blais, 2019; Dardis, Reinhardt, Foynes, Medoff, & Street, 2018; O'Brien, Keith, & Shoemaker, 2015). Multi-faceted initiatives across institutions have led to burgeoning research on MST (Holliday, Maguen, Hoyt, Blais, & Monteith, 2018b), which portrays an array of negative outcomes associated with experiencing SH or SA during one's military service. MST is associated with posttraumatic stress disorder (PTSD), depression, eating disorders, and substance use disorders (Kimerling, Gima, Smith, Street, & Frayne, 2007; Klingensmith, Tsai, Mota, Southwick, & Pietrzak, 2014; Millegan, Wang, LeardMann, Miletich, & Street, 2016; Surís & Lind, 2008), as well as cardiovascular disease, chronic pulmonary and liver disease, genito-urinary conditions, sexually transmitted infection, and sexual dysfunction (Kimerling et al., 2007; Surís, Holliday, Weitlauf, North, & the Veteran Safety Initiative Writing Collaborative, 2013; Turchik et al., 2012). Whereas these mental and physical health risks are extensive, the toll of experiencing MST extends beyond one's mental and physical health, also encompassing impaired social functioning and interpersonal relationships, decreased military readiness, lower socioeconomic status, heightened risk for unemployment and disability, and homelessness (Brignone et al., 2016; Brownstone, Holliman, Gerber, & Monteith, 2018; Millegan et al., 2016; Monteith, Gerber, Brownstone, Soberay, & Bahraini, 2019; Surís et al., 2013).

Whereas the aforementioned findings illuminate a variety of adverse experiences associated with MST, the extent to which MST is associated with suicide, suicide attempts, and suicidal ideation (SI) has been less studied until recently, despite the fact that veterans remain at heightened risk for suicide (Department of Veterans Affairs, 2018). Understanding whether MST is associated with these outcomes, for whom this relationship is the strongest, and potential mechanisms by which this occurs is essential. Such knowledge would also inform targeted suicide prevention efforts for service members and veterans who experience MST. In this chapter, we review research on MST and SI, suicide attempt, and suicide, followed by knowledge of factors associated with these outcomes among MST survivors. We discuss the strengths and limitations of the research conducted and delineate recommendations for future research. When possible, we differentiate between suicide-related constructs, utilizing the nomenclature developed by the Centers for Disease Control and Prevention (CDC) and mandated for use in the VA and DoD (Suicidal Self-Directed Violence Classification System [SDVCS]; Brenner et al., 2011; CDC, 2011).

Is military sexual trauma associated with suicidal ideation, suicide attempts, and suicide?

Suicidal ideation

The majority of research examining the association between MST and suicide-related outcomes has focused on SI, defined as "thoughts of engaging in suicide-related behavior" (CDC, 2011, p. 90). These studies, described in Table 26.1, have primarily been cross-sectional and reliant upon self-report measures of SI.

Table 26.1 Studies examining whether military sexual trauma is associated with suicidal ideation

Authors	Sample	MST	SI	Findings
Klingensmith et al. (2014)	1,468 veterans (1,312 males, 156 females)	VA MST Screen	Modified PHQ-9 SI Item $\geq 1^a$	MST was associated with SI, adjusting for age, sex, marital status, race/ethnicity, employment, enlistment, branch, and lifetime depression/PTSD screens (AOR = 2.19; 95% CI: 1.25, 3.84).
Monteith et al. (2016a)	354 veterans in VA care (310 men, 44 women)	VA MST Screen (EMIR)	BSS ^a	MST was associated with SI (OR = 2.64, 95% CI: 1.03, 6.75, $p = 0.043$), adjusting for age, gender, combat, PTSD, depressive disorders, negative affect, and lifetime suicide attempt. Gender moderated this.
Lemaire and Graham (2011)	1,740 OEF/OIF veterans with initial VA MH screens	VHA MST screen (EMIR); DRRRI SH Scale	Clinical evaluation: current SI	Neither MST nor SH (DRRI) were associated with current SI in unadjusted analyses or during forward stepwise regression models (with Bonferroni correction).
Blais and Geiser (2019)	1,189 female veterans and service members	VA MST Screening Questions (modified)	PHQ-9 SI Item	Depression severity ($B = 0.19$, 95% CI = 0.12, 0.28, $\beta = 0.11$) and PTSD-related anhedonia ($B = 0.10$, 95% CI = 0.01, 0.20; $\beta = 0.06$) mediated association between SA (but not SH) and SI. Age, race, marital status, branch, deployment, and veteran status were covaried.

(Continued)

Table 26.1 (Continued)

<i>Authors</i>	<i>Sample</i>	<i>MST</i>	<i>SI</i>	<i>Findings</i>
Khan et al. (2019)	403 women veterans with ≥ 1 appointment at urban VA	Exposure to Military Service Stressors^b	PHQ-9 SI Item $\geq 1^a$	SH and SA correlated with SI. SH (OR = 2.7, 95% CI: 1.2, 5.8, $p \leq 0.01$), but not SA, significant when including perceived life threat, killing, witnessing killings/injury, seeing injured/dead bodies, loss, injury.
Gradus, Street et al. (2013)	2,321 veterans (1,188 women, 1,133 men) who deployed for OEF/OIF	DRRI SH Scale	SBQ-R-SF item: SI since last deployment ^c	SH associated with post-deployment SI for women ($b = .089$; $\beta = .29$, $p < 0.0001$) and men ($b = .079$, $\beta = 0.07$, $p < 0.0001$). Controlling for symptoms of depression, PTSD, and alcohol use, SH was significant for women ($b = 0.026$; $\beta = .087$, $p < 0.05$), but not men.
Gradus et al. (2017)	2,161 OEF/OIF veterans (1,062 men, 1,099 women)	DRRI SH Scale^a	SBQ-SF item: SI since last deployment ^c	Re-analysis of data using machine learning. Excluded if suicidal plans/attempts. SH was a key factor in SI among women, but not men. SH interacted with probable PTSD and depression for women.
Monteith et al. (2015); Monteith, Menefee et al. (2016c)	199 OEF/OIF/OND veterans (171 men, 28 women) entering VA inpatient care	DRRI SH Scale	BSS	DST was associated with BSS, adjusting for age, gender, and combat experiences. More severe DST was associated with SI, whereas other types were not, adjusting for age and gender.

(Continued)

Table 26.1 (Continued)

Authors	Sample	MST	SI	Findings
Monteith, Hoffmire et al. (2018)	824 OEF/OIF/OND veterans (480 men, 344 women)	DRRI-2 SH Scale	C-SSRS (SI severity, past 3 months)	DST associated with SI in bivariate analyses for men and women (p 's ≤ 0.01). Accounting for age, PTSD symptoms, possible depression, and lifetime suicide attempt, PDS moderated association between DST and SI in men, but mediated this association in women.
Schry et al. (2015)	2,546 post-9/11 male veterans, active duty, Reserve members	TLEQ; unwanted touching ^d	BSS	Males with MSA histories reported higher BSS scores, compared to full sample ($\chi^2 = 16.10, p < 0.001$) and controls ($\chi^2 = 5.74, p = 0.017$) without MSA and matched on other trauma-related exposures.
Bryan et al. (2015)	464 military personnel and veterans enrolled in college (70.7% male)	LEC; SA and unwanted/uncomfortable sexual experiences ^d	SITBI (self-report version): SI after joining military	MST associated with SI, but not when adjusting for age, gender, and pre-military sexual trauma. SA and unwanted sexual experiences associated with SI, but not when examining pre-military sexual trauma. Significant interaction of gender and unwanted sexual experiences. SA and unwanted sexual experiences associated with SI in unadjusted models for men, but not women; only unwanted sexual experiences associated with SI in adjusted models for men.

(Continued)

Table 26.1 (Continued)

Authors	Sample	MST	SI	Findings
White et al. (2018)	997 National Guard personnel from Utah and Idaho (82.5% male)	LEC; SA or uncomfortable/unwanted sexual experiences ^d	SITBI (self-report version): lifetime SI	MST was associated with SI (OR = 3.3, 95% CI: 2.1, 5.1, $p < 0.001$), adjusting for gender, age, race (OR = 3.3, 95% CI: 2.1, 5.4 $p < 0.001$); probable MDD, PTSD, AUD (OR = 2.3, 95% CI: 1.3, 3.9, $p < 0.01$); and pre-military sexual trauma (OR = 2.0, 95% CI: 1.1, 3.5, $p < 0.05$).
DiMauro et al. (2018)	255 women veterans in monogamous relationships exposed to military trauma	Open-ended response “most stressful military trauma”	PHQ-9 SI Item	Participants reporting sexual (vs. non-sexual) trauma as their most stressful military trauma reported more severe SI ($F = 4.74, p < 0.05$). Indirect effect of trauma type on SI via sexual satisfaction. Trauma type moderated association of sexual functioning and SI.
Griffith (2019)	12,567 Army National Guard (gender not reported)	URI item: SH in unit in past 12 months	URI item: SI past 12 months	SH was associated with SI, $B = 1.64$, OR = 5.17, 95% CI: 3.51–7.61, $p < 0.001$. Units/companies with more SH had more soldiers with SI. SH within the unit moderated the effect of trust in unit leaders on SI.

Abbreviations: MST = military sexual trauma; VA = Veterans Affairs; PHQ-9 = Patient Health Questionnaire-9; SI = suicidal ideation; AOR = adjusted odds ratio; CI = confidence interval; PTSD = posttraumatic stress disorder; BSS = Beck Scale for Suicide Ideation; OR = Odds Ratio; OEF = Operation Enduring Freedom; OIF = Operation Iraqi Freedom; VAMC = Veterans Affairs Medical Center; DRR1 = Deployment Risk and Resilience Inventory; SH = sexual harassment; SBQ-R-SF = Suicidal Behaviors Questionnaire-Revised Short Form; OND = Operation New Dawn; C-SSRS = Columbia-Suicide Severity Rating Scale; PDS = post-deployment support; TLEQ = Traumatic Life Events Questionnaire; SA = sexual assault; LEC = Life Events Checklist; SITBI = Self-Injurious Thoughts and Behaviors Interview; NS = not significant; URI = Unit Risk Inventory.

a Was scored dichotomously.
 b SH/SA questions similar to MST screen.
 c Specific to OEF/OIF deployment.
 d During military service.

Veterans Affairs Military Sexual Trauma Screen

Some of these studies examined the association between MST with SI, relying upon VA MST screening results in veterans' electronic medical records or administering the MST screen specifically for research purposes. Two of these studies found that veterans with a positive MST screen were more than twice as likely to report recent SI (Klingensmith et al., 2014; Monteith, Bahraini, Matarazzo, Gerber, Soberay, & Forster, 2016a). In contrast, an earlier study, which relied upon clinical suicide risk evaluation data, did not find a significant association between MST screening results and current SI (Lemaire & Graham, 2011). One advantage to using the VA MST screen to assess for MST is its established validity (Mengeling et al., 2019) and that it allows for consistent measurement of MST through the universal definition used throughout VA. As such, studies using the VA MST screen offer important implications – suggesting that screening for SI may be indicated for veterans who screen positive for MST (Klingensmith et al., 2014; Monteith, Bahraini, Matarazzo, Gerber et al., 2016a). However, the VA MST screen does not differentiate MST type (SH vs. SA), unless examining items individually (Khan et al., 2019).

Deployment Risk and Resilience Inventory

Studies of SI have also utilized the Deployment Risk and Resilience Inventory (DRRI) Sexual Harassment Scale (King, King, Vogt, Knight, & Samper, 2006), which was developed to assess SH experiences while deployed. An advantage of this measure is that it captures the frequency with which various experiences occurred and yields a continuous score – a potential advantage over the dichotomous VA MST screen. It also includes items that assess SA (e.g., being raped); however, these experiences are not differentially weighted (e.g., being raped is scored similarly to verbal harassment), potentially impacting inference from findings.

The studies utilizing the DRRI SH Scale reported herein surveyed previously deployed veterans who served following 9/11 in Operation Enduring Freedom (OEF), Operation Iraqi Freedom (OEF), and/or Operation New Dawn (OND). Such studies have typically found that scores on the DRRI SH Scale are associated with SI (Gradus, Street, Suvak, & Resick, 2013; Monteith, Menefee, Forster, Wanner, & Bahraini, 2015; Monteith et al., 2018), with only one exception (Lemaire & Graham, 2011). Moreover, this association has been reported for both men and women, using different measures of SI, and accounting for combat-related experiences, although some gender differences have been reported (Gradus, King, Galatzer-Levy, & Street, 2017). Interestingly, an exploratory study examined whether specific types of experiences on the DRRI SH Scale were associated with SI; items indicative of deployment-related SA (e.g., unwanted attempts to have sex, being forced to have sex), but not deployment-related SH (e.g., crude and offensive sexual remarks, being offered a reward or special treatment for sexual behavior), were associated with SI (Monteith, Menefee, Forster, & Bahraini, 2016c). These findings underscore the importance of suicide prevention efforts for survivors of deployment SA while highlighting the need for additional research to examine whether specific MST experiences are associated with SI.

Alternate measures of sexual harassment/sexual assault

Finally, a select number of studies have utilized alternate means of assessing MST. These studies reported that SH (Griffith, 2019), SA (Schry et al., 2015), and unwanted sexual experiences or SA during military service (White et al., 2018) were associated with SI in various samples. Of note, a study with college student veterans and service members found differing results depending on

the covariates included (Bryan, Bryan, & Clemans, 2015). However, many of these studies used measures initially developed to assess lifetime trauma history that were modified to assess MST or SH/SA specifically. While replication of results with alternative methods of assessment is an important component of science, the reliability and validity of the modified methods, which were not originally developed for these purposes, is unknown. Readers are encouraged to keep this caveat in mind when considering such findings.

Factors that moderate or mediate these associations

Researchers have also begun to examine factors that moderate or mediate the association between MST and SI. For example, gender has been identified as an important moderating variable (Bryan et al., 2015; Monteith, Bahraini, Matarazzo, Soberay, & Smith, 2016b). Gender differences have also been identified with respect to factors that attenuate, exacerbate, or account for the association between MST and SI. Gradus, Street et al. (2013) found that, when accounting for mental health symptoms, the association between DRRI SH Scale scores with post-deployment SI was no longer significant for men, but remained significant for women, although SA and SH were not differentiated. Thus, results suggested a need to identify other factors accounting for this association in women. Building upon these results, Monteith, Hoffmire et al. (2018) examined if perceived unit support and post-deployment support moderated or mediated the association between DRRI SH Scale scores and recent SI, with different results obtained for men vs. women. Perceived post-deployment support moderated the association between DRRI SH Scale scores and SI for men, but mediated this association among women. Blais and Geiser (2019) found that depressive symptom severity and PTSD-related anhedonia mediated the association between SA and SI among female service members and veterans. Finally, DiMauro, Renshaw, and Blais (2018) reported that sexual satisfaction mediated the association between sexual trauma and SI. In sum, the association between MST and SI appears to be moderated by factors such as gender and post-deployment support, and mediated by mental health symptoms, post-deployment support, and sexual satisfaction, with some evidence of gender differences within these.

Suicide attempt

Fewer studies have examined whether MST is associated with suicide attempts, defined as “non-fatal self-directed potentially injurious behavior with any intent to die as a result of the behavior” (CDC, 2011, p. 21). Results from extant studies reveal a fairly consistent pattern of results (Table 26.2).

Across multiple studies, associations between MST and suicide attempts were significant and robust. In two large studies of veterans in VHA care, veterans with positive MST screens were significantly more likely to have ICD-9 codes related to “suicide and intentional self-inflicted injury” diagnosed in their medical record, compared to those who screened negative (Kimerling et al., 2007; Pavao et al., 2013). Both studies stratified analyses by gender, adjusted for demographic variables, and included “suicide and intentional self-inflicted injury” as one of multiple health outcomes of interest. Yet the specific ICD-9 codes used to classify “intentional self-inflicted injury” were not reported. Thus, it is difficult to ascertain if all types of self-directed violence included were suicidal (i.e., suicide attempts) or the extent to which non-suicidal self-directed violence (e.g., intentionally injuring oneself without intent to die) was also included. Addressing these limitations, Klingensmith et al. (2014) conducted a nationally representative survey of veterans, including those not using VHA care, in which they asked participants if they had ever attempted suicide. MST was associated with being over two times as likely to report a

Table 26.2 Studies examining if military sexual trauma is associated with suicide attempt

Authors	Sample	MST	Suicide Attempt	Findings
Kimerling et al. (2007)	4,325,768 veterans (185,880 women, 4,319,888 men) with VHA outpatient visit	MST screen (VA EMR)	ICD-9 codes “suicide and intentional self-inflicted injury”	In unadjusted analyses and adjusting for age and race, MST was associated with “suicide and intentional self-inflicted injury” among women (AOR = 2.15; 99% CI: 1.45, 3.21) and men (AOR = 2.93; 99% CI: 2.22, 3.88).
Pavao et al. (2013)	126,598 homeless veterans (8,915 females, 117,683 males) who used VHA outpatient care	MST screen from VHA MST Support Team Data Archive	ICD-9-CM codes “suicide and intentional self-inflicted injury”	Adjusting for age, race, ethnicity, and marital status, MST was associated with “suicide and intentional self-inflicted injury” in females (AOR = 1.64; 95% CI: 1.37, 1.95) and males (AOR = 1.73; 95% CI: 1.56, 1.92).
Klingsensmith et al. (2014)	1,468 veterans (1,312 males, 156 females) in NHRVS	MST Screen	Lifetime attempt: “Have you ever tried to kill yourself?”	MST associated with suicide attempt (AOR = 2.78; 95% CI: 1.53, 5.05), adjusting for age, sex, race/ethnicity, marital status, employment, enlistment branch, and depression/PTSD.
Gradus, Shipherd et al. (2013)	680 former U.S. Marine recruits	Sexual Experiences Questionnaire^a	Two questions for suicide attempt 10 years post-training	SH (but not SA) during training predicted post-training suicide attempt (OR = 2.8; 95% CI: 1.2, 6.6), in unadjusted analyses and controlling for gender.
Rosellini et al. (2017)	4,238 female regular Army Soldiers who served from 2004–2009 with SA, matched to 21,190 controls without SA report)	Administratively-recorded SA (criminal justice data unrestricted SA report)	DoD SER & ICD-9-CM codes (E950–959) in treatment records (attempts 12 months after SA)	Women with SA were more likely to attempt suicide (OR = 3.0; 95% CI, 2.5, 3.6) vs. controls and adjusting for follow-up months, etc. Significant in those without prior MH treatment (OR = 6.2; 95% CI = 1.4, 28.0), but among not women with prior outpatient/inpatient treatment.

(Continued)

Table 26.2 (Continued)

<i>Authors</i>	<i>Sample</i>	<i>MST</i>	<i>Suicide Attempt</i>	<i>Findings</i>
Bryan et al. (2015)	464 military personnel and veterans enrolled in college (70.7% male)	LEC ; SA and/or unwanted/uncomfortable sexual experiences ^b	SITBI (self-report); suicide attempt after joining military	MST associated with suicide attempt, but not adjusting for age, gender, and premilitary sexual trauma. SA and unwanted sexual experiences NS in fully adjusted model (with pre-military sexual trauma). Gender interactions NS. Unwanted sexual experiences associated with attempts in males. SA NS.
White et al. (2018)	997 National Guard personnel from Utah or Idaho (82.5% male)	LEC ; SA or uncomfortable/unwanted sexual experiences ^b	SITBI (self-report): lifetime suicide attempt	MST associated with suicide attempt adjusting for gender, age, and race (AOR = 3.9, 95% CI: 1.8, 8.6, p < 0.001), but not with probable MDD, PTSD, and AUD. Similar results accounting for premilitary sexual victimization.
Griffith (2019)	12,567 Army National Guard soldiers in 180 company-sized units ^c	URI item : SH in unit in past 12 months	URI item : suicide attempt in past 12 months	SH associated with suicide attempt (OR = 15.40, 95% CI: 7.60, 31.22, p < 0.001). Units with more SH had more suicide attempts. SH in unit moderated effect of trust in unit leaders on suicide attempts.

Abbreviations: MST = military sexual trauma; VHA = Veterans Health Administration; FY = fiscal year; VA = Veterans Affairs; EMR = electronic medical records; ICD = International Classification of Diseases; AOR = adjusted odds ratio; CI = confidence interval; NHRVS = National Health and Resilience in Veterans Study; PTSD = posttraumatic stress disorder; SH = sexual harassment; SA = sexual assault; DoDSER = Department of Defense Suicide Event Report; CM = clinical modification; MH = mental health; LEC = Life Events Checklist; SITBI = Self-Injurious Thoughts and Behaviors Interview; NS = not significant; MDD = major depressive disorder; AUD = alcohol use disorder; URI = unit risk inventory.

a Scored dichotomously.
 b During military service
 c Gender not reported.

lifetime suicide attempt, accounting for an array of factors; however, the focus on lifetime suicide attempts (which could have preceded MST) potentially limited these findings.

Other studies have analyzed suicide attempt variables within prescribed timeframes, such as “lifetime,” “in the past year,” “since military service,” or following an index event. Such studies often used adapted measures of lifetime trauma exposure (e.g., Life Events Checklist) or military SH and SA with differing definitions from the VA MST screen (i.e., Sexual Experiences Questionnaire), or analyzed records of administratively recorded military SA reports. Mirroring the aforementioned studies on SI, replication and validation of measures specific to MST remain important considerations. Nonetheless, these studies indicate that SH is associated with suicide attempts, both in the past year (Griffith, 2019) and the decade following recruit training (Gradus, Shipherd, Suvak, Giasson, & Miller, 2013), and that female soldiers with administratively recorded SA are more likely to attempt suicide in the ensuing year (Rosellini et al., 2017).

Although most studies on MST and suicide attempt have reported significant associations, two studies obtained divergent results. White et al. (2018) reported that MST was associated with lifetime suicide attempt when accounting for gender, age, and race, but not when covarying for probable major depressive disorder, PTSD, and alcohol use disorder. Bryan et al. (2015) reported a significant bivariate association between MST and suicide attempts; however, adjusted associations were not significant, apart from the association between unwanted sexual experiences during military service with suicide attempts among male college students.

Factors that moderate or mediate these associations

Unlike research on SI, only three studies have examined factors that moderate the association between MST and suicide attempt, and none have examined mediators of this association. Mirroring his findings on SI, Griffith (2019) found that the association between SH and suicide attempt was exacerbated in units/companies with more SH. Bryan et al. (2015) did not find gender to moderate the association between MST and suicide attempts, a departure from their SI findings. Lastly, Rosellini et al. (2017) examined if prior mental health treatment moderated the association between SA and suicide attempts. Indeed, SA was associated with suicide attempts for female soldiers who lacked a record of mental health treatment in the past year, but was not significant in those with prior treatment, underscoring mental health care as potentially protective after SA.

Suicide

By comparison to research on SI and suicide attempt, research examining if MST is associated with suicide (i.e., “death caused by self-directed injurious behavior with any intent to die as a result of the behavior”; CDC, 2011) has been sparse (Table 26.3).

This is likely due to the inherent challenges of studying suicide, a low-base rate occurrence. Of the two published studies, both relied upon documentation of MST and suicide based on electronic medical records or databases. Significant associations were found between MST and suicide (Kimerling, Makin-Byrd, Louzon, Ignacio, & McCarthy, 2016). Importantly, several important factors were accounted for, further supporting the salience of MST as a potential risk factor for suicide, above and beyond psychiatric diagnoses and demographic characteristics. Gender-stratified analyses, which were significant for both men and women, revealed a more nuanced portrait of the role of MST as it relates to suicide. Street et al. (2015) did not directly aim to examine associations between SA and suicide; however, their findings suggested that SA

Table 26.3 Studies examining whether military sexual trauma is associated with suicide

<i>Authors</i>	<i>Sample</i>	<i>MST</i>	<i>Suicide</i>	<i>Findings</i>
Kimerling et al. (2016)	4,325,768 veterans (5,991,080 men, 360,774 women) with outpatient visit(s) to VHA facilities in FY 2007–2011 and MST screen	VHA MST screen, per VA National Patient Care Database	ICD-10 suicide codes (X60–X84,Y87.0), per National Death Index data (through CY 2011 or death)	MST was associated with increased risk for suicide in unadjusted and fully adjusted models. Adjusting for age, rurality, depression, bipolar disorder, schizophrenia, PTSD, SUD, anxiety disorders, and medical morbidity, the hazards ratio was 1.19 (95% CI: 1.01, 1.39) for men and 1.35 (95% CI: 1.01, 1.83) for women.
Street et al. (2015)	975,057 active duty enlisted Regular Army soldiers serving in 2004–2009	Administratively-recorded SA in prior 12 months	Army Forces Medical Examiner Tracking System	The effect of the gender X deployment interaction in predicting suicide was reduced when accounting for SA and other variables. Results suggest that SA may partially explain females' elevated suicide risk while deployed.

Abbreviations: MST = military sexual trauma; VHA = Veterans Health Administration; FY = fiscal year; VA = Veterans Affairs; ICD = International Classification of Diseases; CY = calendar year; PTSD = posttraumatic stress disorder; SUD = substance use disorder; CI = confidence interval; SA = sexual assault.

may partially explain female soldiers' elevated risk for suicide while deployed. Unsurprisingly, given that research on MST and suicide is in its infancy, no studies have examined factors that mediate this association.

What factors are associated with suicidal ideation and attempts among military sexual trauma survivors?

As a growing number of studies report that MST is associated with SI, suicide attempts, and suicide, identifying factors that are associated with these outcomes among MST survivors is increasingly important. Studies conducted in this area to date (Table 26.4) are described next.

Suicidal ideation

Several factors have been found to relate to SI among samples of MST survivors. These include psychological distress, depressive symptoms, and hazardous alcohol use (Monteith, Holliday,

Table 26.4 Studies examining factors associated with suicidal ideation and suicide attempts in military sexual trauma survivors

Study	Sample	SI	Suicide Attempt	SI Findings	Suicide Attempt Findings
Monteith et al. (2016b)	49 veterans reporting MST (31 women, 18 men)	Post-MST (SITBI)	Post-MST (SITBI)	Institutional betrayal not associated with post-MST SI. Similar results in subsample with MSA.	Institutional betrayal was associated with post-MST suicide attempt. Similar results in subsample with MSA.
Monteith et al. (2017)	92 female veterans with MST, entering VA inpatient care	Past-week (BSS)		Accounting for lifetime suicide attempts and depressive/PTSD symptoms, PB, TB, and FAD associated with SI. TB NS in full model.	
Blais and Monteith (2019)	311 female service members or veterans with MST and Criterion A	Past 2 weeks (PHQ-9)		MST- (vs. non-MST events; combat/deployment) as PTSD symptom source associated with SI. Similar results adjusting for PTSD/depression. Age, marital status, branch, race, deployment also covaried.	
Holliday et al. (2018a,b)	107 veterans with MST (65 females, 42 males)	Past-week (BSS)		MST survivors with lifetime NSSI more likely to endorse recent SI.	
Monteith, Smith et al. (2018)	115 veterans (56 females, 59 males) with MST	Past 2 weeks (PHQ-9)	As adult (“tried to kill” self at ≥ 18)	Psychological distress, hazardous alcohol use, and general disapproval from others associated with SI. Age, race/ethnicity, branch, lifetime trauma, social support, and loneliness in model.	Hazardous alcohol use and general disapproval associated with suicide attempt. Lifetime trauma, distress, social support, loneliness included in model.

(Continued)

Table 26.4 (Continued)

Study	Sample	SI	Suicide Attempt	SI Findings	Suicide Attempt Findings
Sexton et al. (2018)	277 veterans seeking MST care (70.8% female)		Lifetime (MINI-IV)		Sexual/gender minority veterans had higher lifetime suicide attempt rates.
Monteith, Holliday et al. (2019)	108 veterans (66 women, 42 men) with MST	Past-week (BSS ^a); post-MST (SITBI)	Post-MST (SITBI)	Negative PTCI Self and pre-MST SI associated with past-week SI. Similar results covarying for depressive/PTSD symptoms. Negative PTCI Self, MSA, pre-MST SI, and childhood physical abuse associated with post-MST SI. Age and gender included.	Negative PTCI Self and pre-MST suicide attempt associated with post-MST suicide attempt, controlling for age and gender.

Abbreviations: SI = suicidal ideation; MST = military sexual trauma; SITBI = Self-Injurious Thoughts and Behaviors Interview; OR = odds ratio; CI = confidence interval; MSA = military sexual assault; VA = Veterans Affairs; BSS = Beck Scale for Suicide Ideation; PB = perceived burdensomeness; TB = thwarted belonging; FAD = fearlessness about death; PTSD = posttraumatic stress disorder; NS = not significant; PHQ-9 = Patient Health Questionnaire-9; NSSI = non-suicidal self-injury; MINI = Mini-International Neuropsychiatric Interview; PTCI = Posttraumatic Cognitions Inventory.

^a Scored dichotomously.

Schneider, Forster, & Bahraini, 2019; Monteith, Smith, Holliday, & Pietrzak, 2018). Female service members and veterans who endorse MST, as opposed to other military experiences (e.g., combat/deployment-related), as the source of their current PTSD symptoms are more likely to report experiencing recent SI (Blais & Monteith, 2019). Nonetheless, PTSD symptoms have not consistently been found to be associated with recent SI among MST survivors when accounting for other factors (Monteith, Bahraini, & Menefee, 2017; Monteith, Holliday et al., 2019). Consistent with findings by Monteith, Menefee et al. (2016c), military SA is also associated with post-MST SI (Monteith, Holliday et al., 2019). In addition, pre-MST SI, lifetime NSSI, and fearlessness about death have also been found to be associated with SI in this population (Holliday, Smith, & Monteith, 2018; Monteith et al., 2017; Monteith, Holliday et al., 2019). Finally, specific interpersonal beliefs and experiences, such as perceptions of burdensomeness, thwarted belonging, general disapproval from others following one's worst traumatic experience, and negative posttraumatic beliefs about oneself, are associated with SI among veterans who have experienced MST (Monteith et al., 2017; Monteith, Holliday et al., 2019; Monteith, Smith et al. 2018). Together, these studies suggest that MST survivors' SI may relate to specific MST-related characteristics and a broad range of psychiatric, interpersonal, and cognitive-affective factors.

Suicide attempt

Efforts to identify factors associated with suicide attempts in MST survivors have been sparse. Monteith, Smith et al. (2018) examined factors associated with suicide attempt in adulthood using National Health and Resilience in Veterans Study (NHRVS) data. MST survivors reporting hazardous alcohol use and general disapproval from others were more likely to report attempting suicide as an adult. Another study found that perceptions of institutional betrayal were associated with post-MST suicide attempts (Monteith et al., 2016b); in a larger examination, pre-MST suicide attempts and negative posttraumatic cognitions about the self were most strongly associated with post-MST suicide attempt (Monteith, Holliday et al., 2019). Lifetime history of suicide attempt has also been found to be more prevalent among sexual/gender minority MST survivors compared to non-sexual/gender minority MST survivors (Sexton et al., 2018). These studies suggest a potentially complex etiology of suicide attempts among MST survivors, with additional research warranted.

Limitations and future research

The increased number of publications on this topic is promising. At the same time, understanding the limitations of this body of research can help with interpreting findings and guiding subsequent research. Some of these limitations are specific to certain constructs or topics, while others generalize more broadly.

Study design and intent

Many studies described earlier were conducted as secondary analyses, which at times resulted in methods not ideal for testing the associations of interest (e.g., excluding participants with a recent suicide attempt). In addition, MST, particularly SA, and suicide attempts are occurrences with relatively low base rates. As such, some studies may have been inadequately powered to draw generalizable findings regarding the association between MST with suicide attempts and may warrant replication in larger samples. Relatedly, for examinations of factors associated with SI or suicide attempts among MST survivors, samples tended to be small. This is an inherent challenge

to conducting research on SI and SA with MST survivors, as low base rates of these phenomenon, coupled with underreporting due to stigma and distrust, can make it challenging to study the intersection of these experiences. Finally, most studies described were cross-sectional. While no study design is without limitations, longitudinal studies are needed to identify predictors of suicide-related outcomes following MST. A comprehensive understanding of risk among this population also requires tracking factors that increase and decrease risk across multiple timepoints. Longitudinal examination of these phenomena with larger samples, sufficiently powered and designed to address these critical questions, would be invaluable to advance understanding of distinct trajectories of risk among MST survivors over time, including identification of factors that increase or mitigate suicide risk.

Measurement of suicidal ideation and suicide attempt

Research has also been limited with respect to assessment of SI and suicide attempt. The majority of studies have relied upon self-report measures of suicide attempt or SI, including single-item self-report measures originally designed for other purposes (e.g., depression screens). Assessing SI or suicide attempts via single-item self-reports can result in misclassification, reduced statistical power, and erroneous results (Hom, Joiner, & Bernert, 2016; Millner, Lee, & Nock, 2015). Although there is not presently a consensus “gold standard” measure for assessing SI and SA, several validated self-report measures do exist (c.f. Batterham et al., 2015) and are worth including in future studies.

Relatedly, few studies have utilized interview-based measures of SI or suicide attempt, even though such measures can help to ensure accurate classification of SI and suicide attempts given proper training in administration and interpretation of such measures. Thus, future research may benefit from utilizing such measures to avoid misclassification. Another issue concerns the temporality of SI and suicide attempt, particularly for studies that assessed lifetime SI or suicide attempts, which is potentially problematic when examining associations with MST, as MST could have followed, rather than preceded, SI or suicide attempts. Prospectively examining future suicide attempts or SI, or examining SI or suicide attempts that more reasonably could have occurred at some point following MST, is suggested as an alternative.

Finally, relying upon suicide attempts coded in medical or administrative records is potentially problematic (CDC, 2008; Hansen, 2018), as the reliability of such data is unknown; it is possible that only suicide attempts warranting medical attention (e.g., hospitalization) were coded. Relatedly, reporting the specific ICD codes included is essential for determining the extent to which suicide attempts are being assessed and for replication by other investigators.

Measurement of military sexual trauma

A leading challenge to this research is the broad variations that have occurred in the measurement of MST, as well as varying definitions used to assess SH or SA. The VA MST screen (or variations thereof) has received preliminary psychometric support (Mengeling et al., 2019), but was developed to screen for MST rather than to delineate the impact of differing MST experiences. Relying solely upon MST screening results in VA medical records also runs the risk of false negatives (Divita et al., 2017; Gundlapalli et al., 2017), due to stigma associated with disclosure of MST.

The DRRI SH Scale can be useful for assessing the frequency of SH experiences during deployment; however, the fact that instructions are specific to deployment suggests that (unless modified) this measure is only applicable to those who have deployed – a subset of veteran and military populations. Most DoD reports on SH and SA rely solely on legal definitions with broad, encompassing categories that do not differentiate between qualitatively and contextually

different incidents. These reports would be improved through a more detailed assessment of the specific events experienced by individuals, allowing for more tailored assessment and intervention in military units. In addition, validation of the DRRI SH scale has relied primarily on traditional psychometric methods; however, modern psychometric methods, such as Rasch analysis, may be particularly useful for enhancing measurement precision by weighting individual items based on their contributions to the underlying trait. Rasch analysis would also allow for examination of gender-based differential item functioning, which is critical to ensuring that items on the DRRI SH scale do not function differently for men and women. As it stands, difficulties in MST measurement remain a prominent challenge to advancing this body of research. Addressing this limitation would be monumental in overcoming these inherent methodological challenges.

Gender

Studies took varying approaches to gender. Some adjusted for gender or sex as a covariate, likely due to insufficient numbers to conduct gender-stratified analyses. Many studies also stratified results by gender, which at times revealed important gender differences. These findings were further corroborated when examining gender as a potential moderator or conducting mediation analyses separately by gender. These results underscore the importance of continued research with sufficient numbers of men and women to stratify analyses by gender or examine potential moderation by gender. Finally, while several studies exclusively sampled females, only one quantitative study has occurred exclusively with men (Schry et al., 2015). This major limitation contributes to ongoing gaps in knowledge regarding the impact of MST among men and may inadvertently reinforce existing stereotypes and notions regarding MST (e.g., that MST only happens to women; Morris, Smith, Farooqui, & Surís, 2014). As men who experience MST may be at particularly elevated risk for SI and experience unique concerns that potentially place them at heightened risk (e.g., masculinity-related concerns; Monteith, Brownstone, Gerber, Soberay, & Bahraini, 2018), examination of such constructs in relation to SI and SA is needed.

Covariates

Across published studies, a largely consistent pattern emerged: MST was generally associated with heightened risk for SI, suicide attempt, and suicide. Many studies that accounted for known correlates of SI, suicide attempt, and suicide (e.g., psychiatric symptoms or diagnoses; prior SI or suicide attempt) continued to report significant associations. Further, associations generally remained significant when accounting for other stressful or traumatic military-related experiences (e.g., combat exposure; Monteith et al., 2015; Monteith, Bahraini, Matarazzo, Gerber et al., 2016a) or when matching based on trauma exposure (Schry et al., 2015), with one exception (Khan et al., 2019). Research accounting for pre-military sexual victimization, however, has been mixed (Bryan et al., 2015; White et al., 2018), suggesting another potentially important avenue for future research.

Samples

Many studies of veterans focused on those in VHA care. Yet suicide rates have been increasing more quickly among veterans not using VHA care (e.g., who dropped out or never used care; VA, 2018). Moreover, MST survivors' reasons for not using VHA care (e.g., institutional betrayal, distrust) may also heighten their risk for suicide (Holliday & Monteith, 2019). Thus, research

specific to non-VHA veteran samples is needed. In addition, research with active and reserve service members has been fairly limited outside of congressionally mandated annual surveys by SAPRO (e.g., Department of Defense, 2018b). For example, five suicide deaths (1.7%) and 86 suicide attempts (6.9%) in the 2016 DoD Suicide Event Report recorded SA or SH in the 12 months prior to the suicidal self-directed violence (Pruitt et al., 2018). However, few other published studies on active or reserve military personnel have identified factors that influence this association. Low rates of formal reporting also limit the identification of at-risk samples during military service (Department of Defense, 2018b). Although restricted reporting options allow service members who experience SA and SH to receive services (Department of Defense, 2017), the protected nature of these reports precludes in-depth analysis of their relation to suicidal self-directed violence (Pruitt et al., 2018). As such, this knowledge is largely limited to veterans. This is an important limitation since active military personnel, who may have experienced SA or SH more recently, may differ in their risk for SI or suicide attempts, compared to veterans, who may have experienced MST years or even decades ago.

Broader comprehensive examinations

MST is an unfortunately common potentially traumatic event among men and women who serve in the U.S. military, resulting in a number of mental and physical health consequences. MST has also been associated with SI, suicide attempt, and suicide across a number of studies. While several factors are proposed to partially account for this relationship, longitudinal research is needed to fully elucidate drivers of suicidal self-directed violence among this population (Holliday, Maguen et al., 2018). Utilizing prior research as a framework, considering psychiatric (e.g., specific diagnoses or symptoms) and psychosocial (e.g., distress, interpersonal functioning) factors following the experience of MST within the context of pre-military (e.g., childhood trauma) and sociodemographic (e.g., gender, sexual identity) factors will likely provide the best lens to interpret results and advance understanding of for whom, when, and under what circumstances MST increases risk for SI and suicide attempts.

Researchers can then conceptualize a comprehensive model for understanding drivers of suicide risk within this population, as well as to determine appropriate assessment and intervention. Much of the research described earlier focused on factors that have been established as correlates of suicide risk in other populations (e.g., depression, prior suicide attempts, and hazardous alcohol use). However, understanding the extent to which unique MST sequelae and characteristics (e.g., interpersonal and institutional responses to disclosure and reporting; MST-related care) are associated with SI and suicide attempt would be invaluable. In addition, the majority of interventional research specific to survivors of MST and suicide-related outcomes has been limited to secondary analyses of larger clinical trials.

For example, Wiblin, Holder, Holliday, and Surís (2018) examined correlates of suicide-related beliefs among male and female veterans with MST-related PTSD, noting the relation of these beliefs to depressive symptoms, psychosocial functioning, and negative posttraumatic-related beliefs – mirroring findings of some previously discussed studies. In the same sample, Holliday, Holder, Monteith, and Surís (2018a) reported that cognitive processing therapy, an evidence-based treatment for PTSD, was associated with decreases in suicide-related beliefs following treatment, with reductions sustained up to 6 months post-treatment. Yet this study occurred in the context of a single trial, was limited in sample size, and did not analyze other correlates of SI (e.g., hopelessness) or compare results to other evidence-based treatments (e.g., prolonged exposure). This trial also focused on veterans with PTSD and, similar to other PTSD trials, excluded those experiencing elevations in acute suicide risk, further precluding examination of

interventions in the presence of elevated acute suicide risk (e.g., current SI with intent; Holliday, Holder, Olson-Madden, & Monteith, 2019).

Focusing exclusively on PTSD interventional research is a major limitation to understanding how to mitigate suicide risk in the MST population at large, as several psychiatric diagnoses are associated with MST, and SH may be more strongly associated with other psychiatric diagnoses (Williamson, Holliday, Holder, North, & Surís, 2017). As such, more comprehensive examination of assessment and intervention specific to MST survivors presenting with a spectrum of psychiatric diagnoses (e.g., transdiagnostic interventions, such as skills training in affective and interpersonal regulation) remains warranted. In addition, no studies have examined the acceptability, feasibility, or efficacy of suicide-specific interventions (e.g., safety planning, lethal means safety, cognitive therapy for suicide prevention) among MST survivors, which would provide valuable insight into whether such treatments are optimally suited for preventing suicide among survivors of MST. Finally, based on multiple factors that can impact MST-related research (e.g., initial non-disclosure of MST, seeking treatment outside of the military or VA settings), a multi-institutional response (e.g., DoD, VA, community-based settings) espousing collaboration is likely requisite (Holliday et al., 2018a,b).

Conclusions

MST is a potentially traumatic event that is associated with heightened risk for experiencing SI, attempting suicide, and dying by suicide. Recent research has been integral in elucidating the nuances of these associations – for example, highlighting specific subgroups for whom this relationship is especially pronounced, as well as specific MST-related experiences (such as SA) that may particularly lend themselves to elevated risk for SI or suicide attempt. Moreover, a monumental step in this body of research has entailed beginning to elucidate factors that are associated with SI, as well as suicide attempts, among survivors of MST. Such studies have led to understanding of the broad array of cognitive-affective, interpersonal, and institutional factors that may be associated with SI and suicide attempts among MST survivors. Some of these factors have been identified as relevant in other populations as well, while others appear to be particularly salient to the experience of MST. A critical next step for future research in this area is to identify trajectories of SI and suicide attempt following MST and to discern intrapersonal, interpersonal, and institutional factors that predict such trajectories. Translating knowledge from such endeavors into actual intervention and prevention efforts (e.g., determining efficacious means of preventing suicidal self-directed violence among service members and veterans who have experienced MST) is equally important. While this line of research can present unique challenges and considerations, addressing these questions is essential for optimizing suicide prevention efforts for survivors of MST.

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