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Evaluating the Effectiveness of Safety Plans for Mitigating Suicide Risk in Two Samples of Psychiatrically Hospitalized Military Veterans

Jaclyn C. Kearns[1,2,3], Dev Crasta[4], Elizabeth G. Spitzer[2,5], Kaitlyn R. Gorman[2,6], Jonathan D. Green[2,7], Matthew K. Nock[8], Terence M. Keane[2,3,9], Brian P. Marx[2,3,9], & Peter C. Britton[4,10]

[1]Department of Psychology, University of Rochester, Rochester, NY, USA

[2]VA Boston Healthcare System, Boston, MA, USA

[3]National Center for PTSD, Boston, MA, USA

[4]Center of Excellence for Suicide Prevention, Finger Lakes VA Healthcare System, Canandaigua, NY, USA

[5]Center for Healthcare Organization and Implementation Research, Boston, MA USA

[6]Department of Psychology, University of Massachusetts – Boston, Boston, MA, USA

[7]Evergreen Behavioral Health and Consulting, Boston, MA, USA

[8]Department of Psychology, Harvard University, Cambridge, MA, USA

[9]Boston University Chobanian & Avedisian School of Medicine, Boston, MA, USA

[10]Department of Psychiatry, University of Rochester Medical Center, Rochester, NY, USA

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Corresponding Author: Jaclyn C. Kearns, Ph.D., National Center for PTSD at the VA Boston Healthcare System, 150 S. Huntington Avenue, 116B-4, Boston, MA 02130, United States. Email: Jaclyn.Kearns@va.gov

Highlights

- SP quality was associated with reduced risk for suicide outcomes.
- SP quality issues were common; nearly all contained at least one poor-quality item.
- Higher quality and fidelity were associated with reduced suicide attempt risk.
- Step 1 quality and fidelity were associated with reduced suicide attempt risk.
- Step 2 fidelity was associated with reduced rehospitalization risk.

Abstract

Although safety plans (SPs), following the Stanley-Brown Safety Planning Intervention protocol, are required for suicidal veterans receiving treatment in the Veterans Health Administration (VHA), prior studies have shown that they are frequently incomplete or are not sufficiently personalized to the unique circumstances of each patient. In two studies, we examined SP

completeness, SP quality (i.e., degree to which the SP was clear, actionable, and personalized), and SP fidelity (i.e., sum of completeness and quality). We also examined which SP steps were associated with a reduced likelihood of future psychiatric rehospitalizations (Study 1) and suicide attempts (Study 2) following hospital discharge. Participants were veterans admitted to two VHA acute inpatient psychiatric units for suicide risk (Study 1: $N = 78$; Study 2: $N = 132$). SPs were coded by independent raters on completeness, quality, and fidelity; step scores (e.g., Step 1 quality) were summed to create whole plan scores (e.g., SP quality). In Study 1, 52.5% of participants had a SP and, in Study 2, 93.1% of participants had a SP. In Study 1, whole plan scores were not associated with subsequent psychiatric hospitalization status, but higher Step 2 (internal coping) fidelity scores were associated with decreased likelihood of rehospitalization (AHR = 0.05, 95% CI [0.30, 0.84], $p = .008$). In Study 2, higher whole plan quality (AHR = 0.79, 95% CI [0.66, 0.95], $p = .012$) and fidelity (AHR = 0.84, 95% CI [0.71, 0.99], $p = .040$) scores were associated with a decreased likelihood of future suicide attempt. Step 1 (warning signs) quality (HR = 0.48, 95% CI [0.30, 0.76], $p = .002$) and fidelity scores (AHR = 0.57, 95% CI [0.37, 0.90], $p = .016$) were associated with a decreased likelihood of future suicide attempt. The association of SP characteristics differs by outcome of interest, and fidelity of internal coping strategies may contribute to preventing rehospitalizations, whereas quality and fidelity of warning signs may help prevent future suicide attempts. Overall, results suggest that mandating SPs without training and implementation strategies to ensure quality is not enough.

Keywords: suicide, psychiatric hospitalization, veterans, safety plan, high-risk

Abbreviations. BSSI: Beck Scale for Suicide Ideation; EHR: electronic health record; PHQ-9: Patient Health Questionnaire-9; PCL: Posttraumatic Stress Disorder Checklist; SI: suicide ideation; PTSD: Posttraumatic Stress Disorder; SP: safety plan, VHA: Veterans Health Administration

The year following discharge from psychiatric hospitalization is a period of elevated risk for suicide (Kessler et al., 2015; Olfson et al., 2016), including among veterans of military service (Britton et al., 2017; Desai et al., 2008; Valenstein et al., 2009). To mitigate risk, the

Stanley-Brown Safety Planning Intervention (referred to as the Safety Planning Intervention hereafter; Stanley, Brown, MacRae, et al., 2018) has become one of the most widely used suicide prevention interventions and is mandated by the Veterans Health Administration (VHA) for veterans determined to be a high suicide risk, such as those who are discharged from psychiatric hospitalization (Department of Veterans Affairs, 2019). Although veterans may be stable enough for discharge, they often have difficulty managing post-hospital stressors and, as a result, may experience another suicide crisis. The Safety Planning Intervention, a brief clinical intervention, was explicitly designed to address suicide crises during such high-risk periods (Stanley & Brown, 2012; Stanley, Brown, MacRae, et al., 2018).

In the Safety Planning Intervention, clinicians and patients collaboratively develop a written safety plan (SP) that consists of coping strategies and sources of support for managing a suicide crisis, following a comprehensive suicide risk assessment. In the first five SP steps, which are sequential, the clinician and patient identify: 1) warning signs for a suicide crisis, 2) internal coping strategies for distraction, 3) people and social settings (i.e., external coping) for distraction, 4) supportive social contacts who can provide assistance during the suicide crisis, and 5) professionals and emergency resources to which the patient can outreach for help should all else fail. In the nonsequential sixth step, the clinician and patient decrease access to lethal means (e.g., firearms) and other factors that may rapidly increase suicide risk (e.g., large quantities of alcohol). SPs provide patients with a tool to address acute suicide crises in the context of ongoing outpatient mental health or as patients transition out of acute psychiatric care.

Several studies have examined the efficacy of the Safety Planning Intervention (see Ferguson et al., 2021 for a systematic review on SPs in adults), including among veterans receiving care in VHA emergency departments (Stanley, Brown, Brenner, et al., 2018; Stanley et al., 2015), inpatient units (Rings et al., 2012), and outpatient groups (Goodman et al., 2021). In a cohort study of 1,640 veterans across nine VHA emergency departments, Stanley et al. (2018) found that those who received SP plus structured follow-ups were 45% less likely to engage in suicidal behavior in the six months following their emergency department visit compared with veterans who received usual care. Research has also demonstrated that SPs are feasible to implement and acceptable to suicidal veterans, with nearly two-thirds reporting that they used the SP at some point during their VHA care (Stanley et al., 2016). Although there are data supporting the efficacy of SPs among high-risk veterans receiving VHA care, few studies have examined factors that may contribute to their effectiveness.

SPs are intended to be used during a suicide crisis and should be tailored to the needs of patients by incorporating risk factors and resources that are revealed through a comprehensive risk assessment, narrative interview, and patient-clinician collaboration (Stanley et al., 2018). Therefore, high quality SPs are defined as those that contain clear, actionable items with evidence of personalization to the patient (Green et al., 2018). In two studies of veterans, higher quality SPs were associated with a decreased likelihood of suicide behavior reports (i.e., documentation in a veteran's electronic health record [EHR] following report of any suicidal behavior; Green et al., 2018) and psychiatric hospitalization in the year following the initial SP (Gamarra et al., 2015). In addition, Green et al. (2018) found that higher overall or whole plan SP fidelity scores (i.e., a metric that sums completeness and quality; Gamarra et al., 2015) and higher fidelity scores on SP Step 3 (social distraction) were associated with reduced likelihood of

future suicide-related outcomes. Gamarra et al. (2015) and Green et al. (2018)[1] also examined SP completeness in their analyses and found that quality but not completeness was associated with decreases in suicide attempts and psychiatric hospitalization. These findings suggest that SP quality, especially for SP step 3 (social distraction), may be critical to reducing future suicide-related outcomes among veterans.

Although both studies are notable for their selection of veterans involved with or referred to VHA suicide prevention services, they have important limitations. Gamarra et al. (2015) included a portion of SPs completed during a psychiatric hospitalization (after which patients are known to be at elevated risk for suicide) but did not provide a detailed assessment of SP quality by comparing SPs against information in a veteran's risk assessment. Green et al. (2018) provided a detailed assessment of quality but did not include any SPs completed during a psychiatric hospitalization. Given that suicide risk is especially high in the months following hospital discharge (Chung et al., 2017) and SPs are mandated as part of VHA discharge planning, it is critical to examine the impact of SP quality and completeness on suicide-related outcomes following hospital discharge.

The purpose of our two studies was to understand the association between SP quality and completeness and their effectiveness among two samples of high-risk veterans (those hospitalized for suicide risk) during a high-risk transition period (following hospital discharge). Using the rating system developed by Green et al. (2018), we examined: (1) the level of quality and completeness of SPs among psychiatrically hospitalized veterans and (2) the extent to which SP quality, completeness, and fidelity (total) scores are related to psychiatric rehospitalization and future suicide attempts. In line with the SP Intervention model (Stanley & Brown, 2012) and the results of Gamarra et al. (2015) and Green et al. (2018), we hypothesized that higher quality scores and higher fidelity (total) scores would be associated with a decreased likelihood of psychiatric rehospitalization and future suicide attempts. We also explored these associations at the individual SP step-level (e.g., Step 1 Quality).

Study 1

Materials and Method

Participants and Procedure

Participants were part of a larger study examining cognitive processes associated with suicidality among veterans psychiatrically hospitalized in VHA (Cha et al., 2022; Kearns et al., 2021; Millner et al., 2019). Eligible participants were ≥ 18 years of age, fluent in English, and hospitalized for current SI or suicide attempt; participants were excluded from the larger study if they were severely cognitively impaired (determined by screener or via consultation with attending psychiatrist), actively psychotic, manic, and/or there was the presence of any factor that might impair an individual's ability to comprehend and effectively participate (e.g., violent behavior). Of 157 participants, 78 participants were clinically indicated to have a SP (i.e., admitted for suicide risk) and were included in our analyses (M_{age} = 40.11, *SD* = 12.5). Per their

[1]Green et al. (2018) did find an association between higher SP completeness scores and a decreased likelihood of VHA Suicide Behavior Reports (i.e., an electronic health record note, entered following a report of any self-harm behavior, including a suicide attempt).

VHA treatment plan, each participant was required to have both a suicide/homicide risk assessment (i.e., standardized VHA risk assessment) and a SP entered in the EHR prior to discharge.

Study procedures were approved by the local Institutional Review Board and the Human Research Protection Office of the U.S. Army Medical Research and Materiel Command; informed consent was obtained from all participants. The study was conducted in four phases: 1) baseline assessment; 2) EHR extraction of risk assessment and SP; 3) SP scoring based on each participant's risk assessment; 4) EHR follow-up for one year following hospital discharge. If a participant did not have a risk assessment in the EHR, SPs were scored using aspects of the scoring system that could be applied in the absence of this information (e.g., presence of unsafe or nonsensical items).

Measures

Demographics. At baseline, participants completed a demographics questionnaire in which they reported on a range of personal (e.g., age, military deployments) characteristics.

History of Suicide Attempts. The presence and number of lifetime suicide attempts was assessed at baseline with the Self-Injurious Thoughts and Behaviors Interview (Nock et al., 2007). The Self-Injurious Thoughts and Behaviors Interview is a reliable and valid measure in veterans (Stanley et al., 2023).

Suicide Ideation. Participants completed the self-report version of the Beck Scale for Suicide Ideation (BSSI; Beck & Steer, 1991). The first 19 items of the BSSI assess the past-week severity of suicide ideation (SI), intent, and planning; we excluded BSSI items 20 and 21 which measure history of suicide behavior. Greater scores on the BSSI indicate more severe past-week SI and it was used to characterize the sample. The BSSI is a valid and reliable self-report measure of past-week SI (Beck et al., 1988) and has been used with psychiatrically hospitalized patients (e.g., Steer et al., 1993). In this sample, the BSSI showed good internal consistency (α = .84).

Posttraumatic Stress Disorder Symptoms (PTSD). The Posttraumatic Stress Disorder Checklist for *DSM-5* (PCL-5; Weathers et al., 2013) assesses the presence and severity of posttraumatic stress disorder symptoms in the past month and was used to clinically characterize the sample; scores range from 0 to 80 with higher scores indicating more severe symptoms. The PCL-5 is widely used and has demonstrated strong psychometric properties in veterans (e.g., Bovin et al., 2016). In this sample, the PCL-5 showed excellent internal consistency (α = .92).

Depression Symptoms. The Patient Health Questionnaire-9 (PHQ-9; Kroenke & Spitzer, 2002) assesses the presence and severity of depression symptoms in the past two weeks; scores range from 0 to 27 with higher scores indicating more severe symptoms. We used the PHQ-9 in our adjusted analyses (see *Data Analytic Plan*). The PHQ-9 is widely used and has demonstrated good psychometric properties in psychiatric patients (Beard et al., 2016). In this sample, the PHQ-9 showed excellent internal consistency (α = .90).

Safety Plan Scoring. Green et al. (2018) developed a system to score SPs for completeness (i.e., to what degree each item of the SP was filled out) and quality (i.e., degree to

which the SP was clear, actionable, and personalized). Each SP step is separately scored for completeness and quality. In this system, each step also receives a fidelity score which sums completeness and quality scores (e.g., Step 1 fidelity = Step 1 completeness + Step 1 quality). Scores for individual steps are referred to as SP step scores throughout the manuscript. SP step scores are also combined to produce three whole plan scores for overall SP completeness, quality, and fidelity (e.g., SP completeness = Step 1 completeness + Step 2 completeness + Step 3 completeness + Step 4 completeness + Step 5 completeness + Step 6 completeness). We will refer to these three scores as whole plan scores throughout the manuscript.

When scoring SP completeness, one point is awarded for each item that is complete; no points are removed for incomplete or missing items. When scoring SP quality, one point is removed for every completed item that is of poor quality (i.e., unclear, non-actionable, or lacking personalization). An item's quality is determined by comparing SP responses to the most recent risk assessment in the veteran's EHR. For example, a quality point would be removed if the response seemed unsafe (e.g., using substances was a strategy listed in Step 2 [internal coping]), nonsensical (e.g., "listening to my favorite song" was listed in Step 6 [safe environment]), or if it shows a lack of personalization demonstrated by conflict with other information in the risk assessment or SP (e.g., a specific friend was listed in Step 1 [warning signs], but then listed in Step 4 [social support]). One quality point would be removed if a specific suicide method was endorsed in the risk assessment but is not addressed for means restriction in Step 6 (safe environment).

As an example, if Step 1 (warning signs) had three complete items it would receive a completeness score of three out of three. If coders identified that two of items listed in Step 1 were of poor quality (e.g., unclear or not actionable), they removed a point for each quality issue, resulting in Step 1 getting a quality score of -2. To obtain a fidelity score for Step 1, we would combine the Step 1 completeness score of three with the Step 1 quality score of -2, resulting in a SP Step 1 fidelity score of one. This process is repeated for each SP step. As noted previously, SP steps scores are then summed to create the three whole plan scores for the overall SP (e.g., whole plan fidelity).

Two study authors (JCK, JDG) double coded ten SPs and then separately coded the remaining SPs. Discrepancies were resolved through discussion and consensus scores were reached. Interrater reliability was high, with perfect agreement on completeness scores for all SP steps. There were good to excellent intraclass correlations (ICCs = 0.76-0.98) for the remaining SP steps for quality and fidelity. For whole plan scores, agreement was perfect for completeness (ICC = 1.00) and excellent for quality (ICC = 0.95) and fidelity (ICC = 0.97).

Psychiatric Rehospitalization. In the year following discharge, we obtained data on readmissions to the inpatient psychiatric hospital unit from each participant's EHR.[2]

Data Analytic Plan

We used a cox proportional hazards survival regression model to calculate hazard ratios (HR) and adjusted HR (AHR). Analyses were adjusted for baseline PHQ-9 scores due to the

[2]Due to low power, we could not conduct survival analyses for suicide attempt or suicide behavior reports in Study 1 (n = 6, for each outcome).

significant relationship with our outcome, psychiatric rehospitalization (p = .016), over the follow-up period. We did not adjust analyses for baseline BSSI (p = .868) and PCL-5 (p = .334) scores because they were not associated with our outcome in the cox proportional hazards survival regression models. Analyses for overall SP scores were run unadjusted then adjusted for baseline PHQ-9 scores. The analyses for SP step scores were first run unadjusted then significant predictors were re-run, adjusting for baseline PHQ-9 scores and any other SP steps that were also significant. Using SPSS, we conducted data analyses on only participants who had an SP entered into the EHR.

Study 1 Results

Of the 78 participants who were clinically indicated to have a SP, 41 (52.5%) had a SP entered in the EHR prior to discharge. There were 32 psychiatric rehospitalizations throughout the one-year follow-up period. Table 1 displays participant demographic and military characteristics.

Safety Plan Scores

Table 2 shows that SPs had high levels of completeness with a mean of 16.17 (SD = 1.89) out of 18 expected items (i.e., 89.8% complete). However, poor item quality (i.e., unclear, not actionable, or lacking personalization) was common with all SPs containing at least one quality issue (M = 5.14/plan, SD = 2.78). Regarding SP steps, Step 6 (safe environment) had the lowest levels of completion (M = 2.19 items, SD = 0.84, with 5% having no Step 6 items at all) and were of the poorest quality (M = 2.21 quality issues identified, SD = 1.61; 79% of SPs had at least one quality issue). Supplemental Table 1 shows correlations between clinical characteristics and SP scores.

Survival Analyses for Psychiatric Rehospitalization

In survival analyses in which psychiatric rehospitalization was the dependent variable (Table 3), whole plan scores did not significantly predict psychiatric rehospitalization in any analyses (SP fidelity: AHR = 1.03, 95% CI [0.91, 1.10], p = .668; SP completeness: AHR = 1.0, 95% CI [0.83, 1.38], p = .751; SP quality: AHR = 0.99, 95% CI [0.86, 1.16], p = .945). When examining SP step scores, only higher fidelity scores for Step 2 (internal coping; HR = 0.63, 95% CI [0.41, 0.99], p = .043) were significantly associated with a decreased likelihood of psychiatric rehospitalization. These results remained significant after adjusting for baseline PHQ-9 scores (AHR = 0.50, 95% CI [0.30, 0.84], p = .008).

Study 2

Materials and Method

Participants and Procedure

Participants were 132 veterans (M_{age} = 45.6 years, SD = 12.6) recruited as part of a randomized controlled trial to examine the efficacy of motivational interviewing on SI among those psychiatrically hospitalized in VHA for suicide risk (Britton et al., 2020). Eligible participants were ≥ 18 years of age, English speaking, cleared to participate by attending

psychiatrist, and receiving healthcare from VHA; participants were excluded for current psychosis, mania, dementia, and upcoming hospital discharge. See Britton et al. (2020) for more detailed inclusion/exclusion criteria and trial results. Study procedures were approved by the local VHA Institutional Review Board; informed consent was obtained from all participants. Study 2 was conducted in the same four phases as Study 1 (see *Study 1: Procedure*). However, outcomes were assessed via follow-up telephone interviews over six months rather than an EHR review.

Measures

Demographics. Participants completed a demographics questionnaire in which they reported on their age, sex, and race/ethnicity as well as military characteristics at baseline.

History of Suicide Attempts. The presence and number of lifetime suicide attempts was assessed at baseline using the Columbia-Suicide Severity Rating Scale (C-SSRS; Posner et al., 2011). The C-SSRS is a reliable and valid measure among psychiatric groups (Posner et al., 2011) and veterans (Katz et al., 2020). We used the C-SSRS to clinically characterize the sample.

Suicide Ideation. Baseline SI was measured by the past-week interview version of the BSSI (Beck et al., 1979). The BSSI is a 19-item interview that assesses the presence and severity of SI the week prior to hospitalization. Scores range from 0 to 38 with higher scores indicating greater suicide risk. We used the BSSI in our adjusted analyses (see *Data Analytic Plan*). In this sample, the BSSI at baseline showed excellent internal consistency ($\alpha = .94$).

PTSD Symptoms. Baseline PTSD symptoms were assessed with the PCL-Civilian Version (PCL-C; Weathers et al., 1994). The PCL-C is a 17-item measure that assesses *DSM-IV* criteria for PTSD; scores range from 17 to 85 with higher scores indicating greater PTSD symptom severity. We used PCL-C scores in our adjusted analyses (see *Data Analytic Plan*). In this sample, the PCL-C showed good internal consistency ($\alpha = .88$).

Depression Symptoms. The PHQ-9 (Kroenke & Spitzer, 2002) provided an overview of baseline symptom severity for depression and was used to clinically characterize the sample. In this sample, the PHQ-9 showed adequate internal consistency ($\alpha = .74$).

Safety Plan Scores. Using the scoring system from Green et al. (2018), two authors (JCK, DC) scored all SPs. JCK trained DC on the coding system using five SPs as training cases. A total of 20 SPs were then double coded in increments of five to ensure reliability between coders. Discrepancies were resolved through discussion and consensus SP scores were reached. Interrater reliability was high, with perfect agreement on completeness scores for the first four SP steps and good agreement (0.77-0.92) for the remaining steps. Agreement was excellent for completeness (ICC = 0.96), quality (ICC = 0.90) and fidelity (ICC = 0.96) whole plan scores.

Post-Discharge Suicide Attempts. Follow-up assessments were conducted via telephone at one-, three-, and six-months post-discharge. We used the C-SSRS behavior interview (since last visit version) to assess for suicide attempts (Posner et al., 2011).

Data Analytic Plan

We used a cox proportional hazards survival regression model to calculate HR and AHR. Analyses were adjusted for baseline BSSI (p = .050) and PCL-C (p = .052) scores due to their significant associations with our outcome, suicide attempts, over the follow-up period. Baseline PHQ-9 scores were not associated with suicide attempt (p = .185) and, as a result, were not adjusted for in analyses. The analyses for whole plan SP scores were initially conducted unadjusted, and then later adjusted for baseline SI (i.e., BSSI scores) and PCL-C scores. The analyses for SP step scores were run unadjusted, then significant predictors were re-run adjusting for baseline SI, PCL-C scores, and other SP steps that were also significant. Using STATA, we conducted data analyses on only participants who had a SP entered into the EHR.

Study 2 Results

Of the 132 veterans, 123 (93.1%) received a SP. There were 16 suicide attempts throughout the six-month follow-up period. Table 1 presents participant demographic and military characteristics.

Safety Plan Scores

As displayed in Table 2, SPs were moderately complete with a mean of 12.63 out of 18 expected items (i.e., 70.2% completed). Poor quality items (i.e., unclear, not actionable, or lacking personalization) were similarly common as observed with the Study 1 sample, with 98% of SPs containing at least one item of poor quality (M = 4.70/plan, SD = 2.50). Notably, Step 6 (safe environment) was only completed in 44% of SPs (M = 0.77 items, SD = 0.98) and, as with Study 1, it had the most poor-quality items (M = 1.11, SD = 1.13). Supplemental Table 1 shows correlations between clinical characteristics and SP scores.

Survival Analyses for Suicide Attempts

SP completeness did not significantly predict a decreased likelihood of future suicide attempt using whole plan (AHR = 0.98, 95% CI [0.82, 1.16], p = .789) or step scores (all p's > .30) in survival analyses (see Table 4). SP quality (AHR = 0.78, 95% CI [0.65, 0.94], p = .012) and fidelity (AHR = 0.85, 95% CI [0.72, 1.00], p = .040) whole plan scores were significantly associated with lower risk of suicide attempt. Step 1 (warning signs) quality scores predicted a decreased likelihood of suicide attempt in unadjusted analyses (HR = 0.48, 95% CI [0.30, 0.76], p = .002), but were no longer significant after adjusting for baseline SI and PCL-C scores (AHR = 0.56, 95% CI [0.31, 1.01], p = .052). Step 1 (warning signs) fidelity scores predicted a decreased likelihood of suicide attempt in both unadjusted (HR = 0.58, 95% CI [0.38, 0.89], p = .012) and adjusted analyses (AHR = 0.56, 95% CI [0.36, 0.87], p = .016). Quality scores for Steps 4 (social support; HR = 0.56, 95% CI [0.36, 0.89], p = .014) and 6 (safe environment; HR = 0.61, 95% CI [0.42, 0.88], p = .008) were associated with a decreased likelihood of a suicide attempt in unadjusted analyses, but were no longer significant after adjusting for baseline SI and PCL-C scores (Step 4: AHR = 0.62, 95% CI [0.3, 1.04], p = .070; Step 6: AHR = 0.85, 95% CI [0.54, 1.35], p = .505).

Discussion

These were the first studies to examine the association of SP quality, completeness, and fidelity with key suicide outcomes during the high-risk post-hospitalization period. Results

suggest that the association of SP characteristics differs by outcome, that fidelity of internal coping strategies (Step 2) are prospectively associated with rehospitalization, whereas quality and fidelity for the whole plan and for warning signs (Step 1) are prospectively associated with suicide attempts, and it is possible that the associations may contribute to risk. Merely having a complete SP was not associated with decreased risk for psychiatric rehospitalization or suicide attempt. Instead, our results highlight the importance of quality and fidelity over completeness alone. It is not solely the number of strategies listed on a SP (i.e., completeness scores) that was associated with reduced risk for rehospitalization and suicide attempt, but having enough strategies that are clear, actionable, and personalized to the veteran (i.e., our quality and fidelity scores). In sum, our findings confirm the small and consistent effect of the quality of safety plans on risk for rehospitalization and suicide attempts for veterans in acute care settings, identifying a potential opportunity to improve an already implemented preventive intervention.

The quality of Steps 4 (social support) and 6 (safe environment) were associated with reduced likelihood of suicide attempts; this highlights a unique methodological strength of the SP scoring system. Unlike Steps 1 (warning signs) and 2 (internal coping) where poor quality items referred to vague or missing information (e.g., vague one-word warning signs, the word "relax" for a coping suggestion), Steps 4 (social support) and 6 (safe environment) were frequently penalized when SP steps were not personalized to the veteran's risk assessment. Examples of poor-quality items on Step 4 (social support) included listing one's wife as a social support even though marital conflict was listed as a warning sign for suicide in Step 1 as well as a contributing factor in the VA risk assessment. Similarly, if a veteran endorsed a suicide method on their risk assessment (e.g., past suicide attempt involving a firearm, recent suicide plans focusing on medication overdose), Step 6 quality scores would be penalized if this method was not explicitly addressed (e.g., safe firearm storage, limiting access to medications). Although these results are preliminary, they are consistent with the conceptual guidance and framework of the SP Intervention (Stanley & Brown, 2012; Stanley et al., 2018). Our results encourage providers and veterans to actively collaborate to ensure that the SP is responsive to the circumstances that led to the hospitalization. It also encourages providers and veterans to attend to potentially conflicting items on the SP and to explore whether the items truly decrease the veteran's risk for suicide. Further research is needed to identify the best approaches for personalizing social support and lethal means restriction as both are factors associated with near-term suicide risk (Ammerman & Jacobucci, 2023; Joiner et al., 2003).

We saw a consistent pattern emerge across both studies—the importance of fidelity and quality of SPs over completeness—which aligned with prior SP research (Gamarra et al., 2015; Green et al., 2018) and the broader suicide prevention literature. Step 2 (internal coping) fidelity scores were associated with reduced likelihood of psychiatric rehospitalization which suggests that fidelity (i.e., quality *and* completeness) is relevant for coping skills to prevent veterans from getting to the point where they require hospitalization—not these metrics independently (i.e., quality and completeness scores *alone*). Having a higher number of clear, actionable, personalized coping skills may help patients address risk before they require more intensive interventions such as hospitalization, and supports the view of coping skills as a first-line technique in cognitive therapies (e.g., Brown et al., 2005) and suicide prevention work (e.g., Bazrafshan et al., 2014). Surprisingly, the Step 2 (internal coping) findings were not associated with reduced likelihood of risk for suicide attempts. Instead, higher Step 1 (warning signs) quality and fidelity scores predicted a reduced likelihood of suicide attempt. Having multiple

warning signs that are clear and easy to monitor may have enabled the veteran to understand that a suicide crisis was unfolding which, in turn, allowed them to use the SP to intervene and prevent a suicide attempt. The importance of warning signs in a SP is echoed by recent veteran experience work by Matthieu et al. (2023) in which veterans discussed how knowing their suicide warning signs can help them act before they escalate to suicidal behavior.

As noted previously, one surprising finding was that Step 2 (internal coping) fidelity was not associated with reduced likelihood of suicide attempt in our analyses. One interpretation of this finding is that although the internal coping skills were, on average, complete and of good quality, they may have been insufficient for reducing the escalation to suicidal behavior. It may be that veterans in this study did not have internal coping skills that were fast-acting enough to reduce suicide attempt risk—specifically when they are more proximal to the suicide attempt where we often see significant fluctuations in negative affect and cognition (Sedano-Capdevila et al., 2021). Although Step 2 of the Safety Planning Intervention is designed to focus on skills that are highly distracting, inclusion of skills that are designed to rapidly reduce distress and/or physiological arousal, such as Dialectical Behavior Therapy's "TIPP" skills (e.g., tipping the temperature) which work by modifying body chemistry (Linehan, 2014), may be beneficial to include in Step 2 and examine this change in the Safety Planning Intervention in future research.

From a clinical standpoint, our results and those from prior SP studies (Gamarra et al., 2015; Green et al., 2018) underscore the importance of a provider and patient (veteran, in this case) co-developing a SP with items that are clear, actionable, and personalized and that this is crucial to the intervention's effectiveness. From training and implementation standpoints, SP research raises questions about how to ensure the quality and fidelity of SPs in clinical settings where time and personnel are limited. Time pressures as a practicing clinician, particularly on a busy inpatient psychiatric unit, may make it difficult to create a clear, actionable, and personal SP that is helpful to the veteran post-discharge. We also know that there is variability in the implementation of mandated treatments across VA sites that could reflect a number of causes (e.g., low staffing, high patient volume) which may be related to the differences in SP completion between studies. Although most mental health providers have a degree of comfort with the SP Intervention, almost 70% report needing more training (Moscardini et al., 2020). This supports formally developing a targeted, standard practice for creating effective SPs and providing clinicians with the necessary infrastructure and guidance for doing so. Assessing near-term suicide warning signs (e.g., behaviors, affect) with a brief, structured interview such as the Timeline Follow-Back Interview for Suicide Attempts (e.g., Bagge et al., 2013) may be one approach to aid in developing SPs that are clear, actionable, and personal while on busy clinical units.

Although the present studies have a number of strengths (i.e., inclusion of high-risk veterans during a high-risk transition period in the samples), clinically relevant outcomes, and analytic approach, results should be interpreted within the context of five limitations. First, neither study was an experiment or randomized controlled trial for the Safety Planning Intervention. Participants were drawn from two existing studies examining suicide risk factors and treatment among veterans receiving VHA inpatient psychiatric care. Further, our samples were almost exclusively male and white. As a result, our findings may not generalize to non-veteran samples and more work is needed in racially and ethnically diverse samples to understand for whom the Safety Planning Intervention is most effective. Second, although we

controlled for a range of clinical factors, unmeasured within-person factors may have impacted veterans' ability to engage in the creation of SPs (e.g., personality factors, level of functioning). Third, most SPs in the study had issues with quality, potentially resulting in a restricted range of SP quality, that could have reduced the association of SP quality and suicide outcomes. Fourth, the two separate outcomes were evaluated in separate samples from two VHA settings with different documentation practices (e.g., percentage entered in the EHR), making it difficult to directly compare the specific steps that emerged as predictive for each outcome. To fully explore SP steps differentially predicting each outcome, research assessing both outcomes in a single, larger sample is needed. In addition, in Study 1, non-VA hospitalizations may not have been entered into the EHR. Fifth, and finally, we do not know if the intervention itself was delivered to fidelity (as this study utilized data from the EHR) and coders used all available data, but it is possible relevant data was not included in the EHR (e.g., evaluation of the pros/cons of a particular SP item, discussion with veteran is they found the internal coping strategies distracting). Relatedly, we did not ask veterans about their perceptions regarding their own SP or the SP creation process. Both aspects may have impacted outcomes and perceived utility of the SP for the veteran. Future studies may benefit from including questions related to perceptions of SPs (e.g., Levandowski et al., 2016), including perceptions of efficacy, quality, and the creation process. This may provide insight into potential benefits, attitudes, or barriers related to SPs and their usage during the post-hospital discharge period.

Conclusions

Although post-hospital discharge is a high-risk period for veterans, SPs of high fidelity and quality show promise in reducing risk for psychiatric rehospitalization and suicide attempts, respectively. We found that better Step 1 quality and fidelity scores (warning signs) were critical in their association with reducing risk for future suicide attempts while higher Step 2 fidelity scores (internal coping) were associated with reduced risk for psychiatric rehospitalization. Step 2 fidelity was not associated with reducing the likelihood of suicide attempt which was surprising and warrants further study. Given that SPs are a critical part of VHA's suicide prevention efforts, further research is needed on how to best standardize SP procedures so that they are of the highest fidelity and quality possible to manage suicide risk among psychiatrically hospitalized veterans.

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Table 1.

Demographic characteristics (Study 1, Study 2).

	Study 1	**Study 2**

	(*N* = 78)	(*N* = 132)
Demographics Characteristics		
Age, *M* (*SD*)	40.11 (12.5)	45.64 (12.6)
Gender, % (*n*)		
Male	56.4 (44)	89.39 (118)
Female	41.0 (32)	10.71 (5)
Race, % (*n*)		
White	75.6 (59)	77.27 (102)
Black	12.8 (10)	13.64 (18)
American Indian or Alaskan Native	1.3 (1)	2.27 (3)
Native Hawaiian or Pacific Islander	-	1.52 (2)
Multi-racial/Other	4.3 (1)	5.30 (7)
Marital status, % (*n*)		
Married	11.5 (9)	33.3 (44)
Divorced/Separated	42.3 (33)	43.2 (57)
Never Married	38.5 (30)	18.9 (25)
Widowed	-	4.5 (6)

Other	3.8 (3)	-
Post-9/11 era military service, % (*n*)	41.0 (32)	28.1 (37)
Deployment to a combat zone, % (*n*)	51.3 (40)	46.9 (62)
Clinical Characteristics		
Number of lifetime suicide attempts, *M* (*SD*)	4.31 (7.0)	1.80 (2.5)
PHQ-9, *M (SD)*	19.86 (6.09)	18.13 (4.88)
PCL,[1] *M (SD)*	55.49 (15.82)	58.08 (12.64)

Note. PHQ-9 = Patient Health Questionnaire – 9; PCL = The Posttraumatic Stress Disorder Checklist.

[1]Study 1 used the Posttraumatic Stress Disorder Checklist for *DSM-5*. Study 2 used the Posttraumatic Stress Disorder Checklist-Civilian version.

Table 2.

Descriptives of safety plan items identified within coding system (Study 1, Study 2).

Criterion	Study 1		Study 2	
	Number in SP	**Dichotomized**	**Number in SP**	**Dichotomized**
Specific Step	*M (SD)*	*N* (%)	*M (SD)*	*N* (%)
# Completed Items				
Across Whole SP	16.17 (1.89)	41 (100%)	12.63 (3.18)	123 (100%)
Step 1: Warning Signs	2.97 (0.15)	41 (100%)	2.41 (0.89)	118 (96%)
Step 2: Internal Coping	2.95 (0.22)	41 (100%)	2.53 (0.72)	120 (98%)
Step 3: Social Distraction	2.78 (0.47)	41 (100%)	2.33 (0.87)	118 (96%)
Step 4: Social Support	2.56 (0.74)	40 (98%)	1.89 (1.14)	100 (81%)
Step 5: Professionals	2.71 (0.72)	41 (100%)	2.71 (0.52)	122 (99%)

Step 6: Safe Environment	2.19 (0.84)	39 (95%)	0.77 (0.98)	54 (44%)
# Poor Quality Items				
Across Whole SP	5.14 (2.78)	41 (100%)	4.70 (2.50)	120 (98%)
Step 1: Warning Signs	0.34 (0.52)	13 (32%)	0.20 (0.66)	12 (10%)
Step 2: Internal Coping	0.51 (0.74)	16 (39%)	0.83 (1.01)	63 (51%)
Step 3: Social Distraction	0.83 (0.71)	27 (66%)	1.01 (1.07)	70 (57%)
Step 4: Social Support	0.46 (0.67)	16 (39%)	0.63 (0.87)	52 (42%)
Step 5: Professionals	0.80 (1.18)	17 (41%)	0.93 (0.70)	91 (74%)
Step 6: Safe Environment	2.21 (1.61)	32 (79%)	1.11 (1.13)	77 (63%)

Note. SP = safety plan.

Table 3.

Hazard ratios predicting psychiatric rehospitalization (Study 1).

	SP Completeness				SP Quality				SP Fidelity			
	HR [95% CI]	*p*	Adjusted HR [95% CI]	*p*	HR [95% CI]	*p*	Adjusted HR [95% CI]	*p*	HR [95% CI]	*p*	Adjusted HR [95% CI]	*p*
Whole Plan Scores[a]	0.98 [.81, 1.20]	.848	1.07 [0.83, 1.38]	.571	0.94 [0.82, 1.10]	.413	0.99 [0.86, 1.16]	.945	0.98 [0.90, 1.07]	.664	1.03 [0.91, 1.17]	.668
SP Step Scores[b]												
Step 1: Warning Signs	0.72 [0.09, 5.42]	.752			1.63 [0.72, 3.71]	.239			1.54 [0.70, 3.40]	.281		
Step 2: Internal Coping	0.39 [0.09, 1.72]	.217			0.68 [0.43, 1.05]	.085			**0.63 [0.41, 0.99]**	**.043**	**0.50 [0.30, 0.84]**	**.008**
Step 3: Social Distraction	0.94 [0.42, 2.07]	.871			0.83 [0.44, 1.56]	.565			0.86 [0.52, 1.43]	.560		

Step 4: Social Support	1.45 [0.77, 2.73]	.255		0.77 [0.42, 1.40]	.388		1.10 [0.71, 1.68]	.689
Step 5: Professionals	0.90 [0.49, 1.67]	.774		0.97 [0.68, 1.40]	.849		0.97 [0.76, 1.23]	.797
Step 6: Safe Environment	0.82 [0.53, 1.28]	.380		0.95 [0.73, 1.23]	.705		0.87 [0.64, 1.17]	.351

Note. CI = confidence interval; HR = hazard ratio; SP = safety plan.

[a] Analyses for whole plan scores were run unadjusted then adjusted for baseline Patient Health Questionnaire-9.

[b] Analyses for SP step scores were run unadjusted then adjusted for baseline Patient Health Questionnaire-9 scores and any other steps that are also significant.

Table 4.

Hazard ratios predicting suicide attempts (Study 2).

	SP Completeness				**SP Quality**				**SP Fidelity**			
	HR [95% CI]	*p*	Adjusted HR [95% CI]	*p*	HR [95% CI]	*p*	Adjusted HR [95% CI]	*p*	HR [95% CI]	*p*	Adjusted HR [95% CI]	*p*
Whole Plan Scores[a]	1.02 [0.87, 1.19]	.831	0.98 [0.82, 1.16]	.789	**0.76 [0.63, 0.91]**	**.003**	**0.79 [0.66, 0.95]**	**.012**	**0.86 [0.74, 1.00]**	**.049**	**0.84 [0.71, 0.99]**	**.040**
SP Step Scores[b]												
Step 1: Warning Signs	0.80 [0.49, 1.32]	.383			**0.48 [0.30, 0.76]**	**.002**	*0.56 [0.31, 1.01]*	*.052*	**0.58 [0.38, 0.89]**	**.012**	**0.57 [0.37, 0.90]**	**.016**
Step 2: Internal Coping	0.96 [0.49, 1.89]	.903			1.01 [0.60, 1.68]	.979			0.97 [0.61, 1.54]	.890		
Step 3: Social Distraction	1.27 [0.67, 2.41]	.457			0.80 [0.51, 1.25]	.319			0.87 [0.53, 1.43]	.583		
Step 4: Social Support	1.10	.680			**0.56**	**.014**	0.62	.070	0.66 [0.41	.101		

	[0.70, 1.73]		**[0.36, 0.89]**		[0.37, 1.04]		, 1.08]	
Step 5: Professionals	0.67 [0.28, 1.58]	.363	1.60 [0.75, 3.44]	.228			1.17 [0.60, 2.28]	.647
Step 6: Safe Environment	1.26 [0.78, 2.04]	.350	**0.61 [0.42, 0.88]**	**.008**	0.85 [0.54, 1.36]	.505	0.63 [0.21, 1.89]	.413

Note. CI = confidence interval; HR = hazard ratio; SP = safety plan.

[a] Analyses for whole plan scores were run unadjusted then adjusted for baseline Beck Scale for Suicide Ideation and Posttraumatic Stress Disorder Checklist scores.

[b] Analyses for SP step scores were run unadjusted then adjusted for baseline Beck Scale for Suicide Ideation and Posttraumatic Stress Disorder Checklist scores and any other steps that are also significant.

Conflicts of Interest

None of the authors have any conflicts of interest associated with this publication. Dr. Nock receives publication royalties from Macmillan, Pearson, and UpToDate. He has been a paid consultant in the past three years for Apple, Microsoft, and COMPASS Pathways, and for legal

cases regarding a death by suicide. He has stock options in Cerebral Inc. He is an unpaid scientific advisor for Empatica, Koko, and TalkLife. Dr. Marx receives publication royalties from the American Psychological Association.