

ORIGINAL ARTICLE OPEN ACCESS

Comparing the Impacts of Crisis Response Plan and Self-Administered Safety Plan Use in Real Life on Key Clinical Outcomes

Melanie Bozzay¹  | Xiaoxuan Cai² | Jiaxin Chen² | Samantha Daruwala¹  | Lauren Khazem¹ | Heather Wastler¹  | Nicholas P. Allan¹ | AnnaBelle O. Bryan¹ | Craig J. Bryan¹

¹Department of Psychiatry and Behavioral Health, The Ohio State University Wexner Medical Center, Columbus, OH, USA | ²Department of Statistics, The Ohio State University, Columbus, OH, USA

Correspondence: Melanie Bozzay (melanie.bozzay@osumc.edu)

Received: 24 June 2025 | **Revised:** 29 August 2025 | **Accepted:** 1 September 2025

Funding: This work was supported in part by grants from the Boeing Company to C. Bryan; the National Institute of Mental Health (R01MH136286) to M. Bozzay and N. Allan; and charitable contributions from Honor 365, Ride to Zero, and 33 Forever to C. Bryan and A. Bryan. It is also supported by the National Center for Advancing Translational Sciences, Grant UL1TR001070. The content is solely the responsibility of the authors and does not necessarily represent the official views of the Boeing Company, the National Institute of Mental Health, Honor 365, Ride to Zero, or 33 Forever.

Keywords: crisis response plan | ecological momentary assessment | negative affect | positive affect | safety plan | suicide

ABSTRACT

Background: Suicidal crises can occur when a clinician is not available to intervene. Safety planning-type interventions, such as the Crisis Response Plan (CRP) and the self-guided Safety Plan (SP), were developed to provide patients with skills to manage their suicide risk in daily life. These plans are similar in makeup, but differ in terms of how they are created. This study examined whether plan type moderated associations between frequency of plan use and suicide ideation and affect.

Method: Participants were 115 military personnel in a randomized clinical trial comparing the effectiveness of CRP versus a self-guided SP who completed an ecological momentary assessment battery. Generalized linear mixed-effects models examined whether plan type moderated the association between daily plan use frequency and clinical outcomes.

Results: Treatment group moderated the relationship between plan use frequency and the odds of suicidal ideation. When participants used plans more frequently than their average, they reported lower suicidal ideation and higher positive affect for CRP versus self-guided SP.

Conclusions: More frequent CRP use was linked with lower risk of suicidal ideation and greater positive affect. This may reflect better plan use due to clinician guidance. Results have critical implications for the implementation of safety planning-type interventions.

1 | INTRODUCTION

Suicide is the 12th leading cause of death in the United States and has increased by over 35% since 1999 (World Health Organization 2021). Although efficacious treatments for suicidal behaviors have been developed (Bryan and Rudd 2018), preventing suicide remains a critical challenge because

suicidal crises can escalate rapidly (i.e., within hours to days) (Coppersmith et al. 2022; Kleiman et al. 2017) and are difficult to anticipate (Matarazzo et al. 2019). Consequently, clinicians often do not know that a patient is experiencing a suicidal crisis outside of clinical visits, limiting their ability to intervene in a timely manner. Because of this, safety planning-type interventions were developed to provide patients with a strategy

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for independently managing their suicide risk in daily life. However, patient experiences using these plans in the real world are not well understood. The purpose of this study is to examine whether patients who use different forms of safety planning-type interventions (the Crisis Response Plan [CRP] and the self-guided Safety Plan [SP]) differ in their experiences of suicidal ideation and positive and negative affect in daily life.

Broadly defined, safety planning-type interventions entail a set of procedures designed to help people use self-regulation skills to manage suicide risk in daily life (Linehan 2014). Such interventions, which include the CRP (Rudd et al. 2001, 2006) and related “coping card” protocols (Chen et al. 2013), and the clinician-administered (Stanley et al. 2008) and self-guided (Boudreux et al. 2013) SPs, share several common features. These include developing a plan that describes individualized warning signs that precede a suicidal crisis, internal coping strategies (i.e., distraction, self-soothing), people who can be contacted for distraction or support, and professional services to contact when other strategies are ineffective. Different plan approaches also have procedure-specific elements; the CRP, for instance, includes a section focused on identifying reasons for living (Bryan et al. 2017) while the original SP intervention includes a section focused on reducing access to suicide attempt methods (i.e., lethal means safety) (Stanley et al. 2008). Moreover, the CRP and the SP can differ in *how* the plans are created with patients. Both plans were designed to be collaboratively developed between providers and patients (Bryan and Rudd 2018; Stanley et al. 2008), and the CRP specifically involves a collaborative narrative assessment of a recent suicidal crisis prior to plan development with a clinician. However, self-guided templated SP forms without this collaborative element are commonly used in medical settings due to logistical challenges (i.e., limited time, staffing). In these settings, the SP is commonly self-administered by the patient using a paper form (Boudreux et al. 2013) or a web-based digital format (Boudreux et al. 2017) and is comparable to the clinician-administered SP in terms of feasibility and acceptability (Boudreux et al. 2017). Results of multiple randomized clinical trials have shown that CRP (Bryan et al. 2024, 2017) and the related crisis coping cards (Chen et al. 2013; Wang et al. 2016) significantly reduce suicide attempts and suicidal ideation. Non-randomized trials of the self-guided SP have also reported reductions in suicide attempts (Miller et al. 2017) and emergency department visits (Boudreux et al. 2023).

Although the results of published clinical trials generally support the effectiveness of safety planning-type interventions (Nuij et al. 2021), preliminary evidence suggests many suicidal patients do not use their plans. For instance, only 37% to 61% of patients who created a SP while receiving care in a psychiatric inpatient unit or emergency department reported using their plans after discharge (Leonard et al. 2021; Stanley et al. 2016). Another study found that, although 80% of patients who visited an emergency department or walk-in triage behavioral health service remembered creating a CRP with a clinician, only 25% reported knowing where the plan was located when interviewed several months later (Bryan et al. 2018). There may be differences in how frequently plans are used as well. For example,

Lohani, Baker, et al. (2024) found that suicidal adults reported using CRPs more often than self-guided SPs (Lohani, Baker, et al. 2024). Bryan et al. (2018) also found that the effect of plan use on subsequent reductions in suicidal ideation was moderated by the intervention received by patients; whereas more frequent use of CRPs was associated with larger reductions in suicidal ideation, more frequent use of other crisis interventions was not (Bryan et al. 2018). Subsequent research suggests this effect may be related specifically to discussions about patients' reasons for living, a component that is central to the development of the CRP (Bryan et al. 2019). Additional research investigating how safety planning-type intervention use affects suicidal ideation and associated cognitive-affective processes is therefore warranted.

Although safety planning-type interventions are meant to be used in the real world to alleviate suicide risk in the moment, very little research has been conducted to understand how plan use impacts outcomes in real-time. Given the differences in the delivery of the self-guided SP and CRP outlined above, it is plausible that patient experiences when using these plans vary. For example, when patients use their CRPs, they may do so on days when they experience lower suicidal ideation than patients using SPs, as therapists emphasize using CRPs habitually and early in a crisis with patients when developing these plans. It is also possible that the different components of the plans, such as lethal means safety on the self-guided SP and salient prompts to visualize or remember specific events typifying reasons for living on the CRP, contribute to differences in daily affective experiences for patients, especially when they use their plans repeatedly. However, no studies to date have examined whether the frequency of use of the CRP or self-guided SP differs across these critical and highly clinically relevant outcomes.

Thus, this study sought to characterize patterns of patient use of safety planning-type interventions in real-world settings. In so doing, we used data collected via ecological momentary assessment (EMA), a methodology that assesses patient experiences as they occur in daily life to better understand these experiences. We examined whether same-day associations between frequency of plan use and suicide ideation, positive affect, and negative affect differed across patients who were using a CRP versus a self-guided SP.

2 | Materials and Methods

2.1 | Participants and Procedures

This study involves a secondary analysis of data from a randomized clinical trial comparing the effectiveness of CRP versus self-guided SP administered during massed talk therapy for PTSD (clinicaltrials.gov identifier: NCT04690582). This study was approved by the Institutional Review Board at The Ohio State University. The primary results of this trial have been reported elsewhere (Bryan et al. 2024). Participants included in the present analyses were 116¹ U.S. military personnel and veterans meeting diagnostic criteria for full or subthreshold PTSD (i.e., having at least 3 of 4 DSM-5 symptom criteria), established with the Diagnostic Interview for Anxiety, Mood, and

OCD and Related Neuropsychiatric Disorders (DIAMOND; Tolin et al. 2018). Individuals were excluded if they were unable to complete the informed consent process, had a severe substance use disorder requiring medical management, or had imminently severe suicide risk warranting inpatient psychiatric hospitalization.

Study procedures occurred in-person or remotely using a video platform. After providing informed consent, participants completed a baseline assessment, downloaded a smartphone app for EMA data collection, and completed a brief tutorial to learn how to use the app. Participants next attended 10 1-h sessions of cognitive processing therapy (CPT) (Resick et al. 2016) scheduled on 10 consecutive business days (i.e., “massed” CPT), excluding weekends and holidays. Prior to the first session of massed CPT, participants met with their assigned therapist for 1 h to learn about the therapy and complete one of the two randomly determined study interventions: either CRP or self-guided SP. During treatment, clinicians were allowed to reference the plans in whatever way was clinically indicated. During CPT, participants received four EMA alerts per day for 14 consecutive calendar days, including weekends and holidays, at pseudo-random times between 8AM and 10PM. Each survey took less than 5 min to complete.

2.2 | Treatments

All participants were scheduled for 10 one-hour sessions of massed CPT. CPT is an empirically supported psychological treatment that has been shown to significantly reduce PTSD symptoms (Asmundson et al. 2019). During CPT, participants learn about the relation between their thoughts and emotions, how to identify and challenge beliefs that maintain their PTSD symptoms (called “stuck points”), and develop alternative beliefs that facilitate recovery. Once participants learn to identify and challenge their stuck points, they apply these cognitive restructuring skills to challenge beliefs associated with five key themes: safety, trust, power/control, esteem, and intimacy. Participants were not excluded based on psychotropic medication use, and no restrictions on medication use or changes were imposed. Prior to starting massed CPT, participants met with their therapist to complete one of two randomly assigned procedures: CRP or self-guided SP.

2.2.1 | Crisis Response Planning

CRP is a collaborative, therapist-guided intervention in which participants create a personalized plan designed to help them respond to acutely elevated emotional distress and suicidal urges (Bryan et al. 2017; Bryan and Rudd 2018). In CRP, the therapist first invites the participant to “tell the story” of a recent suicidal crisis or suicide attempt (if applicable), a process called the narrative assessment. If the participant is not experiencing suicidal ideation and has not previously attempted suicide, the therapist instead invites them to “tell the story” of a recent period of heightened emotional distress. After the narrative assessment, the therapist helps the patient create a handwritten plan comprised of several sections: (1) personal warning signs that signal an impending crisis, (2)

self-management strategies for reducing or distracting from emotional distress, (3) reasons for living or sources of meaning and purpose in life, (4) people who can be contacted for assistance and support, and (5) sources of professional assistance and crisis support. Plans were handwritten on blank index cards, copies of which were maintained by the therapist for later reference, if needed.

2.2.2 | Self-Guided Safety Planning

SP is a self-guided intervention (Boudreax et al. 2013) based on the Stanley-Brown Safety Planning Intervention (Stanley et al. 2008), a modified version of CRP. We selected the self-guided SP as a comparator for this study as it is widely used in healthcare settings as a procedure for managing acutely elevated suicide risk among patients. In the self-guided SP, participants were encouraged to complete a standardized fill-in-the-blank form comprised of several sections: (1) warning signs of a suicidal crisis, (2) internal coping strategies, (3) people and social settings that provide distraction, (4) people who can be contacted for help, (5) professionals or agencies that can be contacted during a crisis, and (6) steps for limiting access to potentially lethal suicide attempt methods. Therapists answered participants' questions about the intervention but otherwise did not actively assist participants in creating their plans, to mirror real-world implementation of the self-guided SP (Boudreax et al. 2017, 2013). Plans were handwritten or typed on blank templated forms, copies of which were maintained by the therapist for later reference, if needed.

2.3 | Randomization Procedures

Participants were randomly assigned to either CRP or self-guided SP using a randomization module in the Research Electronic Data Capture (REDCap) system hosted at The Ohio State University (Harris et al. 2019, 2009). To minimize group differences, three randomization strata were employed: biological sex (male or female), self-reported suicidal ideation at baseline (yes or no), and treatment delivery format (in-person or remote/virtual). In this study, the presence of suicidal ideation at baseline was defined as a non-zero endorsement of either item 4 (active suicidal ideation) or item 5 (passive suicidal ideation) on the Scale for Suicide Ideation (Beck et al. 1988).

2.4 | Measures

2.4.1 | Positive and Negative Affect

Momentary affective states were assessed at each EMA prompt using the Positive and Negative Affect Scale Short Form (Watson et al. 1988). Respondents indicated how they felt “right now” using a Likert rating scale ranging from 1 (very slightly or not at all) to 5 (extremely). Responses to the 10 positive affect (PA) states (interested, excited, strong, enthusiastic, proud, alert, inspired, determined, attentive, active) and 10 negative affect (NA) states (distressed, upset, guilty, scared, hostile, irritable, ashamed, nervous, jittery, afraid) states were summed to create total positive and negative affect scores, respectively.

2.4.2 | Suicidal Ideation

Momentary suicidal ideation was assessed at each EMA prompt using the first five items of the Scale for Suicidal Ideation (Beck et al. 1988). Items assessed the wish to live, wish to die, balance of reasons for living versus reasons for dying, active suicidal ideation, and passive suicidal ideation using a 3-point ordinal scale. Participants were directed to report the intensity of each item “right now.” The five items were summed to provide an overall metric of suicidal ideation severity, with higher total scores reflecting more severe suicidal ideation.

2.4.3 | Frequency of Plan Use

At the end of each day, participants were asked to report how many times they had used their assigned plan (either CRP or self-guided SP) during the day: “How many times did you use your crisis or safety plan today?” Response options ranged from 0 to 10.

2.5 | Data Analysis

Of 6496 possible EMA survey responses (56 possible per participant across 116 participants), data were available from 3667 (56.5%) responses, with at least one response recorded daily for all participants. This rate is comparable to previous EMA studies of suicidal ideation (Gee et al. 2020; Kleiman et al. 2017; Schatten et al. 2025). Given the daily resolution of the “Frequency of Plan Use” question, which was assessed in the final EMA survey of each day, items assessed multiple times throughout the day (i.e., affect, suicidal ideation) were averaged for analysis. Missing data were assessed using the `mcarr_test()` function in R. There was no evidence to suggest a violation of the Missing Completely At Random (MCAR) assumption ($p=0.13$). Thus, missing data were addressed using maximum likelihood estimation within the generalized linear mixed-effects models (GLMM). All analyses were conducted using R (R Core Team 2013).

We conducted several models to examine associations between plan use, severity of suicidal ideation (primary outcome), and positive and negative affect (secondary outcomes). For the original continuous measure of suicidal ideation (SI), we initially employed negative binomial and zero-inflated negative binomial (ZINB) mixed-effects models to address over-dispersion and the high prevalence of zeros in the data, incorporating appropriate random effects to account for individual variability. However, due to the complexity of the models and the available sample size, convergence issues arose, precluding reliable statistical conclusions. Instead, we applied a logistic mixed-effects model to examine the association between plan use frequency and the likelihood of SI (1 = SI; 0 = no SI) during each EMA survey. Fixed effects included time, within-person and between-person plan use frequency, treatment group (CRP or SP), and the interaction between treatment group and plan use frequency to assess if treatment condition moderated the association between plan use and SI. A random intercept was included to account for baseline differences in SI across individuals. Random slopes for within-person and between-person plan use frequency were

evaluated but ultimately excluded based on likelihood ratio tests (see Appendix S1).

For secondary outcomes, to analyze total PA and NA, we employed gamma mixed-effects models using the same fixed and random effects as used in the SI model, but with one exception. For total negative affect, results of likelihood ratio tests indicated that inclusion of random slopes improved model performance (see Tables S1–S3 for formal model comparisons); therefore, unlike the models examining positive affect and SI, this model also tested random slopes for plan use frequency, reflecting individual differences in how plan use frequency impacted negative affect.

We also computed additional models for all outcomes controlling for potential confounders provided at each EMA prompt: social context during the day (alone or with others), alcohol consumption (yes/no), and location at the time of each survey (at home, at school, at work, in the hospital or a clinic, in transit, or somewhere else). None of our results changed with the inclusion of these covariates; thus, we reported unadjusted models for ease of interpretation in this study. Adjusted models are available in Appendix S1.

3 | Results

Sample characteristics are summarized in Table 1. Among the 116 participants, 61 endorsed the use of a self-guided SP, at an average frequency of 0.93 times per day ($SD=0.84$). Meanwhile, 54 participants endorsed the use of a CRP, at an average frequency of 1.37 times per day ($SD=1.36$). The groups did not significantly differ in the frequency of plan use ($p=0.10$).² Patients in the CRP group were more likely to be male or non-Hispanic. No other group differences were apparent.

3.1 | Primary Outcome: Suicidal Ideation

See Table 2 (SI Model) for model results. Participants were less likely to endorse SI over time ($\beta=-0.89$, $p<0.001$). Both within-person plan use frequency and between-person plan use frequency were significantly associated with SI. Specifically, participants who reported using their plan more frequently were also more likely to report SI ($\beta=0.45$, $p<0.001$). Additionally, individuals with a higher average frequency of plan use overall across the study period were also more likely to report SI ($\beta=1.02$, $p<0.001$).

Individuals in the CRP group were less likely to endorse SI ($\beta=-0.45$, $p<0.001$) compared to the self-guided SP group. Participants receiving CRP reported lower odds of SI at the same frequency of plan use both on a daily basis (within-person interaction; $\beta=-0.37$, $p<0.001$) and on average across participants (between-person interaction; $\beta=-0.92$, $p<0.001$). Treatment group significantly moderated the association between plan use frequency and the odds of SI, both at the between-person level ($\beta=-0.92$, $SE=0.001$, $p<0.001$) and the within-person level ($\beta=-0.37$, $SE=0.001$, $p<0.001$). Participants in the self-guided SP (OR = 2.78, $\beta=1.02$, $SE=0.001$, $p<0.001$) group were more likely to report SI than patients in the CRP group (OR = 1.11,

TABLE 1 | Sample characteristics ($n=115$).

Variable	Full sample n (%)	SP group 61 (53%)	CRP group 54 (47%)	Group comparisons
Age (M , SD)	46.6 (11.9)	48.3 (11.0)	45.0 (12.6)	—
Biological sex				$p < 0.05$
Male	81 (69.8)	37 (60.7)	43 (79.6)	
Female	34 (29.3)	24 (39.3)	11 (20.4)	
Gender				—
Male	78 (67.2)	36 (59.0)	41 (75.9)	
Female	35 (30.2)	24 (39.3)	12 (22.2)	
Trans	1 (0.9)	1 (1.6)	1 (1.9)	
Other	1 (0.09)	1 (1.6)	—	
Race				—
White	89 (76.7)	48 (78.7)	41 (75.9)	
Black	12 (10.3)	6 (9.8)	7 (13.0)	
Asian	4 (3.4)	2 (3.3)	2 (3.7)	
Native American	3 (2.6)	2 (3.3)	1 (1.9)	
Other	7 (6.0)	3 (4.9)	3 (5.6)	
Hispanic/Latino ethnicity				$p < 0.05$
Yes	7 (6.0)	1 (1.6)	7 (13.0)	
No	108 (93.1)	60 (98.4)	47 (87.0)	
Sexual orientation				—
Straight	104 (89.7)	54 (88.5)	50 (92.6)	
Gay/lesbian	3 (2.6)	1 (1.6)	2 (3.7)	
Bisexual	7 (6.0)	6 (9.8)	1 (1.9)	
Other	1 (0.9)	—	1 (1.9)	
Prebaseline suicide risk				—
Suicidal ideation	91 (78.4)	46 (75.4)	44 (81.5)	
Suicide attempt	37 (31.9)	21 (34.4)	17 (31.5)	

$\beta=0.10$, $SE=0.001$, $p < 0.001$). Among participants who used their plans more frequently than their personal average, those in the SP group experienced higher odds of suicidal ideation (SI; $OR=1.57$, $\beta=0.50$, $SE=0.001$, $p < 0.001$) compared to those in the CRP group ($OR=1.08$, $\beta=0.08$, $SE=0.001$, $p < 0.001$).

3.2 | Secondary Outcomes: Affect

3.2.1 | Positive Affect

See Table 2 (PA Model) for model results. Participants endorsed greater positive affect over time ($\beta=0.03$, $p < 0.001$). No significant differences in average positive affect were observed between the CRP and SP groups. However, more frequent plan use within (but not between) individuals was associated with lower positive affect ($\beta=-0.02$, $p < 0.05$), suggesting that participants used their plans more frequently when experiencing lower

positive affect. This relationship significantly differed across treatment groups ($\beta=0.03$, $p < 0.05$). Treatment group moderated the association between plan use frequency and positive affect at the within-person level ($\beta=-0.02$, $SE=0.01$, $p=0.018$), but not the between-person level ($\beta=0.07$, $SE=0.07$, $p=0.310$). In the SP group, more frequent plan use was associated with lower positive affect ($\beta=-0.02$, $SE=0.01$, $p=0.018$), suggesting that participants used their plans more on days when they experienced reduced positive affect, while this relationship was non-significant in the CRP group ($\beta=0.003$, $SE=0.01$, $p=0.737$).

3.2.2 | Negative Affect

See Table 2 (NA Model) for model results. Participants endorsed less negative affect over time ($\beta=-0.07$, $p < 0.001$). In both groups, more frequent plan use within-person was associated with greater negative affect ($\beta=0.03$, $p < 0.05$) but

TABLE 2 | Generalized Mixed-Effect Models for Suicidal Ideation (SI), Daily Average Total Positive Affect (PA) and Daily Average Total Negative Affect (NA).

Fixed effects	SI model		PA model		NA model	
	Estimate (SE)	95% CI	Estimate (SE)	95% CI	Estimate (SE)	95% CI
Intercept	-1.051 (0.001)***	-1.053, -1.050	3.064 (0.054)***	2.959, 3.169	2.906 (0.057)***	2.794, 3.019
Time	-0.887 (0.001)***	-0.888, -0.886	0.028 (0.006)***	0.016, 0.039	-0.074 (0.006)***	-0.086, -0.062
Plan use freq. (within-subject)	0.449 (0.001)***	0.448, 0.450	-0.024 (0.010)*	-0.043, -0.004	0.033 (0.016)*	0.001, 0.065
Plan use freq. (between-subject)	1.021 (0.001)***	1.020, 1.022	0.068 (0.067)	-0.063, 0.199	0.085 (0.066)	-0.044, 0.215
Group (CRP)	-0.446 (0.001)***	-0.447, -0.445	-0.024 (0.078)	-0.177, 0.129	-0.037 (0.085)	-0.204, 0.131
Plan use freq. (within-subject) × Group (CRP)	-0.373 (0.001)***	-0.374, -0.372	0.026 (0.013)*	0.001, 0.051	-0.018 (0.022)	-0.061, 0.026
Plan use freq. (between-subject) × Group (CRP)	-0.917 (0.001)***	-0.918, -0.916	-0.032 (0.077)	-0.183, 0.120	-0.115 (0.074)	-0.260, 0.030
Random effects	Variance	SD	Variance	SD	Variance	SD
Intercept	28.38	5.327	0.029	0.170	0.036	0.189
Plan use freq. (within-subject)					0.002	0.042
Plan use freq. (between-subject)					0.001	0.023
Model fit						
R2 Fixed	0.037		0.040		0.167	
R2 Total	0.900		0.426			
AIC	733.7		6917.5		6400.4	
BIC	774.3		6963.1		6471.4	

Note: + $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

between-person plan use frequency was not. These associations did not significantly differ between groups.

CRPs are used in real life, and have important implications for the clinical implementation of safety planning-type interventions with patients.

4 | Discussion

Safety planning-type interventions are meant to be used in the real world to manage one's own suicide risk. To our knowledge, no studies have investigated if patients use these plans as intended or how they affect daily clinical outcomes. This study examined whether the daily suicidal and affective experiences of patients varied as a function of the frequency of CRP versus self-guided SP use. We found that more frequent plan use was linked with lower odds of SI among CRP patients versus self-guided SP patients (i.e., between-subject effects). Furthermore, when patients in the SP versus CRP group used their plans more often than usual (i.e., a within-subject effect), they experienced higher odds of SI and lower positive affect. There were no significant group differences for negative affect, however. These results further our knowledge about how self-guided SPs and

Our findings that patients who used the CRP had lower odds of SI are notable because patients in each treatment group did not differ with respect to how often they were using their assigned plans. This suggests that, despite similarities in content types and frequency of use, the two interventions had different effects on SI and emotional states. It may be that self-guided SPs were less effective for patients because they were self-created. Although this process mirrors how SPs are often completed in clinical practice, patients may be limited in their ability to identify effective warning signs on their own. Therapist-guided versions of safety planning-type interventions, such as the CRP, involve developing a collaborative understanding of risk with the patient (i.e., the narrative assessment of a recent suicidal crisis in the CRP) to inform identification of warning signs. A recent clinical trial found that including this component of plan development reduces suicidal ideation at follow-up (Lohani, Bryan, et al. 2024) compared

to self-guided plans. Perhaps due to these factors, completion of the CRP has also been linked with a stronger therapeutic alliance with the clinician than the self-guided SP (Lohani, Baker, et al. 2024), a factor that can provide another buffer against suicidal ideation and attempts for high-risk patients (Fartacek et al. 2023; Huggett et al. 2022). Therapist involvement in the development of the CRP may have also contributed to better implementation of coping skills. Patients often need “coaching” from clinicians to identify which skills they are able to use effectively in crisis situations, and when it is appropriate to use them (Linehan 2014). During the development of the CRP, clinicians encourage patients to use their CRPs repeatedly and “prophylactically” (i.e., at lower levels of distress) to become proficient in using their coping skills (Bryan and Rudd 2018). As such, it is possible that many patients in this study were using their CRPs prior to experiencing suicidal thoughts. Since the presence of heightened distress can disrupt cognitive control functions (Allen et al. 2019; Bozzay and Verona 2023; Hudson 2016), this approach may enable patients to use their plans more effectively in the moment, reducing the likelihood of experiencing SI that day. Still, additional research elucidating the reasons for these differences is needed to guide more effective development of safety planning-type interventions with patients. Qualitative research examining patients' perspectives on developing and using both interventions may be especially useful for identifying such differences. Of note, the self-guided SP also includes means safety—a component that is not included in the CRP. Future research is thus needed to examine which specific components of the plans are more frequently used (e.g., self-management strategies versus social support) and if certain components (combined or as a standalone) have a stronger impact on clinical outcomes than others to lead to further refinement of the interventions.

It is also possible that differences in daily positive and negative affective experiences across treatment groups partially explain the reduced risk of SI in the CRP group. We found that, on days when patients more frequently used the CRP, they experienced greater positive affect than patients in the self-guided SP group. And, when patients used their CRPs more frequently than was typical for them, their positive affect was even more amplified. Since suicide risk results from a “push-pull” between risk and protective processes, it may be that the presence of greater positive affect helped to buffer against distress, reducing the risk of experiencing suicidal thoughts. Indeed, positive affect can foster resilience to stress by reducing physiological stress responses (van Steenbergen et al. 2021), and facilitating emotional regulation and cognitive coping processes (Waugh 2020), factors which could enable patients to more effectively use their CRPs. Moreover, research shows that positive affect is protective against the risk of daily SI (Husky et al. 2017). Specific components of the CRP, such as reasons for living, may particularly amplify positive affective experiences and help to buffer against suicide risk. During the development of the CRP, rather than just creating a checklist of reasons for living, patients identify a specific memory or value that makes a particular reason for living more emotionally salient, to make the emotional connection to that reason for living more retrievable during a distressed state. Notably, reasons for living mediate the association between stressors, coping, and suicidal behavior (Bagge et al. 2014; Wang et al. 2007) and protect against suicidal ideation and attempts (Bakhiyi et al. 2016). Nevertheless, since we measured plan use

at the day level in this study, we were unable to examine whether plan use preceded changes in affect. Thus, additional research disentangling the temporal nature of these effects, and to understand the aspects of CRP use that contribute to positive affect is needed to identify strategies for amplifying this important protective effect in safety planning-type interventions.

The current findings also have important clinical implications. Findings suggest a collaborative, non-templated safety planning-type intervention that includes reasons for living and is used as a “prophylactic” may lead to a lower risk of SI and greater positive affect. While SP was designed to be collaboratively developed between providers and patients, self-guided templated forms are commonly used in the real world due to time constraints in certain settings (e.g., emergency departments). The collaborative aspect, however, may be especially important and impact the frequency of plan use and its outcomes. Thus, providers administering safety planning-type interventions are encouraged to collaboratively develop the plan with patients and discuss how the plan can also be used during heightened emotional distress to interrupt the cascade to a suicidal crisis, and not just when suicidal urges occur. While collaboratively developed plans may take a bit longer to complete compared to self-guided plans, the benefits of it leading to a lower risk of SI and greater positive affect may better empower patients to self-regulate and manage crises on their own, thereby contributing to better patient outcomes. We also found that negative affect did not differ across the two treatment groups, suggesting that these interventions do not necessarily have to reduce negative affect to reduce the risk of SI. Rather, enhancing positive affect, such as through the use of coping skills or thinking of reasons for living, may be more impactful on reducing SI.

Nevertheless, due to our study design, even though patients in the self-guided SP condition created plans on their own, they may have had some clinical follow-up related to their plans during sessions. Notably, *completely* self-guided SPs in which patients create their own plans and receive no clinical follow-up related to their plans are not uncommon (i.e., lost to contact after creating plan; provider does not follow up on plans in later sessions). However, there is a paucity of research investigating plan use in the absence of clinical follow-up, with most major studies (i.e., ED-SAFE; Miller et al. 2017), including this one, including some element of additional clinical contact, making it difficult to truly understand how vital clinical interactions are for promoting and enhancing plan use. However, some research suggests that those clinical interactions may be critical for the survivability of high-risk patients. In one study, clinicians followed up with callers several times after they had made an initial crisis call to the National Suicide Prevention Lifeline (Gould et al. 2018). Most follow-up calls included practices typically employed in the CRP or SP (i.e., discussing coping strategies, identifying social contacts to call for help, discussing warning signs/triggers to suicide risk; >90%) and explored reasons for living (77%) – essentially reinforcing plan use. Most callers also stated that the follow-up contacts prevented them from killing themselves (>80%). Additional research is thus needed to examine whether safety planning-type interventions are effective (and regularly used) in the absence of clinical follow-up. Such findings could have critical implications for reducing suicides as some of the patients who are most vulnerable to dying by suicide are also those who may be most likely to be lost to clinical contact. Of note, recent research showed

that only 37% to 61% of patients use their safety planning-type interventions in the high-risk weeks post-discharge from an inpatient unit or emergency department (Leonard et al. 2021; Stanley et al. 2016), indicating a clear need for research to help understand how to more effectively implement these plans and promote their use among suicidal patients.

4.1 | Limitations

This study has several limitations. First, it was conducted in a sample of military personnel and veterans seeking treatment for PTSD; thus, additional research to ascertain the generalizability of our findings to other diagnostic and demographic subgroups is needed. Second, we used a daily measure of frequency of plan use in our analyses, precluding a more fine-grained assessment of the temporal process by which plan use may impact the experience of affect and suicidal ideation. We also did not assess plan use overnight, which may be a period of time when patients are especially vulnerable to experiencing SI. Relatedly, although our study implicates CRP use in different patient experiences in SI and affect compared to the self-guided SP, the design of our study precludes making causal inferences about the nature of these findings. Third, it is possible that EMA prompts may have reminded participants to use their plans, inflating the frequency of plan use in this study. Fourth, participants did not complete a sizable portion of EMA prompts (~40%). Although our compliance rate is comparable to that of patients with high suicide risk and/or psychiatric diagnoses (Bozzay et al. 2024; Schatten et al. 2025), it is unclear why participants did not answer these prompts (i.e., busyness versus high distress) and how relevant their reason(s) may have been for understanding why they did or did not use their plans. It is also unknown if they were using their plans during times of missed prompts. Fifth, our study measured a single facet of suicidal ideation, and we did not assess suicidal behaviors via EMA. Characterizing the use of safety planning-type interventions in relation to broader dimensions of suicide risk and suicide attempts, in particular, is thus an important direction for future research in this area.

5 | Conclusions

Nevertheless, this study is the first to examine whether daily suicidal and affective experiences varied as a function of CRP versus self-guided SP use in the real world. These findings provide key information about how self-guided SPs and CRPs are used by patients and suggest that the two interventions have different effects on suicidal ideation and emotional states in real life, with CRP use linked to a lower risk of suicidal ideation and greater positive affect compared to SP use. Findings have important implications for how providers can deliver safety planning-type interventions to enhance their use by patients in the real world.

Author Contributions

M.B. conceptualized the research question. X.C. and J.C. completed the data analyses. M.B., X.C., J.C., S.D., and C.J.B. wrote the original manuscript. L.K., H.W., N.P.A., and A.O.B. revised the manuscript. All authors have reviewed and approved the final manuscript.

Acknowledgments

This work was supported in part by grants from the Boeing Company to C. Bryan; the National Institute of Mental Health (R01MH136286) to M. Bozzay and N. P. Allan; and charitable contributions from Honor 365, Ride to Zero, and 33 Forever to C. Bryan and A. Bryan. It is also supported by the National Center for Advancing Translational Sciences, Grant UL1TR001070. The content is solely the responsibility of the authors and does not necessarily represent the official views of the Boeing Company, the National Institute of Mental Health, Honor 365, Ride to Zero, or 33 Forever.

Ethics Statement

All study procedures were approved by The Ohio State University Institutional Review Board (#2020H0431).

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

Research data are not shared.

Endnotes

¹The original clinical trial recruited 157 participants (CRP: $n=76$; Self-guided SP: $n=81$). Of these individuals, 129 participants (~82%) agreed to participate in the EMA component of the study ($n=129$). The majority of these individuals provided EMA responses ($n=116$). Of the 157 total participants, a similar proportion of individuals in both conditions (75% of individuals in the safety planning condition and 71% in the crisis response planning condition) completed EMA and were included in this study.

²It could be that answering questions about CRP/SP use reminded participants that they had plans—which could have encouraged them to use their plans more frequently. Notably, our prompts included items that could be linked to prophylactic use to interrupt a crisis (i.e., distress/affect) or use in a crisis (i.e., suicide risk items) – meaning that if participants were using plans prophylactically vs. in a crisis, and if this were to be a factor impacting when and how participants decided to use plans, the survey should have in a sense ‘triggered’ reminders for both plan types. Upon further inspection, we found that the SP/CRP groups did not significantly differ in frequency of plan use ($p>0.05$), and we also found that they did not differ in terms of overall EMA compliance ($p>0.05$). This suggests that, if there are effects of EMA prompts on plan use, they did not differentially prompt use of SPs/CRPs.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section. **Appendix S1:** slrb70050-sup-0001-AppendixS1.docx.