

# Evidence-Based Psychotherapies for Suicide Prevention

## Future Directions

Gregory K. Brown, PhD, Shari Jager-Hyman, PhD

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Psychotherapeutic interventions targeting suicidal thoughts and behaviors are essential for reducing suicide attempts and deaths by suicide. To determine whether specific psychotherapies are efficacious in preventing suicide and suicide-related behaviors, it is necessary to rigorously evaluate therapies using RCTs. To date, a number of RCTs have demonstrated efficacy for several interventions focused on preventing suicide attempts and reducing suicidal ideation. Although these studies have contributed greatly to the understanding of treatment for suicidal thoughts and behaviors, the extant literature is hampered by a number of gaps and methodologic limitations. Thus, further research employing increased methodologic rigor is needed to improve psychotherapeutic suicide prevention efforts. The aims of this paper are to briefly review the state of the science for psychotherapeutic interventions for suicide prevention, discuss gaps and methodologic limitations of the extant literature, and suggest next steps for improving future studies.

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### Introduction

The development and implementation of effective interventions are imperative for reducing rates of suicide and related behaviors. In response to the ongoing need for effective treatments aimed at preventing suicide and self-directed violence, the National Action Alliance for Suicide Prevention's (Action Alliance) Research Prioritization Task Force (RPTF)<sup>1</sup> has proposed the following Aspirational Goal focused on psychotherapeutic interventions: "...develop widely available, more effective and efficient psychosocial interventions targeted at individuals, families, and community levels."

The current paper has three main aims in discussing this Aspirational Goal. First, with a focus on RCTs, the state of the science for evidence-based psychotherapy interventions for suicidal ideation and behavior is reviewed. Second, limitations of the current research and suggestions for future research are discussed. Finally, a step-by-step pathway for evaluating psychotherapy interventions for suicide prevention is proposed.

### State of the Science of Evidence-Based Treatments for Suicide Prevention

Several RCTs<sup>2–5</sup> have demonstrated promising results in reducing suicide attempts and self-directed violence. A comprehensive review of the literature is beyond the scope of this paper; however, reviews<sup>2–5</sup> were used to identify studies to include in this brief review. A selection of studies yielding positive effects will be highlighted and presented in Table 1. Briefly, cognitive therapy for suicide prevention (CT-SP)<sup>6</sup>; cognitive-behavioral therapy (CBT)<sup>7</sup>; dialectical behavior therapy (DBT)<sup>8</sup>; problem-solving therapy (PST)<sup>9</sup>; mentalization-based treatment (MBT)<sup>10</sup>; and psychodynamic interpersonal therapy (PIT)<sup>11</sup> have all evidenced positive effects for preventing suicide attempts or self-directed violence in adults.

More specifically, recent suicide attempters who received CT-SP were 50% less likely to reattempt than participants who received enhanced usual care (EUC) with tracking and referrals.<sup>6</sup> CBT plus treatment as usual (TAU) also reduced self-harming behaviors relative to TAU alone.<sup>7</sup> For individuals with borderline personality disorder (BPD), DBT demonstrated a greater reduction in suicide attempts relative to community treatment by experts.<sup>8</sup> However, DBT was not statistically more effective than a manualized general psychiatric management condition, consisting of case management, dynamically informed psychotherapy, and medication management.<sup>12</sup>

Also focused on BPD, MBT, a psychoanalytically oriented partial hospitalization program, was more

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From the Perelman School of Medicine of the University of Pennsylvania, Philadelphia, Pennsylvania

Address correspondence to: Gregory K. Brown, PhD, Department of Psychiatry, University of Pennsylvania, 3535 Market Street, Room 2032, Philadelphia PA 19104-3309. E-mail: gregbrow@mail.med.upenn.edu.

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Table 1. Summary of select RCTs

Authors	Sample	Study intervention	Control condition	Outcome variables	Follow-up intervals	Main findings
Bateman and Fonagy (1999) <sup>10</sup>	Adults with BPD referred to psychiatric unit	Partial hospitalization (n=19)	Standard psychiatric care (n=19)	Suicide attempts	3, 6, 9, 12, 15, 18 months	Patients who received the study intervention experienced a significant reduction in attempts from admission to 18 months (Kendall's $W=0.59$ , $\chi^2(3)=33.5$ , $p < 0.001$ )
Blum et al. (2008) <sup>13</sup>	Adults with BPD	STEPS plus TAU (n=65)	TAU (n=59)	Suicide attempts	1, 3, 6, 9, 12 months	No differences in time to first suicide attempt between STEPPS + TAU and TAU groups; $\chi^2(1) < 0.1$ , $p=0.994$
Brown et al. (2005) <sup>6</sup>	Adults recruited from ED following a suicide attempt	CT (n=60)	EUC (n=60)	Suicidal ideation, suicide attempts	1, 3, 6, 12, 18 months	At 6 months, using the Kaplan-Meier method, estimated reattempt-free probability: CT group=0.86 (95% CI=0.74, 0.93); usual care =0.68 (95% CI=0.54, 0.79) At 18 months, estimated reattempt-free probability: CT=0.76 (95% CI=0.62, 0.85); usual care=0.58 (95% CI=0.44, 0.70) Patients in the CT condition had a significantly lower reattempt rate (Wald $\chi^2=3.9$ , $p=0.049$ ) and were 50% less likely to reattempt than the usual care group (hazard ratio=0.51, 95% CI=0.26, 0.997) There were no significant group differences in suicidal ideation
Bruce et al. (2004) <sup>21</sup>	Depressed older adults recruited from primary care	Structured, team-based intervention including citalopram + psychotherapy (n=320)	TAU (n=278)	Suicidal ideation	4, 8, 12 months	Rates of suicidal ideation declined faster for the intervention group (12.9% decline from baseline) than the TAU group (3.0% decline from baseline); $p=0.01$ for all depressed patients, $p=0.006$ for patients with MDD)
Comtois et al. (2011) <sup>17</sup>	Adults evaluated for suicide attempt or imminent risk but judged safe for discharge	CAMS (n=16)	E-CAU (n=16)	Suicide attempts, suicidal ideation	2, 4, 6, 12 months	Participants who received CAMS made fewer suicide attempts than those who received E-CAU at 2, 4, and 6-month follow-ups <sup>a</sup> Suicidal ideation improved significantly for CAMS patients, reaching 89% reduction at 12 months, RR=0.11, 95% CI=0.04, 0.30; at 12 months, E-CAU patients reported significantly worse suicidal ideation than CAMS patients (RR=4.81, 95% CI=1.61, 14.33)

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Table 1. Summary of select RCTs (continued)

Authors	Sample	Study intervention	Control condition	Outcome variables	Follow-up intervals	Main findings
Davidson et al. (2006) <sup>14</sup>	Adults with BPD and an episode of DSH within the past 12 months	CBT + TAU (n=53)	TAU (n=49)	Suicidal acts	6, 12, 18, 24 months	After 24 months, there was a greater reduction in number of suicidal acts in the intervention group compared to the TAU group (mean difference=-0.91, p=0.020)
Diamond et al. (2010) <sup>19</sup>	Adolescents identified as suicidal by screening during primary care or ED visits	ABFT (n=35)	EUC (n=31)	Suicidal ideation	6, 12, 24 weeks	At the 12-week assessment, patients receiving ABFT demonstrated a significantly greater rate of improvement in suicidal ideation than patients receiving EUC, $F(1, 64)=12.60$ , $p=0.001$ . ABFT had a significant effect on clinical recovery (SIQ-JR $\leq 13$ ) of suicidal ideation at all time points; at 6 weeks, 69.7% of ABFT patients and 40.7% of EUC patients reported suicidal ideation in the normative range, OR=3.35, 95% CI=1.15, 9.73, $\chi^2(1)=5.07$ , $p=0.02$ ; at 12 weeks, 87.1% of ABFT patients and 51.7% of EUC patients reported ideation in the normative range, OR=6.30, 95% CI=1.76, 22.61, $\chi^2(1)=8.93$ , $p=0.003$ ; at 24 weeks, 70% of ABFT patients and 34.6% of EUC patients reported ideation in the normative range, OR=4.41, 95% CI=1.43, 13.56, $\chi^2(1)=7.01$ , $p=0.008$
Guthrie et al. (2001) <sup>11</sup>	Adults presenting to ED after self-poisoning	Psychodynamic interpersonal therapy delivered in home (n=58)	TAU (n=61)	Suicidal ideation	1, 6 months	At the 6-month follow-up assessment, patients receiving the study intervention reported lower levels of suicidal ideation compared to those receiving TAU (differences between means=-4.9, 95% CI=-8.2, -1.6, $p=0.005$ )
Hatcher et al. (2011) <sup>9</sup>	Adults presenting to a hospital after self-harm	PST (n=522)	Usual care (n=572)	Self-harm	3, 12 months	Fewer patients receiving PST reported repeat episodes of self-harm at the 12-month assessment than those receiving usual care (RR=0.39, 95% CI=0.07, 0.60, $p=0.03$ )
Huey et al. (2004) <sup>16</sup>	Youth following ED visit for suicide attempt, ideation, or planning	MST <sup>b</sup>	Standard treatment <sup>b</sup>	Suicidal ideation, suicide attempts	4, 16 months	MST was significantly more effective than standard treatment at reducing suicide attempts over 16 months, $t(\text{linear})=2.61$ , $p<0.01$ , $t(\text{quadratic})=3.60$ , $p<0.001$ . There were no significant group differences for suicidal ideation

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Table 1. Summary of select RCTs (continued)

Authors	Sample	Study intervention	Control condition	Outcome variables	Follow-up intervals	Main findings
Linehan et al. (2006) <sup>8</sup>	Women with BPD with $\geq 2$ episodes of self-harm in the past 5 years, including $\geq 1$ within the past 8 weeks	DBT (n=52)	Community treatment by experts (n=49)	Suicidal ideation, suicide attempts	4, 8, 12, 16, 20, 24 months	Fewer patients receiving DBT had suicide attempts than those receiving treatment by experts (23.1% vs 46%, hazard ratio=2.66, $p=0.005$ , NNT=4.24, 95% CI=2.40, 18.07); the mean proportions of suicide attempters per treatment group per period were 6.2% (95% CI=3.1%, 11.7%) and 12.2% (95% CI=7.1%, 20.3%) for the DBT and control groups, respectively Fewer patients receiving DBT than community treatment by experts had non-ambivalent suicide attempts (5.8% vs 13.3%, $p=0.18$ , Fisher's exact test and NNT=13.3, 95% CI=5.28, 25.41) There were no significant group differences for suicidal ideation
McMain et al. (2009) <sup>12</sup>	Adults with BPD with $\geq 2$ suicidal or non-suicidal self-injurious episodes in the past 5 years, $\geq 1$ episode in the past 3 months	DBT (n=90)	General psychiatric management (n=90)	Frequency and severity of suicidal episodes	4, 8, 12 months	There were no significant group differences for suicidal episodes
Slee et al. (2008) <sup>7</sup>	Adults who recently engaged in deliberate self-poisoning or self-injury	CBT + TAU (n=40)	TAU (n=42)	Self-harm, suicidal cognition	3, 6, 9 months	At 9 months, patients who received CBT + TAU had significantly greater reductions in self-harm than those who received TAU alone ( $p < 0.05$ ) CBT + TAU patients had significantly decreased suicidal cognitions as compared to TAU patients at the 3- ( $p < 0.05$ ), 6- ( $p < 0.05$ ), and 9-month ( $p < 0.01$ ) assessments
Stewart et al. (2009) <sup>18</sup>	Adults in treatment following a suicide attempt	CBT (n=11), PST (n=12)	TAU (n=9)	Suicidal ideation, suicide attempts	4 weeks (PST), 7 weeks (CBT), 2 months (TAU)	CBT was the most effective treatment for reducing suicide attempts; patients receiving CBT made no attempts during the study, whereas patients receiving PST and TAU made an average of 0.33 attempts and 0.22 attempts, respectively Suicidal ideation decreased with both CBT ( $z = -2.32$ , $p < 0.05$ , $r = -0.49$ ) and PST ( $z = -2.39$ , $p < 0.05$ , $r = -0.49$ ); decreases in suicidal ideation were greater for the PST than TAU group ( $U = 26.5$ , $p \leq 0.05$ , $r = -0.49$ )

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Table 1. Summary of select RCTs (continued)

Authors	Sample	Study intervention	Control condition	Outcome variables	Follow-up intervals	Main findings
Unützer et al. (2006) <sup>20</sup>	Older adults with MDD or dysthymia	IMPACT intervention (n=906)	Usual care (n=895)	Suicidal ideation	6, 12, 18, 24 months	Fewer patients receiving the IMPACT intervention than usual care reported thoughts of suicide at 6 (OR=0.54, 95% CI=0.37, 0.78, p=0.001), 12 (OR=0.54, 95% CI=0.40, 0.73, p<0.001), 18 (OR=0.52, 95% CI=0.36, 0.75, p<0.001), and 24 (OR=0.65, 95% CI=0.46, 0.91, p<0.01) months. Fewer patients receiving the IMPACT intervention reported thoughts of death or dying at 6 (OR=0.62, 95% CI=0.49, 0.78, p<0.001), 12 (OR=0.44, 95% CI= 0.35, 0.56, p<0.001), 18 (OR=0.62, 95% CI=0.49, 0.79, p<0.001), and 24 (OR=0.72, 95% CI=0.57, 0.92, p=0.01) months.
Wood et al. (2001) <sup>15</sup>	Adolescents referred to mental health services after deliberate self-harm	Group therapy (n=32)	Routine care (n=31)	Repetition of self-harm, suicidal thinking	6 weeks, 7 months	Participants who received group therapy were less likely to repeat self-harm than those who received routine care (OR=6.3, 65% CI=1.4, 28.7). There were no significant group differences regarding suicidal thinking.

Note: Only outcomes related to suicide ideation and attempts are reported.

<sup>a</sup>No statistical analyses were performed for these results.

<sup>b</sup>Study did not indicate the number of participants per condition.

ABFT, attachment-based family therapy; BPD, borderline personality disorder; CAMS, collaborative assessment and management of suicidality; CBT, cognitive-behavioral therapy; CT, cognitive therapy; DBT, dialectical behavior therapy; DSH, deliberate self-harm; E-CAU, enhanced care as usual; ED, emergency department; EUC, enhanced usual care; IMPACT, Improving Mood: Promoting Access to Collaborative Treatment; MDD, major depressive disorder; MST, multisystemic therapy; NNT, number needed to treat; PST, problem-solving therapy; RR, risk ratio; SIQ-JR, Suicide Ideation Questionnaire-Junior; STEPPS, systems training for emotional predictability and problem solving; TAU, treatment as usual

effective than general psychiatric services in reducing suicidal and self-mutilatory acts.<sup>10</sup> Similarly, relative to TAU alone, PST plus usual care resulted in a decrease in repeat hospitalizations for self-harm in individuals with a history of previous self-harm.<sup>9</sup> Finally, four home-based sessions of interpersonal therapy were more effective than TAU in reducing suicidal ideation and repeated self-harm in individuals who self-poisoned.<sup>11</sup>

Although a number of suicide-prevention interventions have evidenced efficacy, other interventions, including systems training for emotional predictability and problem solving<sup>13</sup> and CBT for Cluster B personality disorders,<sup>14</sup> have not been supported empirically. For a comprehensive review of negative findings, please see previous reviews.<sup>2-5</sup>

Fewer studies<sup>15,16</sup> have demonstrated efficacy for psychotherapy interventions in reducing self-directed violence in adolescents. Wood and colleagues<sup>15</sup> found that adolescents who received developmental group therapy (consisting of components of CBT, DBT, and psychodynamic group therapy) plus TAU were less likely to engage in repeated deliberate self-harm on two or more occasions than those who received TAU alone. Finally, multi-systemic therapy, an intensive family-based treatment, reduced the frequency of suicide attempts compared to treatment received during inpatient hospitalization.<sup>16</sup>

In addition to psychosocial interventions designed to prevent suicide attempts, several psychotherapy treatments directly target suicidal ideation. Specifically, collaborative assessment and management of suicidality (CAMS),<sup>17</sup> CBT,<sup>18</sup> PST,<sup>18</sup> and PIT<sup>11</sup> have resulted in the reduction of suicidal ideation in adults. CAMS, a therapeutic framework focused on identifying causes of suicidal ideation and treatment goals for reducing suicidal ideation, was associated with significantly greater and sustained reduction of suicidal ideation at 12 months post-treatment compared to TAU.<sup>17</sup> Similarly, both PST and CBT resulted in greater reduction of suicidal ideation than TAU.<sup>16</sup> Attachment-based family



therapy, which focuses on strengthening the parent–adolescent attachment bond, has also demonstrated promise in reducing suicidal ideation in suicidal adolescents relative to EUC.<sup>19</sup>

Finally, to our knowledge, two studies have demonstrated efficacy in reducing suicidal ideation in depressed older adults in primary care settings.<sup>20,21</sup> The Improving Mood: Promoting Access to Collaborative Treatment study determined that a collaborative, team-based approach to treating depression resulted in a greater reduction of suicidal ideation than usual care. The Prevention of Suicide in Primary Care Elderly: Collaborative Trial intervention, consisting of a clinical algorithm for treating geriatric depression in primary care settings and care management, was more effective in reducing suicidal ideation than EUC.

### **Limitations of the Current State of the Science**

Although the aforementioned RCTs represent important first steps in gaining a deeper understanding of effective suicide prevention strategies, several gaps and methodologic concerns limit conclusions that can be drawn from these studies. Several significant gaps in the literature should be noted. First, given the paucity of RCTs powered to detect deaths by suicide, it is unknown whether death by suicide (rather than suicide attempts) can be prevented by psychotherapy. Moreover, it is unclear as to whether the reduction of suicide attempts or ideation via psychotherapy actually reduces deaths by suicide.

Second, many studies focused on suicide prevention exclude patients at imminent risk for suicide, making it impossible to determine whether interventions that are efficacious for lower-risk patients are also efficacious for those at highest risk.<sup>22</sup> Third, there are limited psychotherapy RCTs focused on preventing suicide attempts for many at-risk populations, including older adults; Veterans or military service members; lesbian, gay, bisexual, transgender, queer, and two-spirit (LGBTQ2) populations; Native Americans and other minority groups; and survivors of suicide or suicide attempts. It is unclear whether the results of existing RCTs generalize to these populations.

Additionally, the majority of psychotherapy interventions for suicidal thoughts and behaviors have been conducted in outpatient settings, and very few RCTs have been conducted in acute care settings, such as emergency departments, inpatient units, and crisis hotlines. The development of interventions for these settings is particularly important given that many high-risk patients only present to acute care services and never receive additional psychosocial treatment. The dearth of knowledge about effective treatments for inpatient settings is especially

alarming given that the current standard of care is to admit high-risk patients to inpatient units. This suggests that patients who are at high risk for suicide may not receive appropriate evidence-based treatments to prevent suicide.

A final gap in the extant research examining the efficacy of psychotherapy interventions for suicide prevention is the failure to replicate studies in which treatments have been found to be efficacious. It is especially critical that replication trials be conducted by independent researchers, as in some cases replication studies conducted outside of the original research groups have failed to demonstrate the same beneficial effects.<sup>12</sup>

A variety of methodologic limitations of the existing research hamper the ability to draw firm conclusions regarding the effectiveness and generalizability of various suicide prevention efforts (limitations have been published elsewhere<sup>1–4</sup>). First, a lack of consensus regarding terms and operationalized definitions used to describe suicide, attempts, ideation, and other related behaviors limits the ability to generalize across studies and replicate findings. Researchers also often neglect to use reliable and validated measures of suicidal ideation and behaviors, making it difficult to understand the specific behaviors measured and targeted by the interventions in question.

In addition, many previously published RCTs do not provide detailed psychotherapy manuals. The absence of treatment manuals creates significant challenges for dissemination and implementation efforts in the community and precludes appropriate replication studies. Furthermore, researchers often neglect to include measures assessing the integrity of the study intervention. It is important to assess the extent to which study therapists adhere to the theory and practice of the intervention of interest.

An additional common methodologic problem is that studies are underpowered to adequately detect treatment effects, causing potentially efficacious treatments to yield negative results owing to lack of power rather than lack of efficacy. Moreover, very few studies include descriptions of power analyses, making it difficult to determine the reasons for failing to find positive effects. Other studies conduct power analyses based on unlikely or biased estimates of effects, leading to inadequate estimates of sample sizes. Conservative estimates are necessary to ensure that samples are powered sufficiently to detect effects.

Given that RCTs are generally longitudinal, attrition is common and results in an additional methodologic issue of handling missing data. This is particularly problematic when dropout rates differ across treatment conditions, which may result in biased results.<sup>7</sup> As recommended in the CONSORT guidelines for reporting RCT results, intention-to-treat analysis is a helpful statistical approach to handling missing data to minimize bias.<sup>23</sup>

Other methodologic limitations encountered in the extant literature include potential threats to external validity by choosing highly selective samples<sup>11</sup>; failure to use blind investigators, assessors, or patients or specify whether blinding was implemented; potential measurement bias (e.g., using differential measurement intervals and methods for assessing primary outcomes in intervention and control groups<sup>10</sup>); failure to identify, measure, and control for potential non-study co-interventions (e.g., pharmacotherapy); and analyses capitalizing on differences in baseline characteristics.<sup>16</sup>

It is also advised that researchers focus on a priori analyses and refrain from making firm conclusions on the basis of unplanned, underpowered subgroup analyses. Finally, stratified randomization is an important tool in preventing Type I errors and imbalance between treatment groups, particularly for smaller trials in which known factors influence treatment responsiveness.

### **Next Steps and Breakthroughs Needed**

Although the existing RCTs have created an important jumping-off point for evaluating future psychotherapeutic interventions for suicide attempts and ideation, much work remains. The adoption of the following recommendations may lead to increased methodologic rigor with which suicide research is conducted, and in turn, the development and dissemination of treatments that reduce suicidal ideation, suicide attempts, and ultimately, suicide.

Given that the current lack of consensus of terms and definitions leads to difficulty in interpreting results and aggregating findings across studies, an important short-term goal is to adopt an agreed-upon nomenclature for all studies addressing suicide-relevant thoughts and behaviors, such as the self-directed violence nomenclature proposed by the CDC's National Center for Injury Prevention and Control.<sup>24</sup> It is then essential to employ valid and reliable measures to assess these constructs.

The Columbia Suicide Severity Rating Scale (C-SSRS<sup>25</sup>) is one such measure endorsed by the U.S. Food and Drug Administration for use in pharmaceutical trials. It would also be beneficial to use an agreed-upon measure for psychotherapy trials. Furthermore, to achieve continuity across studies, it would be helpful for all studies to use the same endpoints in reporting outcomes, thereby increasing the ease with which results can be aggregated across studies via meta-analyses.

There is also a need for methods to address ambiguous suicide behavior that may not neatly fit into a specific category of suicidal thoughts or behaviors. One potential solution to this problem is to form suicide adjudication boards to review ambiguous behaviors and reach a consensus regarding appropriate classification.<sup>26</sup>

An additional short-term goal is to develop interventions designed for high-risk populations, including older adults, Veterans or military service members, LGBTQ2 individuals, minority groups, and survivors of suicide or suicide attempts as indicated by empirical research. There is also a need for methods to screen and treat high-risk individuals in acute care settings, including emergency departments, crisis hotlines, and inpatient units.

As previously mentioned, many studies assessing the efficacy of treatments for suicide prevention are underpowered. Although preliminary studies to determine acceptability and feasibility of specific interventions are necessary, large-scale RCTs that are adequately powered to detect treatment effects are also imperative. This is true for studies assessing treatments focused on reducing suicidal thoughts, suicide attempts, and other self-directed violence, as well as those designed to evaluate treatments for the prevention of deaths by suicide.

Because suicide is a low base rate behavior, very large samples are required to conduct adequately powered trials. Multi-site collaborations allow the collection of data from large samples while reducing financial and organizational burden on any one site. In addition, the use of standardized outcome measures and data sharing may facilitate meta-analytic approaches and circumvent problems associated with inadequately powered studies.

Further development and dissemination of treatments specifically targeting suicidal ideation are also necessary, particularly for populations such as older men who have the highest rates of suicide of any age group.<sup>27</sup> Despite their increased rate of deaths by suicide, older adults are less likely to make suicide attempts than individuals in any other age group.<sup>28</sup> Suicidal ideation may thus serve as the only warning sign of future suicides in older adults, making it especially important to specifically target suicidal ideation in this population. As frequent attempts are less common in this population, treatments focused on preventing attempts may be less appropriate.

Because suicidal ideation is a dimensional construct that waxes and wanes over time, RCTs should include appropriate measures for tracking fluctuations in suicidal ideation. The use of ecological momentary assessment, for example, would provide much-needed insight into the fluctuation of suicidal ideation and inform the development of timely interventions that specifically target changes in suicidal ideation.

Very little is known about whether positive effects of psychotherapies for suicide prevention extend beyond laboratory settings. In addition to efficacy trials, effectiveness trials are also needed to assess whether specific treatments work in real-world settings. Moreover, in order to increase external validity of psychotherapy trials,

it is important that inclusion and exclusion criteria result in samples that reflect patients as they present in the real world (e.g., the exclusion of potential participants who do not misuse substances may result in a biased sample of suicide attempters<sup>10</sup>).

There is a need to better develop mechanisms to ensure that the individuals at risk of suicide have access to treatments that work. In designing interventions, researchers should consider ways to increase the feasibility and ease with which treatments can be disseminated and adapted to various settings. For example, future psychotherapies that can be implemented in rural settings using telehealth technologies are needed.

In addition, researchers are encouraged to clearly communicate the specific treatment components necessary to successfully implement interventions in non-laboratory settings. Another potential approach to increasing the availability of evidence-based treatments is to develop innovative electronic health interventions (e.g., smartphone applications, texting, web-based interventions, or chat rooms) as either widely available stand-alone interventions or adjunctive treatments to face-to-face interventions. Finally, further research is needed to determine the cost-effectiveness and cost utility of psychotherapy studies for suicide prevention.

As researchers continue to find support for treatments that reduce suicidal thoughts and behaviors, it is necessary to identify potential mechanisms of actions that account for therapeutic change. Thus, in addition to asking whether a treatment works, it is essential to ask why a treatment works. This can be achieved by including measures assessing constructs underlying treatment effects, such as improvements in hopelessness or emotion regulation. Identifying mechanisms of action will allow for the

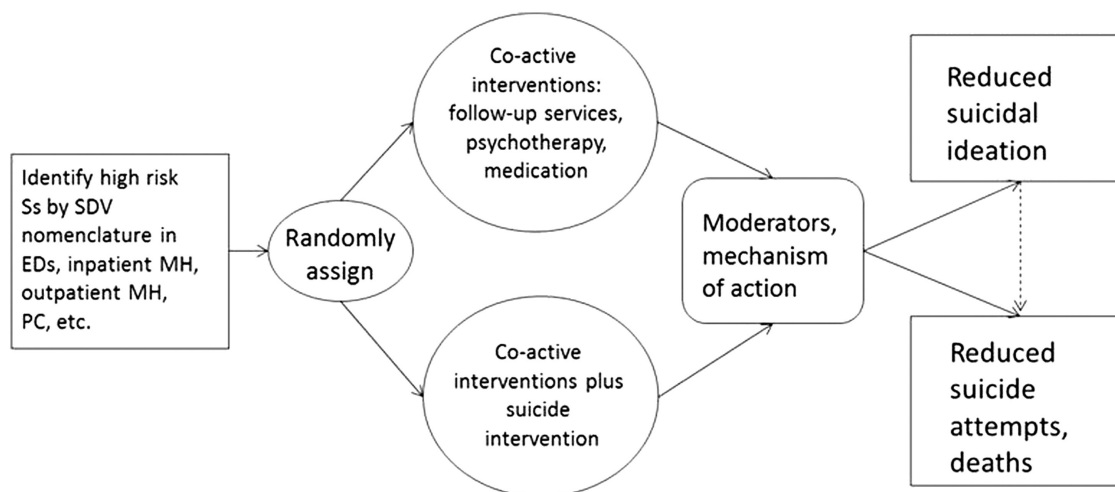
development of more efficient, targeted treatments and may provide insight into which treatments work best for whom.

In addition to identifying treatments that are effective in reducing suicide ideation and behaviors, it is also important to understand which treatments have not garnered support in psychotherapy trials. Systematic trial registration is one method for reducing the “file-drawer effect” in which negative findings are not presented to the public.

Given the gaps and methodologic flaws in the literature focused on psychotherapy interventions for suicide prevention, additional research is needed to determine the efficacy of existing and future treatments. Thus, we propose a general step-by-step research pathway for conducting future RCTs with high-risk patients for examining the efficacy of new psychotherapy treatments (Figure 1).

The first step of this paradigm is to identify high-risk subjects by using agreed-upon nomenclature (e.g., CDC nomenclature) as well as validated and reliable assessment measures. These high-risk patients can be recruited from a variety of settings including emergency departments, inpatient units, mental health outpatient clinics, and primary care. Following recruitment and initial assessment to determine eligibility, it is recommended that patients be randomly assigned to either (1) the co-active intervention condition, which may include medication, treatment as usual, a comparative therapy, or follow-up services, or (2) the same co-active intervention plus a suicide-specific study intervention condition.

Alternatively, depending on the question of interest, it may be more appropriate to omit the co-active intervention for participants who are randomized to the suicide-specific study intervention condition. In order to gain an understanding of the pathways by which



**Figure 1.** Proposed step-by-step research pathway for conducting RCTs

ED, emergency department; MH, mental health; PC, primary care; SDV, self-directed violence; Ss, subjects



treatment affects the outcome of interest (i.e., suicidal ideation, suicide attempts, or suicides), it is imperative to examine moderators of the study treatment and potential mechanisms of actions. Elucidating the moderators and mechanisms at play will inform the development of more efficient and targeted future interventions. This paradigm will also allow for increased understanding of the relation between reductions in suicidal ideation and reductions in suicide attempts or deaths by suicide.

## Conclusions

Despite important advances in the development and evaluation of psychotherapeutic treatments for suicide prevention, additional research is needed to improve the current state of the science. A focus on filling the gaps in the literature and increasing methodologic rigor with which RCTs of suicide-prevention psychotherapies are conducted will lead to increasingly effective treatments for reducing suicidal ideation, attempts, and deaths.

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