

A Review of Evidence-Based Follow-Up Care for Suicide Prevention

Where Do We Go From Here?

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Context: Follow-up services are an important component of a comprehensive, national strategy for suicide prevention. Increasing our knowledge of effective follow-up care has been identified as an Aspirational Goal by The National Action Alliance for Suicide Prevention's Research Prioritization Task Force.

Evidence acquisition: Several recent comprehensive reviews informed the selection of studies included in this brief review. Studies of follow-up services that reported significant effects for the outcomes of death by suicide, suicide attempts, or suicidal ideation were included.

Evidence synthesis: Although there is a paucity of research in this area, promising paradigms that have demonstrated effectiveness in preventing suicide and suicide attempts and reducing suicidal ideation will be discussed. The major limitations of the literature in this area include numerous methodological flaws in the design and analyses of such studies and the lack of replication of studies with positive findings.

Conclusions: This paper identifies several breakthroughs that would be helpful for advancing this area of research and describes a comprehensive research pathway for achieving both short- and long-term research objectives.

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Introduction

The development and implementation of effective follow-up care for individuals at risk for suicide is important for reducing rates of suicide and related behaviors. In response to the ongoing need for effective treatments aimed at preventing suicide, the National Action Alliance for Suicide Prevention's (Action Alliance) Research Prioritization Task Force (RPTF) developed a comprehensive set of goals.¹

Specifically, Aspirational Goal 6 aims to “ensure that people who have attempted suicide can get effective interventions to prevent further attempts.” Follow-up care is defined as services interventions that aim to both increase access to and engagement in care, as well as to prevent suicide and related behaviors, as opposed to more acute care interventions, such as psychotherapy.

The aims of this article are to (1) briefly review the state of the science for follow-up care; (2) summarize limitations

of the current research and needed breakthroughs; and (3) describe both short- and long-term research objectives as well as a step-by-step research pathway to advance the field of providing follow-up care for suicide prevention.

Evidence Acquisition

As a comprehensive review was beyond the scope of this paper, several recent comprehensive systematic reviews^{2–5} were used to identify studies to include in this brief review. Those studies with significant findings for the outcomes of death by suicide, suicide attempts, or suicidal ideation were selected for inclusion. There are additional studies^{2–5} that have examined the effectiveness of follow-up approaches, primarily on the outcome of suicide attempts or self-injury behavior, that failed to report significant effects and are not included in this brief review. Table 1 provides more detailed descriptions of the intervention and comparison conditions evaluated in each study, as well as the assessed outcomes and results.

Evidence Synthesis

The primary finding noted from these reviews is that only two RCTs have examined the effect of follow-up care on death by suicide. The first study⁶ followed patients who had attempted suicide and refused or

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Table 1. Studies reviewed with condition descriptions, assessed outcomes, and results

Study	RCT	n	Follow-up service description	Comparison condition description	Primary outcome(s)	Results
Motto and Bostrom, 2001 ⁶	Yes	389 Intervention 454 Control	Subjects were sent letters expressing care and concern by research staff (24 letters over 5 years); letters were non-demanding (i.e., subjects were invited to respond if they wished, but this was not required)	Subjects received no additional contact from study staff	Death by suicide	Kaplan-Meier survival probabilities between groups were significantly different for the first 2 years of follow-up ($p=0.043$); M (SE): Year 1: Treatment, 0.990 (0.005) Control, 0.978 (0.007) Year 2: Treatment, 0.983 (0.006) Control, 0.964 (0.009)
Fleischmann et al., 2008 ⁷	Yes	922 Intervention 945 Control	Subjects received a brief 1-hour psychoeducational intervention close to discharge and 9 follow-up contacts (either by phone or in-person) over 18 months	Subjects received TAU	Death by suicide	At 18-month follow-up, significantly more subjects died by suicide in the TAU condition than the intervention condition: $\chi^2=13.83$, $p<0.001$
Welu, 1977 ⁸	Yes	62 Intervention 57 Control	Subjects received treatment within the context of a special outreach program, in which they were contacted by a mental health clinician as soon as possible following discharge, and follow-up contacts included a home visit and weekly or biweekly contact over a 4-month follow-up period	Subjects received TAU	Suicide attempt	At 4-month follow-up, Fisher's exact test indicated that fewer subjects in the intervention condition reported a suicide attempt compared to the TAU condition: $p=0.04573$
Carter et al., 2005 ⁹ and 2007 ¹⁰	Yes	378 Intervention 394 Control	Subjects received 8 postcards expressing care and concern over a 12-month period	Subjects received no postcards	Intentional self-poisoning	At 12-month follow-up, there were no significant differences in the proportion of subjects in each group who repeated self-poisoning; however, the number of repetitions was significantly lower in the intervention group compared to the control group: IRR=0.55, $p=0.01$, 95% CI=0.35, 0.87 At 24-month follow-up, there was no significant difference in the proportion of subjects who repeated self-poisoning; however, the number of repetitions was significantly lower in the intervention group compared to the control group for women only: IRR=0.49, $p=0.004$, 95% CI=0.30, 0.80
Hassanian-Moghaddam et al., 2011 ¹¹	Yes	1,150 Intervention 1,150 Control	Subjects received 9 postcards expressing care and concern over a 12-month period.	Subjects received TAU	Suicide attempt, suicidal ideation	At 12-month follow-up, the intervention group demonstrated less suicidal ideation

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Table 1. Studies reviewed with condition descriptions, assessed outcomes, and results (continued)

Study	RCT	n	Follow-up service description	Comparison condition description	Primary outcome(s)	Results
Vaiva et al., 2006 ¹²	Yes	147 Phone calls after 1 month 145 Phone calls after 3 months 312 Control	Subjects received follow-up phone calls either 1 or 3 months after the suicide attempt from a psychiatrist during which the psychiatrist reviewed the treatment recommended by the ED and suggested a new treatment plan if the original was too difficult for the patient to follow; an urgent appointment was also scheduled at the ED if the patient was considered at high risk for suicide	Subjects received TAU	ideation Suicide attempt	(RRR=0.31, 95% CI=0.22, 0.38), and lower rate of suicide attempt (RRR=0.42, 95% CI=0.11, 0.63) compared with the control condition Additionally, the number of suicide attempts was also reduced in the intervention condition compared to the control condition (IRR=0.64, 95% CI=0.42, 0.97) At 13-month follow-up, the number of subjects who attempted suicide was significantly lower over the 6 months post-contact for those that received contact after 1 month compared to the TAU group: $\chi^2=4.7$, $p=0.03$, difference=10%, 95% CI=2%, 18%; there were no significant differences between the 3-month contact group and the TAU group
Termansen and Bywater, 1975 ¹³	No	57 Intervention with same mental health worker 57 Intervention with crisis center volunteer 50 Assessment in ED 38 Identification from ED admission records	Subjects in the follow-up care conditions received either: (1) assessment in the ED and follow-up for 3 months by same mental health worker who assessed the patient in the ED; or (2) assessment in the ED and follow-up for 3 months with a crisis center volunteer; contact occurred with tapering frequency over the course of 12 weeks	Subjects in the control conditions received either: (1) assessment in the ED and no follow-up; or (2) identification from emergency admission records only	Suicide attempt	At 3-month follow-up, subjects in the first group who received follow-up by the same mental health clinician demonstrated significantly fewer suicide attempts compared to the other three groups (no test statistic reported, $p=0.05$)
Torhorst et al., 1987 ¹⁴	Yes	68 Treatment from same therapist 85 Routine referral to local agency 73 Treatment at suicide prevention center	Subjects received treatment from the same therapist they saw in the hospital	Subjects in the comparison conditions received either (1) a routine referral to a local agency; or (2) treatment from a different therapist at a specialized suicide prevention center	Suicide attempt	At 12-month follow-up, subjects who received treatment from a different therapist at a suicide prevention center had a lower suicide attempt rate than those in the experimental group ($\chi^2=5.363$, $df=2$, $p<0.1$)
King et al., 2001 ¹⁵	No	600 Control 300 Deceased	This study was a retrospective chart review study; subjects were either discharged individuals who subsequently died by suicide or matched psychiatric controls; the presence of continuity of care and contact with the same professional were examined	NA	Death by suicide	Both continuous care (OR=0.57, 95% CI=0.37, 0.87, $p=0.01$) and contact with the same professional (OR=18.45, 95% CI=4.46, 76.32, $p<0.001$) predicted decreased risk of death by suicide

ED, emergency department; IRR, incidence risk ratio; RRR, relative risk reduction; TAU, treatment as usual

discontinued outpatient treatment in the month after discharge from the hospital, and then randomized them to receive either a caring letters intervention or no follow-up. The study found that the rate of suicide for the intervention condition was significantly lower than that for the control group for the first 2 years of follow-up.

The second study⁷ enrolled suicide attempters from eight emergency departments (EDs) in five low- to middle-income countries and randomized them to receive either treatment as usual (TAU) or a brief intervention with follow-up contact. Follow-up over an 18-month period revealed that individuals in the intervention condition had a significantly lower rate of suicide than those receiving TAU.

More attention has been given to investigating the effect of follow-up care on preventing or reducing suicide attempts and self-directed violence (i.e., some studies reported one outcome that combined suicide attempts and non-suicidal self-injury) than has been given to the outcome of death by suicide. For example, one study⁸ found that fewer participants who were assigned to receive an intensive follow-up contact intervention experienced a repeat suicide attempt over a 4-month follow-up period relative to those assigned to TAU.

Three studies have examined less time-intensive follow-up services. An Australian study^{9,10} recruited patients from toxicology units following intentional self-poisoning and randomly assigned them to receive either follow-up postcards or no intervention. This study found that participants assigned to receive the postcards had fewer numbers of intentional self-poisoning behaviors than controls over a 24-month follow-up period.

A similar study¹¹ recruited individuals who intentionally self-poisoned and randomized participants to receive either follow-up postcards or TAU. Results indicated that those in the intervention condition demonstrated fewer instances of suicidal ideation and suicide attempts (both in terms of rate and total numbers) than those in TAU.

A third study¹² involving patients discharged from the ED following an intentional overdose randomized participants to receive a follow-up call 1-month post-discharge, a call at 3 months post-discharge, or TAU. Participants in the intervention condition that received the 1-month call were less likely to make subsequent suicide attempts than those in TAU over the first 6 months of the 13-month follow-up period.

Three other studies have found significant results for follow-up interventions, depending on the specific individual who performed the follow-up contact. One compared¹³ follow-up by a mental health worker, follow-up by a crisis volunteer, and no follow-up for patients discharged from a hospital after a suicide attempt. The study found a significant reduction in

repeat suicide attempts for follow-up by a mental health worker compared to follow-up by a crisis center volunteer or no follow-up.

Torhorst and colleagues¹⁴ reported that the rate of suicide attempts in the group of patients who saw a different therapist for treatment following discharge from the hospital was lower than that of patients who saw the same clinician who treated them in the hospital. A retrospective chart review study,¹⁵ on the other hand, found that both continuity of care alone and contact with the same professional predicted reduced suicide risk in discharged patients who had died by suicide and matched controls.

In summary, there are several studies with promising initial findings concerning the efficacy of follow-up care and suicide prevention. Specifically, research suggests that clinicians who reach out to patients (especially those patients not engaged in treatment) using caring letters to express concern and support may help to reduce the rate of suicide following discharge from a psychiatric hospital.

Additionally, low-cost follow-up interventions (e.g., phone calls, postcards) may be effective and particularly important for reducing death by suicide and repeat suicide attempts, especially in areas with limited resources. Outreach programs that provide comprehensive mental health treatment and emphasize follow-up and continuity of care following discharge from the hospital may also help to prevent repeat suicide attempts.

Gaps and Limitations of the Current State of the Science

Although findings from these studies warrant optimism that follow-up services can ultimately be an effective strategy for suicide prevention, there are several gaps in our current knowledge, as well as major limitations (i.e., methodological flaws) of the work that has been done thus far.

With regard to gaps in the literature, the first major limitation is the paucity of RCTs, especially those investigating effects of follow-up services on death by suicide.⁴ Specifically, only two studies^{6,7} have demonstrated efficacy for preventing suicide. Although several studies have demonstrated efficacious follow-up services for preventing suicide attempts and self-directed violence, these outcomes are only proxies for death by suicide and may not generalize to services that will actually prevent suicide. Additionally, the studies that have found positive results have not investigated the mechanisms by which the follow-up services affected outcomes (e.g., greater engagement in care).

Further, our knowledge of effective services for specific subpopulations, particularly those at high risk relative to the general population, is severely limited. For example,

there are no RCTs of follow-up services that have demonstrated efficacy to prevent suicide or related behaviors for adolescents, older adults, and other minority groups.

Additionally, existing studies have recruited patients mostly from acute treatment settings (e.g., hospitals, EDs). Research¹⁶ has found that most individuals who attempt suicide seek no treatment following their attempt. Thus, it is unclear whether findings from studies of follow-up services conducted to date can be generalized to other settings, such as primary care, outpatient mental health, or other community settings.

Finally, the failure to replicate studies that have found significant effects is a major gap in the literature. Although developing novel interventions is important, there has been less emphasis placed on replicating studies with positive results or improving existing interventions that have been found to be effective.

With regard to methodological problems, there are many major flaws in the RCTs that have been conducted thus far that have been described in previous reviews.^{2,4} Many of these methodological problems also apply to acute intervention research and were discussed in more detail in Brown and Jager-Hyman's psychotherapy review¹⁷ in this issue.

Those problems discussed previously that also apply to follow-up services research include (1) failure to provide operational definitions or use a standardized nomenclature for assessing suicide, suicide attempts, suicidal ideation, and other related behaviors; (2) failure to include reliable and validated outcome measures; and (3) failure to control for sources of bias. Methodological problems such as those outlined here led to the following conclusion in the Veterans Affairs systematic review: "Overall, these intervention trials had methodological limitations that resulted in their providing only low strength and insufficient evidence to properly draw conclusions on the effectiveness of the various treatment interventions and follow-up strategies."⁴

Discussion

Future research should seek to achieve breakthroughs, which are needed to address these limitations and increase our knowledge about effective follow-up services for suicide prevention. These needs include (1) improving methodological rigor in future studies; (2) developing additional follow-up services and paradigms that are cost-effective and innovative; (3) expanding research to additional settings and subpopulations; and (4) replicating and disseminating evidence-based follow-up services.

Improving the methodological rigor in designing future RCTs and other studies is of paramount

importance. There are several short-term research goals that can achieve this aim. First, it is important that studies use standardized assessments that have been found to be valid and reliable, and it is important that such measures correspond to standardized nomenclature of suicide ideation and behavior such as the CDC's Self-Directed Violence Classification System (SDVCS).¹⁸

Second, future research should be devoted to developing novel assessment methods, such as ecological momentary assessment, to more accurately track suicidal ideation and behavior over time. Third, future research should include methods to address ambivalent suicidal behavior (e.g., suicide adjudication boards).

Fourth, future studies should include methods for controlling sources of bias, such as performing intent-to-treat analyses, identifying and measuring non-study co-interventions, and blinding research staff and/or research participants and assessing any breaks in blinding. Finally, future studies should develop innovative methods for retaining participants in studies and monitoring long-term outcomes.

Developing and testing novel follow-up services for suicide prevention is also especially warranted. In order to improve the feasibility of conducting adequately powered studies to detect the treatment effects on death by suicide, it would be beneficial to develop interventions of minimal economic cost as a short-term research goal. Studies of these approaches should determine whether follow-up care actually facilitates treatment engagement and reduces rates of suicide, suicide attempts, or suicidal ideation. Cost-effectiveness studies should also be conducted alongside efficacy and effectiveness trials of tested interventions.

Additionally, the development of follow-up services that use innovative electronic health technologies (e.g., chat rooms, texting, smartphone apps, and other web-based applications) as stand-alone or adjunctive services is also needed and achievable over the short term. These technologies have the potential to reach a larger segment of the population at a low cost. Thus far, one small pilot test¹⁹ of text messaging over 4 weeks following discharge found this intervention to be feasible and acceptable to patients who attempted suicide. To date, however, no study has been conducted to evaluate the impact of electronic services on suicide, suicide attempts, or suicidal ideation.

Ultimately, identifying and developing evidence-based follow-up services that can be delivered following discharge from acute care settings for the prevention of suicide is especially needed. This long-term goal can be attained by conducting large-scale, adequately powered RCTs. These studies should determine whether the effects of an intervention are partially mediated by engagement in mental health care or whether there is a

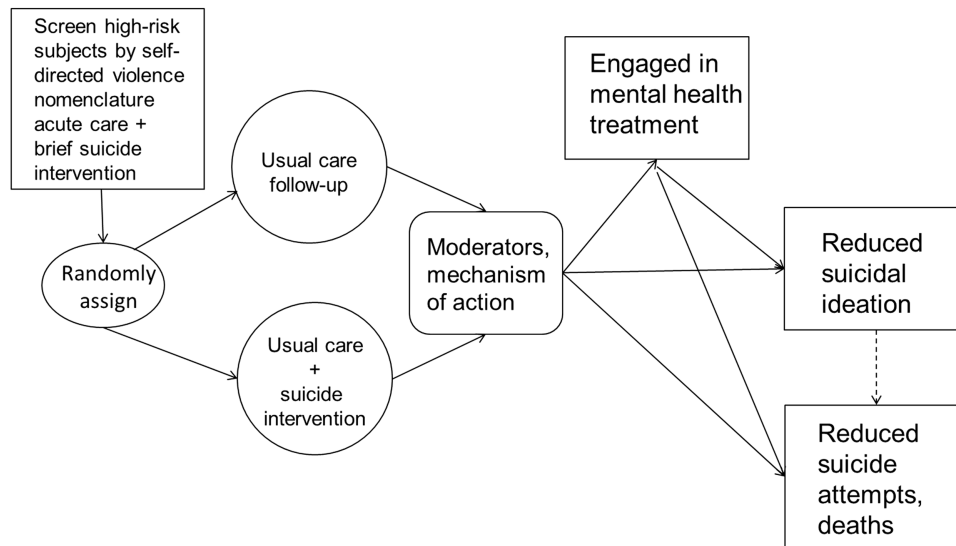


Figure 1. Proposed step-by-step research pathway for future RCTs

direct effect on outcomes. Such studies should also explore whether there are other moderating or mediating effects of the intervention by identifying and testing potential mechanisms of action in effective interventions and developing valid and reliable measures of such mechanisms.

Once effective follow-up services are identified, expanding the research into new settings and populations is also needed in order to investigate the generalizability of these interventions. Thus, over the long term, researchers should continue to develop novel methods to recruit and screen at-risk individuals both in acute care settings such as EDs as well as in the community at large. Schools, community centers, primary care settings, and workplaces are also potential areas to target in order to obtain more representative samples and reach individuals at risk for suicide who may not present to mental health facilities. Future research should also examine the relative efficacy of evidence-based follow-up services for specific subpopulations that are at an increased risk for suicide, such as adolescents, older adults, and other minority populations, as warranted by empirical data.

Finally, studies with positive findings of follow-up services should be replicated by independent research groups to ensure that robust effects are generalizable across locations and populations. An especially important long-term objective is for researchers to develop and test models to efficiently disseminate evidence-based follow-up services so that they can be widely available and become the standard of care for facilitating engagement in treatment and ultimately preventing suicide.

Figure 1 illustrates a proposed step-by-step research pathway that can serve as a model for future studies that test the effectiveness of follow-up services to reduce

suicide risk. Briefly, following this pathway, research participants should be screened using standardized measures. Following screening, enrolled participants should be randomized to either TAU alone or in addition to the study intervention. Potential mechanisms of action should then be assessed over the course of care to determine what aspects of an intervention lead to reductions in suicide-related outcomes. Increased engagement in care as a result of the study intervention should also be evaluated as a potential mediator of the relationship between the intervention and outcome.

Conclusions

Although promising initial findings on follow-up care and services for suicide prevention exist in the literature, there are significant research gaps. Thus, additional research is warranted to both improve the quality of the research in this area and expand current knowledge. A major research goal involves the rigorous study of novel, cost-effective approaches to follow-up care across a variety of populations and settings. Ultimately, such studies may result in the improvement of the standard of care for individuals who are at risk for suicide by disseminating evidence-based strategies to prevent suicide.

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