

An Evaluation of Crisis Hotline Outcomes Part 2: Suicidal Callers

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In this study we evaluated the effectiveness of telephone crisis services/hotlines, examining proximal outcomes as measured by changes in callers' suicide state from the beginning to the end of their calls to eight centers in the U.S. and again within 3 weeks of their calls. Between March 2003 and July 2004, 1,085 suicide callers were assessed during their calls and 380 (35.0%) participated in the follow-up assessment. Several key findings emerged. Seriously suicidal individuals reached out to telephone crisis services. Significant decreases in suicidality were found during the course of the telephone session, with continuing decreases in hopelessness and psychological pain in the following weeks. A caller's intent to die at the end of the call was the most potent predictor of subsequent suicidality. The need to heighten outreach strategies and improve referrals is highlighted.

Crisis hotlines are one of the oldest suicide prevention resources in the United States (Litman, Farberow, Shneidman, Heilig, & Kramer, 1965; Shneidman & Farberow, 1957) and United Kingdom (Day, 1974), and are now ubiquitous sources of help worldwide. One rationale for crisis hotlines (Mishara & Daigle, 2000; Shaffer, Garland, Gould, Fisher, & Trautman, 1988) is that suicidal behavior is often associated with a crisis. The psychological autopsy research generally supports the association of stressful life

events, such as interpersonal losses and legal or disciplinary problems, with suicide (Brent et al., 1993; Marttunen, Aro, & Lonnqvist, 1993; Rich, Fowler, Fogarty, & Young, 1988; Gould, Fisher, Parides, Flory, & Shaffer, 1996; Runeson, 1990). Furthermore, suicide is usually contemplated with psychological ambivalence, as evidenced by surviving suicide attempters who often report that the wish to die coexisted with wishes to be rescued and saved (Shaffer et al., 1988). This wish sometimes results in a "cry for help,"

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which can be addressed by those with special training (Litman et al., 1965). Lastly, crisis services may provide relief to an individual who is in the "final common pathway to suicide" (Shaffer et al., 1988) by providing the opportunity for immediate support at these critical times through services that are convenient, accessible, and available outside of usual office hours.

Despite strong theoretical and practical justification as a suicide prevention strategy, hotlines' empirical effectiveness has yet to be demonstrated unequivocally. One measure of the effectiveness of telephone crisis services has been the assessment of suicide rates in communities served by the centers. Studies examining the impact of crisis hotlines on mortality have largely employed ecological designs. These studies have compared the suicide rates in areas with and without a crisis program or in areas before and after the introduction of a crisis program. Several studies (Barraclough & Jennings, 1977; Bridge, Potkin, Zung, & Soldo, 1977; Jennings, Barraclough, & Moss, 1978; Lester, 1973, 1974; Riehl, Marchner, & Moller, 1988; Wiener, 1969), including a meta-analysis (Dew, Bromet, Brent, & Greenhouse, 1987), found no significant effects of hotlines on suicide rates. A significant effect of Samaritan suicide prevention programs in England was found by Bagley (1968), but the results were not replicated by other researchers using more elaborate and accurate statistical techniques (Barraclough & Jennings, 1977; Jennings et al., 1978). These broad measures of community suicide rates did not, however, consider the populations reached by crisis services. Miller, Coombs, Leeper, and Barton (1984) examined race-sex-age-specific suicide rates in U.S. counties with and without, and before and after the introduction of, a suicide prevention program. A significant reduction in the suicide rate in young White females was found, but no evidence of an impact in other population groups emerged. In their paper, the authors also reported a replication of their findings on a second set of counties for a different time span. The findings of Miller

et al. are consistent with surveys of hotline users that indicate that young White females are the most frequent callers to hotline services (King, 1977; Litman et al., 1965; Slem & Cotler, 1973). More recently, Lester (1997) conducted a meta-analysis of 14 studies on the relationship of suicide prevention centers on suicide rates. While the results of individual studies did not always reach statistical significance, Lester found a significant overall preventive effect. Finally, Leenaars and Lester (2004) reported two studies on the number of suicide prevention centers in ten Canadian provinces and two territories. The first assessed the relationship between the density of centers in 1985 and age-adjusted rates for 1985–1989 and found no significant preventive impact. The second assessed the relationship between the density of centers in 1994 and age-adjusted rates for 1994–1998 and found negative correlations between presence of centers and change in the suicide rates for 8 of the 12 correlations. That is, the more centers, the lower the suicide rates. When the Yukon and Northwest territories were excluded, the correlation coefficients "approached or reached statistical significance" (p. 67). They concluded that this indicated "a preventive impact, though weak, of suicide prevention centers on suicide in Canada" (p. 67). However, caution is advised against the use of the term *impact* as the authors correctly note that the study was correlational and did not take into account changes in other social variables over the period.

It is difficult to draw conclusions about the effectiveness of crisis centers from studies of the relationship between the presence of suicide prevention/crisis centers and community suicide rates without a consideration of a complementary evaluation of proximal outcomes among crisis center users. One means to evaluate proximal outcomes is through silent monitoring of calls (Mishara & Daigle, 1997). Mishara and Daigle listened to 617 telephone calls from suicidal callers to two Canadian suicide centers. Immediate or proximal effects on the reduction of depres-

sive mood and in suicidal urgency were linked to specific intervention styles, most notably an empathetic Rogerian style, which also included directive components. King, Nurcombe, Bickman, Hides, and Reid (2003) rated 100 taped suicide calls to Kids Help Line in Australia. Significant decreases in suicidality and significant improvements in the mental state of youth were observed during the course of the call (King et al., 2003).

The present study employed the callers' own ratings of their mental state and suicidality, in response to a standardized set of inquiries by the crisis counselors, at the beginning and end of the call to assess the immediate proximal effect of the crisis intervention. Research findings have indicated that individuals' self ratings of their own suicidal states are more predictive of their subsequent suicidality than clinicians' ratings (Joiner, Rudd, & Rajab, 1999). A follow-up assessment, 2 to 4 weeks later, was also conducted in the present study to assess the duration of an effect and the telephone intervention's impact on future suicidal risk and behavior. To our knowledge this is the first evaluation of telephone crisis services to employ such a follow-up assessment, despite a follow-up being considered a critical evaluation strategy (King et al., 2003; Mishara & Daigle, 2000).

The aims of the present study are to determine (1) the extent to which callers to telephone crisis services are seriously suicidal; (2) whether significant decreases in suicidality occur during the call; (3) the extent and predictors of suicidality after the call; (4) the callers' perceptions of the utility of the intervention; and (5) the types of referrals given during the calls, and the extent to which callers follow through with them.

METHODS

A detailed description of the methods of this study has been provided in the accompanying article by Kalafat and colleagues (this issue). With the exception of the variables and sample that are unique to this article, only a brief description of the methods is

given. The project was approved by the Institutional Review Boards of New York State Psychiatric Institute/Columbia University and Rutgers Graduate School of Applied and Professional Psychology. A confidentiality certificate was obtained from the Department of Health and Human Service through the Substance Abuse and Mental Health Services Administration (SAMHSA).

Sample

Adult suicidal individuals calling eight telephone crisis services/hotlines across the United States were the targeted population for this study. Between March 2003 and July 2004 telephone crisis counselors conducted assessments with 1,085 suicidal callers (39.4% male and 60.6% female). Individuals who called a center more than once during the data collection period were only assessed during their first contact with the center. The majority (72.0%) of assessed suicide callers called the center's local crisis hotline telephone number, the remaining called 1-800-SUICIDE, a national network of crisis centers. Of the 426 calls received on the 1-800-SUICIDE line, 277 (65%) were suicide calls. There were 654 nonparticipants who were not assessed because crisis counselors, using their own clinical criteria, considered the callers' risk status to be "too high." These callers were in an acute suicidal state, and as such, efforts to moderate their suicidality and/or initiate rescue procedures took precedence over the administration of our standard risk assessment (described in the measures section below). As noted in Kalafat et al. (this issue), other callers were not assessed because call volume was too high, the caller refused/hung up, the counselor thought it not appropriate to assess, or phone problems existed. Among these non-assessed callers, we could not differentiate suicidal from nonsuicidal crisis callers. Thus, we do not have a precise estimate of the total number of suicidal callers; the lower bound of the estimate is 1,739 (1,085 + 654), yielding a 62.4% participation rate (upper bound).

Between April 2003 and August 2004

follow-up assessments were conducted with 380 of the 1,085 suicide callers who completed the baseline assessment (35.3%). Follow-up assessments were conducted between 1 and 52 days from the baseline assessment date, with the average being 13.5 days. For the 380 suicide callers who were followed, 30.3% were male and 69.7% female; their age ranged from 18–72, and the mean was 36.1 years. The ethnic distribution was 66.3% White, 15.2% African American, 10.2% Hispanic, 3.5% Native American, 3.2% Asian, and 1.6% Other. Ethnicity was not coded for six callers.

The reasons for no follow-up assessment for 705 suicidal callers were: 311 (44.1%) callers at baseline refused re-contact; 273 (38.7%) callers at baseline were not asked by the counselors if they wanted to receive a follow-up call; 63 (9.0%) callers gave consent at baseline for follow-up contact but the follow-up interviewers received passive or active refusals at follow up; and 58 (8.2%) callers gave the crisis counselors invalid contact information. Common reasons for counselors not asking for consent for the follow-up call were that the caller had to quickly terminate the call or hung up before the counselor could ask. A significantly greater proportion of suicidal callers (38.7%) compared to crisis callers (8.5%) were not asked for consent at baseline. Suicide callers who did not complete a follow-up assessment were significantly more intent on dying ($F = 15.3, p < .001$), more hopeless ($F = 14.2, p < .001$), more likely to be rescued ($\chi^2 = 19.9, p < .001$), and less likely to be given a referral ($\chi^2 = 24.9, p < .001$) at baseline compared to suicide callers who completed the follow-up. However, changes in suicide state (intent to die, hopelessness, and psychological pain) from the beginning to the end of the baseline call did not vary as a function of follow-up participation status.

Measures

Suicide Risk Status. The suicide risk assessment was shaped by Chiles and Strohsahl's (1995) book on the assessment, treat-

ment, and case management of suicidal patients, and the chapter on psychiatric and psychological factors in a report by the Institute of Medicine (Goldsmith, Pellmar, Kleinman, & Bunney, 2002), which showed evidence supporting Shneidman's (1993) concept of psychological pain as a contributing factor to suicidal behavior. The assessment was also influenced by the empirical risk factors reviewed by Joiner, Walker, Rudd, and Jobes (1999) and the factor-analytic study of the Modified Scale for Suicidal Ideation (Joiner, Rudd, & Rajab, 1997). Practical considerations as to the feasibility of conducting a risk assessment within the context of a telephone intervention also shaped the suicide risk assessment. This was based on input from the crisis center directors on our advisory board and crisis center counselors who piloted the assessments (described in Kalafat et al., this issue).

Questions assessing callers' risk status included suicidal ideation and behavior, intent to die, hopelessness, and psychological pain. Three questions were asked about the caller's thoughts of suicide (any thoughts, persistence of thoughts, and control over thoughts); one question assessed whether the caller considered suicide the only possible option to solve problems; one question asked about current plans (plus narrative of "how," "when," and "where"); one question asked whether the caller had taken any action or preparatory behavior to kill or harm him/herself immediately prior to the call; and three questions assessed past attempts (lifetime occurrence, number of attempts, and whether treatment was required). These questions were asked at the beginning of the call. Suicidal thoughts, plans, and attempts since the call to the center were reassessed at the follow-up assessment. Three *a priori* scales—*intent to die*, *hopelessness*, and *psychological pain*—were the three major outcomes of the study, and were asked at the beginning of the call to the center and repeated at the end of the call and at the follow-up. These outcomes were chosen in collaboration with our advisory board, with particular input from the crisis center directors (see details in Kala-

fat et al., this issue). These outcomes were considered to be appropriate targets for an intervention plan and their attenuation during a crisis call was deemed to be critical. The items within the intent to die, hopelessness, and psychological pain domains were each rated on a 5-point scale and averaged to derive each scale score. Higher scores indicated more of the particular domain. *Intent to die* was assessed by two questions, "How much do you really want to die?" and "How likely are you to carry out your thoughts/plans to kill yourself?" The correlation of the items was 0.43. *Hopelessness* was comprised of two questions; callers were asked how hopeful they felt about the future and whether they felt they could go on (correlation = 0.32). *Psychological pain* consisted of two items assessing current hurt, anguish, and misery (not physical pain) and whether callers could tolerate the way they felt if their current situation did not change (correlation = 0.47). The correlations of the scales at the beginning of the call were 0.52 (intent to die and hopelessness), 0.38 (intent to die and psychological pain), and 0.43 (hopelessness and psychological pain). (The remaining measures are also described in Kalafat et al., this issue).

Client Feedback on Call. The client feedback questions were asked at the follow-up assessment. Two open-ended questions about what was or was not helpful about the call initiated the assessment: "Thinking back to the call you placed to the crisis line, can you tell me how the call was helpful to you?" "Can you tell me what was not helpful about the call?" Twenty-one close-ended questions followed the open-ended assessment and provided ratings in three areas: helper interventions, emotion regulation, and overall effectiveness, but the responses to the close-ended questions will be the focus of a future paper.

Plan of Action and Compliance. This set of questions assessed whether callers remembered, agreed with, and followed through with plans of actions developed by the crisis counselors with the callers. These questions were asked at the follow-up assessment.

Service Utilization and Compliance.

These questions included the type of referral (emergency services, mental health services, social services, and information and referral services) and the extent of follow through. Information on the type of referral was obtained from the crisis counselors at baseline and the referral follow through questions were asked of the callers at the follow-up assessment.

Procedures

Baseline assessments (Time 1) were conducted by center counselors near the beginning of calls, prior to providing intervention services to callers. The suicide risk assessment was conducted with callers if they had any thoughts about killing themselves. The suicidal crisis was either self-defined by the caller or identified by the crisis worker after an assessment of risk. Not all counselors felt comfortable initiating a suicide risk assessment without some clinical indicator, such as depression, or some veiled threat. Because we tried to minimize interference with the usual interactions between the counselors and the callers, we did not require the centers' counselors to routinely initiate the risk assessment. Upon completing the intervention, counselors then conducted another assessment at the end of the call (Time 2), which included a subset of the initial questions to determine whether the intervention reduced callers' suicidal status. Local data coordinators reviewed the centers' call records on an ongoing basis and compared them to completed assessments to assure that all eligible callers were being assessed. If assessments were not conducted with potentially eligible callers, the coordinators reviewed the call records for these callers with the crisis counselors. Immediately preceding the end of the calls, counselors used a standardized script to ask callers if the research team could contact them in 1 to 2 weeks to see if they were interested in participating in the follow-up assessment. The follow-up assessments were conducted by independent research interviewers

who had prior training and experience as telephone crisis counselors. The training, quality control procedures, and consent procedures are described in detail in the article by Kalafat and colleagues (this issue); only safety procedures, specific to suicide callers, will be described here. In the beginning of the risk assessment during the call to the center, suicide callers were asked if they had done anything, including preparatory behavior, to hurt or kill themselves before they called the crisis center. If a caller was in imminent danger, the crisis center stopped the interview and initiated their standard rescue procedures. The assessment was only continued if it was helpful to keep the caller engaged while waiting for emergency rescue services to arrive.

The follow-up assessment included criteria to be used by our interviewers to determine whether callers needed intervention at follow-up. The need for intervention was defined by a past plan or actual attempt at self-injury since speaking with the center, or a serious intent to die at the time of the follow-up interview. The method for getting help to callers consisted of follow-up interviewers re-connecting callers back to the center they had initially phoned. If callers were unable to participate in a call-back to the center immediately after completing their interviews, follow-up interviewers obtained callers' consent for the center to contact the callers. In this last instance, the follow-up interviewer contacted the center and gave them the caller's contact information and details as to why the caller needed intervention.

Analytic Strategy

The primary sampling unit of the study was crisis center, and the secondary sampling unit was caller within center. Thus, we examined the extent of within-center clustering in order to determine whether this clustering variable warranted inclusion in the analyses. The sample clusters (center) had little impact on outcomes (intent to die, psy-

chological pain, and hopelessness) as indicated by the intraclass correlation coefficients, which were all close to zero (ranging from .004 to .05). Therefore, the use of mixed-effects linear models to account for the clustering variable of center was unnecessary. Center was included as a covariate in the analyses.

A repeated measures design was employed to examine changes over time, always employing center as the between subjects factor. The measures were assessed at three points: near the beginning of the call (Time 1), at the end of the call (Time 2), and at follow-up (Time 3). The repeated measures for the suicide callers were intent to die, psychological pain, and hopelessness. These repeated measures were also examined as a function of the suicide risk elements (i.e., whether the caller had a suicide plan, had made a preparatory or actual action to harm/kill self prior to the call, or had an attempt history).

A series of logistic regression analyses were conducted to determine the baseline predictors of any suicidality (thoughts, plans, or attempts) following the crisis call. The independent variables included in separate models were intent to die, psychological pain, and hopelessness (each at the beginning and end of the baseline call), persistence of suicide thoughts, control over thoughts, considering suicide as the only solution to problems, plans to kill self, actions or preparatory behavior before the call, and a history of an attempt. Age and gender were included in all models. All significant predictors in the initial models were entered simultaneously as independent variables in a final multivariate analysis.

Those callers followed up were compared to those who were not followed up on baseline measures at the beginning of the call (as previously described) by means of univariate analyses of variance. Interactions between follow-up status and changes from Time 1 to Time 2 were examined using two-way analyses of variance.

The statistical analyses were con-

ducted with SPSS statistical software (version 12.0). Given the number of comparisons, results were considered significant at $\alpha < .001$, but results at $\alpha < .01$ are presented in the tables.

RESULTS

Presenting Problems

Suicide callers contacted the centers with a variety of problems ranging from abuse/violence (10.0%), physical health problems (16.1%), work problems (12.8%), addictions (17.9%), base needs (25.9%), mental health problems (54.7%), and interpersonal problems (58.4%), along with their suicidal crises. Gender differences were significantly related to only one type of problem: males (24.8%) had significantly more addiction problems than females (13.5%) ($\chi^2 = 21.4, p < .001$).

Risk Profile

Of all the suicide callers who completed the baseline assessment (1,085 callers), over half (585 callers) had a suicide plan when they called the crisis center and 8.1% (88 callers) had taken some action to harm or kill themselves immediately before calling the center. More than half (57.5%, 624 callers) had made prior suicide attempts, of which 53.2% (332 callers) had made multiple attempts and 44.1% (275 callers) had made single attempts. There were 17 callers (2.7% of those who had prior attempts) for whom the number of prior suicide attempts was not coded. Only 22.2% of the suicidal callers had no current plans, actions, or a history of suicidal behavior; 5.7% had all three suicide risks. Of those with current suicide plans, 366 (62.6%) had a history of past attempts. Of those who had taken some action to harm/kill themselves immediately before their call, 63 (71.6%) had a history of past attempts. The suicide risk profile of males and females was similar with the exception of a significantly higher rate of previous suicide attempts among the females (64.8% versus

49.3%) ($\chi^2 = 24.5, p < .001$). There was no significant difference in the risk profile of callers to the centers' regular line and to 1-800-SUICIDE.

Rescues

Counselors reported initiating rescue procedures with 136 (12.6%) of the callers who participated in the baseline assessment. Rescue procedures were significantly more likely to be initiated for the callers who had engaged in preparatory behavior or had done something to hurt/kill themselves (37.9%) than for callers who had not taken these actions (10.8%) ($\chi^2 = 49.2, p < .001$). Of the suicidal callers who had taken some action to hurt/kill themselves and had not initiated rescue ($n = 54$), eight had been unable to have a rescue initiated because the center was unable to identify the caller's telephone number or the caller refused or hung up prematurely. Rescues were initiated significantly more often for callers who had a current plan to hurt/kill themselves (19.2%) than for those without a plan (4.9%) ($\chi^2 = 45.3, p < .001$). Rescues were also initiated more often for callers who had a history of previous suicide attempts (15.2%) than for those with no such history (8.5%) ($\chi^2 = 10.0, p < .01$).

Referrals

Out of the 1,085 callers who participated in the baseline assessment, 506 (46.6%) were given a new referral, of which 284 (56.1%) were to mental health resources. An additional 116 (10.7%) callers were referred back to their current therapist or services. Of the 380 callers who participated in the follow-up, 221 (58.2%) were given a new referral at baseline, of which 151 (68.3%) were to mental health resources. An additional 52 (13.7%) callers were referred back to their current therapist or services. The overall referral rate for those who participated in the baseline was 57.3% and the rate of referral for those who participated in the follow-up was 71.8%.

Overall, the rate of referrals was some-

what *lower* for callers with more serious suicide risk profiles compared to other callers. Callers who had current plans to hurt/kill themselves received *fewer* referrals (44.2%) than callers who had no current plans (53.0%) ($\chi^2 = 7.4, p < .01$). Callers who had taken action to hurt/kill themselves also received fewer referrals (34.5%) than callers who had not taken any action (49.3%) ($\chi^2 = 6.5, p = .01$). Callers who had at least one previous suicide attempt were given the same rate of referrals (46.7%) as callers who did not have at least one previous attempt (51.2%) ($\chi^2 = 1.8, p > .05$). This referral pattern may reflect the significantly greater propensity of counselors to initiate rescues among callers with higher risk profiles, thus precluding any other follow-up recommendations.

Immediate Outcomes

For the 1,085 callers who completed the baseline assessment, there was a significant reduction in suicide status from the beginning of the call (Time 1), to the end of the call (Time 2) on intent to die ($F = 130.8, p < .001$), hopelessness ($F = 112.8, p < .001$), and psychological pain ($F = 181.4, p < .001$) (Table 1). The extent to which the immediate outcomes were modified by the suicide risk profile factors (plans, actions, and prior attempts) was examined (Table 2). Despite the considerable overlap among the risk factors, as previously noted, each was examined separately as a potential modifier. This analytic strategy allowed the clinical import of each factor to be highlighted. While callers who

had a suicide plan, who had taken actions to hurt/kill themselves, or who had a history of suicide attempts had higher scores on psychological pain and were significantly more hopeless and intent on dying, there were no significant interactions between the suicide risk profile factors and time. In other words, changes from Time 1 to Time 2 were not modified by the suicide risk profile.

Intermediate Outcomes

There were significant reductions in callers' psychological pain ($F = 13.1, p < .001$) and hopelessness ($F = 17.0, p < .001$) from the end of the call (Time 2) to follow-up (Time 3) among the 380 suicide callers who completed a follow-up assessment (Table 3). However, there was no significant reduction in callers' intent to die during this period ($F = 0.19, p > .05$). At follow-up, 43.2% (164/380) of callers reported any suicidality (ideation, plan, or attempt) since their call to the center. Of these, 17.1% (28/164; 7.4% of total sample) had made a suicide plan, and 6.7% (11/164; 2.9% of total sample) had made a suicide attempt. Of those who made a suicide attempt after their call to the center, 63.6% (7/11) had made a prior attempt some time before their call. Intent to die at the end of the baseline call (OR = 1.7, 95% CI = 1.2, 2.3, $p < .001$), having made any specific plan to hurt or kill self prior to the call (OR = 1.6, 95% CI = 1.02, 2.4, $p < .04$), and persistent suicidal thoughts at baseline (OR = 1.6, 95% CI = 1.03, 2.4, $p < .04$) were statistically significant predictors of any suicidality (ide-

TABLE 1
Immediate Outcomes from Beginning (Time 1) to End (Time 2) of Call

Outcomes	Time 1		Time 2		Main Effect of Time	
	Mean	(SD)	Mean	(SD)	F	p
Intent to Die	2.81	(1.07)	2.31	(1.04)	130.84	.001
Hopelessness	3.41	(0.99)	2.87	(0.97)	112.79	.001
Psych Pain	4.09	(0.92)	3.47	(1.08)	181.37	.001

TABLE 2
Immediate Outcomes by Suicide Risk Profile

Outcome	Intent to Die						Hopelessness						Psychological Pain					
	Main Effect of Risk		Interaction Effect of Time by Risk		Main Effect of Risk		Interaction Effect of Time by Risk		Main Effect of Risk		Interaction Effect of Time by Risk		Main Effect of Risk		Interaction Effect of Time by Risk			
	Time 1	Time 2	F	p	Time 1	Time 2	F	p	Time 1	Time 2	F	p	Time 1	Time 2	F	p		
	Mean (SD)	Mean (SD)			Mean (SD)	Mean (SD)			Mean (SD)	Mean (SD)			Mean (SD)	Mean (SD)				
Risk Profile																		
Plan (n = 585)	3.15 (1.04)	2.59 (1.10)	109.9	0.001	4.13	ns	3.62 (0.97)	3.03 (0.97)	40.26	.001	3.72	ns	4.32 (0.80)	3.68 (1.05)	50.05	.001		
No Plan (n = 468)	2.42 (0.96)	1.98 (0.85)			3.16 (0.96)	2.69 (0.92)												
Action (n = 88)	3.28 (1.15)	2.85 (1.30)	19.40	.001	1.14	ns	3.72 (1.04)	3.28 (1.10)	11.34	.001	1.40	ns	4.37 (0.89)	3.79 (1.09)	8.04	.01		
No Action (n = 980)	2.77 (1.05)	2.27 (1.01)			3.38 (0.98)	2.84 (0.95)							4.07 (0.92)	3.45 (1.08)				
Multiple Attempts (n = 332)	3.06 (1.03)	2.50 (1.07)	10.97	.001	1.22	ns	3.62 (0.98)	2.98 (1.00)	6.43	.01	3.83	ns	4.22 (0.83)	3.54 (1.07)	1.90	ns		
Single Attempts (n = 275)	2.76 (1.01)	2.28 (0.99)			3.28 (0.97)	2.82 (0.92)							4.08 (0.88)	3.45 (1.09)				
No Attempts (n = 440)	2.67 (1.09)	2.20 (1.03)			3.33 (0.98)	2.83 (0.96)							4.02 (0.98)	3.34 (1.10)				

TABLE 3
Intermediate (Follow-up) Outcomes

	Time 1		Time 2		Time 3		Main Effect of Time		T2-T3 Contrast	
	Mean	(SD)	Mean	(SD)	Mean	(SD)	F	p	F	p
Intent to Die	2.80	(0.90)	2.35	(0.90)	2.25	(0.95)	7.57	.01	0.19	ns
Hopelessness	3.27	(0.93)	2.72	(0.87)	2.24	(1.09)	47.84	.001	17.03	.001
Psych Pain	4.07	(0.89)	3.42	(1.06)	2.85	(1.22)	52.84	.001	14.13	.001

ation, plan, or attempt) at follow-up (43.2% of the callers) (Table 4). When these three items were entered simultaneously in the logistic regression model, only intent to die at the end of the baseline call remained a significant predictor (OR = 1.7, 95% CI = 1.2, 2.3, $p < .002$).

Caller Feedback. At follow-up, 380 suicide callers provided a total of 668 positive responses and 83 negative responses to the

two open-ended questions about what was or was not helpful about the call. There were six positive categories most frequently mentioned by suicide callers: listen and let talk (23.2% of responses; 40.8% of callers), warm and caring etc. (9.7%; 17.1%), options for dealing with concerns (7.5%; 13.2%), available and patient (7.3%; 12.9%), calm down (6.9%; 12.1%), and think clearly/new perspective (6.9%; 12.1%). Notably, 11.6% ($n =$

TABLE 4
Predictors of Suicidality (Thoughts, Plans, or Attempts) Following Telephone Intervention

Suicide Risks	Model 1 ^a		Model 2 ^b	
	Odds Ratio (CI)	p	Odds Ratio (CI)	p
Persistent thoughts†	1.6 (1.03–2.4)	.03	1.3 (0.8–2.0)	.30
Control over thoughts†	1.4 (0.9 –2.2)	.16	–	–
Suicide as only possible option†	0.8 (0.5 –1.3)	.29	–	–
Plans†	1.6 (1.02–2.4)	.04	1.4 (0.8–2.0)	.35
Actions/preparatory behavior†	1.1 (0.5 –2.8)	.80	–	–
Prior attempts†	1.4 (0.9 –2.2)	.11	–	–
Intent to die‡—beginning of call	1.0 (0.8 –1.3)	.96	0.9 (0.7–1.2)	.62
—end of call	1.7 (1.2 –2.3)	.001	1.7 (1.2–2.3)	.002
Hopelessness‡—beginning of call	1.1 (0.9 –1.5)	.41	–	–
—end of call	1.3 (0.9 –1.7)	.15	–	–
Psychological pain‡—beginning of call	1.0 (0.8 –1.4)	.87	–	–
—end of call	1.1 (0.9 –1.4)	.52	–	–

Note. Age and gender were included in all models.

†Dichotomous item

‡5-point scale

^aEach suicide risk variable was entered into separate logistic models, with exception of intent to die, psychological pain, and hopelessness for which the same measure at the beginning and end of call were entered simultaneously.

^bSuicide risk variables that were statistically significant in model 1 were entered simultaneously in model 2. Intent to die (beginning of call) was entered into model 2 despite not being statistically significant in model 1 in order to account for it when assessing intent to die (end of call).

44) of suicide callers said that the call prevented them from killing or harming themselves.

The most frequent negative feedback concerned problems with the referral (10.8% of responses; 23.7% of callers). Other concerns were raised about unhelpful interventions; such as counselors being condescending, not concerned, or abrupt (16.9% of responses; 3.7% of callers); counselors providing unhelpful solutions/suggestions (12.1%; 2.6%); and counselors not identifying the problem (8.4%; 1.8%). Six respondents stated that the call was too short (7.2%; 1.6%) and six stated that the helper asked too many questions (7.2%; 1.6%).

Action Plan Compliance. Of the 380 suicide callers who participated in the follow-up, counselors developed plans of action with 278 (73.2%) callers. Examples of action plans included having a friend come over to stay with caller; and calling friends and family members. At follow up, 60 (21.6%) of the 278 callers did not recall the plan. Of those recalling the plan, 102 (46.8%) callers completed "all" of the plan, 34 (15.6%) callers completed "most," 28 (12.8%) callers completed "some" of the plan, 24 (11.0%) callers said the plan was still "in process," and 26 (11.9%) callers had not carried out any of the plan. The extent of follow through was not coded for four callers (1.8%).

Follow Through with Referral. Of the 151 follow-up suicidal callers who were given a new mental health referral, 35% had kept or made an appointment with a mental health service in the period between the initial call to the center and the follow-up assessment.

Re-Contact with the Center. Of the 380 suicide callers who participated in the follow-up, 107 (28.2%) callers had another contact with the crisis center after their initial call. Of these callers, 59 (55.1%) callers had one additional contact, 19 (17.8%) callers had two contacts, 9 (8.4%) callers had three contacts, 4 (3.7%) callers had four contacts, 10 (9.3%) callers had between 5 and 30 contacts, and 6 (5.6%) callers did not remember the

number of times. Fifty-two percent ($n = 56$) of the 107 callers had received a new referral or referral back to a mental health resource, yet only 15.8% (17) had either completed or set up an appointment.

DISCUSSION

Several studies have suggested that telephone crisis services do not reach individuals at high risk for suicide but instead attract lower-risk suicidal individuals who are more likely to attempt than complete suicide (Clum, Patsiokas, & Luscomb, 1979; Greaves, 1973; Lester, 1972; Maris, 1969; Sawyer, Sudak, & Hall, 1972). The higher proportion of females who call telephone crisis services is consistent with this conjecture (Miller et al., 1984; Mishara & Diagle, 2000). Although our study also found that females were more likely than males to call crisis services, the profile of the suicide callers indicated substantial levels of risk. Over half of the suicidal callers had current plans to harm themselves when they called the crisis service and nearly 10 percent had taken some action to hurt or kill themselves immediately prior to their call. Furthermore, nearly 60 percent of the suicidal callers had made previous suicide attempts, one of the strongest predictors of completed suicide (Gould, Greenberg, Velting, & Shaffer, 2003; Groholt, Ekeberg, Wickstrom, & Hadorsen, 1997; Reinherz et al., 1995). Notably, the suicide risk exhibited by our sample of suicide callers is probably underestimated, given the substantial proportion of callers who were not assessed as part of our research protocol at baseline ($n = 654$) because they were deemed at too high a risk of suicide by the telephone counselors. Thus, our study empirically supports an earlier impression that seriously suicidal individuals are reaching out to telephone crisis services (Dew et al., 1987).

The clinical effectiveness of the crisis intervention is consistent with the significant decreases in suicidality, specifically, intent to die, hopelessness and psychological pain, found

during the course of the telephone session, similar to a recent evaluation of telephone counseling services (King et al., 2003). The immediate suicidality outcomes were not modified by the suicide risk status of the callers. This suggests that the reductions in suicidality were not simply a function of "regression to the mean," which would have been more consistent with greater decreases among higher risk individuals. In light of these positive proximal outcomes, the relatively weak, albeit positive, preventive impact of suicide prevention centers on community suicide rates (Leenaars & Lester, 2004; Lester, 1997) suggests that greater efforts are needed to attract a greater proportion of suicidal individuals in the community.

In the weeks following the crisis intervention, callers' hopelessness and psychological pain continued to lessen but the intensity of their intent to die did not continue to diminish. Moreover, a substantial proportion (43.2%) of the callers continued to express suicidal ideation a few weeks after the initial call and nearly 3 percent had made a suicide attempt after their call. The callers' intent to die score at the end of the crisis intervention was the only significant independent predictor of suicidality following the call; although having made any specific plan to hurt or kill self prior to the call and persistent suicidal thoughts at baseline were also significant, albeit not independent, predictors of any suicidality (ideation, plan, or attempt). Our findings suggest that outreach strategies, such as follow-up calls, may need to be heightened, particularly for suicidal callers with a high level of intent to die and for callers with a history of suicide attempts, who were significantly overrepresented among those who reattempted shortly after their call to the center. Moreover, outreach efforts during the course of the call may also need to be expanded in light of our findings that a rescue procedure was initiated for only 40 percent of suicidal callers who had engaged in either preparatory behavior or an actual action to hurt or kill themselves immediately prior to calling the center.

A sizable minority, nearly 30 percent, of suicidal callers had another contact with the crisis center after their initial call. This is consistent with reported rates of repeated use of telephone crisis services (Apsler & Hoople, 1976; Mishara & Daigle, 2000; Murphy, Wetzel, Swallow, & McClure, 1969; Speer, 1971; Wold, 1973). This finding is difficult to interpret; it may indicate that the caller found the initial intervention to be useful or may merely indicate that the callers are inappropriately relying on the crisis hotline rather than getting the mental health services they need. The latter is suggested by our finding that only 16 percent of the repeat callers followed through with a mental health referral after their initial call to the centers. The need to improve referrals to mental health services by telephone crisis services is also highlighted by several findings in the present study: over half of suicidal callers presented with mental health problems at the time of the call; only about a third of the suicidal callers were given a new referral to a mental health resource or a referral back to such a service; only a third of suicide callers had followed through with the referral; and, the most frequent negative feedback by suicidal callers was about problems with referrals. While callers' follow through with referrals is a function of many factors, including caller motivation (Stein & Lambert, 1984), it appears that steps need to be taken by crisis centers and counselors to address the factors under their control; for example, increasing their knowledge of community resources, matching caller needs with appropriate services, and fostering connectedness to support services (De Leo, Buono, & Dwyer, 2002).

Limitations

The study has important limitations, as described in Kalafat et al. (this issue), which also apply to the current article. A particularly important limitation is that the study was uncontrolled, and the lack of a control condition makes it difficult to definitively attribute the reduction in suicidality to the cri-

sis intervention. However, ethical concerns about compromising the clinical services provided to callers in crisis precluded the inclusion of a control condition. Another limitation specific to this article was the low participation rate at follow-up, reflecting the difficulty of implementing outreach procedures with suicidal callers. One major obstacle was the crisis counselor's reluctance to ask for the caller's consent for re-contact. This is an area that needs to be addressed in the training of crisis counselors. The substantial differences observed between the suicidal callers who were followed and those who were lost to follow-up are problematic. Those who participated in the follow-up were significantly less suicidal than the non-participants; however, changes in suicide state from the beginning to the end of the call did not vary as a function of follow-up participation status; thus, we are reassured that the findings generally apply to most callers in a suicidal crisis. The results may indeed underestimate the impact of the intervention on suicidality because rescue procedures were initiated significantly more often for the suicidal callers who were not followed and were most likely initiated for a substantial proportion of the high risk individuals who were not assessed at baseline.

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Conclusions

Our study provides empirical evidence that seriously suicidal individuals are reaching out to telephone crisis services. The clinical effectiveness of the crisis intervention is consistent with the significant decreases in suicidality found during the course of the telephone session, and the continuing decrease in callers' hopelessness and psychological pain in the weeks following the crisis intervention. Without a control group, however, these effects cannot be definitively attributed to the crisis intervention. Our findings also suggest that follow-up outreach strategies may need to be heightened, particularly for suicidal callers with a history of suicide attempts, who were significantly over-represented among those who reattempted shortly after their call to the center. The need to improve referrals to mental health services by telephone crisis services is also highlighted. Lastly, any suicide risk assessment should include a re-evaluation of the caller's intent to die at the end of the call, in light of its predictiveness of subsequent suicidality.

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