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The Collaborative Assessment and Management of Suicidality versus Treatment as Usual: A Retrospective Study with Suicidal Outpatients

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The Collaborative Assessment and Management of Suicidality (CAMS) is a novel clinical approach used to identify, assess, and manage suicidal outpatients (Jobes & Drozd, 2004). The results of a retrospective study evaluating the impact of CAMS versus treatment as usual (TAU) on suicidal outpatients are presented. Patients in the CAMS treatment group ($n = 25$) resolved their suicidality significantly more quickly than TAU patients ($n = 30$). CAMS was also significantly associated with decreased medical health care utilization in the 6 months after the start of suicide-related mental health treatment. These results provide promising preliminary support for the effectiveness of CAMS and a foundation for prospective research.

Suicidality is the most commonly encountered clinical emergency for mental health professionals (Schein, 1976), yet clinicians typically receive little formal training in clinical suicidology (Bongar, 1991). Working with suicidal patients is increasingly challenging given managed care limitations on the traditional practice of hospitalizing suicidal patients; increases in suicide-related malpractice lawsuits also engenders fear in clinicians (Jobes, 2000; Jobes & Berman, 1993; Salkever, Shinogle, & Goldman, 1999). Not surprisingly, no other patient behavior generates more stress among mental health professionals than suicide and suicide-related behaviors (e.g., Pope & Tabachnick, 1993).

For many years there was remarkably little empirical research available to help guide clinical practice with suicidal patients—most of the extant literature described theory-based or anecdotal approaches with no empirical support (Jobes, 1995, 2000). In more recent years, however, a growing number of researchers have begun to develop and empirically investigate more theoretically sophisticated clinical approaches for suicidality (e.g., Henriques, Beck, & Brown, 2003; Linehan, 1993; Rudd, Joiner, Jobes, & King, 1999; Rudd, Joiner, & Rajab, 2001).

In response to the above issues, Jobes and colleagues (Jobes, 2000, 2005; Jobes, & Drozd, 2004; Jobes, Luoma, Jacoby, & Mann,

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1998) have developed a new clinical approach to suicidality called the Collaborative Assessment and Management of Suicidality (CAMS). The CAMS approach to suicidality integrates psychodynamic, cognitive, behavioral, humanistic, existential, and interpersonal theory into a structured clinical format emphasizing the importance of the therapist and patient working together to elucidate and understand the "functional" role of suicidality in the patient's phenomenological world (Jobes & Drozd, 2004). A collaborative and interactive approach to suicide risk assessment helps identify key constructs underlying the patient's suicidal state. By then targeting and treating these constructs, CAMS aims to reduce the patient's suicidal risk in an efficient and economical manner (Drozd, Jobes, & Luoma, 2000). CAMS is fundamentally designed to strengthen the therapeutic alliance; one of the essential factors in successful clinical outcomes (Horvath & Symonds, 1991). Philosophically speaking, CAMS emphasizes an intentional move away from the directive "therapist as expert" approach that can lead to adversarial power struggles around hospitalization and the unfortunate use of coercive "safety contracts" (Jobes, 2000). *Suicidality* is the primary focus of care in CAMS, rather than seeing suicidality as merely a symptom of a major psychiatric disorder (see also Henriques et al., 2003).

The CAMS method is initiated when a patient acknowledges current suicidal ideation, either through a self-report instrument or during a clinical interview. Clinical assessment pertaining to the patient's suicidal phenomenology is accomplished by collaboratively completing an assessment tool called the Suicide Status Form (SSF). The SSF uses both quantitative and qualitative responses to assess key variables of suicidality. Built on the theoretical work of Shneidman (1993); Beck, Rush, Shaw, and Emery (1979); Baumeister (1990); Linehan, Goodstein, Nielsen, and Chiles (1983); and Jobes (1995), the SSF uses Likert and qualitative open-ended items related to the patient's psychological pain, stress, agitation, hopelessness, self-hate, and overall suicide risk (Jobes, 2005). Use of the SSF is introduced as a collaborative endeavor, wherein the clinician asks for permission to literally take a seat next to the patient. The dyad then works together to rate, describe, and rank order the patient's responses. Throughout the assessment process, the patient's perspective is treated as the assessment gold standard. Completion of the SSF clarifies the nature of the patient's suicidality and sets the stage for a treatment planning process where the patient and clinician co-author an outpatient treatment plan. Within CAMS suicidal patients are administratively placed on "Suicide Status" and are assessed and treatment plans are updated at each clinical contact until clinical resolution is achieved (i.e., three consecutive sessions of no suicidality—see Jobes, Jacoby, Cimbolic, & Hustead, 1997). In summary, CAMS is designed to modify clinician behaviors in how they identify, engage, conceptualize, assess, treatment plan, and manage suicidal outpatients over the course of clinical care. Critically, CAMS does not usurp clinical judgment or dictate the treatment to be used.

The current study of CAMS used a retrospective design to study a medical record archive from two clinics using patient-focused data analytic techniques (see Lambert, 2001). Session-by-session clinical outcomes and medical record data from patients working with CAMS therapists were compared to patients receiving treatment as usual (TAU). Prior to examining the medical records, a series of a-priori exploratory hypotheses were proposed. We hypothesized that patients in the CAMS treatment group would show improved outcomes over patients in the TAU group on suicide-related variables. Specifically, CAMS patients would reduce their suicidality and meet criteria for resolution of suicidality more quickly, have fewer suicide attempts, and be hospitalized fewer times (with less inpatient time spent). We also hypothesized additional advantages for CAMS on various indirect treatment variables. Specifically, we hypothesized that CAMS patients would have better categorical treatment outcomes, less psychiatric symptoms, meet criteria for clinical recovery more quickly, and

have lower overall mental health care costs than TAU patients.

METHOD

Patients in the study received care at two outpatient Life Skills Centers in the U.S. Air Force 10th Medical Group located in the intermountain region of the United States. Medical record charts and computerized archival databases were used to obtain all mental health and medical health care information. Patient names and all identifying information were cleansed from these records prior to conducting this investigation.

Participants

This study used archival data of two groups of patient-practitioner dyads. The experimental group was 25 dyads where the clinician used the CAMS approach. The control group was 30 dyads where the clinician did not use CAMS (i.e., treatment as usual). Some clinicians were represented in both groups by virtue of adopting CAMS during the data collection period. Patients had provided written consent allowing use of their clinical data (in aggregate form with no individual identifying information) for program evaluation, practice improvement, and research purposes.

Patient Participants. Archival medical chart data were retrieved for adult outpatient psychotherapy cases treated for varying amounts of time at the two sites during an approximately 4-year period from 1998–2001. Standard clinic procedures required all patients to complete at intake and at each subsequent clinical contact a symptom-oriented assessment form (the OQ-45) containing an item addressing suicidal ideation: "I have thoughts of ending my life." Any patient who endorsed having such thoughts at a frequency of "sometimes" or greater was operationally considered suicidal and included in the current study sample. Progress notes were reviewed to ensure that patients also discussed suicidality with their therapists in session as an issue in treatment. There were no exclusion criteria (e.g., multiple diagnoses, high suicide risk, and medication usage); patients were thus representative of suicidal outpatients seen in these clinical settings.

Fifty-five consecutive patients across the two clinical sites met the criteria for being suicidal and were included in the sample. Complete patient demographic information for each treatment group is presented in Table 1. The average age was 29.1 years (SD = 7.2) and 66% were male. Eighty-four percent were Caucasian, 4% were African American, 5% were Hispanic, 4% were Asian, and 3% identified themselves as biracial. Forty-seven percent were married. In military rank, 20% were officers and 80% were enlisted personnel. The distribution of Axis I diagnoses was 31% adjustment disorders, 46% mood disorders, 4% anxiety disorders, 1% psychotic disorders, 7% relational problems, and 11% "V-code" diagnoses.

Clinician Participants. Four clinicians at Site 1 and three at Site 2 participated in this study. Four were doctoral-level psychologists, one was a clinical social worker, and two were psychiatrists. The average clinician age was 37.3 years old (SD = 7.4); average years of experience was 8.9 years (SD = 6.1); four were male and three were female.

Measures

Suicide Status Form. The Suicide Status Form (SSF) is a suicide risk assessment instrument that uses five-point Likert scales and various open-ended questions to assess psychological pain, stress, agitation, hopelessness, and self-hate as well as the patient's overall behavioral risk of suicide (Jobes et al., 1997). Patients are also asked to rank the relative importance of these constructs; additional Likert scales are used again to assess the nature of patient's suicidality (related to self vs. others) and their relative wish to live or die. Patients also provide written responses pertaining to their respective reasons for living versus their reasons for dying; each set of responses is then rank ordered by the patient. The initial assessment section ends with an

TABLE 1
Sample Characteristics of Treatment Groups

Characteristic	CAMS ($n = 25$)	TAU ($n = 30$)
Mean Age	27.68 ($SD = 6.84$)	30.3 ($SD = 7.56$)
Gender		
Male	68%	63%
Female	32%	37%
Ethnicity		
Caucasian	92%	77%
African American	4%	2%
Asian	0%	7%
Hispanic	4%	7%
Biracial	0%	7%
Education*		
High School	92%	57%
Bachelors	8%	17%
Graduate degree	0%	26%
Rank*		
Officers	4%	33%
Enlisted	96%	67%
Married	40%	63%
OQ-45 Mean Scores		
Initial Total	89.72 ($SD = 24.46$)	92.67 ($SD = 16.61$)
$t(53) = 0.53$, $p = .60$		
Initial Item #8	2.20 ($SD = 0.65$)	2.17 ($SD = 0.38$)
$t(53) = 0.24$, $p = .81$		
Initial Therapist-Rated GAF	62.87 ($SD = 11.14$)	64.08 ($SD = 9.029$)
$t(53) = 0.42$, $p = .68$		
Axis I Diagnoses		
$X^2(5, N = 55) = 6.98$, $p = 0.22$		
Adjustment Disorder	44%	20%
Mood Disorder	32%	58%
Anxiety Disorder	4%	3%
Psychotic Disorder	None	3%
Relational Problem	12%	3%
V-Code	8%	13%
Axis II Diagnoses	1 patient	1 patient
Medications used	56%	60%
Attended Healthy Thinking	44%	33%

*Between group comparison of characteristic significant at $p < .05$.

open-ended question asking for the "one thing" that would help them no longer feel suicidal. A subsequent assessment provides additional questions related to empirically based risk factors that precede the treatment plan section of the SSF. The SSF has solid psychometric validity and reliability both quantitatively (Jobes et al., 1997) and qualitatively (Jobes et al., 2004; Jobes & Mann, 1999, 2000; Nunno, Jobes, Peterson, Pentiuc, & Kiernan, 2002).

Outcome Questionnaire-45. The Outcome Questionnaire-45 (OQ-45; Lambert, Hansen et al., 1996) is a brief, standardized, 45-item self-report measure of patient progress in psychotherapy that takes approxi-

mately 5 minutes to complete. The measure is based on the conceptual work of Lambert (1983) and Strupp and Hadley (1977), and is designed to assess subjective discomfort (i.e., psychiatric symptoms), interpersonal relationships, and social role functioning. Each item on the OQ-45 is rated on a 5-point Likert scale (0 = *never*, 1 = *rarely*, 2 = *sometimes*, 3 = *frequently*, or 4 = *almost always*), resulting in a possible total score ranging from 0 to 180, with higher values indicating poorer functioning. The OQ-45 is designed to be administered repeatedly during the course of treatment and was given to each participant at intake and every therapy session. Item #8 on the OQ-45 ("I have thoughts of ending my life") was used to monitor session-by-session suicidality. In accordance with Jobes et al. (1997) patients were considered to have resolved their suicidality after three consecutive sessions with a score of zero on Item #8. The OQ-45 has been shown to have adequate internal consistency ($r = 0.93$; Lambert, Hansen, et al., 1996) and a satisfactory 3-week test-retest reliability ($r = 0.84$; Lambert, Burlingame, et al., 1996). It has been shown to have good concurrent validity with multiple other measures of depression, anxiety, and overall psychiatric functioning (Umphress, Lambert, Smart, Barlow, & Clouse, 1997). Normative data are available from a national database (Lambert & Finch, 1999; Umphress et al., 1997).

Procedure

Treatment Conditions. Mental health services at both sites were provided utilizing a primarily cognitive-behavioral therapy (CBT) model. Five therapists described their primary theoretical orientation as CBT; two were "eclectic" and acknowledged using CBT. In addition to individual therapy, clinic policy encouraged all patients to complete a 4-week, 8-hour "Healthy Thinking" class that taught various cognitive-behavioral strategies (e.g., self-monitoring). Suicidal patients taking this class were seen concurrently in individual therapy. Thirty-eight percent of patients attended Healthy Thinking classes in addition to individual therapy. All patients could thus be described as receiving naturalistic CBT. Patients were also offered the option of a psychiatric consultation in order to explore the possibility of using medication as an adjunct to therapy. Forty-two percent of patients used psychiatric medications during treatment.

All therapists were introduced to the CAMS protocol during a staff presentation by one of the participating psychologists (JFD) who had previous training in the model. Therapists who expressed interest ($n = 5$) received additional training by the participating psychologist in the philosophy and procedures of CAMS and were instructed in the use of the SSF with suicidal patients. Consequently, 6 out of 7 therapists attained at least a basic working understanding of CAMS and the use of the SSF. For the purposes of this study, suicidal patients of therapists who then used CAMS and the SSF constitute the CAMS treatment group ($n = 25$). Patients of the therapist who chose not to adopt the CAMS model, *and* patients of the remaining therapists *prior* to their adoption of CAMS, constitute the treatment as usual group ($n = 30$). Five therapists contributed cases to both conditions, one contributed only to TAU, and one contributed only to the CAMS.

RESULTS

The following results address major findings between experimental and control groups and further describe additional post hoc findings for direct and indirect variables.

Between Group Comparison at Pretreatment

Table 1 shows pretreatment sample characteristics for both groups. There were no significant pretreatment group differences in terms of age, gender, ethnicity, use of psychiatric medications during treatment, and participation in Healthy Thinking classes. However, patients in the TAU group were

significantly more educated, $\chi^2(3, N = 55) = 9.812$, $p = .02$, and more likely to be officers as opposed to enlisted personnel, $\chi^2(1, N = 55) = 7.333$, $p = .01$. In addition, there was a statistical trend toward TAU patients being more likely to be currently married, $\chi^2(1, N = 55) = 2.979$, $p = .08$.

No significant difference was found between initial total OQ-45 scores for patients in the CAMS group and patients in the TAU group. A comparison of initial scores on item #8 of the OQ-45 for the CAMS group and the TAU group was also nonsignificant. Therapist-rated GAF scores were not significantly different between the two groups. A comparison of the distribution of patients in each treatment group across Axis I diagnostic categories was nonsignificant. Only one patient in each group was diagnosed with an Axis II disorder; three patients in each group had traits of a personality disorder.

Significant differences were found in the distribution of patients across treatment sites, $\chi^2(1, N = 55) = 4.77$, $p = .03$. Site 1 treated 69% of the total patient sample; 76% of the TAU group was seen at Site 2. Significant differences were found in the distribution of patients across therapists, $\chi^2(1, N = 55) = 13.75$, $p = .03$; five therapists treated patients in both treatment groups and two treated patients from only one treatment group.

Direct Suicide-Related Variables

The groups were nearly identical in terms of the percentage of patients resolving their suicidality prior to ending treatment (see Table 2). Criteria for resolution were met by 66% of patients in the TAU group and 68% of patients in the CAMS group, $\chi^2(1, N = 55) = 0.01$, $p = .916$. However, among patients who resolved their suicidality, those in the CAMS group did so in significantly fewer sessions ($M = 7.35$, $SD = 4.21$) than those in the TAU group ($M = 11.4$, $SD = 7.02$), $t(35) = 2.08$, $p = .045$, $d = .69$.

A survival function was computed for each treatment group in order to provide a more global index of the time to resolution. Survival analysis (SA; see Wright, 2000) differs from the previous analysis in that it includes data from the patients in each group who did not resolve their suicidality during their treatment. The survival functions are estimated probability functions calculated from the sample data and are thus isomorphic to, but not identical to, a graphical depiction of the percentage of each group who resolved their suicidality at each session. Data from patients who were medically separated from the Air Force and who did not resolve their suicidality (TAU $n = 2$; CAMS $n = 3$) were excluded from the SA due to the fact that the censoring of their cases was related to treatment in a systematic manner (i.e., all significantly impaired and/or suicidal enough to warrant medical separation). Data from medically separated patients who did resolve their suicidality were included in the SA.

The survival functions displayed in Figure 1 represent the estimated proportion of each treatment group who should remain suicidal as a function of session number. A visual inspection reveals that initially the probability of remaining suicidal decreases in a similar fashion for both groups; however, patients in the CAMS group appear to have a lower estimated proportion of suicidal patients in approximately the 7–19 session range. The two survival plots almost merge again around 20 sessions and then have similar decreasing probabilities of remaining suicidal. The median estimated time to resolution is 7.00 sessions (95% CI 5.72, 8.28) for the CAMS group and 12.00 sessions (95% CI = 5.61, 18.39) for the TAU group. Two significance tests designed to detect between-group differences in the resolution survival curves yielded significant results. The value for the log-rank significance test was 4.76 ($df = 1$), $p = .03$. The value for the Breslow significance test was 3.74 ($df = 1$), $p = .05$.

Clinic policy required therapists to complete formal paperwork documenting suicidal behaviors made by patients, regardless of whether or not they resulted in injuries. As a result, this provided a fairly inclusive measure of the number of suicide attempts

TABLE 2
Direct Suicide Related Variables

Variable	Group	*N*	Mean	Std. Dev.	*T*-value	*df*	*p* value
# Hosp.	TAU	30	0.3333	0.9589	–0.11	53	0.913
	CAMS	25	0.36	0.8103			
Days hosp.	TAU	4	12	8.5245	0.704	7	0.504
	CAMS	5	8.2	7.6616			
# Attempts	TAU	30	0.1	0.3051	–0.233	53	0.817
	CAMS	25	0.12	0.3317			
Sess/Res	TAU	20	11.4	7.0218	2.077	35	0.045*
	CAMS	17	7.3529	4.2122			

*$p < 0.05$.

made in each treatment group. No significant between-group differences were found in the number of attempts; three patients in each treatment group made one suicide attempt apiece during the course of treatment.

There were also no significant group differences in the number of psychiatric hospitalizations that took place during treatment, or in the resulting number of days spent in the hospital. Four patients in the TAU group were hospitalized a total of 10 times, and spent an average of 12 total days (*SD* = 8.52) in the hospital. Comparatively, five patients in the CAMS group were hospitalized a total of nine times, and spent an average of 8.2 total days (*SD* = 7.66) in the hos-

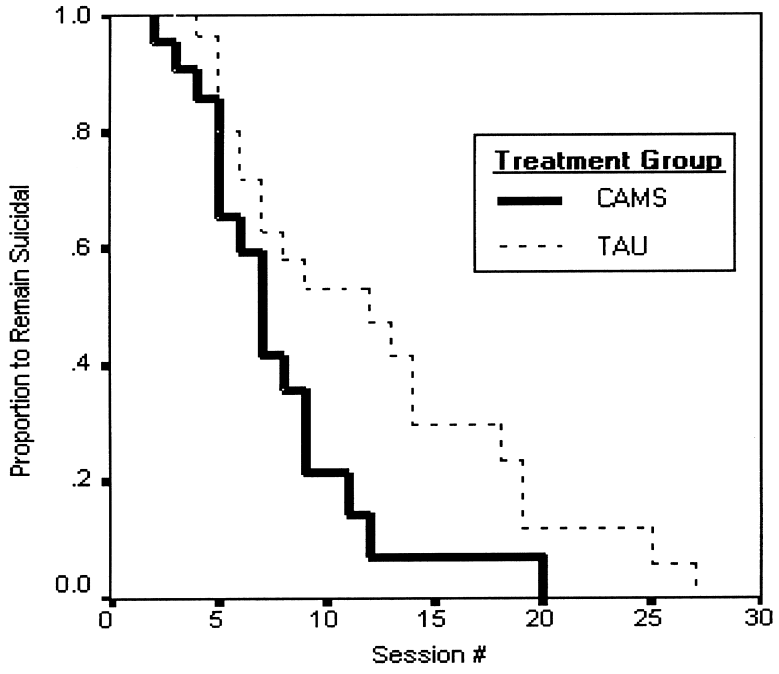

Figure 1. Estimated proportion of patients in the CAMS and TAU groups to remain suicidal as a function of session number.

pital. No patient in this study completed suicide.

Indirect Outcomes

Table 3 displays data for the outcomes of the indirect variables. No significant difference was found between the total number of sessions attended by patients in the CAMS group and the TAU group. Patients in both groups cancelled and "no-showed" for an average of 17% of scheduled sessions. Computer records were used to determine the number of other medical (non-mental health) appointments attended by patients during the time period in which they were engaged in mental health treatment. Due to computer record-keeping problems, data were not available for four patients in the TAU group and five patients in the CAMS group. For comparative purposes, the frequency of such medical appointments in terms of visits per year was calculated for each patient. TAU patients attended other medical appointments ($M = 14.51$, $SD = 14.69$) at a significantly higher rate than CAMS patients ($M = 6.42$, $SD = 6.95$; $t\ (44) = 2.27$, $p = .028$). Total cost of mental health treatment was calculated for each patient by multiplying the number of outpatient visits by $85 and then adding $600 per day for psychiatric hospitalization. No significant difference was found in the average cost of mental health treatment for patients in the CAMS group and the TAU group.

A chi-square analysis revealed no significant differences in overall categorical treatment outcomes based on pre/post OQ-45 total scores. Determinations of categorical treatment outcomes were based on the criteria established by Lambert, Hansen, et al. (1996) utilizing the principles developed by Jacobson and Truax (1991) for clinically significant change. Of those patients in the CAMS group who began treatment in the dysfunctional range ($n = 20$), 15% experienced no significant change, 30% experienced significant improvement but did not meet criteria for recovered status, and 55% met criteria for recovered status. The corresponding values for patients in the TAU group ($n = 28$) were 7%, 22%, and 71%, respectively. All patients who were medically separated who began treatment in the dys-

TABLE 3
Indirect Variables

Variable	Group	*N*	Mean	Std. Dev.	*T*-value	df	*p* value
Index OQ	TAU	30	92.6667	16.6119	0.53	53	0.598
	CAMS	25	89.72	24.4566			
Ind. OQ #8	TAU	30	2.1667	0.379	–0.238	53	0.813
	CAMS	25	2.2	0.6455			
Index GAF	TAU	26	64.0769	9.0285	0.417	46	0.679
	CAMS	22	62.8636	11.1411			
Tot. sess.	TAU	30	11.7667	8.6131	0.949	53	0.347
	CAMS	25	9.76	6.7037			
Tx days	TAU	30	229	219.3505	1.588	53	0.118
	CAMS	25	144.16	166.9261			
# Cancel	TAU	26	2.6923	2.4128	1.033	44	0.307
	CAMS	20	2	2.0261			
Med. appts.	TAU	26	14.5188	14.6965	2.271	44	0.028*
Per year	CAMS	20	6.4235	6.9558			
Direct Costs	TAU	30	$1,960.17	3438.1733	0.165	53	0.87
	CAMS	25	$1,813.60	3100.7115			

*$p < 0.05$.

functional range ($n = 7$) either recovered or improved and thus were included in this description of categorical outcomes.

Among patients in the CAMS group who began treatment in the functional range ($n = 5$), two experienced no significant change and three experienced significant improvement. Among patients in the TAU group who began treatment in the functional range ($n = 2$), one experienced significant improvement and one was medically separated while experiencing no significant change; no patients deteriorated during treatment.

Additional Post Hoc Analyses

Because of the retrospective design of the study, a great effort was made to address possible third variable explanations for the relevant results. Post hoc analyses were thus conducted when possible to replicate primary analyses while controlling for the potential effects of the covariates of education, rank (officer or enlisted), site, and therapist. The possible effect of each variable on the between group comparison of interest was considered by itself in a separate analysis, with the exception that education and rank were also considered in combination.

For patients in each group who resolved their suicidality, an Analysis of Covariance (ANCOVA) was conducted to compare the time to resolution between treatment groups while controlling for each of the previously mentioned covariates and the combination of education and rank. In each comparison, the between group difference was no longer statistically significant at the alpha-level of .05; however, the general trend of an advantage for patients in the CAMS group remained clear, with p values ranging from .05 to .08. This process was repeated to compare the frequency of other medical appointments attended while controlling for the specified covariates. All comparisons remained statistically significant, with p values ranging from .05 and under.

All primary analyses were also repeated using only data from Site 1 (CAMS $n = 21$; TAU $n = 17$) in order to remove potential site effects. Data from Site 2 were not analyzed in this manner, as the number of patients was too small (CAMS $n = 4$; TAU $n = 13$). Again, the overall pattern of results for Site 1 was virtually identical to the full sample. Although differences in the resolution of suicidality and number of medical appointments were not statistically significant at $p < .05$, the trend toward an advantage for patients in the CAMS group was still clear throughout the results.

Medical Utilization

The observed lower medical utilization of CAMS patients compared to TAU patients led to subsequent chart reviews to further understand this unexpected finding. The resulting post hoc analyses evaluated the following: (a) the specific number and types of medical specialists seen, (b) the types of medical tests ordered, (c) the length of time spent in medical appointments, (d) the types and numbers of medicines prescribed, (e) CPT codes, (f) medical diagnoses, and (g) estimates of total (nonmental health) medical care costs. Moreover, an interrupted time series analysis (Bordens & Abbott, 2002) was performed to further understand the medical utilization data. Specifically, we retrieved 6 months medical utilization data for all subjects in the period prior to their seeking Life Skills Center mental health care (the index event), and we further retrieved medical utilization data for the 6 months after their initiation of mental health care. Similar mental health care utilization data for all subjects was obtained for the same 1 year catchment period.

As shown in Table 4, CAMS patients had statistically significantly fewer emergency room visits than did TAU patients. CAMS patients also spent significantly fewer minutes in the emergency room than did TAU patients. Similarly, CAMS patients had significantly fewer (nonmental health) medical appointments in comparison to TAU patients. Finally, CAMS patients spent significantly fewer minutes in medical appointments than

TABLE 4
Between Subjects Finding for Medical Utilization

Variable	Group	*N*	Mean	Std. Dev.	*F* value	*df*	*p* value
ER Visits	TAU	30	.90	1.40	21.54	1, 52	$p = .000$
	CAMS	24	.25	.44			
ER Time	TAU	30	124.57	258.23	12.72	1, 52	$p = .001$
(minutes)	CAMS	24	24.5	53.37			
Med Appts.	TAU	30	7.57	8.39	5.71	1, 52	$p = .021$
	CAMS	24	4.42	5.40			
Time in	TAU	30	268.57	350.84	20.06	1, 52	$p = .000$
Med Appts	CAMS	24	106.54	118.79			
(minutes)							

TAU patients in the 6 months after seeking mental health care.

Figure 2 depicts no significant between-group differences for CAMS and TAU patients in terms of medical utilization prior to seeking mental health treatment; however, there was a statistically significant between-group difference in the 6 months *after* seeking mental health care ($p = .02$). In terms of within-subjects analyses, there was no significant difference in medical appointments for CAMS patients before and after seeking mental health care. In contrast, TAU patients attended significantly more medical appointments after seeking mental health care compared to before ($t = 1.77$, $p = .04$). Critically, no significant differences were found between groups in terms of diagnoses or use of psychotropic medications over the year catchment period.

DISCUSSION

The treatment groups were well matched overall on a host of pretreatment demographic variables. Reflective of a substantial segment of the Air Force as a whole, the prototypic patient in each group was a White male in his twenties or thirties. Research on the treatment of this type of patient is of special importance given that the vast majority of suicide completers in the general population are White males (Hoyert, Arias, Smith, Murphy, & Kochanek, 2001). The majority of patients in each group were diagnosed with a mood disorder or an adjustment disorder with a mood component. This finding is consistent with a significant body of research linking mood disorders and suicidality (Tanney, 2001). Based on normative data provided by Lambert, Hansen, et al. (1996), the mean pretreatment total OQ-45 scores for the treatment groups were roughly 0.4 standard deviations above the mean of an outpatient normative sample, and 2.5 standard deviations above the mean of a nonpatient community sample. Thus, patients in the present study were experiencing a significant level of distress commensurate with that typically found among outpatients.

The treatment groups were remarkably similar on most pretreatment variables considering the lack of random assignment to treatment conditions. Comparability of the treatment groups was critical given the nonrandom retrospective nature of this study. Interestingly, approximately two thirds of patients in each group resolved their suicidality prior to ending treatment. But as noted in the results, the CAMS patients who resolved their suicidality did so an average of four sessions more quickly than TAU suicidal resolvers. This particular finding is especially important if it ultimately translates into closing the patient's window of suicidal vulnerability by approximately 1 month—a meaningful difference. In addition, our data may suggest that collaborative aspects of CAMS may be more effective than more traditional

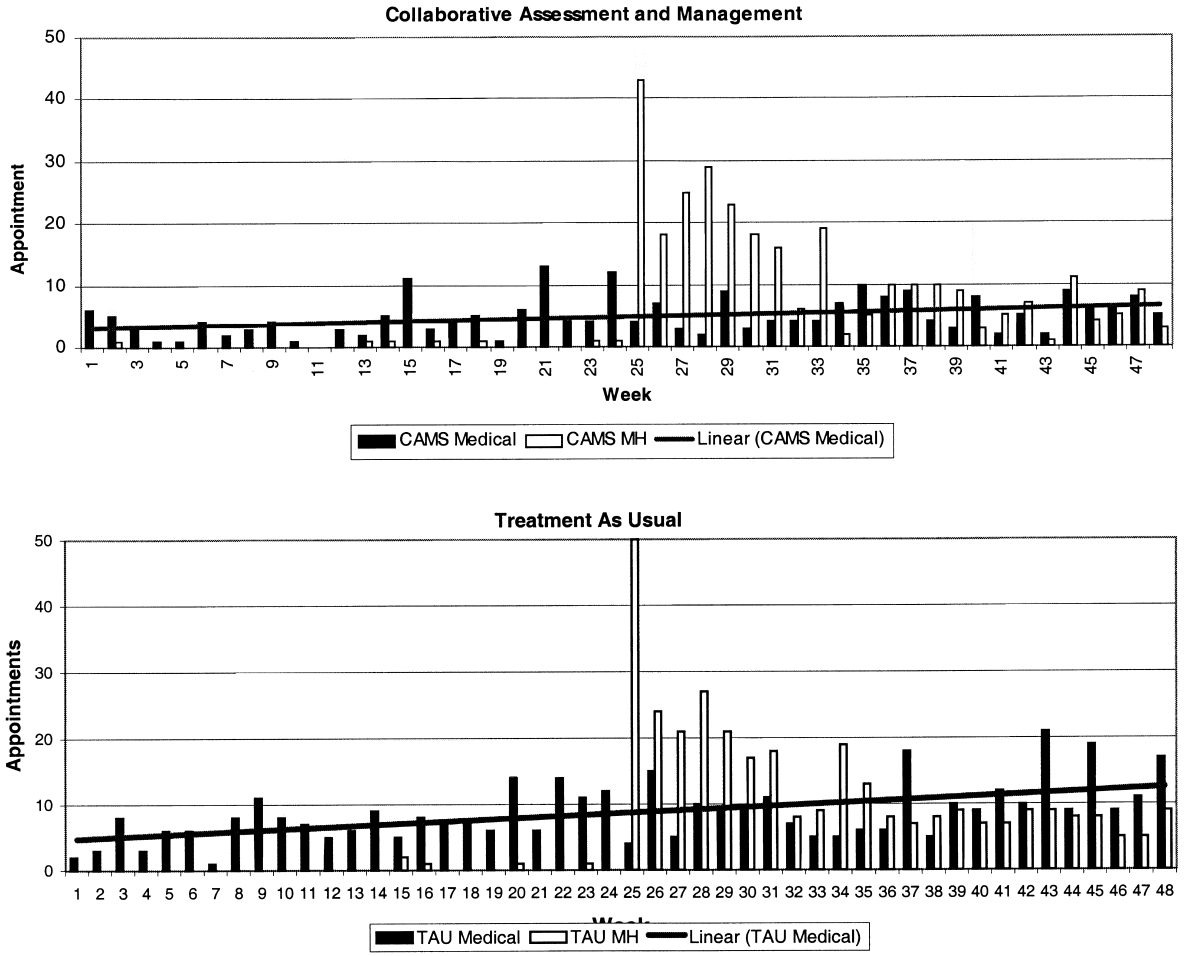

Figure 2. Comparison of aggregate mental health and medical appointments for CAMS versus TAU.

"directive" treatments—an important observation seen elsewhere in the clinical literature (Geller, Brown, Zaitsoff, Goodrich, & Hastings, 2003).

Multiple post hoc analyses were conducted to thoroughly investigate alternate—third variable—explanations for any observed group differences. These analyses did not produce any significant changes in results when primary analyses were repeated while controlling for various covariates identified as significant pretreatment differences. Although the effect sizes and statistical significance levels of most analyses were reduced when controlling for covariates, all statistical trends remained and none of the observed effects completely disappeared. Given the small sample size and methodological limits of the study, maintaining the overall pattern of results was notable. Moreover, one might argue that some of the few differences between the treatment groups would actually favor the TAU patients (e.g., the TAU trend of more married patients is a protective factor against suicidality in the general population—see Maris, Berman, & Silverman, 2000).

A somewhat unexpected finding of the initial series of analyses was that patients in the CAMS group attended significantly fewer non-mental health medical appointments than patients in the TAU group. A significant body of research has established that the presence of a psychiatric disorder, especially depression, is related to higher rates of non-psychiatric health care utilization (Koenig & Kuchibhatla, 1998; Rowan, Davidson, Campbell, Dolorez, & MacLean, 2002; Simon, Ormel, VonKorff, & Barlow, 1995). In fact, Luoma, Martin, and Pearson (2002) found that patients who completed suicide were more likely to see a primary care doctor than a mental health professional in the months and year before their death. The findings of the present study directly address this important area of contemporary concern.

As noted, our post hoc chart reviews and analyses revealed that CAMS was significantly associated with considerable medical care cost savings. Compared to TAU, CAMS treatment was clearly associated with considerably lower medical utilization in the 6 months after the start of mental health treatment. Critically, when such medical utilization is conservatively costed-out, the savings may be substantial in terms of medical personnel labor and other health care costs. For example, medical utilization cost estimates extrapolated for 75 suicidal patients anticipated for the 2003–2004 fiscal year at one of our study sites would be $135,506.25 for CAMS patients and $168,082.50 for TAU patients. Thus, over one calendar year, mental health practitioners using CAMS at this site might potentially save the Air Force Medical Service approximately $32,576.25. Extrapolating these data further across 80 Air Force clinics worldwide, it is possible that CAMS mental health care for suicidal outpatients might be associated with medical care cost savings approaching $2 million a year (not including considerable costs savings pertaining to lab tests and specialty consultations). While such extrapolations should of course be viewed with caution, the implications are noteworthy.

The present study utilized an array of outcome measures and data-analytic techniques to retrospectively evaluate the potential benefits of using the CAMS model of assessing and treating suicidal outpatients compared to treatment as it is usually delivered. With a few exceptions, results consistently showed that both treatment groups improved at generally similar rates in terms of suicide-specific variables as well as measures of overall psychiatric symptoms. Patients in the CAMS treatment group, however, resolved their suicidality more quickly and attended fewer non-mental health medical appointments than patients receiving TAU. Given the relatively small samples and modest effect sizes, these significant differences stand out as important findings.

Limitations of this study include the lack of random assignment to treatment, the unequal distribution of patients across treatment sites and therapists, and the lack of measures of treatment fidelity; however, the study has extremely high external validity. The present investigation represents perhaps

the "purest" test possible of the potential real world advantages for CAMS, as its effects were evaluated only after the process of its implementation in two clinics was naturalistically completed. It therefore does not represent an approximation of what would have happened if CAMS were introduced into outpatient treatment settings; rather, we studied this process as it happened in reality (i.e., suicidal patients in this study were at these clinics to be treated—not studied).

One of the central contributions of the present study is the adaptation of the principles of patient-focused research to create a comprehensive methodology and data analytic strategy to assess the real world session-by-session effectiveness of a new clinical approach. Gathering session-by-session data enabled us to understand a process of care that is not seen in typical pre-post treatment studies where measures are administered only at the start and end of care. Moreover, as far as we know, this is the first study to naturalistically observe the use of medical care by a suicidal sample both before and after seeking mental health care—these unexpected exploratory findings are particularly prominent given current exponential increases in health care delivery costs.

The methodological additions of random assignment to treatment condition, assessment of treatment fidelity, and an increased sample size within a prospective research design would of course be a more definitive test of the effectiveness of CAMS. Such a strategy would create a methodological "middle ground," in which internal and external validity could be maximized. Nevertheless, the present study does suggest that CAMS may potentially create a superior treatment trajectory in comparison to TAU. Consequently, it provides promising preliminary support for a novel method of assessing and clinically managing suicidal patients and sets the stage for future prospective studies of the potential effectiveness of CAMS as a viable clinical approach for suicidal patients.

REFERENCES

BAUMEISTER, R. F. (1990). Suicide as escape from self. *Psychological Review*, *97*, 90–113.

BECK, A. T., RUSH, A. J., SHAW, B. F., & EMERY, G. (1979). *Cognitive therapy of depression*. New York: Guilford.

BONGAR, B. (1991). *The suicidal patient: Clinical and legal standards of care*. Washington, DC: American Psychological Association.

BORDENS, K. S., & ABBOTT, B. B. (2002). *Research design and methods: A process approach*. Mountain View, CA: Mayfield.

DROZD, J. F., JOBES, D. A., & LUOMA, J. B. (2000). The collaborative assessment and management of suicidality in Air Force mental health clinics. *The Air Force Psychologist*, *18*, 6–11.

GELLER, J., BROWN, K. E., ZAITSOFF, S. L., GOODRICH, S., & HASTINGS, F. (2003). Collaborative versus directive interventions in the treatment of eating disorders: Implications for care providers. *Professional Psychology: Research and Practice*, *34*, 406–413.

HENRIQUES, G., BECK, A. T., & BROWN, G. K. (2003). Cognitive therapy for adolescent and young adult suicide attempters. *American Behavioral Scientist*, *46*, 1258–1268.

HORVATH, A. O., & SYMONDS, B. (1991). Relation between working alliance and outcome in psychotherapy: A meta-analysis. *Journal of Counseling Psychology*, *38*, 139–149.

HOYERT, D. L., ARIAS, E., SMITH, B. L., MURPHY, S. L., & KOCHANEK, K. D. (2001). Deaths: Final data for 1999. *National Vital Statistics Report*, *49* (DHHS Publication No. PHS 2001–1120). Hyattsville, MD: National Center for Health Statistics.

JACOBSON, N. S., & TRAUX, P. (1991). Clinical Significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology*, *59*, 12–19.

JOBES, D. A. (1995). The challenge and the promise of clinical suicidology. *Suicide and Life-Threatening Behavior*, *25*, 437–449.

JOBES, D. A. (2000). Collaborating to prevent suicide: A clinical-research perspective. *Suicide and Life-Threatening Behavior*, *30*, 8–17.

JOBES, D. A. (2005). *The collaborative assessment and management of suicidality (CAMS)*. Manuscript in preparation.

JOBES, D. A., & BERMAN, A. L. (1993). Suicide and malpractice liability: Assessing and revising policies, procedures, and practice in outpatient

settings. *Professional Psychology: Research and Practice*, *24*, 91–99.

JOBES, D. A., & DROZD, J. F. (2004). The CAMS approach to working with suicidal patients. *Journal of Contemporary Psychotherapy*, *34*, 73–85.

JOBES, D. A., JACOBY, A. M., CIMBOLIC, P., & HUSTEAD, L.A.T. (1997). The assessment and treatment of suicidal clients in a university counseling center. *Journal of Counseling*, *44*, 368–377.

JOBES, D. A., LUOMA, J. B., JACOBY, A. M., & MANN, R. (1998). *Manual for the collaborative assessment and management of suicidality*. Unpublished manuscript.

JOBES, D. A., & MANN, R. E. (1999). Reasons for living versus reasons for dying: Examining the internal debate of suicide. *Suicide and Life-Threatening Behavior*, *29*, 97–104.

JOBES, D. A., & MANN, R. E. (2000). Letters to the editor—Reply. *Suicide and Life-Threatening Behavior*, *30*, 182.

JOBES, D. A., NELSON, K. N., PETERSON, E. M., PENTIUC, D., DOWNING, V., FRANCINI, K., ET AL. (2004). Describing suicidality: An investigation of qualitative SSF responses. *Suicide and Life-Threatening Behavior*, *34*, 99–112.

KOENIG, H. G., & KUCHIBHATLA, M. (1998). Use of health services by hospitalized medically ill depressed elderly patients. *American Journal of Psychiatry*, *155*, 871–877.

LAMBERT, M. J. (1983). Introduction to the assessment of psychotherapy outcome: Historical perspectives and current issues. In M. J. Lambert, E. R. Christensen, & S. S. DeJulio (Eds.), *The assessment of psychotherapy outcome* (pp. 3–32). New York: Wiley.

LAMBERT, M. J. (2001). Psychotherapy outcome and quality improvement: Introduction to the special section on patient-focused research. *Journal of Consulting and Clinical Psychology*, *69*, 147–149.

LAMBERT, M. J., BURLINGAME, G., UMPHRESS, V., HANSEN, N., VERMEERSCH, D., CLOUSE, G., ET AL. (1996). The reliability and validity of the Outcome Questionnaire. *Clinical Psychology and Psychotherapy*, *3*, 106–116.

LAMBERT, M. J., & FINCH, A. E. (1999). The Outcome Questionnaire. In M. E. Maruish (Ed.), *The use of psychological testing for treatment planning and outcomes assessment* (2nd ed., pp. 831–869). Mahwah, NJ: Earlbaum.

LAMBERT, M. J., HANSEN, N. B, UMPHRESS, V., LUNNEN, K., OKIISHI, J., BURLINGAME, G., ET AL. (1996). *Administration and scoring manual for the Outcome Questionnaire (OQ 45.2)*. Wilmington, DE: American Professional Credentialing Services.

LINEHAN, M. M. (1993). *Skills training manual for treating borderline personality disorder*. New York: Guilford.

LINEHAN, M. M., GOODSTEIN, J. L., NIELSEN, S. L., & CHILES, J. A. (1983). Reasons for staying alive when you are thinking of killing yourself: The Reasons for Living Inventory. *Journal of Consulting and Clinical Psychology*, *51*, 276–286.

LUOMA, J. B., MARTIN, C. E., & PEARSON, J. L. (2002). Contact with mental health and primary care providers before suicide: A review of the evidence. *American Journal of Psychiatry*, *159*, 909–916.

MARIS, R. W., BERMAN, A. L., & SILVERMAN, M. M. (2000). *Comprehensive textbook of suicidology*. New York: Guilford.

NUNNO, K. M., JOBES, D. A., PETERSON, E. M., PENTIUC, D., & KIERNAN, A. (2002, April). *A qualitative examination of suicide status form variables*. Paper presented at the annual conference of the American Association of Suicidology, Washington, DC.

POPE, K. S., & TABACHNIK, B. G. (1993). Therapists' anger, fear, and sexual feelings: National survey of therapist responses, client characteristics, critical events, formal complaints, and training. *Professional Psychology: Research and Practice*, *24*, 142–152.

ROWAN, P. J., DAVIDSON, K., CAMPBELL, J. A., DOBREZ, D. G., & MACLEAN, D. R. (2002). Depressive symptoms predict medical care utilization in a population-based sample. *Psychological Medicine*, *32*, 903–908.

RUDD, M. D., JOINER, T. E., JOBES, D. A., & KING, C. A. (1999). Practice guidelines in the outpatient treatment of suicidality: An integration of science and a recognition of its limitations. *Professional Psychology: Research and Practice*, *30*, 437–446.

RUDD, M. D., JOINER, T., & RAJAB, M. H. (2001). *Treating suicidal behavior: An effective, time-limited approach*. New York: Guilford.

SALKEVER, D. S., SHINOGLE, J., & GOLDMAN, H. (1999). Mental health benefit limits and cost sharing under managed care: A national survey of employers. *Psychiatric Services*, *50*, 1631–1633.

SCHEIN, H. M. (1976). Obstacles in the education of psychiatric residents. *Omega*, *7*, 75–82.

SHNEIDMAN, E. S. (1993). *Suicide as psychache: A clinical approach to self-destructive behavior*. Northvale, NJ: Aronson.

SIMON, G., ORMEL, J., VONKORFF, M., & BARLOW, W. (1995). Health care costs associated with depressive and anxiety disorders in primary care. *American Journal of Psychiatry*, *152*, 352–357.

STRUPP, H. H., & HADLEY, S. W. (1977). A tripartite model of mental health and therapeutic outcomes: With special reference to negative effects in psychotherapy. *American Psychologist*, *32*, 187–196.

TANNEY, N. L. (2001). Psychiatric diagnoses and suicidal acts. In R. W. Maris, A. L. Ber-

man, & M. M. Silverman (Eds.), *Comprehensive textbook of suicidology* (pp. 311–341). New York: Guilford.

UMPHRESS, V. J., LAMBERT, M. J., SMART, D. W., BARLOW, S. H., & CLOUSE, G. (1997). Concurrent and construct validity of the Outcome Questionnaire. *Journal of Psychoeducational Assessment, 15*, 40–55.

WRIGHT, R. E. (2000). Survival analysis. In L. G. Grimm & P. R. Yarnold (Eds.), *Reading and understanding MORE multivariate statistics* (pp. 941–948). Washington, DC: American Psychological Association.

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