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Effects of an Emergency Department Mental Health Intervention for Linking Pediatric Suicidal Patients to Follow-Up Mental Health Treatment: A Randomized Controlled Trial

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Abstract

Objective—Suicide is the third leading cause of death among adolescents. Many suicidal youths treated in Emergency Departments (EDs) do not receive follow-up treatment, as advocated by our National Strategy for Suicide Prevention. We compared two strategies for improving rates of follow-up treatment.

Methods—Randomized controlled trial in which suicidal youths at two EDs (N=181; aged 10–18) were individually randomized between April 2003 and August 2005 to one of two conditions: an enhanced mental health intervention involving a family-based cognitive-behavior therapy session in the ED designed to increase motivation for follow-up treatment and safety, supplemented by care linkage telephone contacts after discharge; or Usual ED-Care enhanced by provider education. Assessments were conducted at baseline and at about 2-months after ED/hospital discharge. The primary outcome measure was rates of outpatient mental health treatment after discharge.

Results—Intervention patients were significantly more likely to attend outpatient treatment, as compared to usual ED-Care patients (92% vs 76%, $p=.004$). The intervention group also had a significantly higher rate of psychotherapy (76% vs 49%; $p=.001$); combined psychotherapy and medication (58% vs 37%; $p=.003$); and significantly more psychotherapy visits (mean 5.3 vs 3.1; $p=.003$). Neither the ED intervention nor community outpatient treatment (in exploratory analyses) was significantly associated with improved clinical/functioning outcomes.

Conclusions—Results support efficacy of the enhanced ED intervention for improving linkage to outpatient mental health treatment, but underscore the need for improved community outpatient treatment to prevent suicide/suicide attempts and poor clinical/functioning outcomes in the high-risk youths treated in EDs for suicidality.

Suicide is the third leading cause of death among youths ages 10–24 and reducing suicide and suicide attempts are national health promotion goals (Healthy People 2010, 18.1–18.2).¹ The National Strategy for Suicide Prevention identifies the ED as an important suicide

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prevention site and includes increasing rates of post-discharge mental health follow-up treatment for suicidal ED patients as a national objective (7.1).² Youths presenting to the ED with suicidality are a high-risk group: medically dangerous suicide attempts are treated in the ED; and a prior suicide attempt is a strong predictor of future attempts, death by suicide, and other negative outcomes.³ Yet, many of these youths do not receive outpatient mental health treatment, despite evidence that this may improve outcomes.⁴

This article presents results of a randomized controlled trial (RCT) evaluating the Family Intervention for Suicide Prevention (FISP), compared to usual ED-care enhanced by staff training. The FISP is an adaptation of the Specialized Emergency Room (ER; now ED) Intervention listed as a promising practice in the Registry of Evidence-Based Suicide Prevention Programs⁵ and uses the ED visit as a window of opportunity to deliver an effective intervention and link youths to outpatient mental health treatment. A pilot quasi-experimental trial suggested that when combined with a structured outpatient cognitive-behavioral family treatment, the ED-intervention led to improved adherence to outpatient treatment, less suicidal ideation, and less depression.^{4, 6} In the pilot, patients from a first time period were assigned to usual ED-care and patients from a second period to intervention. Hence, results could reflect differences in the two time periods vs. intervention effects. The present RCT overcame this difficulty, allows evaluation of the ED-intervention independent from the effects of the outpatient treatment, adapted the ED intervention to “usual” EDs where access to outpatient treatment is not guaranteed,⁷ and evaluates the intervention in two EDs that differ from the original ED development site (Columbia).

This is the first RCT to evaluate the ED-intervention/FISP independently from the outpatient cognitive-behavioral family treatment and to our knowledge the largest completed RCT evaluating an ED-intervention specifically for pediatric suicidal ED patients.⁸ We predicted that the FISP, relative to usual ED-care, would be associated with higher rates of outpatient treatment, particularly psychotherapy (the FISP treatment modality). The secondary outcome was fewer suicide attempts. We also explore intervention effects on youth suicidal ideation, depression, other mental health/functioning problems, parent depression, and family functioning.

METHODS

Setting & Design

Patients were recruited from two EDs in Los Angeles selected to include different geographic areas and populations. ED-A, was in a largely middle class area, connected to a psychiatric hospital with youth inpatient services, and served roughly 42,000 patients annually. ED-B, operated by the Department of Health, served roughly 77,000 public-sector patients annually across psychiatric, adult, and pediatric EDs. All procedures were approved by the Institutional Review Boards; all participants gave informed consent/assent. We focus here on follow-up procedures; detailed description of the baseline sample and methods are provided elsewhere.^{7, 9}

Consecutive patients (N=181) were recruited between April 2003 and August 2005. ED personnel identified possible participants and paged study staff, who verified eligibility and enrolled participants. To address the needs of EDs to treat the diverse youths presenting with suicidality, eligibility criteria were expanded over the earlier pilot which included only female adolescent attempters. *Inclusion criteria* were: presenting to the ED for suicide attempts and/or ideation; age 10–18. *Exclusion criteria* were: acute psychosis/symptoms that impede consent/assessment; no parent/guardian to consent; youth not English-speaking; parents/guardians not English or Spanish-speaking.

After participants completed the 20–30 minute baseline assessment, participants (N=181) were randomly assigned to either: FISP (n=89); or Usual Care (n=92). Randomization was stratified by site, assigned by a computerized random number generator, and allocation completed through project directors accessing the computerized system. When patients were randomized to FISP, clinicians were called/paged to deliver the intervention in the ED. Recruitment and assessment staff were blinded to randomization status. Follow-up assessments were completed at about 2-months after ED/hospital discharge (median=41 days, mean=57±51 days). Measures were available in Spanish and English for parents.

Intervention Condition

CONTROL—Usual care was enhanced by a one-session training for ED staff. Based on the American Academy of Child and Adolescent Psychiatry Practice parameters,¹⁰ training emphasized the importance of linking suicidal patients to outpatient mental health treatment, restricting access to dangerous/lethal attempt methods, and increased risk associated with substance use. Training was conducted during staff meetings and supplemented by informal contacts and distribution of practice parameters.⁷ A list of referral resources was available at each ED.

FISP—The FISP began with a brief youth and family crisis-therapy session in the ED focused on: reframing the suicide attempt as a problem requiring action, educating families regarding the importance of outpatient mental health treatment and restricting access to dangerous attempt methods, and obtaining a commitment from the youth to use a safety plan in future crises; strengthening family support by encouraging youths and parents to identify positive attributes in the youth and family; developing an hierarchy of potential suicidality-triggers using an “emotional thermometer” to identify feelings and physical, cognitive, and behavioral reactions to these triggers; developing and practice using a “safety plan” for reducing “emotional temperature” and attempt-risk; and creating a “Safety Plan Card” (often supplemented by a “Hope Box”^{11, 12}) to provide a concrete tool that youths could use at times of acute stress/suicide attempt-risk to cue reminders of reasons for living and safe/adaptive coping.

Structured telephone contacts focused on motivating and supporting outpatient treatment attendance were made within the first 48 hours after ED/hospital discharge with additional contacts as needed (usually at 1, 2, and 4-weeks post-discharge). These were modeled after other compliance enhancement¹³ and care manager¹⁴ interventions.

Clinicians with graduate mental health training received didactic training with role playing, observed intervention sessions, were observed until a senior clinician certified them as proficient, and received regular quality assurance monitoring/supervision. Additional details are provided in our clinical article.⁷

Outcome Measures

The primary outcome was linkage to outpatient mental health treatment assessed using the *Service Assessment for Children and Adolescents (SACA)*,¹⁴ adapted for the ED-population. Reliability of parent and youth reports was strong for measures of presence vs. absence of outpatient mental health treatment, psychotherapy, and medication (kappa=.72-.93). Because parents are generally more reliable reporters of more objective variables,¹⁵ we used parent-reports substituting youth data when parent data were unavailable. Results of sensitivity analyses using youth-report as the primary source were similar, and noted when inconsistent.

The secondary outcome was suicide attempts on the NIMH DISC-IV, an established psychometrically strong diagnostic interview.^{16, 17} Because youths are considered to be more sensitive and accurate reporters on variables that rely on internal state such as suicidal intent and depression,¹⁵ we used youth reports substituting parent report when youth data were unavailable. Sensitivity analyses using parent report led to the same conclusions. Youth report on the Harkavy Hasnis Scale (HASS),¹⁶ provided additional details on level of suicidality during the follow-up interval ($\alpha=.89-.92$). The HASS includes two subscales: active suicidal behavior and ideation (5-items, e.g. “tried to kill yourself”) and more passive suicidal ideation (12-items, e.g. “had ideas about killing yourself”).

Other exploratory outcomes were youth and parent depression, assessed using the Center for Epidemiological Studies Depression Scale (*CES-D*), a self-report measure of past-week symptoms with established psychometric properties in adolescents and adults.^{18, 19} The parent-completed *Child Behavior Checklist (CBCL)* provided a measure of overall psychopathology (Total Problems), externalizing/behavioral problems, and internalizing/emotional problems.²⁰ Family functioning was assessed by youth report on the *Conflict Behavior Questionnaire (CBQ)*.²¹

Statistical Analysis

To assess balance across experimental arms, we examined sample demographic and baseline clinical characteristics, time to follow-up, and follow-up completion rates, comparing FISP and CONTROL groups using standard univariate statistics. Intervention effects were evaluated using intent-to-treat analyses for each outcome, regardless of the intervention dose received. We fitted logistic regression models for dichotomous outcomes and linear regression models for continuous outcomes, with intervention status as the main independent variable. In all analyses, we adjusted for baseline score for the same outcome, days between baseline and follow-up, site, age, gender, CBCL Total Problems (due to marginally higher scores in the FISP vs. CONTROL group ($p<.10$); and CES-D (because follow-up participation rates varied significantly by baseline scores, $t=2.3$, $df=179$, $p=.02$). For highly skewed count variables, negative binomial regression was used. To show effect sizes, we present: unadjusted means and proportions by intervention condition, and adjusted mean differences for continuously scaled variables; odds ratios (ORs) for binary variables; and rate ratios (RRs) for count variables that are adjusted for covariates listed above. We conducted sensitivity analyses that limited the time from baseline to follow-up to 90 days ($n=135$), and others adjusting for length of hospitalization, and pre-ED treatment status, with no change in conclusions or substantive results. Multiple imputation was used to address missing data for the 12% of patients who did not complete follow-up assessments, using the MI procedure in SAS version 9.2 (SAS Institute, Cary, NC).^{22, 23}

To examine time effects on clinical outcomes we fitted mixed effect regression models for continuously scaled variables using the MIXED procedure in SAS, and mixed effect logistic regression model for dichotomous variables using the GLIMMIX procedure in SAS with time indicator (baseline, follow-up) as the primary predictor controlling for intervention status, study site, age, and gender. In the models, we specified random intercept model to account for the within-subject correlation over time.

Due to multiple comparisons, we used a conservative p value of $<.01$ to detect statistically significant differences.

The study was designed to have power of .80 with alpha of .05 (two-sided) to detect odds ratio of 2.5 in rates of treatment linkage and 4.5 in suicide attempt rates. Enrolling 90 patients per condition allowed up to a 15% attrition rate.

RESULTS

Among 340 youths approached, 254 were eligible (62%), 86 were ineligible (48 parents not present to consent/participate, 10 not English or Spanish-speakers, 28 met other exclusion criteria), 210 of the 254 eligible youths (83%) completed baseline assessments, 29 were excluded after baseline (27 pilots, 2 determined ineligible after baseline, and 181 were enrolled in the RCT (eFIGURE 1). Patients' mean age was 14.7 ± 2.0 , 69% were female, and 67% ethnic/racial minorities (TABLE 1). The ED visit was due to a suicide attempt in 53% of youths, with the remainder due to suicidal ideation. Past-year suicide attempts were reported by 66% of youths, with 27% reporting multiple (≥ 2) past-year attempts. Mental health/functioning problems were common at baseline: 78% reported severe depression (CES-D ≥ 24); 53% screened positive for post-traumatic stress disorder;²⁴ 17% reported probable substance abuse;²⁵ and 70%, 58%, and 73% of youths scored in the clinical range on the Child Behavior Checklist (CBCL) internalizing, externalizing, and total problems, respectively.²⁰ FISP and CONTROL groups were similar at baseline, with the exception of marginally higher total problem scores in the FISP condition.

Most youths were hospitalized after ED evaluation/treatment (70%), with no significant between group differences. Based on retrospective assessments completed at follow-up, 40% (N=56/139) of youths met DISC-IV criteria for depressive disorders in the year before the emergency department visit (major depression, N=53; dysthymic disorder, N=3), with no significant group differences. Youths not meeting criteria for depressive disorders still had high levels of depressive symptoms (71%, or N=59/83, with a CES-D score ≥ 24) and externalizing (54%, or N=42/78, in the clinical range) and internalizing (65%, or N=51/78, in the clinical range) problems.

Linkage to Outpatient Community Mental Health Treatment

Table 2 presents the intervention effect on linkage to outpatient treatment, with and without multiple imputation for missing values. FISP patients were significantly more likely than controls to be linked to outpatient treatment (92% vs 76%; OR=6.2; 95% CI=1.8–21.3, $p=.004$). FISP patients also had significantly higher rates of psychotherapy (76% vs 49%; OR=4.0, 95% CI=1.9–8.5, $p=.001$), combined psychotherapy and medication vs. monotherapy (psychotherapy or medication alone) or no treatment (58% vs 37%; OR=3.3, 95% CI=1.5–7.0, $p=.003$), and significantly more outpatient treatment visits (FISP mean= 5.3 ± 7.0 , median=3.0, range=0–36; CONTROL mean= 3.1 ± 5.5 , median=.5).

Inpatient hospitalization was also associated with increased linkage (91% vs 67%, $X^2=14.69$, $df=1$, $p=.001$). However, the intervention effect remained significant when hospitalization was included in the model ($X^2=8.37$, $df=1$, $p<.004$), significant when the sample was restricted to hospitalized patients (97% FISP vs 86% CONTROL, $X^2=4.18$, $df=1$, $p<.05$, $n=114$); within the smaller sample of non-hospitalized youths ($n=45$), the between-group difference was larger but marginal (82% FISP, 57% CONTROL).

Suicidality & Exploratory Outcomes

At follow-up, nine youths had attempted suicide (6%), four who received the FISP intervention (6%) and five who received enhanced usual emergency care (6%). There was one completed suicide. Suicidal ideation was observed among 18 youths (8 in FISP, 13%; 10 in the control group, 13%) on the DISC-IV. There were no statistically significant intervention effects on suicidality or other clinical/functioning outcomes (eTABLES 1–2).

Results from random effects models revealed statistically significant improvements from baseline to follow-up: CES-D total score ($t=-8.5$, $df=130$, $p<.0001$), severe CES-D (OR=.24, 95% CI=.14–.41, $p<.0001$); CBCL total problems in clinical range (OR=.52, 95% CI=.

30–.90, $p=.02$); parent CES-D ($t=-2.15$, $df=96$, $p=.04$); and CBQ ($t=-10.12$, $df=128$, $p<.0001$).

Did Outpatient Treatment Linkage Affect Clinical Outcomes?

Given the significant intervention effect on linkage to outpatient treatment and non-significant effects on clinical outcomes, we conducted exploratory instrumental variables (IV) analyses examining whether linkage was associated with improved clinical outcomes. These IV analyses estimate the effect of linkage while adjusting for selection effects which can lead to non-significant treatment-outcome relationships using traditional analyses.^{26–28} IV analysis relies on identifying an instrument that predicts the probability of treatment, but has no independent effect on outcomes. We used randomized intervention status as the instrument, linkage to any outpatient mental health treatment, and examined three youth outcomes: suicidal behavior (HASS Suicidal Behavior), severe depression (CES-D ≥ 24), and overall psychopathology (CBCL Total Problems, Clinical Range). For HASS score, we fit two step treatment-effects model using `treatreg` command in STATA version 11.1. For two binary outcomes, we fit bivariate probit regression model with `biprobit` command to jointly model clinical outcome and treatment linkage, explicitly taking into account the correlation. In all models, the effect of intervention on linkage was significant ($p < .05$), but no statistically significant benefits of treatment linkage on clinical/functioning outcomes (HASS, CES-D, Total Problems) emerged and treatment linkage was associated with more severe CES-D depression (eTABLE 3).

DISCUSSION

The FISP was associated with improved linkage to outpatient mental health treatment, relative to usual ED-Care, indicating that the FISP offers one strategy for addressing our National Suicide Prevention Objective (7.1) of increasing linkage to outpatient mental health treatment for suicidal youth ED patients.² Clinically, 6.3 youths would need to receive the FISP in order to prevent one youth from failing to receive outpatient treatment. Given the high morbidity and mortality of these patients, this is a clinically meaningful finding which emerged in the presence of high hospitalization rates from the ED.

Despite the success of the FISP in improving our primary outcome (treatment linkage), the FISP did not lead to significant decreases in suicide attempts or improvements on other clinical/functioning outcomes. Although a brief ED-intervention could lead to some direct clinical benefits, we expected that most clinical benefits from the intervention would result from improved linkage to outpatient mental health treatment. However, exploratory IV analyses suggest that treatment linkage, while necessary for delivering effective treatment, did not lead to improved clinical/functioning outcomes. These results are consistent with data indicating poor outcomes for “usual” mental health treatment for youths,²⁹ a recent British study indicating that a brief “therapeutic assessment” led to improved outpatient treatment linkage but no benefits on clinical outcomes,³⁰ and suggest that brief ED-interventions require supplementation by efforts to improve typical outpatient treatment. There was a tendency towards improvement over time. Still, during the follow-up period, one youth died by suicide, 6% made attempts, 18% reported some active suicidal behavior on the HASS, over 50% reported severe depression, and 63% scored in the clinical range for total problems.

The impact on clinical outcomes observed in the pilot evaluation of the initial ED-intervention plus outpatient cognitive-behavioral family treatment⁴ suggests that this outpatient treatment may have strengthened the clinical benefits of the ED-intervention. Although we currently lack treatments with clear evidence documenting efficacy for reducing suicide attempt rates in adolescents, a number of treatments/service delivery

strategies have shown some promise.^{14, 31–37} Our data underscore the need to develop effective outpatient treatments/services.

While we incorporated effectiveness components in our design, FISP therapists were hired and paid by the study, a feature of efficacy trials. Other limitations included: the relatively brief follow-up interval; limitations associated with the constraints of the ED-setting (the brief/limited baseline assessment and intervention, lack of immediate post-intervention evaluation of clinical/functioning outcomes), and weak statistical power for clinical outcomes. Although our data support intervention efficacy across two diverse ED-sites, linkage rates would likely be lower in sites with lower post-ED hospitalization rates and insurance, as outpatient treatment is not required/guaranteed in the United States. Whether a youth attends outpatient treatment is determined by a range of variables. Both hospitalization and the FISP improved treatment linkage, although the FISP led to improved linkage even among hospitalized youths. Repeating FISP components at hospital discharge might have strengthened clinical impact. We cannot disentangle the effects of the ED-intervention and care-linkage calls. However, other research indicating the value of a therapy component within the emergency evaluation (therapeutic assessment model)³⁰ and more limited impact of a compliance enhancement intervention with high barriers to follow-up treatment,¹³ suggests the combination is needed to overcome the substantial barriers to treatment linkage. The IV analyses examined linkage to “any treatment” regardless of quality; the lack of clinical impact may have been due to poor quality of care or inadequate treatment dose.

Similar to the rape crisis team, FISP clinicians were paged for suicidal patients and delivered the ED-intervention. There were challenges (youths in the ED without parents, space, need to minimize length of ED-stay), but the FISP was feasible and accepted across two diverse EDs.

CONCLUSION

The present results support efficacy for the FISP in linking suicidal youth ED patients to outpatient mental health treatment, a major objective in the US National Suicide Prevention Agenda.² Results further highlight the importance of developing effective outpatient mental health treatments and services.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Table 1

Baseline Background, Service Use, and Clinical Characteristics*

Characteristic	Overall N=181 †		FISP N=89		CONTROL N=92		P value [§]
	M±SD or N	%	M±SD or N	%	M±SD or N	%	
Age, M ± SD	14.7±2.0		14.8±2.1		14.6±1.9		.40
Female sex	125	69	59	66	66	72	.43
Race/Ethnicity							.78
White, Non-Hispanic	60	33	31	35	29	32	
African American	23	13	12	14	11	12	
Hispanic	82	45	37	42	45	49	
Other	16	9	9	10	7	8	
Annual income							.27
≤ \$14,999	42	26	23	30	19	23	
\$15,000–\$29,999	36	23	12	16	24	29	
\$30,000–\$49,999	36	23	19	25	17	21	
\$50,000–\$74,999	13	8	8	10	5	6	
≥\$75,000	32	20	15	20	17	21	
Has health insurance	135	83	66	84	69	82	.81
Study Site- Site A, N and %	80	44	39	44	41	45	.92
Suicide Attempt at ED Visit	96	53	47	53	49	53	.95
CES-D total score, M±SD	33.64±11.81		33.2±11.9		34.1±11.8		.62
CES-D severe range, ≥ 24	142	78	72	81	70	76	.43
PTSD, positive, ≥ 2	89	53	43	53	46	52	.91
Substance abuse-probable	31	17	16	18	15	17	.76
CBCL internalizing, M±SD	68.45±10.55		69.6±9.9		67.4±11.1		.20
CBCL externalizing, M±SD	66.43±11.52		68.0±10.2		65.0±12.5		.10
CBCL total problems, M±SD	69.73±10.49		71.3±11.1		68.3±9.6		.06
CBCL internalizing clinical range	115	70	59	75	56	66	.22
CBCL externalizing clinical range	95	58	51	65	44	52	.10

Characteristic	Overall N=181 [†]		FISP N=89		CONTROL N=92		P value [‡]
	M±SD or N	%	M±SD or N	%	M±SD or N	%	
CBCL total problems clinical range	119	73	64	81	55	65	.02
CBQ family conflict, M±SD	9.87±5.97		10.2±5.7		9.6±6.2		.46
Parent CES-D, M±SD	19.44±13.46		19.9±12.7		19.0±14.2		.70
Treatment, 6 months pre-ED visit							
Mental health care	104	58	49	55	55	60	.52
Medication treatment	67	37	32	36	35	38	.77
ED Visit	52	29	27	30	25	27	.64
Inpatient treatment	44	24	20	23	24	26	.57

Abbreviations: FISP, Family Intervention for Suicide Prevention; SD, standard deviation; CES-D, Center for Epidemiological Studies-Depression Scale; PTSD, Post-traumatic stress disorder; CBCL, Child Behavior Checklist; CBQ, Conflict Behavior Questionnaire.

[†] Due to missing data, N < 181 for some variables.

[‡] Chi-square tests were used for comparisons of FISP vs. CONTROL groups on categorical variables and t-tests for numerical variables.

Table 2
Intervention Effects on Linkage to Outpatient Mental Health Treatment After ED/Hospital Discharge (N=160)*

Variables [†]	Unadjusted Estimate				Adjusted Analysis [‡]					
	Intervention vs. CONTROL				Intervention vs. CONTROL					
	FISP N=76		CONTROL N=84		Without Multiple Imputation for Missing Values		With Multiple Imputation for Missing Values			
	N	%	N	%	OR	95% CI	P	OR	95% CI	P Value
Any mental health treatment										
Parent report	70	92	64	76	6.2	1.8–21.3	.004	6.0	1.9–19.2	.002
Youth report	69	91	64	76	4.3	1.4–13.0	.010	4.5	1.5–13.3	.006
Psychotherapy										
Parent report	56	76	41	49	4.0	1.9–8.5	.001	3.6	1.7–7.4	.001
Youth report	55	74	44	53	3.2	1.5–6.8	.002	2.9	1.4–5.8	.003
Any medication										
Parent report	57	75	54	64	2.5	1.0–6.3	.053	2.4	1.0–5.8	.051
Youth report	56	74	52	62	2.8	1.1–7.1	.033	2.5	1.0–6	.038
Combined psychotherapy and medication										
Parent report	43	58	31	37	3.3	1.5–7.0	.003	3.1	1.4–6.4	.003
Youth report	42	57	32	39	3.0	1.4–6.6	.006	2.7	1.3–5.6	.008
	Mean±SD		Mean ±SD		RR^b	95% CI		RR^b	95% CI	
Number of therapy visits										
Parent report	5.3±7.0		3.1±5.5		2.0	1.3–3.2	.003	1.8	1.2–2.7	.009
Youth report	5.3±7.4		3.9±8.3		2.1	1.3–3.4	.002	1.6	1–2.5	.07

Abbreviations: FISP, Family Intervention for Suicide Prevention; CONTROL, Emergency Department Treatment as Usual (Enhanced by Provider Education); SD, standard deviation; OR, odds ratio; RR, rate ratio; CI, confidence interval.

* Due to missing data, analytic sample sizes ranged from 155–160.

[†] Adjusted for baseline variable for the same construct, site, gender, age, time to follow-up, baseline CES-D, baseline CBCL Total Problem Score.

[‡] Variables listed as ‘Parent report’ are based on parent response, with youth response substituted when parent data unavailable. The reverse is true for variables listed as ‘Youth report’.

^a Logistic regression;

^b Negative binomial.

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