
BRIEF REPORTS

Predictors of Treatment Response for Suicidal Youth Referred for Emergency Psychiatric Hospitalization

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This study evaluated factors that predicted poor treatment response for 70 suicidal youth (ages 10 to 17 years; 67% African American) who received either multisystemic therapy (MST) or inpatient psychiatric hospitalization. Following treatment, suicidal youth were classified as either treatment responders or nonresponders based on caregiver or youth report of attempted suicide. Overall, female gender, depressive affect, parental control, caregiver psychiatric distress, and caregiver history of psychiatric hospitalization were associated with suicide attempts. However, controlling for other variables, only depressive affect and parental control predicted treatment non-response. These results suggest the need to adapt existing treatments for suicidal youth to better address problems relating to youth depression.

Although research-based psychotherapy is generally effective with clinically distressed children and adolescents (Weisz, Weiss, Han, Granger, & Morton, 1995), many youth fail to achieve clinical remission over the course of treatment. Results from recent clinical trials (Brent et al., 1997; Kazdin, Esveldt-Dawson, French, & Unis, 1987; Weisz et al., 1995) suggest that even when therapies demonstrate efficacy, treatment failure for some youth is likely and should be of concern to mental health professionals.

In light of such findings, investigators have sought to better understand why some youth fail to benefit from empirically supported treatments. The resulting studies point to an array of factors related to the youth, caregiver, and treatment context that contribute to sub-optimal treatment outcomes for clinically disturbed

youth. For example, Brent and colleagues (1998) found that higher cognitive distortion and hopelessness, among other factors, were predictive of poor response to treatment for clinically depressed youth who received either cognitive behavior therapy, family-based treatment, or supportive therapy. Also, Southam-Gerow, Kendall, and Weersing (2001) found that initial problem severity, early onset, family adversity (including low socioeconomic status, low social support, and parental psychopathology), and older youth age were predictive of poor response to treatment for youth with anxiety disorders. In addition, a series of studies published over the past 2 decades indicate that youth with conduct disorder who are characterized by early-onset, serious aggressive behavior, negative parenting, and family adversity tend to be less responsive to cognitive behavioral treatments (e.g., Dumas & Wahler, 1983; Kazdin, 1995; Kazdin & Crowley, 1997; Webster-Stratton, Reid, & Hammond, 2001). Although these studies expand our understanding of outcome predictors for the most common child clinical problems, they tell us little about the factors that portend poor outcomes for suicidal youth receiving empir-

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ically supported treatments. Furthermore, virtually no data exists on the predictors of therapy outcomes with ethnic minority youth or for youth who receive complex, multicomponent interventions.

This study addresses this gap by evaluating the factors that predict poor treatment response for suicidal youth who received either multisystemic therapy (MST; Henggeler, Schoenwald, Rowland, & Cunningham, 2002) or inpatient psychiatric hospitalization. MST is a family-centered, home-based intervention that targets the multiple systems in which the youth is embedded. MST is intensive (contact is daily when needed), yet time-limited (services range from 3 to 5 months), and delivered in the family's natural environment (e.g., home, school, community) by therapists trained in the use of a variety of evidence-based interventions (e.g., contingency contracting, communication training, behavioral parent training). Conversely, inpatient psychiatric treatment (at the Medical University of South Carolina) consists of a behaviorally based milieu program that individualizes services for each youth and implements procedures that maximize youth safety while on the unit (e.g., staff observation, safety contracting). At discharge, the treatment team attempts to match the youth's needs with available mental health providers in the community. Results from a recent clinical trial found that attempted suicide decreased in both treatment conditions, although MST was significantly more effective than psychiatric hospitalization (Huey et al., 2004). However, 13% of MST youth and 20% of hospitalized youth continued to engage in some form of self-harm behavior (based on caregiver or youth report) during the 1-year follow-up period. Why some youth appeared to benefit from treatment whereas others did not is unclear.

This study examines the predictors of suicide re-attempts for youth who receive either MST or inpatient psychiatric hospitalization. In selecting potential predictors, factors known to contribute to poor long-term prognosis in suicidal youth were examined, as well as factors associated with poor treatment response for other child clinical problems. Thus, four classes of variables were evaluated as predictors of treatment outcomes for suicidal youth: (a) youth demographic characteristics, (b) indexes of youth negative affectivity, (c) family-based risk factors, and (d) treatment condition (MST vs. hospitalization) and satisfaction with treatment.

Method

Participants

Participants in the full treatment trial (Henggeler et al., 1999; Huey et al., 2004) were 156 youth who were approved for emergency psychiatric hospitalization at the Medical University of South Carolina because of suicidal ideation or planning, attempted suicide, homicidal ideation or behavior, psychosis, or other threat of

harm to self or others. Youth were included if they were (a) between the ages of 10 and 17 years, (b) Medicaid-funded or had no health insurance, and (c) residing in a noninstitutional environment such as the home of a family member or relative, foster home, or shelter.

Families were recruited for inclusion at the hospital's emergency department or inpatient admission office. Following youth assent and caregiver consent, the family was then randomly assigned to either the MST or hospitalization condition (see Huey et al., 2004, for further details regarding these interventions and how they address youth suicidality). Participants were evaluated at five points in time: within 24 hr of acceptance into the project, approximately 2 weeks following study enrollment, at the completion of MST home-based services, 6 months following treatment termination, and approximately 1 year following termination. For this study, we focused only on the pre treatment and 1-year follow-up assessments. Families were paid \$50 for each assessment. This study was approved by the Medical University of South Carolina Institutional Review Board.

Our sample included only those 70 youth who engaged in self-harm behavior prior to hospital referral, based on reports by either the youth ($n = 33$), a primary caregiver ($n = 60$), or both ($n = 23$). The youth were predominantly male (60%) with an average age of 13.4 years ($SD = 2.2$). Sixty-seven percent were African American and 33% European American.

Measures

Attempted suicide. Attempted suicide was evaluated using two sources. First, using the Youth Risk Behavior Survey (Kolbe, Kann, & Collins, 1993), the youth self-reported the number of times he or she attempted suicide during the past 12 months (i.e., "How many times did you actually attempt suicide?"). Responses ranged from 0 (*zero times*) to 4 (*six or more times*). Evidence suggests good 2-week test-retest reliability for this item among middle- and high-school students ($\kappa = .76$; Brener, Collins, Kann, Warren, & Williams, 1995).

Second, a single item representing the frequency of youth self-harm behavior from the caregiver's perspective ("Deliberately harms self or attempts suicide") was selected from the Child Behavior Checklist (Achenbach, 1991). The Child Behavior Checklist requires caregivers to rate 118 child behavior problems on a scale from 0 (*not true*) to 2 (*very often true*) over the past 6 months. This variable was dichotomized into "yes" (attempt occurred) or "no" (attempted suicide did not occur). Although validity data for this item is not available, one study found that a scale including this item was moderately predictive of later suicidal ideation (Garber, Little, Hilsman, & Weaver, 1998). Interestingly, youth and caregiver reports of attempted suicide were posi-

tively correlated at pretreatment, $\chi^2(1, N=61) = 6.28, p < .05$, but not at follow-up, $\chi^2(1, N=64) = 0.89, p = 0.35$.

Suicidal ideation. The presence of suicidal ideation was evaluated using items from youth self-report on both the Youth Risk Behavior Survey and the Brief Symptom Inventory (BSI; Derogatis, 1992). From the Youth Risk Behavior Survey, the item "Did you seriously consider attempting suicide during the past 12 months?" was used as the first index of youth suicidal ideation. Second, the BSI required youth to rate the extent to which they experienced 53 psychiatric symptoms over the past 7 days. Suicidal ideators were those who gave a positive rating to at least one of two items ("How often did you have thoughts of ending your life?" and "How often did you have thoughts of death or dying?").

Depressive affect. Youth depressive affect was derived from youth report on the depression subscale of the BSI, which included six items indicating dysphoric mood and affect over the past 7 days. One item on this subscale was indicative of suicidal thinking. Because we were interested in creating an index of depression independent of suicidality, this item was deleted from the Depression subscale. Thus, the final scale included five items with $\alpha = .82$. The BSI has been used to evaluate depressive affect and psychiatric distress in samples that included preadolescent youth (e.g., Epstein, 1999; Geist, Davis, & Heinmaa, 1998), although no validity data are available for children under age 12.

Family conflict and parental control. Family conflict and parental control were evaluated using youth and caregiver reports on the Family, Friends, and Self Scale (Simpson & McBride, 1992). This scale is a 60-item questionnaire designed to assess youth social relationships and psychological adjustment. Items are rated on a scale from 0 (*never*) to 4 (*almost always*). For this study, the Conflict subscale (e.g., "How often do your family members hit or yell at each other?"; "Are there many arguments or fights in your family?") was utilized as an index of family conflict, and the Control subscale (e.g., "Are there exact rules that you have to follow in your family?"; "Do your parents let you go anywhere you please without asking?") was used as an index of parental control. Alpha coefficients for caregiver ($\alpha = .76$) and youth ($\alpha = .81$) reports on the Conflict subscale were acceptable. Although alpha coefficients for caregiver ($\alpha = .69$) and youth ($\alpha = .67$) reports on the Control subscale were only modest for this sample, previous research suggests that the youth version of this scale has good reliability and predictive validity (Simpson & McBride, 1992). Cross-informant correlations on the Control (pretreatment: $r = .31, p < .01$; follow-up: $r = .31, p < .05$) and Conflict (pretreatment: $r = .36, p < .01$; follow-up: $r = .30, p < .05$) scales were moderate and significant at both assessment periods.

Caregiver distress. Primary caregivers reported their current levels of psychological distress by rating symptoms on the BSI. The BSI yields a General Severity Index, which is a combined measure of the number of symptoms endorsed and the intensity of perceived distress. Coefficient alpha for this index was excellent ($\alpha = .97$). Caregiver history of psychiatric hospitalization was derived from a pretreatment demographics questionnaire.

Medication use. Using a medication-monitoring protocol developed for this study, caregivers reported whether youth were taking antidepressant medication at each assessment period. Youth were classified as continuous antidepressant users if their caregivers reported usage at *each* assessment period from treatment initiation through 6-month follow-up. Results from the 1-year follow-up were not considered due to unacceptably high levels of missing data.

Treatment satisfaction. The Family Satisfaction Survey (Kutash & Rivera, 1994) was used to evaluate caregiver and youth satisfaction with clinical services (e.g., "Did these services help your family?" and "Would you recommend these services to others or use them again for your family?").

Treatment Responder Groups

Treatment responders were youth who attempted suicide or self-harm at pretreatment but not during the 1-year follow-up, whereas treatment nonresponders attempted suicide at both time periods. Of the study participants initially approved for emergency hospitalization, 50 were categorized as responders at the 1-year follow-up, whereas 10 were considered nonresponders, based solely on caregiver report. Similarly, 30 were responders and 3 were nonresponders, based solely on youth report. Data based on youth report of attempted suicide were not considered further because (a) the sample size of 33 fell well below the rule of thumb of 30 participants per cell (Cohen, 1988) and (b) only 3 youth were classified as nonresponders. Thus, all subsequent analyses were based on caregiver report of attempted suicide.

Results

Responders and nonresponders were compared on a variety of demographic, psychiatric, family, and treatment-related variables. Means and standard deviations (for continuous variables), proportions (for dichotomous variables), significance tests, and effect size statistics (partial eta-squared) are shown in Table 1. Nonresponders differed from responders on several key variables. Nonresponders were more likely to be fe-

Table 1. Demographic, Affective, Family, and Treatment Characteristics of Suicidal Youth by Treatment Responder Status^a

	Total Sample ^b			Treatment Responders ^c			Treatment Nonresponders ^d			2 or F	Partial ²
	M	SD	%	M	SD	%	M	SD	%		
Youth/Family Demographics											
Sex (% Female)			42			36			70	$\chi^2(1, N = 60) = 3.96^*$	—
Ethnicity										$\chi^2(1, N = 59) = 0.07$	—
African American			63			62			67		
Euro American			37			38			33		
Child Age	13.41	2.04		13.58	2.11		12.58	1.51		$F(1, 58) = 2.02$	0.03
Family Socioeconomic Status											
Monthly Income (in dollars)	770	1,001		761	1,012		819	997		$F(1, 58) = 0.03$	0.00
Family on AFDC			72			70			80	$\chi^2(1, N = 60) = 0.41$	—
Mother Unemployed			55			55			56	$\chi^2(1, N = 53) = 0.00$	—
Negative Affectivity											
BSI Depressive Affect	1.13	1.03		1.01	1.00		1.74	1.07		$F(1, 58) = 4.36^*$	0.07
BSI Suicidal Ideation			34			33			40	$\chi^2(1, N = 59) = 0.20$	—
YRB Suicidal Ideation			58			56			67	$\chi^2(1, N = 52) = 0.36$	—
Family or Caregiver Functioning											
Parent Control											
Caregiver	2.93	0.57		2.93	0.54		2.93	0.76		$F(1, 58) = 0.00$	0.00
Youth	2.53	0.78		2.42	0.77		3.07	0.63		$F(1, 58) = 6.30^*$	0.10
Family Conflict											
Caregiver	1.83	0.86		1.85	0.87		1.73	0.83		$F(1, 58) = 0.17$	0.00
Youth	1.79	1.18		1.76	1.22		1.95	1.01		$F(1, 58) = 0.37$	0.00
Caregiver Distress (GSI)	33.65	34.55		28.26	25.50		60.60	57.50		$F(1, 58) = 8.19^{**}$	0.12
Caregiver History of Psychiatric Hospitalization			15			9			40	$\chi^2(1, N = 54) = 6.17^*$	—
Treatment Characteristics											
Treatment Condition											
MST			55			58			40	$\chi^2(1, N = 60) = 1.09$	—
Hospital			45			42			60		
Continuous Antidepressant Use			26			21			50	$\chi^2(1, N = 58) = 3.67^+$	—
Treatment Satisfaction											
Caregiver Satisfaction	15.98	3.94		16.43	3.57		13.90	5.04		$F(1, 55) = 3.54^+$	0.06
Youth Satisfaction	13.70	4.42		13.74	4.44		13.50	4.55		$F(1, 55) = 0.03$	0.00

Note: AFDC = Aid to Families with Dependent Children; BSI = Brief Symptom Inventory; GSI = General Symptom Index from the Brief Symptom Inventory; MST = Multisystemic Therapy; YRB = Youth Risk Behavior Survey.

^aBased on caregiver report of attempted suicide. ^b*n* = 60. ^c*n* = 50. ^d*n* = 10.

+*p* < .10. **p* < .05. ***p* < .01.

Table 2. Predictors of Posttreatment Suicide Attempts Based on Caregiver Report

Variable	B	SE	Wald	Odds Ratio
Treatment Condition (MST versus Hospitalization)	-0.54	1.11	0.24	0.58
Sex (male vs. female)	-1.56	1.19	1.72	0.21
Depressive Affect	1.15*	0.56	4.29	3.16
Parent Control–Youth Report	2.00*	0.87	5.30	7.36
Caregiver Distress	0.03	0.02	1.57	1.03
Caregiver Prior Hospitalization	-0.96	1.59	0.36	0.38

Note: MST = Multisystemic Therapy. Results are from a simultaneous logistic regression analysis with parent report of suicide attempts as the criterion variable.

* $p < .05$.

male than responders. Also, nonresponders exhibited more depressive affect at pretreatment. Caregivers of nonresponders reported more psychiatric distress, were more likely to have experienced a previous psychiatric hospitalization, and were somewhat less likely to be satisfied with the treatment they received than treatment responders. Finally, nonresponders reported higher levels of youth-rated parental control and, surprisingly, somewhat higher levels of antidepressant use than did responders.

Logistic regression was performed to evaluate the contribution of individual risk factors and their odds ratios for predicting caregiver-rated treatment response (Table 2). Because we were interested in evaluating how multiple factors accumulate to increase risk for poor response, each variable that was significant in the previous analysis was entered into the logistic regression. Although treatment condition was not significant in univariate analyses, this variable was included as a covariate given prior evidence of MST's efficacy with the larger sample of hospital-referred youth (Huey et al., 2004).

The coefficients for depressive affect and youth-rated parental control were both significant when taking into account the effects of other variables. Thus, youth who experienced more depressive symptoms and who reported that their caregivers exerted more parental control were more likely to attempt during the follow-up period. More specifically, for each 1-point increase on the Depression and Caregiver Control scales, the risk of attempted suicide increased by a factor of 3.16 and 7.36, respectively, when controlling for other factors. However, with all other variables controlled, gender, caregiver distress, and caregiver psychiatric hospitalization did not contribute significantly to the prediction of response status.

Discussion

This study evaluated the predictors of posttreatment suicide attempts in a controlled outcome study with youth who received either MST or inpatient psychiatric hospitalization following referral for suicidal behaviors. Five pretreatment variables emerged as sig-

nificant correlates of suicide attempts at the 1-year follow-up: female gender, depressive affect, youth-rated parental control, caregiver psychiatric distress, and caregiver history of psychiatric hospitalization. Two factors, depressive affect and parental control, were found to independently predict suicide attempts, controlling for other correlates.

Given the well-established causal relation between depression and attempted suicide (Lewinsohn, Rhode, & Seeley, 1994; Pfeffer et al., 1991) and the effectiveness of suicide prevention efforts at ameliorating depression (e.g., Rotheram-Borus, Piacentini, Cantwell, Belin, & Song, 2001), the utility of depressive affect as a predictor of negative outcomes was expected. Harrington et al. (1998) reported similar findings, showing that suicidal youth who were clinically depressed did not benefit from home-based treatment whereas their nondepressed counterparts did. Results from this study and Harrington et al. suggest that MST and other suicide-prevention efforts for youth should incorporate strategies to target depressed mood.

Conversely, the findings regarding parental control were surprising given MST's emphasis on helping parents to communicate with, monitor, and discipline their children effectively (Henggeler et al., 2002). Contrary to expectations, higher parental control at pretreatment predicted attempted suicide at follow-up. There are several possible ways to interpret this finding. First, parental control strategies to diminish risk (e.g., youth monitoring, rule setting, rule enforcement) may actually exacerbate suicidal behaviors in targeted youth. Consistent with coercion theory (Patterson, Reid, & Dishion, 1992), overly controlling parents may arbitrarily impose restrictions on youth behavior that, in turn, may aggravate defiant behavior. Such a response may lead to further escalation of parental control efforts, and the resulting family discord may precipitate an episode of suicidal behavior (Negron, Piacentini, Graae, Davies, & Shaffer, 1997). However, given that family conflict was not associated with poor treatment response, an alternative interpretation appears equally likely. Perhaps the direction of effect is from child to parent (Bell & Chapman, 1986), with high parental control being a *consequence* of youth suicidality (Wag-

ner, 1997). Thus, initially high levels of parental control may reflect efforts by worried parents to reduce suicide risk for their troubled children.

Female gender, caregiver distress, and caregiver history of psychiatric hospitalization also predicted suicide attempts but not after controlling for other factors. The percentage of nonresponders who were girls was nearly twice that for responders. Although it is unclear why girls would benefit less from treatment, these results are consistent with prior research showing gender to interact with other precipitating factors to increase the risk of suicidality for adolescent girls (Bettes & Walker, 1986; Hollis, 1996).

Present and past history of caregiver psychopathology was also linked to poorer treatment outcomes. The mean General Severity Index rating for caregivers of nonresponders was 60.60 (versus 28.26 for caregivers of responders), which indicated an elevated level of pretreatment distress when compared with population norms (Derogatis, 1992). Also, a remarkable 40% of caregivers of nonresponders reported a history of psychiatric hospitalization, in contrast to 9% of caregivers of responders. This finding is consistent with literature suggesting that psychiatric disturbance in parents predicts youth suicidality (Spirito, Brown, Overholser, & Fritz, 1989; Wagner, 1997), as well as treatment failure following child- and family-based psychotherapy (Southam-Gerow et al., 2001; Webster-Stratton, 1992). Psychiatric disturbance could interfere with the ability of parents to follow through with therapist recommendations and model inappropriate coping responses for youth who already suffer from significant deficits in problem solving (Sadowski & Kelley, 1993; Spirito, Overholser, & Stark, 1989). Although MST was designed to address parental psychopathology, low social support, and other caregiver barriers to treatment engagement (Henggeler et al., 2002), results from this study suggest that a more intensive form of adjunctive therapy with caregivers (see e.g., Kazdin & Whitley, 2003) may be necessary to minimize the likelihood of suicide reattempts among high-risk youth.

Notably, treatment condition did not significantly predict outcomes. In a previous analysis, MST was more effective than hospitalization at reducing youth-rated attempted suicide, yet outcomes based on caregiver report were more complicated depending on several moderating factors (Huey et al., 2004). Thus, for this study, caregiver-based outcomes may not have been sufficiently robust to survive the reduction in power that resulted from our subsample analysis with youth who were suicidal at intake.

Another interesting result was that nonresponders were somewhat *more likely* to use antidepressants on a continuous basis. Although some might argue that these results suggest harmful effects of antidepressant use, another possibility is that greater suicidality

among nonresponders contributed to higher use of antidepressants. Because the results were only marginal and based on a small sample, these results must be interpreted with caution.

Several important limitations should be noted. First, although significant results were obtained using caregiver report of suicidal behavior, analyses based on youth self-report were not possible because only 3 youth self-identified as treatment nonresponders. Given evidence that depressed caregivers may be biased in their appraisals of child behavior (Richters, 1992), it may be that distressed caregivers of nonresponders were simply overreporting suicidal behaviors in their children. Furthermore, given the wording of the Child Behavior Checklist "attempted suicide" item, caregiver report may have included episodes of self-harm behavior that would not be classified as suicidal. Caregivers may have reported a greater frequency of attempted suicide because, compared to youth, they used a much broader definition of self-harm behavior. This difference may also explain why youth and caregiver report were not correlated at the 1-year follow-up. Thus, it is unclear how generalizable these results are to children who self-report suicidal behavior and highlights the need to consider developmental factors when assessing suicidality in youth.

Another generalizability concern relates to the ethnicity of study participants. Although African Americans are underrepresented among those who attempt suicide (Grunbaum et al., 2002), they constitute the majority of participants in this sample; thus results may not be applicable to suicidal youth more broadly. On the other hand, this work adds to the sparse literature on predictors of treatment outcome for ethnic minority youngsters.

A third limitation involves the sample size. Although simulation studies suggest that our 10:1 participant to predictor ratio provided adequate power (Peduzzi, Concato, Kemper, Holford, & Feinstein, 1996), the stability of these results remains unclear given the unequal distribution of participants and the limited use of the Child Behavior Checklist attempted suicide item in treatment outcome research. Thus, future work on the predictors of empirically supported treatments with suicidal youth is clearly needed.

As a final limitation, the caregiver-based measure of attempted suicide may have failed to capture youth who attempted soon after treatment terminated. When rating attempted suicide in their children, primary caregivers were instructed to focus on the previous 6 months. Thus, during the 1-year follow-up assessment, it is quite possible that caregivers failed to consider attempts that occurred within 6 months following treatment termination.

Overall, however, these results leave considerable room for optimism regarding future efforts to treat suicidal youth. Notably, the two significant predictors of

poor treatment response are both amenable to change given the effectiveness of existing interventions to address youth depression and coercive parenting behavior (Asarnow, Jaycox, & Tompson, 2001; Patterson et al., 1992). In previous MST clinical trials, we found that treatment fidelity as well as contextual factors predicted clinical outcomes for delinquent youth (e.g., Henggeler, Melton, Brondino, Scherer, & Hanley, 1997; Huey, Henggeler, Brondino, & Pickrel, 2000), and, accordingly, appropriate adjustments have been made to MST procedures to enhance treatment implementation and outcomes (Henggeler, 1999). Pertinent to this study, MST research efforts are currently underway to import and adapt evidence-based treatments of adult psychopathology for use with caregivers in MST programs.

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