

CME Activity

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CME Objectives

After completing this CME activity, the reader will:

- Be able to discuss commonly studied factors influencing suicidal ideation
- Be able to identify risk factors for suicidal ideation and behavior
- Be able to discuss findings of the current study and their relationship to previous literature
- Be aware of the role played by drug and alcohol abuse when evaluating suicidal patients

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Dr. Ries is a member of the speaker's bureau for Eli Lilly, Janssen Pharmaceuticals, SmithKline Beecham, and Bristol-Myers Squibb.

Neither Drs. Pages, Russo, Roy-Byrne, nor Cowley has significant relationships with any entities that may have influenced their presentation in any way.

Discussion of Investigational Information

During the course of their talks and discussions in this *Journal*, faculty have presented no investigational information about pharmaceutical agents that is outside Food and Drug Administration–approved labeling.

Determinants of Suicidal Ideation: The Role of Substance Use Disorders

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Background: This study tested the hypothesis that the amount of psychoactive substance consumed (frequency and/or quantity), life problems resulting from this use, and a DSM-IV diagnosis of substance abuse/dependence are independent risk factors associated with increased suicidal ideation in a population of psychiatric inpatients with major depressive disorder.

Method: 891 hospitalized patients with a primary diagnosis of nonpsychotic major depressive disorder (MDD) received a standardized, psychiatrist-administered assessment battery. To examine the relationship between admission suicidality and demographic, psychiatric history, and admission variables, chi-square analyses were used for categorical data and one-way ANOVAs were used for continuous indices. Stepwise hierarchical multiple regression analyses were performed to determine the set of variables that was independently related to admission suicidality level.

Results: There was general agreement between our findings and previous literature in regard to the association between severity of Axis I diagnosis, depressed mood, hopelessness, male gender, unemployment, involuntary treatment, and alcohol/drug problems and higher suicidal ideation. In our sample of hospitalized patients with unipolar major depressive disorder, higher current drug and/or alcohol dependency and high current use of alcohol or other substances of abuse were independently associated with higher levels of suicidal ideation.

Conclusion: This association with higher suicidal ideation lends support to the importance of treating patients for both alcohol/drug problems and depression in an effort to decrease their risk for future suicide. We hope that our findings will improve the care that patients with dual diagnoses receive.

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Although accurately predicting suicide is one of the most important problems facing psychiatrists, the ability to predict which patients will commit suicide is quite poor. Several studies have attempted to assign relative weight to clinical factors thought to influence risk of suicide.^{1–3} Socioeconomic status and other demographic data,⁴ depression,⁵ substance abuse,^{6,7} and schizophrenia⁸ have been the most widely studied variables associated with suicidal ideation, attempted suicide, and completed suicide. The extent to which substance abuse independently contributes to suicidal ideation is less well documented.

Up to 90% of suicide victims have an Axis I psychiatric disorder, most commonly depressive disorders and substance abuse disorders.^{1–3} Hopelessness and depressed mood correlate strongly with suicidal ideation and are usually perceived to be the main determinants of a person's decision to use suicide as a coping mechanism.^{9,10} However, numerous studies have also implicated drug and alcohol abuse as a factor that increases risk of suicidal ideas and behavior,^{11–16} by almost seven times in one study.¹² What is less well understood is the independent contribution of alcohol and drug abuse to suicidal behaviors versus other factors such as depressed mood, hopelessness, and other clinical and demographic factors.

While it is fortunate that suicide is a rare event, the low base rate has been cited as an obstacle to studying this phenomenon.¹⁷ By narrowing the focus of studies to specific, high-risk groups, this base rate can be increased and our ability to make predictions improved. Toward this end, we assessed the contribution of demographic variables, individual depressive symptoms, substance abuse, and other clinical factors to suicidal ideation and attempts in patients on our psychiatric inpatient units who had ma-

jor depressive disorder. We believed that increased levels of suicidality would be associated with depressed mood, hopelessness, male gender, unemployment, and involuntary admissions. Clinical experience in addition to support from the literature suggested that we would find those with substance abuse problems to be more suicidal than patients without substance abuse histories. Specifically, we hypothesized that a DSM-IV diagnosis of a psychoactive substance use disorder, amount of substance consumed, and dysfunctional consequences of substance use would be independent risk factors.

METHOD

Sample

Eight hundred ninety-one patients with a primary diagnosis of nonpsychotic major depressive disorder (MDD) were admitted to either locked or voluntary inpatient units at Harborview Medical Center over a 4-year period. The decision as to where a patient is admitted is made by a resident and a chief nurse. Patients who are a danger to themselves or others or gravely disabled are evaluated by an independent mental health professional who makes the initial decision to commit the patient for up to 3 days, which is followed by a legal hearing for a longer (14-day) commitment. Because this study is based on medical records data routinely collected as part of the clinical evaluation and care of all patients, no informed consent was obtained. Use of this routine data for research purposes has been approved by the University of Washington Human Subjects committee. Patients with major depression account for approximately 38% of our patient population.

Assessments

All patients received standardized assessment batteries¹⁸ that were administered by a Board Certified Attending Psychiatrist within 24 hours of admission and discharge. Each assessment contained demographics, psychiatric history, checklist-generated DSM-IV psychiatric and substance use diagnoses, and results from an expanded 32-item version of the Psychiatric Symptom Assessment Scale (PSAS).¹⁹ Each PSAS item or subscale (e.g., conceptual disorganization) is rated on a 0- to 6-point scale where 0 = not present and 6 = most severe. This battery has been shown to be both reliable and valid for use with inpatients.¹⁸ Attending psychiatrists meet monthly to conduct a joint patient interview in order to recalibrate diagnoses and PSAS ratings and provide continuing interrater reliability and validity. The internal con-

sistency reliability was 0.76 for both admission and discharge. We calculated the total PSAS scores without including the suicidality item. Severity of MDD diagnosis was psychiatrist-rated on a DSM-IV checklist²⁰ and ranged from 0 (no severity) to 100 (as severe as possible). Additional items on denial of psychiatric illness and substance abuse were also assessed as previously described.¹⁸ A patient's denial of psychiatric illness or that patient's understanding of it was psychiatrist-rated on a 6-point scale (0 = complete understanding to 6 = denies problems, confabulates about reason for hospitalization). The dysfunctional consequences item was psychiatrist-rated on a 6-point scale: 0 = none; 1 or 2 = mild, i.e., alcohol or drug use has led to minor problems, e.g., arguments, moodiness; 3 or 4 = moderate, i.e., alcohol or drug use has led to major problems in multiple spheres (abuse); 5 or 6 = severe, i.e., alcohol or drug use shows dependence (compulsive use consequences, loss of control). Current substance use, indicating both frequency and quantity, was also psychiatrist-rated on a 6-point scale (0 = abstinent more than 12 months to 6 = current use more often than weekly in a high quantity).

We wanted to evaluate different degrees of suicidality (defined as degree to which patient wants to die or commit suicide; degree of risk for suicide). Therefore, for descriptive analyses, the PSAS suicidality item was re-coded into four categories from the 0 to 6 rating: 0 = none; 1 or 2 = thinks about killing self and dying; 3, 4, or 5 = has urges or impulses to kill self and has a plan or is hopeless and wants to kill self as soon as possible; and 6 = recent suicide attempts or behavior.

The Mini-Mental State Examination (MMSE)²¹ was administered at admission to assess cognitive functioning. The MMSE has scores ranging from 0 to 30, in which high scores indicate better cognitive functioning. At admission, the physician-rated Social and Occupational Functioning Assessment Scale (SOFAS-Revised Global Assessment of Functioning [GAF]) was administered. The SOFAS-GAF, with exclusively functional anchor points, has been previously shown to be rated by psychiatrists more as an indicator of symptomatology than of functioning²² and, hence, is likely to be similar to the original GAF,²⁰ in which higher scores indicate less severe symptomatology.

Statistical Analyses

To examine on an individual basis the relationship between admission suicidality and demographic, psychiatric history, and admission variables, chi-square analyses were used for categorical data and one-way ANOVAs

Table 1. Major Depressive Disorder (MDD) Comparison by Degree of Suicidality

Variable	None (N = 46, 5.2%)		Thoughts (N = 209, 23.5%)		Thoughts + Plans (N = 513, 57.6%)		Recent Attempt (N = 123, 13.7%)		χ^2 (df = 1)
	N	%	N	%	N	%	N	%	
Demographics									
Male	15	32.6	103	49.3	289	56.3	69	56.1	11.55***
White	32	69.6	145	69.4	352	68.8 ^a	90	73.2	0.92
Unemployed	32	69.6	166	80.2 ^a	399	78.4 ^a	82	67.8 ^a	8.97*
Living alone prior to admission	19	42.2 ^a	85	42.1 ^a	265	52.4 ^a	51	43.2 ^a	8.37*
Moderate-to-severe medical illness	8	17.8 ^a	30	15.3 ^a	92	18.5 ^a	23	19.5 ^a	1.24
Against medical advice	2	4.3	17	8.1	23	4.5	3	2.4	6.28
Involuntary admission	4	8.7	9	4.3	22	4.3	13	10.6	9.16*
Psychiatric history									
Admission within last year	14	30.4	49	23.4	136	26.5	32	26.0	1.25
Assault history	9	20.5 ^a	49	25.3 ^a	125	25.7 ^a	25	22.3 ^a	1.03
Substance abuse									
Current diagnosis	10	21.7	98	46.9	255	49.7	60	48.8	13.36**
Dysfunctional consequences ^b	9	20.5 ^a	73	36.5 ^a	209	42.3 ^a	48	40.7 ^a	9.12*
Current use ^c	12	26.7 ^a	102	51.8 ^a	258	51.9 ^a	64	53.3 ^a	11.11**

^aTotal sample size varies for these variables due to missing data.

^bPercentage represents patients with major problems (rated 5 or 6).

^cPercentage represents patients with high current use (4, 5, or 6).

*p < .05; **p < .01; ***p < .001.

were used for the continuous indices. Post hoc Tukey tests ($p < .05$) were performed to determine group differences.

Stepwise hierarchical multiple regression analysis was performed to determine the set of variables that independently relates to admission suicidality level. To further minimize type I errors, only variables that were significantly related to suicidality at $p < .05$ in the univariate analyses were included as independent variables in the regression. The dependent variable was the 0- to 6-rated admission PSAS suicidality item. The independent variables were tested in hierarchical steps. In the first step, demographic and psychiatric history variables that had a statistically significant effect were entered into the model in a stepwise manner. In the second step, admission PSAS items that were significant as determined by univariate analysis were entered in a stepwise manner. In the third step, the three substance use variables (dysfunctional consequences item, substance use item, and DSM-IV substance use diagnosis) were allowed to enter the model if they were related to suicidality independent of the demographic, psychiatric history, and PSAS items. From this analysis, we were able to ascertain whether substance use contributed independent and significant variance to the prediction of the degree of suicidality. In the last step, interactions of the significant predictors with substance use variables were entered into the model in a stepwise manner, allowing us to determine if the relationship between the significant predictors and suicidality might be differ-

ent for patients with and without a substance use disorder. The regression model was tested for statistical outliers (standardized residuals greater than 3.0). Outliers were removed, and the model was refit. The final model included only significant independent variables.

RESULTS

Table 1 presents the categorical demographic and psychiatric history data for the suicidality groups. Patients with more severe suicidality were more likely to be male. The groups also differed in rates of unemployment and involuntary admissions. Dysfunctional consequences of alcohol or drug use, high current substance use, and a current diagnosis of a substance use disorder were all significantly associated with greater suicidality. The groups did not differ in the percentage with medical comorbidity or a history of assault.

The admission PSAS subscale scores and the continuous variables are presented in Table 2. Mean item scores on several PSAS items increased linearly with increasing suicidality: helplessness/hopelessness, depressed mood, and guilt feelings. Conceptual disorganization decreased linearly with increasing suicidality. Although tension, anxious mood, and hostility items differed between the suicidality groups, the mean scores did not increase linearly with increasing severity. The thoughts only group was rated significantly lower than the other three groups,

Table 2. Characteristics for Group With MDD by Degree of Suicidality (N = 891)†

Variable	None (N = 46, 5.2%)		Thoughts (N = 209, 23.5%)		Thoughts + Plans (N = 513, 57.6%)		Recent Attempt (N = 126, 13.7%)		F Ratio (df = 3,887)
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
Age (y)	40.59	13.83	35.98	11.66	35.83	10.53	37.72	12.02	3.25*
MMSE score	27.85	3.68	28.03	2.63	28.00	3.14	27.48	4.03	0.78
GAF score	42.95	14.53	49.32	11.77	46.54	11.71	44.14	15.92	5.78***
Admission PSAS total score	25.55	10.41	20.81	8.30	26.03	8.61	26.21	8.80	19.47***
Severity of MDD	55.34	18.26	59.32	16.44	66.96	14.45	66.08	12.80	19.19***
Admission PSAS subscore									
Withdrawal	1.62	1.67	1.61	1.30	2.06	1.42	1.99	1.56	5.70***
Helplessness/hopelessness	3.10	1.69	3.16	1.29	3.86	1.19	4.15	1.62	21.46***
Depressed mood	3.26	1.47	3.29	1.17	4.13	0.94	4.57	1.38	49.85***
Blunted affect	1.59	1.53	1.47	1.43	1.90	1.56	2.00	1.73	4.88**
Guilt feelings	2.00	1.46	2.10	1.39	2.73	1.41	2.69	1.68	12.02***
Anxious mood	2.22	1.55	1.56	1.30	2.17	1.51	2.15	1.56	9.06***
Hostility/aggression	0.60	1.23	0.43	0.92	0.66	1.13	0.77	1.26	2.90*
Tension	2.00	1.33	1.43	1.18	1.88	1.38	1.71	1.38	6.10***
Conceptual disorganization	0.70	1.05	0.48	0.88	0.37	0.79	0.26	0.64	4.12**
Disorientation	0.29	0.69	0.10	0.39	0.19	0.63	0.22	0.71	2.03
Uncooperativeness	1.06	1.62	0.56	1.12	0.55	1.05	0.80	1.44	39.98**
Motor retardation	1.43	1.68	1.39	1.29	1.75	1.49	1.61	1.57	3.56**
Denial of problems									
Denial of psychiatric illness	1.24	1.75	0.95	1.34	0.76	1.17	1.12	1.69	3.97**
Denial of chemical dependency	0.56	1.29	0.98	1.48	0.90	1.44	1.12	1.70	1.77

†Abbreviations: GAF = Global Assessment of Functionality; MMSE = Mini-Mental State Examination; PSAS = Psychiatric Symptom Assessment Scale.

* $p < .05$; ** $p < .01$; *** $p < .001$.

Table 3. Multiple Regression Results for Degree of Suicidality at Inpatient Admission

Predictors	Standardized Beta	Correlation With Suicidality	Wald's t
Gender ^a	-.07	-.08	-2.32*
Depressed mood	.36	.41	10.23***
Conceptual disorganization	-.10	-.11	-3.46***
Anxious mood	.09	.12	3.20***
Helplessness/hopelessness	.08	.28	2.13*
Frequency of drug or alcohol use	.08	.08	2.49**

^a0 = male, 1 = female.

* $p < .05$; ** $p < .01$; *** $p < .001$.

which did not differ among themselves. The none and thoughts only groups had significantly lower withdrawal and motor retardation item mean ratings than the thoughts plus plans and the recent attempt groups, which did not differ between themselves. The none group was significantly less cooperative than the thoughts and thoughts plus plans groups. Depressed patients with no suicidality had significantly higher denial of their psychiatric problems than the thoughts plus plans group.

Patients with no suicidality tended to be significantly older than the other groups; however, there was no difference in MMSE scores between the groups. The GAF

scores differed between the groups, with worse functioning in the none and recent attempt groups than in the thoughts and thoughts plus plans groups. The groups differed in terms of global severity measures. The PSAS total (without the suicide item) was significantly lower in the thoughts only group than the other three groups, which did not differ among themselves. The severity of MDD diagnostic criteria increased linearly with increasing suicidality.

The multiple regression analysis was significant ($F = 38.02$, $df = 6,880$; $p < .001$; $R^2 = .20$) and contained six significant independent variables (Table 3): gender, four PSAS admission items (depressed mood, conceptual disorganization, helplessness/hopelessness, and anxious mood), and the frequency of current substance use. Patients who were rated as having higher levels of suicidality were more likely to be male, have more depressed mood, more helplessness/hopelessness, higher anxiety, less conceptual disorganization, and more frequent substance use than patients with less severe suicidality. It should be noted that although current substance use was the most significant predictor of suicidality, had dysfunctional consequences or current diagnosis been entered into the model, the predictability of suicide would have been only slightly less significant. The high correlation among these indices (none less than $r = .72$, $p < .001$) dis-

allowed the entry of more than one variable into the regression model. Eighty-seven percent of patients with high substance use had a diagnosis of substance use disorder. The stepwise procedure indicated the current use variable had a slightly stronger relationship with suicidality.

DISCUSSION

There was general agreement between our findings and previous literature in regard to the association of severity of Axis I diagnosis, depressed mood, hopelessness, and alcohol/drug problems with suicidal ideation. Higher suicidal ideation was also associated with male gender, unemployment, and involuntary treatment, as has been previously demonstrated.^{23,24}

The severity of the depressive episode, helpless/hopeless feelings, depressed mood, and guilt feelings all increased linearly with increasing suicidal ideation. In addition, we wanted to test the hypothesis that depressed patients with comorbid substance abuse problems would endorse higher levels of suicidal ideation, independent of their level of depression, than depressed patients without comorbid substance abuse. In our sample of hospitalized patients with major depressive disorder, high current use of alcohol or other substances of abuse and higher current drug and/or alcohol dependency were both associated with higher levels of suicidal ideation, independent of depressed mood.

We recognized a number of limitations of our study. These data were collected as part of routine patient care activity at a busy urban general hospital and not as part of a controlled, prospective study. Previous studies in this area have highlighted the importance of life events and interpersonal losses in the development of suicidal ideation,²⁵ perhaps especially in the substance-abusing subset of suicidal persons.²⁶ Our study did not measure this variable. Finally, we did not exclude patients with substance-induced mood disorder, a limitation that we are addressing in a revised version of our assessment form. Pilot data from our revised form showed that of 128 patients with major depression, only 7 (5.5%) had substance-induced mood disorder.

The relative strengths of our study include a large sample size, the use of a standardized psychiatric assessment form, and a single, fairly homogeneous sample of patients with nonpsychotic, nonbipolar depression. We also believe our sample to be representative of patients most likely to be encountered in an inpatient setting in an urban general hospital's psychiatric units.

We believe our study adds to the growing literature suggesting alcohol and drug abuse play a role in the development of suicidal ideation. Our findings are consistent with those of Cornelius et al.,¹⁴ who found depressed alcoholic patients to be significantly more suicidal (59% greater expression of suicidal ideation on their rating instrument) than nonalcoholic depressed patients. Salloum et al.²⁷ found a higher likelihood of suicidal plans in psychiatric inpatients with major depression and alcohol and cocaine problems than in patients with major depression without alcohol or cocaine problems. Seibyl and colleagues²⁸ studied hospitalized patients with schizophrenia and showed that those who used cocaine prior to admission endorsed increased suicidal ideation. Fawcett²⁹ evaluated data sets from three studies and divided risk factors into predictors of early and late (relative to onset of illness) suicides. Alcohol abuse was found to be a risk factor for early but not later suicide. Our group has reported an association between substance-induced mood disorder and medically serious suicide attempts.¹⁶ Finally, Young et al.³⁰ explored the interaction among risk factors for suicide by studying 955 subjects from the Collaborative Study of the Psychobiology of Depression-Clinical Studies. The authors found a higher rate of suicide among men than among women that was explained by a higher rate of alcohol and drug abuse among men and the presence of children under 18 in the home of the women. They also found that those at the highest risk for suicide suffered from alcohol and drug abuse but not pervasive hopelessness.

Conceptual disorganization decreased linearly with increasing suicide. This finding was in contradiction to the earlier cited study by Fawcett.²⁹ Nevertheless, we saw this as a finding with face validity. Our suicidality scale's rating increases with *planning*, which works against a disorganized person. Conceptual disorganization was defined as "degree to which speech is confused, disconnected, or disorganized" and rated with behavioral anchors from 0 for none to 6 for severe ("incomprehensible or incoherent; severe blocking or word salad; non-existent words"). A post hoc analysis of our data revealed an *r* value of $-.43$ ($p < .001$) between MMSE and this subscale. Additional items rated as more severe in the none group than in the groups with higher suicidality were anxious mood, tension, and uncooperativeness. While none of these are core depressive symptoms, they do add to the total severity of illness of the patient. We believe that in the absence of suicidal ideas, these other factors gain prominence and become the clinically relevant indications for hospitalization.

Possible explanations for why depressed people with comorbid psychoactive substance use problems may be at greater risk for suicidal behavior are many. Neurotransmitter abnormalities such as low cerebrospinal fluid and cerebral cortex 5-hydroxyindoleacetic acid may underlie comorbid alcohol use,³¹ impulsivity,³² and depression as well as increased risk of suicide.³³

Another explanation focuses on the psychosocial wreckage that alcohol and drugs bring to those who become dependent on them. The lack of "reasons for living" due to family abandonment, unemployment, poor housing, and failing medical health may make depressed alcoholics more likely to see suicide as a viable escape from their misery. A study by Murphy et al.⁶ found that in alcoholics who committed suicide, four of seven features were psychosocial: poor social support, serious medical illness, unemployment, and living alone. Nevertheless, our data failed to support these relationships. A possible reason is the overall low socioeconomic status of the majority of our patients, e.g., 77% unemployed and 28% homeless, which reduces the variance of these measures and, hence, likelihood of finding significant correlations.

We hope that our findings, which show that alcohol/drug problems do independently contribute to suicidal ideation, will improve the care that patients with dual diagnoses receive. This association with higher suicidal ideation lends support to the importance of treating patients for both alcohol/drug problems and depression in an effort to decrease their risk for future suicide. We recommend that patients with dual diagnoses who express suicidal ideation be taken seriously and that appropriate means of stabilizing their crisis, including use of hospitalization, be taken.

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Instructions

Psychiatrists may receive 1 hour of Category 1 credit toward the American Medical Association Physician's Recognition Award by reading the article starting on page 510 and correctly answering at least 70% of the questions in the quiz that follows.

1. Read each question carefully and circle the correct corresponding answer on the Registration form.
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1. Which of the following have been among the most studied clinical factors thought to effect suicidal ideation?
 - a. Socioeconomic status
 - b. Depression
 - c. Substance abuse
 - d. Schizophrenia
 - e. All of the above
2. Prior literature has most frequently implicated which symptom in the development of suicidal ideation?
 - a. Hopelessness
 - b. Depressed mood
 - c. Impulsivity
 - d. Answers a and b only
 - e. Answers b and c only
3. Which substance abuse variable was associated with increasing suicidal ideation?
 - a. High current use of psychoactive substances
 - b. A DSM-IV psychoactive substance use disorder diagnosis
 - c. Use of cocaine
 - d. Answers a and b only
 - e. All of the above
4. The study presented showed that bipolar depression was a significant risk factor for suicidal ideation.
 - a. True
 - b. False
5. In the study presented, suicidal ideation was associated with:
 - a. Male gender
 - b. Unemployment
 - c. Involuntary treatment
 - d. None of the above
 - e. All of the above
6. Approximately what percentage of suicide victims are thought to have had an Axis I psychiatric disorder?
 - a. 15%
 - b. 30%
 - c. 50%
 - d. 70%
 - e. 90%
7. Narrowing the focus of studies of suicidal patients is needed because:
 - a. There is a high base rate of suicide
 - b. There is a low base rate of suicide
 - c. Patients are not interested in participating
 - d. It is unethical to study suicidal patients
 - e. None of the above

Answers to the May 1997 CME quiz

1. d
2. a
3. d
4. b
5. d

Circle the one correct answer for each question.

1. a b c d e
2. a b c d e
3. a b c d e
4. a b
5. a b c d e
6. a b c d e
7. a b c d e

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Please evaluate the effectiveness of this CME activity on a scale of 1 to 5 (1 being poor, 5 being excellent).

1. Overall quality of this CME activity _____

2. Content _____

3. Format _____

4. Faculty _____

5. Achievement of educational objectives:

A. Enabled the reader to discuss commonly studied factors influencing suicidal ideation. _____

B. Enabled the reader to identify risk factors for suicidal ideation and behavior. _____

C. Enabled the reader to discuss findings of the current study and their relationship to previous literature. _____

D. Enabled the reader to be aware of the role played by drug and alcohol abuse when evaluating suicidal patients. _____

6. This CME activity provided a balanced, scientifically rigorous presentation of therapeutic options related to the topic, without commercial bias. _____

7. Please comment on the impact that this CME activity might have on your management of patients.

8. Please offer additional comments and/or suggested topics for future CME activities.

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