

Suicide Attempts in the Epidemiologic Catchment Area Study

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This study examines risk factors for attempted suicide in the general community. Data from the five-site NIMH Epidemiologic Catchment Area (ECA) Study were used to estimate lifetime prevalence and identify risk factors for suicide attempts. Occurrence of suicide attempts and lifetime diagnosis of psychiatric disorder were ascertained, using the NIMH Diagnostic Interview Schedule (DIS). Of 18,571 adult respondents aged 18 and over, 2.9 percent reported that they had attempted suicide at some time in their lives. A weighted logistic regression model was constructed to ascertain significant ($p < .0028$ with Bonferroni correction) risk factors for attempted suicide. Persons who had a lifetime diagnosis of a psychiatric disorder had the highest risk of attempted suicide (odds ratio [OR] = 8.4). Females (OR = 3.3), separated or divorced persons (OR = 2.5), Whites (OR = 1.7), persons in the two lowest socioeconomic quartiles (ORs = 2.2, 2.3), and respondents from the Los Angeles ECA (OR = 1.8) were also more likely to have attempted suicide. These findings contribute to an understanding of suicide and suicidal behavior in general populations, outside the clinical setting.

INTRODUCTION

This paper presents community-based data on the prevalence and risk factors for attempted suicide.

Attempted suicide has been extensively studied in the psychiatric setting. These studies have shown that suicide attempters are more frequently women, under 30 years of age, of lower socioeconomic status, and more likely to be divorced. Diagnoses of depression, alcoholism, or schizophrenia are most frequently associated with attempted or completed suicide in patient populations [1–5].

In contrast to the many clinical studies, there have been few community studies of suicide attempts, and only three previous household surveys, all conducted in North America. The first study was the classic one reported by Paykel and his colleagues using data from the 1969 New Haven Study, a psychiatric survey of the New Haven population [6]; these investigators found a lifetime prevalence of 1.1 percent for suicide attempts. Schwab and his colleagues conducted a survey in Northern Florida in order to measure social psychiatric impairment and evaluate the area's mental health needs

Abbreviations: DIS: Diagnostic Interview Scale DSM-III: Diagnostic and Statistical Manual, third edition ECA: Epidemiological Catchment Area NIMH: National Institute of Mental Health OR: odds ratio

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and services; they found a lifetime prevalence of 2.7 percent for suicide attempts [7]. The last study, conducted by Ramsay and Bagley in Calgary, Alberta, Canada, was the only study to survey suicidal behaviors specifically; the others were based on surveys designed to collect information on psychiatric symptoms and disorders, and collected suicide data as part of a broader effort. Based on a low response rate of 61 percent, Ramsay and Bagley found a lifetime prevalence of 4.2 percent among Calgary residents [8].

METHOD

The largest community study in which suicidal behaviors were measured was the National Institute of Mental Health Epidemiologic Catchment Area (ECA) Study, conducted from 1980 to 1985. This research program is a five-site, multi-wave survey of selected psychiatric disorders in the population and is the largest such study of its kind ever undertaken [9–19]. Briefly, nearly 20,000 adults aged 18 years and over were surveyed in communities and institutions in New Haven, Connecticut; Baltimore, Maryland; St. Louis, Missouri; five counties in the Piedmont region of North Carolina; and Los Angeles, California. Two face-to-face interviews were conducted one year apart, with a brief contact at six months, by telephone or in person. The elderly were oversampled in New Haven, Baltimore, and the Piedmont. Blacks were oversampled in St. Louis, and the Baltimore site selected some neighborhoods in the catchment area in which high concentrations of Blacks resided. The Los Angeles site sampled from two ethnically distinct catchment areas, one predominantly non-Hispanic White and the other Hispanic.

Initial findings on attempted suicide based on data from the Wave 1 household interview from all sites will be described here. Findings incorporating Wave 2 data will be described in a future paper.

Some of the effects of the oversampling can be seen in Table 1, which shows the sociodemographic characteristics of the respondents to the first wave of data collection by site, weighted up to the United States population. The distribution of the U.S. household population by sex, age, and race appears in parentheses. The overall response rate to the Wave 1 household interview was 76 percent. The majority of respondents were female, under 44 years of age (although a large proportion were elderly), and White. Slightly under half were married, and nearly one-fifth were widowed. Over half were of low or medium low socioeconomic status, and of those for whom employment status was known, over half were unemployed. These distributions reflect in large part the results of the oversamples of the elderly, who would be expected to be female, widowed, of lower educational achievement and income, and retired. One-third of all respondents had suffered from a diagnosable psychiatric disorder at some time during their lives.

Each site used the NIMH Diagnostic Interview Schedule (DIS) to gather data on selected psychiatric diagnoses [20–22]. This instrument is a highly structured psychiatric interview, designed to be administered by trained lay interviewers to collect systematic information on psychiatric symptoms. Diagnoses for psychiatric disorders were not made by the interviewers but were later generated by computer algorithm, according to standardized criteria from the Diagnostic and Statistical Manual (DSM-III) of the American Psychiatric Association [23]. The major psychiatric disorders surveyed in the ECA included major depression, schizophrenia, bipolar disorder, phobias, panic attacks, substance abuse, and obsessive-compulsive disorder.

There were four suicidal behavior questions, which were asked of each respondent. Together these comprise the death/suicide symptom cluster, which is one of eight symptom clusters that can be used to establish a criterion for diagnosis of major depressive episode:

1. Has there ever been a period of two weeks or more when you thought a lot about death—either your own, someone else's, or death in general?
2. Has there ever been a period of two weeks or more when you felt like you wanted to die?
3. Have you ever felt so low you thought of committing suicide?
4. Have you ever attempted suicide?

Each of the 18,571 respondents to the first wave of the ECA was asked the above questions, regardless of psychiatric status. Although these questions could be used to generate a diagnosis of major depressive episode, it was possible for a respondent to endorse one or more of the symptoms without receiving a diagnosis, if other criteria were not met. Persons who responded affirmatively to the last question were considered to be suicide attempters.

ANALYSES

All analyses took into account the complex sampling procedures used in the study. The data were weighted by age, sex, and race/ethnicity to standardize the combined five-site population to the United States household population based on the 1980 Census [24]. Responses to the suicide attempt question were tabulated by sex, age, race, marital status, socioeconomic status, employment status, site, and psychiatric diagnosis, and weighted prevalence estimates were generated using PROC SESUDAAN [25]. Ninety-nine percent confidence limits were calculated for each estimate [26]. Weighted logistic regression analyses (RTILOGIT) [27,28] were used to examine the independent effects of site, sociodemographic characteristics, and psychiatric status on lifetime prevalence of suicidal behavior.

RESULTS

Table 2 shows weighted lifetime prevalence estimates and 99 percent confidence limits by site, sociodemographic characteristics, and psychiatric status. The overall, weighted, lifetime prevalence of attempted suicide was 2.9 percent. The prevalence ranged from 1.5 percent in the Piedmont to 4.3 percent in Los Angeles. The Piedmont estimate was significantly lower than the estimates from the Baltimore, St. Louis, and Los Angeles sites; the Los Angeles estimate was significantly higher than the New Haven and Piedmont estimates. A significantly higher proportion of women than men had made suicide attempts. The prevalence was significantly higher for persons 25–44 years of age than for persons over 44 years of age, with the lowest prevalence among persons over 65 years of age. There were no significant differences by race/ethnicity. With respect to marital status, the highest prevalence was among those who were separated or divorced, and the lowest among the married and widowed. There was a decrease in the prevalence of suicide attempts with increasing socioeconomic status. The proportion of suicide attempters in the highest quartile was significantly lower than the proportions of attempters in the two lowest quartiles. Among those for whom

TABLE 1
 Sociodemographic Characteristics (% Distribution) of Respondents by Site, Epidemiologic Catchment Area Study, Wave 1, 1981-1984

Characteristic (n)	Total (18,571)	New Haven (5,034)	Baltimore (3,481)	St. Louis (3,004)	Piedmont, NC (3,921)	Los Angeles (3,131)
Total	100.0	100.0	100.0	100.0	100.0	100.0
Sex						
Male (47.4) ^a	41.0	41.0	38.0	40.0	39.5	47.3
Female (52.6)	59.0	59.0	62.0	60.0	60.5	52.7
Age ^b						
18-24 (17.3)	12.1	8.5	14.5	15.7	9.6	15.3
25-44 (39.3)	35.1	24.4	34.8	41.1	31.4	51.5
45-64 (28.1)	22.0	16.0	24.2	24.0	27.4	20.7
≥65 (15.3)	30.7	51.2	26.5	19.2	31.7	12.3
Ethnicity ^c						
Non-Black/ Non-Hispanic (84.2)	68.8	90.3	65.2	61.0	63.9	51.1
Black (10.2)	23.4	8.4	34.0	38.5	35.8	4.6
Hispanic (5.6)	7.8	1.3	0.8	0.5	0.3	44.3
Marital status						
Married	46.8	49.5	42.2	45.7	51.1	43.3
Never married	20.5	15.7	22.8	22.5	15.3	30.2
Separated/Divorced	14.9	10.3	18.4	18.5	11.6	19.3
Widowed	17.7	24.5	16.4	13.3	22.1	7.2

Socioeconomic status in quartiles									
Lowest	24.3	20.6	30.3	22.7	29.5	18.3			
Medium low	33.5	32.9	39.6	35.6	31.1	28.5			
Medium high	28.2	30.6	24.9	27.8	26.1	31.2			
Highest	14.0	16.0	5.2	13.9	13.2	22.0			
Employment status ^d									
Employed	47.1	38.8	40.0	48.7	46.3	65.4			
Not employed	52.9	61.2	60.0	51.3	53.7	34.6			
Psychiatric diagnosis (ever in lifetime)									
No	67.1	75.4	61.2	65.4	64.8	64.8			
Yes	32.9	24.6	38.8	34.6	35.2	35.2			

^aNumbers in parentheses indicate distribution of U.S. household population aged 18 and older, 1980 Census.

^bThe elderly were oversampled in New Haven, Baltimore, and the Piedmont. Some columns may not total 100.0 due to rounding.

^cBlacks were oversampled in St. Louis; the Baltimore site selected some neighborhoods in the catchment area that were predominantly Black; the Los Angeles site selected some neighborhoods in the catchment area that were predominantly Hispanic.

^d"Not employed" includes homemakers; total number not responding to this question = 1,313.

TABLE 2
 Weighted Prevalence per 100 of Suicide Attempts by Site, Sociodemographic Characteristics,
 and Psychiatric Status, Epidemiologic Catchment Area Study, Wave 1, 1981–1984

Characteristic	Prevalence	99% Confidence Limits
Total	2.9	(2.6–3.2)
Site		
New Haven	2.4	(1.9–3.0)
Baltimore	3.4	(2.7–4.3)
St. Louis	3.1	(2.4–4.0)
Piedmont, NC	1.5	(1.1–2.1)
Los Angeles	4.3	(3.4–5.4)
Sex		
Male	1.5	(1.2–1.9)
Female	4.2	(3.7–4.7)
Age		
18–24	3.4	(2.5–4.6)
25–44	4.0	(3.7–4.7)
45–64	2.1	(1.6–2.8)
≥65	1.1	(0.8–1.5)
Ethnicity		
Non-Black/Non-Hispanic	3.0	(2.6–3.4)
Black	2.3	(1.8–3.0)
Hispanic	3.3	(2.2–4.8)
Marital status		
Married	2.0	(1.6–2.4)
Never married	2.9	(2.3–3.7)
Separated/divorced	8.5	(7.2–10.0)
Widowed	2.0	(1.4–2.8)
Socioeconomic status in quartiles		
Lowest	3.9	(3.2–4.7)
Medium low	3.6	(3.0–4.3)
Medium high	2.6	(2.1–3.2)
Highest	1.5	(1.0–2.3)
Employment status		
Employed	2.4	(2.0–2.9)
Not employed	3.7	(3.2–4.2)
Psychiatric diagnosis (ever in lifetime)		
No	0.8	(0.6–1.0)
Yes	7.4	(6.6–8.3)

employment status was known, the unemployed had a significantly higher prevalence of suicide attempts than did the employed. Finally, persons with a lifetime diagnosis of psychiatric disorder had a significantly higher prevalence of attempted suicide than did persons with no lifetime diagnosis.

Table 3 shows the odds ratios and 99 percent confidence limits of the effects found to be significant in the model. The most powerful risk factor for attempted suicide was a lifetime diagnosis of psychiatric disorder. Female gender, separated or divorced marital status, lower socioeconomic status, and living in the Los Angeles area also contributed independently to increased risk for attempted suicide. Black race/ethnicity was a protective factor. Employment status was marginally significant by our conservative standard, since the lower bound was 1.00. Age was not significant in this model.

TABLE 3
Odds Ratios (99% Confidence Limits) for Suicide Attempt by Psychiatric Status, Sociodemographic Characteristics, and Site, Epidemiologic Catchment Area Study, Wave 1, 1981-1984

Characteristic	Odds Ratio	99% Confidence Limits ^a
Psychiatric diagnosis	8.43*	(5.27-13.49)
Female	3.29*	(2.11-5.14)
Age		
18-24	1.00	
25-44	1.08	(0.61-1.93)
45-64	0.63	(0.29-1.36)
≥65	0.34	(0.11-1.06)
Ethnicity		
Non-Black/Non-Hispanic	1.00	
Black	0.59*	(0.36-0.97)
Hispanic	0.56	(0.26-1.20)
Marital status		
Married	1.00	
Never married	1.13	(0.63-2.01)
Separated/divorced	2.48*	(1.50-4.09)
Widowed	1.21	(0.51-2.85)
Socioeconomic status in quartiles		
Lowest	2.24*	(1.01-4.94)
Medium low	2.32*	(1.21-4.45)
Medium high	1.80	(0.96-3.39)
Highest	1.00	
Employment status		
Employed	1.00	
Not employed	1.51	(1.00-2.28)
Site		
New Haven	1.00	
Baltimore	0.95	(0.54-1.66)
St. Louis	1.18	(0.62-2.23)
Piedmont, NC	0.58	(0.26-1.27)
Los Angeles	1.84*	(1.06-3.19)

^aThe Bonferroni correction was used to establish a confidence interval of 99.72 percent.

* $p < .0028$

DISCUSSION

The purpose of this study was to investigate the prevalence and correlates of attempted suicide in the community, based on data from the NIMH Epidemiologic Catchment Area Program. The overall lifetime prevalence of attempted suicide in the ECA was 2.9 percent, with a five-site range of 1.5 to 4.3 percent. The ECA was the first study that contained sufficiently large numbers of respondents to permit a reasonably detailed analysis of the significant correlates of attempted suicide. Lifetime diagnosis of psychiatric disorder was by far the strongest risk factor. Other correlates included female gender, white race, disrupted marriage, and low socioeconomic status.

The present study has a number of limitations. First, the findings are based on cross-sectional data from Wave 1 of the ECA. Although strong correlates of attempted suicide in the community were identified, no causal inferences can be made. Second, the estimates are based on self-reported occurrences, which are subject to recall bias.

TABLE 4
Community Studies of Suicide Attempts
(Lifetime Prevalence per 100)

Study	Site	n	Estimate
Paykel et al., 1974 [6]	New Haven, CT	720	1.1
Schwab et al., 1972 [7]	Northern Florida	1,645	2.7
Ramsay and Bagley, 1985 [8]	Calgary, Alberta	679	4.2
Mościcki et al., present study	ECA, all sites	18,241	2.9
	New Haven	5,020	2.4
	Baltimore	3,329	3.4
	St. Louis	2,966	3.1
	Piedmont	3,821	1.5
	Los Angeles	3,105	4.3

The third limitation involves a case definition issue. The purpose of the suicide attempt question was to establish criteria for diagnosis of major depressive episode, and its format did not permit us to ascertain the severity of the suicide attempt. There is thus no way of knowing if the suicide attempt was a "cry for help" without intent to die, or a genuine, intentional-but-failed attempt to end one's life. Finally, there is no information on other, known correlates of attempted suicide such as the number of attempts, method of attempt, social isolation, or family history of suicide or suicidal behavior.

Table 4 compares the ECA lifetime rates of attempted suicide with those of the three previous community surveys. The ECA reflects the range of estimates established by the previous studies. What is striking about all these estimates is that they are of a similar order of magnitude despite the different questions used to gather information about suicide attempts. In general, less than 5 percent of the adult community population have attempted suicide at some time in their lives.

Unfortunately, it was not possible to compare the correlates identified in the present study with findings from the previous studies because multivariate analyses were not performed by the other investigators. Paykel et al. showed that psychiatric symptoms and female gender were significantly related to what they termed "suicidal feelings," but they were unable to isolate suicide attempts specifically because of limited numbers [6]. Schwab and his colleagues found suicidal ideation to be significantly related to suicide attempts in their sample, but they did not investigate other psychiatric symptoms [7]. They also found a higher proportion of suicide attempts among women, Whites, persons under 30, those in a disrupted marital status, and those with lower income. They did not test for significance, however.

The relationship between suicidal behavior and completed suicide is not clear. Some characteristics identified for suicide attempters contrast with the known characteristics of suicide completers. In the ECA, women were more likely to be attempters, yet, in the population, men are more likely to be completers [29]. While we found no significant relationship of age or race with attempted suicide, completed suicide is most frequent among elderly White males [29]. Clinical findings indicate that one or more suicide attempts are strong predictors for completed suicide among psychiatric patients, yet it is estimated that only a small proportion of patients who attempt suicide eventually complete [5,30,31]. Further delineation of the relationship between attempted and completed suicide in the community population should help to clarify some of these issues.

The correlates of attempted suicide that we identified through a multivariate analysis of community data have also been identified in clinical studies of suicidal behaviors [1-4]. One explanation may be that most suicide attempts, regardless of the individual's intent to die, are serious enough to warrant some medical attention, and therefore most suicide attempters probably end up in emergency rooms or psychiatric services in any case. An alternative possibility lies in the retrospective nature of the reported suicide attempt. It is possible that ECA respondents recalled suicide attempts if they were serious enough for medical attention, but did not recall the less serious attempts.

Further community studies of suicidal behavior need to be conducted. First, the case definition issue needs to be resolved. This problem was not addressed specifically, but it is a key issue in the study of suicidal behavior. Investigators need to make a distinction between self-injury and an action deliberately designed to end one's life, and to make sure the respondent understands this distinction. Second, the correlates of more and less serious suicide attempts may differ; this aspect needs further study, contingent upon the resolution of case definition issues. Finally, some prospective studies are needed. We will analyze Wave 2 data from the ECA to identify repeat attempters and the risk factors that distinguish these from non-repeaters and non-attempters. From clinical studies it is known that a previous attempt is a consistent predictor of completed suicide. It is also known, however, that not all attempters complete. A well-designed prospective study could make an important contribution toward identifying those risk factors that will predict which attempters are at greatest risk for completion.

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