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## Suicide Attempts and Associated Factors in Older Adults with Schizophrenia

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### Abstract

**Background**—Although there have been numerous studies of suicidality in younger populations with schizophrenia, there have been no studies focused on community-dwelling older adults with schizophrenia. This study provides data on the prevalence of suicidality and factors associated with previous suicide attempts among a mixed racial sample of older persons with schizophrenia living in New York City.

**Methods**—The schizophrenia group consisted of 198 persons aged 55 years who developed schizophrenia before age 45. A community comparison group (n=113) was recruited using randomly selected block-groups. Fifteen predictor variables of lifetime suicide attempts based on a risk model of suicide in schizophrenia were identified.

**Results**—Persons in the schizophrenia group had a significantly higher prevalence of current and lifetime “suicidality” (i.e., wants to be dead, suicidal thoughts, or suicide attempts) when compared to the community group (current: 10% versus 2%; lifetime: 56% versus 7%) as well as past suicidal attempts (30% versus 4%). Within the schizophrenia group, in logistic regression analysis, 2 variables were significantly associated with lifetime suicidal attempts: current syndromal depression and higher scores on the Traumatic and Victimization Scale.

**Conclusions**—The data confirmed that in later life, persons with schizophrenia continue to have a higher prevalence of suicidality than their age peers in the community. Our findings underscore the importance of monitoring for suicidality in this age group. The relative paucity of risk factors means that practitioners can more easily focus their therapeutic efforts on at-risk individuals.

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#### Contributors:

CIC supervised the research project and he led the statistical analyses. CGA and SD assisted CIC with the analysis of the data. All authors contributed to the interpretation of results. CGA and SD did the literature review. All authors worked on the preparation of the final version of the manuscript.

#### Conflict of interest

The authors declare no conflicts of interest.

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## Keywords

Elderly; schizophrenia; suicide; epidemiology

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## 1. Introduction

Suicide risk among persons with schizophrenia is more than 12 times higher than in the general population (Saha, et al., 2007). It has been estimated that between 5 and 10 percent of persons with schizophrenia commit suicide (Meltzer, 1998, 2001; Palmer, et al., 2005; Alaraisanen, et al., 2009). Moreover, the prevalence of suicidal thoughts and attempts is very high, ranging between 30 to 50% (Meltzer, 1998). Although suicide rates in older adults with schizophrenia is lower than in younger persons with schizophrenia (Allebeck, et al., 1986; Osby, et al., 2000; Palmer, et al., 2005), Barak and coauthors (2004) reported nearly 5% of elderly persons with schizophrenia were hospitalized due to suicide attempts, and one third of them made a subsequent suicide attempt on 10-year follow-up. Montross and coauthors (2008) found 49% of their sample of subsyndromally depressed middle-aged and older patients (mean age 51) with schizophrenia had made a previous suicide attempt, and 24 % reported current suicidal ideation. Importantly, older suicidal persons are more apt to complete suicide than younger persons (Conwell, et al., 2002). Despite the continued high potential for suicide, the prevalence of suicidality and its associated risk factors are not well described in older adults with schizophrenia (Barak, et al., 2004).

A variety of risk factors for suicide have been identified among persons with schizophrenia in general (Pompili, et al., 2007). Among the strongest factors are: male, white, younger age, severe psychopathology, co-morbid depression or substance abuse, past attempts, and lack of social support (Montross, et al., 2005). Other clinical and psychosocial factors have been more inconsistently described: paranoid subtype of schizophrenia, command hallucinations, hopelessness, level of functioning, history of violent acts, general medical co-morbid conditions, and tragic loss (Montross, et al., 2005). Factors thought to protect against suicide include positive coping strategies, efficacious problem-solving skills, and general life satisfaction (Montross, et al., 2005).

Among middle-aged and older adults with schizophrenia, Montross and coauthors (2008) found hopelessness, level of depression, general psychopathology, and past attempts were associated with suicidal ideation in a group of subsyndromally depressed persons. In the latter population, Kasckow and coauthors (2007) also found suicidal ideation was associated with lower quality of life. There was no association with gender, ethnicity, marital status, living situation, positive or negative symptoms, or medical illness. Barak and coauthors (2004) were unable to identify any predictors of suicide attempts among older schizophrenia inpatients in Israel. They noted that age, gender, physical illness, type of schizophrenia were not significant predictors.

Thus, although there have been numerous studies in younger schizophrenia populations, the studies among older adults have been limited to depressed persons aged 40 and over and an inpatient cohort (Barak, et al., 2004; Montross, et al., 2008). The generalizability of these findings to older persons with schizophrenia living in the community is unclear. Therefore,

the aim of this study is to address the following questions in a mixed racial sample of community-dwelling persons with schizophrenia aged 55 and over:

1. What is the current and lifetime prevalence of “suicidality” (viz., wants to be dead, thoughts of suicide, or attempted suicide) in older persons with schizophrenia, and how does it compare with their age peers in the general population?
2. What are the factors associated with prior suicide attempts among older persons with schizophrenia?

## 2. Materials and methods

### 2.1. Participants

Details of the study methods are provided elsewhere (Bankole, et al., 2007). Briefly, we recruited participants aged 55 and over living in the community with early onset schizophrenia (onset before age 45). We focus on early-onset persons because approximately 85% of persons with schizophrenia have onset before age 45 and it remains uncertain as to whether the late-onset disorder is the same entity or not (Cohen, et al., 2008). We used a stratified sampling method in which we attempted to interview approximately half the participants from outpatient clinics and day programs, and the other half from supported community residences. Inclusion was based on a DSM IV diagnosis of schizophrenia or schizoaffective disorder that was conducted by clinical agency staff and by a lifetime illness review adapted from Jeste and associates (Jeste, et al., 1997). We excluded persons with cognitive impairment too severe to complete the questionnaire, i.e., scores of <5 on the Mental Status Questionnaire (Kahn, et al., 1960).

We recruited a community comparison group using Wessex Census Summary Tape Files 3 for Kings County, New York. We used randomly selected block groups as the primary sampling unit. An effort was made to interview all persons aged 55 and over in a selected block group by knocking on doors. In order to enhance response rates, participants from the selected block group were also recruited at senior centers, churches, and through personal references. We excluded persons with histories of treatment for schizophrenia or schizoaffective disorder.

The rejection rate was 7 % in the schizophrenia group and 48 % of those contacted in the community group. We obtained written informed consent on all participants, and the study was approved by the SUNY Downstate Medical Center Institutional Review Board. The schizophrenia group consisted of 198 persons with schizophrenia. Among these, 39% were living independently in the community and 61% in supported community residences. From the original community comparison group (n=206), we selected 113 persons who more closely matched the schizophrenia group for age, gender, race, and income. Forty-nine percent of the schizophrenia group were women versus 49% of the community comparison group ( $\chi^2 = .00$ ,  $df = 1$ ,  $p = .96$ ). The racial distribution was African American (35%), Caucasian (57%), Latino (7%), and Other (2%) in the schizophrenia group versus African American (36%), Caucasian (60%), Latino (2%), and Other (2%) in the community comparison group ( $\chi^2 = 3.62$ ,  $df = 3$ ,  $p = .31$ ). The mean ages of the schizophrenia group and community comparison group were 61.5 and 63.0 years ( $t = 2.37$ ,  $df = 306$ ,  $p = .02$ ),

respectively. Thus, despite a small absolute difference in age between the two groups, this difference attained statistical significance. Median income for both groups fell within the same category (\$7000- \$12,999).

## 2.2. Measures

Based on the risk model of suicide in schizophrenia by Pompili and coauthors (2007) and our review of the literature of suicidality in older adults with schizophrenia, we selected 15 predictors of the dependent variable: having had at least one lifetime suicide attempt (see Table 2) (Pompili, et al., 2004; Hawton, et al., 2005; Montross, et al., 2005; Pompili, et al., 2007). The following instruments were used to derive the predictor and dependent variables: (a) Center for Epidemiological Studies Depression Scale—CES-D (Radloff, 1977) with possible scores ranging from 0 to 80 (most depressed), with scores of 16 and above considered consistent with clinical depression; (b) Positive and Negative Symptom Scale (PANSS) (Kay, et al., 1992) with each scale ranging from 1 to 7 (most severe); (c) Financial Strain Scale (Pearlin, et al., 1981) with possible scores ranging from 0 to 12 (least strain); (d) the Multilevel Assessment Inventory and the Physical Self-Maintenance Scale (Lawton, et al., 1982) from which we derived the number of physical disorders and the 9-item Instrumental Activities of Daily Living Scale (IADL) with possible scores ranging from 9 to 27 (higher scores indicate better functioning); (e) Network Analysis Profile (Sokolovsky and Cohen, 1981) from which we used the number of linkages that provide assistance with food, money, or getting medical assistance (“sustenance linkages”); (f) CAGE (Bernadt, et al., 1982), with an affirmative response to any item, currently or in the past, considered to be indicative of probable problems with alcohol; (g) Lifetime Trauma and Victimization Scale (Cohen, et al., 1997) comprising 12 traumatic experiences: victim of crime involving physical assault, other serious physical injuries, victim of crime involving robbery, physical abuse by a relative, physical abuse or torture by a non-relative, spousal abuse, sexual abuse/rape by a relative or stranger, incarceration, witnessed violent death, heavy combat experience, disasters of mass destruction (e.g., fire, hurricane, tornado), and “other”; each item is rated for frequency (range: 0 = never, 1=once in lifetime, 2=2 times in lifetime, 3=3 or more times in lifetime), and is summed to provide a total score; (h) Religiousness Scale, based on 8 items that encompassed the three principal domains of religiousness identified in the literature (religious salience, frequency of attending religious activities, and using religion as a coping style) with possible scores ranging from 1 to 27 (most religiousness).

The internal reliability (Cronbach’s alpha) scores of all scales attained acceptable levels according to Nunnally’s criterion (Nunnally, 1967): CES-D (0.88), PANSS Positive Symptom Scale (0.83), PANSS Negative Symptom Scale (0.78), Financial Strain Scale (0.79), IADL Scale (0.74), Trauma and Victimization Scale (0.71), Financial Strain Scale (0.79), IADL scale (0.77), Religiousness Scale (0.78). The intra-class correlations (ICC) of the raters ranged from 0.79 to 0.99 on the various scales.

We examined current and past “suicidality” (presence of one of the following in past 2 weeks: wanting to die, thoughts of suicide, or attempted suicide). All items were based on self-reports. We opted to use previous suicidal attempts as the dependent variable in the multivariable model because of the low frequency of current suicidality and the compelling

evidence in the literature that a prior suicidal attempt is a very strong risk factor for future attempts (Hawton, et al., 2005; Carlborg, et al., 2009; Reutfors, et al., 2009). For example, Carlborg and colleagues (2009), in a Swedish study of persons with schizophrenia spectrum psychosis followed for a mean of 25 years, found a high association between history of suicide attempts and dying by suicide, i.e., 18% of persons who previously attempted suicide died by suicide versus 2% of persons with no history of suicide attempts.

### 2.3. Data Analysis

We contrasted the schizophrenia and the community comparison groups using chi-square analyses. To examine risk factors associated with prior suicide attempts in the schizophrenia group, we initially conducted bivariate analyses. This was followed by a logistic regression analysis to determine the independent effects of these risk factors. There was no evidence of collinearity among the variables entered into the logistic regression analysis, i.e., all variance inflation factors were  $<1.87$ . Because of the exploratory nature of the study, we did not use a correction for multiple comparisons. A detailed rationale for not using a correction for multiple comparisons is described elsewhere (Abdallah, et al., 2009)

## 3. Results

We found higher prevalence of current and lifetime suicidality among the schizophrenia group compared to the community group (current: 10% vs 0.6%; lifetime: 56% vs 7%) as well as past suicidal attempts (30% versus 4%) (Table 1). When we separately examined the schizophrenia group, we found 19% of those who previously attempted suicide currently exhibited suicidality versus 7% of those who had never attempted suicide ( $\chi^2=6.90$ ,  $df=1$ ,  $p=.009$ ), and 55% of those who currently expressed suicidality had previously attempted suicide. Among those who currently expressed suicidality, 70% were syndromally depressed (CESD 16) versus 28% of those without suicidality ( $\chi^2= 14.44$ ,  $df=1$ ,  $p=.001$ ). Forty seven percent of persons with schizophrenia who had previously attempted suicide currently had syndromal depression versus 27% of those who had never attempted suicide (Table 2).

In looking at the schizophrenia group, in bivariate analysis, only two of the 15 predictor variables, current syndromal depression and higher scores on the Trauma and Victimization Scale, were associated with prior suicide attempts (Table 2). When we examined the 15 predictor variables in a logistic regression analysis, these two variables remained significant predictors of lifetime suicidal attempts (Table 3).

A post-hoc analysis of the Trauma and Victimization Scale indicated significant differences in the schizophrenia group among prior suicide attempters in the frequency of “severe physical abuse or punishment by parent/guardian or other relative” (nonattempters:  $0.2 \pm 0.7$ ; attempters:  $0.6 \pm 1.2$ , Mann-Whitney  $U=3457$ ,  $z=-2.21$ ,  $p=.03$ ) and “sexual abuse or rape by a relative, stranger, or acquaintance” (non-attempters:  $0.3 \pm 0.8$ ; attempters:  $0.8 \pm 1.1$ , Mann-Whitney  $U=3778$ ,  $z=-3.72$ ,  $p<.001$ ). Moreover, there was a significant difference in both of these items occurring before the age of 17; viz., physical abuse (non-attempters: 7% ; attempters: 19%,  $\chi^2=5.86$ ,  $df=1$ ,  $p=.02$ ); sexual abuse (non-attempters: 5% ; attempters: 22%,  $\chi^2=13.40$ ,  $df=1$ ,  $p<.001$ ). There were no significant differences on the other items of the Trauma and Victimization Scale.

## 4. Discussion

In response to our first question regarding the prevalence of suicide in older adults with schizophrenia, this study showed that in comparison to their age peers, older persons with schizophrenia had dramatically higher prevalence of lifetime suicidal thoughts (43% vs. 6%) and suicidal attempts (30% vs. 4%). The prevalence of suicidal thoughts and attempts is consistent with the literature (Meltzer, 1998). In our sample, the 42% of the currently syndromally depressed persons with schizophrenia who had a history of prior suicide attempts was nearly equivalent to the 49% found in Montross middle aged and elderly sample of depressed persons with schizophrenia (Montross, et al., 2008).

With respect to the second question regarding the factors associated with prior suicide attempts among older adults with schizophrenia, our data showed that depression is as strongly associated with prior suicide attempts as it is in younger populations (Roy, et al., 1984; Gupta, et al., 1998; Haw, et al., 2005; Hawton, et al., 2005). We also found past traumatic events to be associated with suicide. This represents a new finding with potential clinical implications. Traumatic events, especially in early life, have been causally linked to schizophrenia (Read, et al., 2005; Gil, et al., 2009). However, it has not been recognized as a risk factor for suicide in this group, although it has been viewed as a risk factor in the general population (Dube, et al., 2001; Afifi, et al., 2008; Pompili, et al., 2009). Interestingly, we found higher rates of early physical and sexual abuse among persons with prior suicide attempts. Thus, while the association of prior traumatic events with suicidal attempts was significant, albeit modest (odds ratio of 1.14), it does suggest that the elucidation and more aggressive treatment of the effects of past traumatic events, especially those related to physical and sexual abuse, may have an impact on suicidality. Finally, we were not able to replicate previous reports of the association between suicide attempts and various demographic, social, and clinical variables.

To our knowledge, this is the first American study to examine suicide attempts and associated risk factors among older adults with schizophrenia. Our study is limited by the use of cross-sectional data, so that causal relationships cannot be determined with certainty; it is based on self reports of suicide attempts, and that there were no criteria for the length of time persons felt suicidal or the seriousness of the suicide attempt; it is confined to one geographical area; and is based on a convenience sample recruited from outpatient programs and supported residences, thereby excluding persons who were no longer in treatment or living in institutions. Moreover, the reason that suicide risk factors differed in our sample from younger populations with schizophrenia may be because persons in this study did not successfully commit suicide in their younger years, despite having high levels of suicidality.

In summary, like their younger counterparts, older persons with schizophrenia continue to be at high risk for suicide as compared to their age peers in the general population. This underscores the importance of obtaining a detailed suicide history and monitoring for suicidality in this age group. Although we were surprised by the low number of risk factors identified in our study, it was consistent with the findings of Barak and coauthors (2004) who failed to identify any risk factors for attempted suicide in older adults with schizophrenia in Israel. The relative paucity of risk factors means that practitioners can more



easily focus their therapeutic efforts on at-risk individuals. Thus, from a clinical perspective, more aggressive pharmacotherapy and/or psychotherapy for depression and for those persons with prior traumatic events may have the potential to decrease the risk of suicidality in older adults with schizophrenia.

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**Table 1**  
Suicidal Ideation and Attempts in Community Comparison Group and Schizophrenia Group<sup>a</sup>

	Community (N=113) %	Schizophrenia (N=198) %	$\chi^2$	df	p
Wishes dead – past 2 weeks	2	8	3.64	1	.06
Wishes dead – lifetime	7	47	52.33	1	.001
Suicidal thoughts – past 2 weeks	0	5	4.41	1	.04
Suicidal thoughts – lifetime	6	43	47.97	1	.001
Suicidal attempts – past 2 weeks	0	0.5	0.00	1	1.00
Suicidal attempts – lifetime	4	30	28.11	1	.001
Current suicidality <sup>b</sup> – past 2 weeks	0.6	10	6.38	1	.01
Suicidality-lifetime	7	56	71.73	1	.001

<sup>a</sup>Yates' Correction used when expected cell size was < 5.

<sup>b</sup>“Suicidality” is defined as the presence of one of the following: wanting to die, thoughts of suicide, or attempted suicide.

**Table 2**  
 Bivariate Analyses of Variables Associated with Prior Suicidal Attempts in Older Adults with Schizophrenia

Variable	Suicidal attempts (n=58)	No suicidal attempts (n=138)	Test statistic	df	P
Sex (female)%	52	48	$\chi^2=.25$	1	.62
Age (mean±SD)	60.8±5.2	61.8±5.8	t=-1.11	191	.27
Race (white)%	66	54	$\chi^2=2.36$	1	.13
Education (mean±SD)	12.5±4.3	12.9±10.0	t=-.32	188	.75
Number of sustenance linkages (mean±SD)	5.1±3.1	4.9±3.4	t=-.41	194	.69
Number of physical illnesses (mean±SD)	1.5±1.5	1.2±1.3	t=-1.26	194	.21
CESD Scale 16, %	47	27	$\chi^2=7.24$	1	.007
Lives in supportive residence, %	57	63	$\chi^2=.65$	1	.42
PANSS Positive Symptom Scale (mean±SD)	12.9±6.7	12.5±6.1	t=-.44	193	.66
PANSS Negative Symptom Scale (mean±SD)	11.4±6.2	12.6±5.9	t=1.01	194	.31
Instrumental Activities of Daily Living Scale (mean±SD)	22.2±4.0	22.2±3.8	t=.02	194	.98
CAGE alcoholism screen: positive lifetime, %	35	33	$\chi^2=.02$	1	.88
Religiosity Scale (mean±SD)	15.7±5.6	15.1±5.7	t=-.65	181	.52
Financial Strain Scale (mean±SD)	7.3±3.1	7.3±3.3	t=.08	194	.94
Trauma and Victimization Scale (mean±SD)	4.8±4.2	3.0±3.5	t=-3.14	193	.002

**Table 3**

Logistic Regression Analysis of Variables Associated with Prior Suicidal Attempts in Older adults with Schizophrenia

Variables	Odds Ratio <sup>a</sup>	p Value	C.I.
Female	1.02	.96	.49 – 2.14
Age	.97	.30	.90 – 1.03
White	1.57	.28	.70 – 3.54
Education	.97	.60	.87 – 1.08
Number of sustenance linkages	1.00	.94	.90 – 1.12
Number of Physical Illnesses	1.00	.97	.75 – 1.32
CESD Scale 16	2.39	.03	1.10 – 5.22
Lives in supportive residence	.78	.54	.35 – 1.74
PANSS Positive Symptom Scale	.99	.75	.92 – 1.07
PANSS Negative Symptom Scale	1.00	.99	.93 – 1.08
Instrumental Activities of Daily Living Scale	.95	.32	.865 – 1.05
CAGE alcoholism screen: positive lifetime	1.02	.96	.47 – 2.20
Religiousness Scale	1.01	.70	.95 – 1.08
Financial Strain Scale	1.11	.11	.98 – 1.26
Trauma and Victimization Scale	1.13	.03	1.02 – 1.27

<sup>a</sup> Odds Ratios greater than 1 are associated with higher rates of suicide and odds ratios less than 1 with lower levels.