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Suicidal ideation in first-episode psychosis: Examination of symptoms of depression and psychosis among individuals in an early phase of treatment

Lindsay A. Bornheimer*

Washington University in St. Louis, Brown School, Missouri, 63130,United States

Introduction

Psychotic disorders, including schizophrenia, are related to increased risk for suicide (Chang et al., 2014; Hawton et al., 2005) with an estimated 4–13% lifetime risk for completion (De Hert et al., 2001; Simms et al., 2007). Further, first-episode psychosis (FEP) is a particularly high-risk period (Austad et al., 2015; Barrett et al., 2010; Chang et al., 2014) in which risk within the first year of treatment is elevated by 60% as compared to other stages of illness (Nordentoft et al., 2004 in Pompilli et al., 2011). In particular, Pompilli and colleagues' (2011) found the highest rates of suicide to occur after discharge from a psychiatric hospital. However, of importance, variability of suicide risk timing within FEP exists within the literature due to several factors that relate to issues with measurement, including diagnostic instability, data being based upon time of first treatment as opposed to onset, and because of the latter, there is much less understood about risk during an untreated period of FEP (Pompilli et al., 2011; Barrett et al., 2010).

It is known that suicidal thoughts are a consistently supported antecedent of suicidal behavior (attempt and completion), and rates of ideation in an initial FEP presentation have been shown to range from 26.2% to 56.5% (Chang et al., 2014; Barrett et al., 2010, Tarrier et al., 2007). Psychiatric factors related to suicidal ideation within FEP include history of suicide attempt, depression, hopelessness (Austad et al., 2015; Bakst et al., 2010; Chang et al., 2014), psychotic symptoms (Bertelsen et al., 2007; Nordentoft et al., 2002), and longer duration of untreated psychosis (Clarke et al., 2006; Foley et al., 2008; Melle et all., 2006).

Bertelsen and colleagues (2007) conducted a longitudinal, prospective study examining suicidal behavior among individuals in FEP in Denmark to find both symptoms of depression and psychosis to be strongly associated with ideation and attempt. In particular, auditory hallucinations were found to be a specific symptom of psychosis involved in those relationships. Similarly, Madsen and Nordentoft (2012) investigated suicide risk factors in early treatment phases and found hallucinations to increase the risk of suicide, specifically auditory in nature. Interestingly, however, delusions were associated with decreased risk for suicide, thus demonstrating a protective factor.

Corresponding author mail id:- lindsay.bornheimer@wustl.edu.

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Though there are findings to date that identify factors involved in suicide risk, it is apparent that many are mixed, thus warranting further examination. Additionally, much of the literature to date focuses on individuals with a longer duration of psychosis, thus, there is an urgency for research to examine suicide risk among individuals in FEP in the beginning stage of treatment due to high suicide rates as a first step towards the development and examination of prevention-focused interventions to reduce premature suicidal death. Accordingly, the aims of the current study are to: (1) explore demographic characteristics of participants who did and did not experience suicidal ideation; (2) examine potential differences in symptoms of depression and psychosis by experience of suicidal ideation; and, (3) examine the relationships between 2 specific positive symptoms of psychosis (hallucinations and delusions) and suicidal ideation. It is hypothesized that: (1) symptoms of depression and psychosis will be greater at baseline among participants who experienced suicidal ideation during the study period, and (2) hallucinations and delusions at baseline will significantly predict the experience of suicidal ideation during the study period. This study also investigates suicidal ideation within FEP among a sample of early-treatment-phase participants in the United States, while much of the literature to date involve international samples.

Methods

Secondary data were obtained from National Institute of Mental Health's Early Treatment Program (ETP) of the Recovery After an Initial Schizophrenia Episode (RAISE) project. ETP is one of two distinct research studies of RAISE within an initiative to change the trajectory and prognosis of first-episode psychosis (FEP). The ETP compared two early treatment programs between 2010 and 2012 to improve functional outcomes and quality of life (Kane et al., 2015).

Participants

Participants (n=404) included individuals between the ages of 15 and 40 with a diagnosis of schizophrenia, schizoaffective disorder, schizophreniform disorder, brief psychotic disorder, or psychotic disorder not otherwise specified based upon the DSM-IV. Participants all had experienced only a first episode of psychosis, spoke English, and had been on antipsychotic medications for 6 or less months across their lifespan. Community mental health clinics (n=34) across 21 states were randomized to offer one of the two programs: either the early treatment intervention (n=223) or standard care (n=181). The early treatment program, entitled NAVIGATE (Mueser et al., 2015), included medication management, psychoeducation, resilience-focused 1:1 therapy, and supported employment and education. Participants who received standard care obtained clinical care for psychosis as determined by providers and clinic capacities (Kane et al., 2016). All participants were involved in clinical assessment at five time points.

Measurement

The Calgary Depression Scale for Schizophrenia (CDSS; Addington et al., 1990) was used to measure symptoms of depression at baseline. The CDSS is a widely used well-validated scale to assess severity of depressive symptoms in individuals diagnosed with schizophrenia

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(Addington et al., 1993). As a result of suicidal ideation (outcome variable) being measured within the CDSS, the suicide item was removed from the scale to measure depression. Thus, symptoms of depression were measured in the past week using 8 of the 9 items of the CDSS, including: depression, hopelessness, self-depreciation, guilty ideas of reference, pathological guilt, morning depression, early wakening, and observed depression. Ratings are coded as absent (0), mild (1), moderate (2), or severe (3), and items are summed to obtain a total score. With the removal of the suicide item, scores range from 0 to 27 with higher scores indicating greater presence and severity of symptoms of depression. Reliability analyses indicated minimal change from this removal (original 9-item scale alpha was .81 at baseline and revised 8-item scale alpha was .80 at baseline).

Positive symptoms of psychosis were measured with the Positive and Negative Syndrome Scale (PANSS; Kay et al., 1987) at baseline. Widely used in clinical studies of psychosis with strong reliability and validity, the PANSS contains 30 items assessing symptoms including positive, negative, and general psychopathology. The positive symptom subscale includes items related to organization, hallucinations, excitement, grandiosity, and suspiciousness/persecution. The negative symptom subscale includes items related to blunted affect, emotional withdrawal, poor rapport, passive/apathetic social withdrawal, difficulty in abstract thinking, lack of spontaneity and flow of conversation, and stereotyped thinking. Lastly, general psychopathology subscale includes items related to somatic concern, anxiety, guilt feelings, tension, mannerisms and posturing, depression, motor retardation, uncooperativeness, unusual thought content, disorientation, poor attention, lack of judgment and insight, disturbance of volition, poor impulse control, preoccupation, and active social avoidance. Rating anchors range from absent (1) to extreme (7) and items are summed to obtain a total score. Positive symptom subscale scores range from 0 to 42 with higher scores indicating greater presence and severity of positive symptoms of psychosis. The positive symptom subscale demonstrated an alpha of .70 at baseline.

Suicidal ideation was measured by a single item from the Calgary Depression Scale for Schizophrenia (CDSS; Addington et al., 1990; Addington et al., 1993) at all time points. The item was coded as absent (0), mild (1), moderate (2), or severe (3), with a positive rating of reported suicidal ideation being indicated by a score of mild (1) or moderate (2; Addington et al., 1990; Witt et al., 2014). The suicide item was subsequently recoded into a dichotomous yes or no variable representing the experience of suicidal ideation at each time points. Lastly, the dichotomous item at each time point after baseline was collapsed into a single dichotomous yes or no variable to represent incidence of suicidal ideation after baseline assessment.

Data Analysis

Data were analyzed using SPSS 24. Univariate and bivariate explorations of both demographic and clinical characteristics were completed to describe and better understand the sample. Differences in demographic characteristics at baseline were explored between participants who did and did not experience suicidal ideation throughout the entire study using Chi-Square tests. Additionally, differences in baseline levels of symptoms of depression and psychosis were examined by incidence of suicidal ideation throughout the

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full study duration utilizing an independent samples t-test. Lastly, a binary logistic regression was preformed to examine the specific relationships between 2 positive symptoms of psychosis (hallucinations and delusions) and suicidal ideation, including treatment condition (early treatment intervention) and antipsychotic status (using or not using at baseline) as covariates.

Results

Demographic characteristics of participants at baseline are presented in Table 1. Participants were on average 23.6 years of age (SD=5.06) and identified as male (73%), White (54%), and non-Hispanic/Latino (82%). The majority endorsed being single/unmarried (89%), completing high school (33%), not working/employed (86%), living with family (71%), and being uninsured (48%). Participants most often had a diagnosis of schizophrenia (53%) and reported the experience of untreated psychosis for on average 6 months (SD=.72). At the time of consent, 83% of participants reported current use of one or more antipsychotic medications. Participants who reported suicidal ideation during the study period endorsed having more months of untreated psychosis (M=8.57, SD=9.56) than those who did not report suicidal ideation during the study period (M=5.58, SD= 8.14; t(401)= −3.09, $p < .01$).

As for clinical characteristics throughout the entire study period, 26% of participants endorsed having suicidal ideation and 8.2% made a suicide attempt. Additionally, the majority reported experiencing hallucinations (84%), delusions (99%), and varying degrees of depressive symptoms (100%). At baseline, 15% of participants endorsed having suicidal ideation and 4% made a suicide attempt. Similar to incidence of ideation across the entire study period, the majority reported experiencing hallucinations (79%), delusions (95%), and varying degrees of depressive symptoms (100%) at baseline.

Table 2 illustrates clinical characteristics at baseline including characteristics by incidence of suicidal ideation during the full study period. Participants who reported suicidal ideation during the study period had significantly higher depression scores at baseline (M=15.41, SD=4.22) than those who did not report suicidal ideation during the study period at baseline (M=11.42, SD= 3.42; t(401)= −9.65, $p < .001$). Pertaining to symptoms of psychosis, participants who reported suicidal ideation during the study period had significantly greater symptoms of psychosis total scores at baseline (M=82.37, SD=14.76) than those who did not report suicidal ideation during the study period at baseline (M=74.59, SD= 14.59; t(180)= −4.66, $p < .001$). Participants who reported suicidal ideation during the study period had significantly higher general psychopathology subscale scores at baseline (M=41.14, SD=7.71) than those who did not report suicidal ideation during the study period at baseline (M=36.43, SD= 7.80; t(184)= −5.37, $p < .001$). Specific to positive symptoms of psychosis, participants who reported suicidal ideation during the study period had significantly higher scores on the positive symptoms subscale at baseline (M=20.37, SD=4.86) than those who did not report suicidal ideation during the study period at baseline (M=18.20, SD= 5.24; t(194)= −3.85, $p < .001$). Specifically within the positive subscale at baseline, the incidence of hallucinations (t(187)= −4.32, $p < .001$) and delusions (t(401)= −3.37, $p < .001$) at baseline were independently significantly greater among participants who experienced suicidal ideation across the fill study period than those who did not experience suicidal

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ideation. There were no significant differences in negative subscale scores at baseline between those who did or did not experience suicidal ideation during the study period.

Lastly, the model examining the specific relationships between 2 positive symptoms of psychosis (hallucinations and delusions) and suicidal ideation demonstrated good fit based upon the non-significant Hosmer and Lemeshow Test ($\chi^2(7) = 6.33$, $p = .502$). Hallucinations and delusions at baseline independently significantly predicted the incidence of suicidal ideation across the full study period, holding treatment condition (early treatment intervention) and antipsychotic status (using or not using at baseline) constant. Table 3 shows the logistic regression coefficient, Wald test, and odds ratio for each of the predictors.

For every one-unit increase in the experience and severity of hallucinations, on average the odds of experiencing suicidal ideation increased by a multiplicative factor of 1.28, holding constant delusions, treatment condition, and antipsychotic status (SE = .08, CI: 1.09– 1.51). In other words, the likelihood of experiencing suicidal ideation during the study period increased as participants reported having greater experience and severity of hallucinations at baseline. Similarly, for every one-unit increase in the experience and severity of delusions, on average the odds of experiencing suicidal ideation increased by a multiplicative factor of 1.26, holding constant hallucinations, treatment condition, and antipsychotic status (SE = . 12, CI: 1.00– 1.58). Essentially, the likelihood of experiencing suicidal ideation during the study period increased as participants reported having greater experience and severity of delusions at baseline.

Discussion

With high rates of suicide and limited understandings of risk factors beyond that of depression, it is imperative to investigate suicide risk among individuals in a first-episode of psychosis with the goal of contributing to intervention efforts to reduce premature suicidal death. The current study examined demographic and clinical characteristics among individuals experiencing suicidal ideation in a first-episode of psychosis within the RAISE project.

Findings emphasize the high-risk of individuals in a first-episode of psychosis experiencing suicidal ideation, with 26% of participants reporting having suicidal ideation and 8.2% making a suicide attempt within the RAISE project. Further, majority of participants reported experience of hallucinations, delusions, and depression at baseline. Consistent with prior research, participants who experienced suicidal ideation during the study period reported having a longer duration of untreated psychosis (Clarke et al., 2006; Foley et al., 2008; Melle et all., 2006). Participants who endorsed having suicidal ideation during the study period reported more symptoms of depression and psychosis at baseline. While the finding of depression relating to suicidal ideation is consistently supported in the literature (Austad et al., 2015; Bakst et al., 2010; Chang et al., 2014), the relationships between ideation, hallucinations, and delusions are not consistently significant (Bertelsen et al., 2007; Hawton et al., 2005; Nordentoft et al., 2002; Pompilli et al., 2011; Challis et al., 2013). In the current study, hallucinations and delusions (positive symptoms) at baseline significantly predicted the experience of suicidal ideation across the full study period. As hypothesized,

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the odds of experiencing suicidal ideation during the study period was increased when hallucinations and delusions increased at baseline.

While much of the literature to date focuses on symptoms of depression with mixed support for the role of positive symptoms of psychosis, the current study provides evidence for the role that positive symptoms (specifically hallucinations and delusions) play in suicidal ideation among individuals in a first-episode of psychosis. These results have several clinical implications. First, the high incidence of suicidal ideation among participants in an early-treatment phase and within the FEP literature (Austad et al., 2015) implies the importance of early intervention. Second, due to the high rate of suicidal ideation in the current sample and of suicide within the FEP literature as a whole (Austad et al., 2015; Barrett et al., 2010; Chang et al., 2014), it is imperative for clinicians to thoroughly conduct initial and ongoing suicide risk assessments.

Third, and within the vein of assessment, clinicians should evaluate for positive symptoms of psychosis, including hallucinations and delusions, in addition to symptoms of depression. Even if an individual does not endorse having symptoms of depression, suicidal ideation, or any history of suicide attempt, it is important to consider the way in which symptoms of psychosis can relate to suicidality. As described by Fedszyn and colleagues (2014), suicide prevention can involve a continuum of varying approaches. Prevention can be seen as universal (targeting the whole population regardless of risk), selective (targeting those at risk for developing suicidality), and indicated (targeting those at high-risk with ideation and/or plans). Universal approaches can involve psychoeducation for both the individual in FEP and their family members, thorough assessment for suicide risk involving access to/elimination of means, bolstering social support, and assessing for imminent contextual needs that may result in increased risk for suicide (e.g. a major life change).

Both selective and indicated approaches may involve varying degrees of interventions aiming to reduce risk (e.g. Cognitive-Behavioral Suicide Prevention for Psychosis; Tarrier et al., 2013) and distress tolerance/social skills training in addition to use of universal approaches (Kopelowicz, Liberman, & Zarate, 2006; Fedyszyn et al., 2014; Lieberman et al., 1986). Cognitive- Behavioral Suicide Prevention for psychosis (CBSPp) is one of few cognitive-behavioral interventions targeted for individuals with psychosis. While data indicate effectiveness to date (Tarrier et al., 2014), future research is needed to examine effectiveness of CBSPp among individuals specifically within FEP. Skills training programs have been shown in the literature to reduce suicide risk (Eggert et al., 1995), however, quantitative evidence is limited and future research is needed to examine the effectiveness of such programs among FEP at risk for suicide.

The current study must be considered in light of several potential limitations. First, the RAISE project was not conducted to address the aims of the current study, thus, measurement of depression and suicidal ideation were derived from a single scale. Specifically, the suicide item of the Calgary Depression Scale for Schizophrenia (CDSS) was removed when measuring symptoms of depression and used to measure suicidal ideation, as there was no formal measure of suicidal ideation in the data. Fortunately, reliability analyses indicated minimal change to the measurement of depression from this

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removal (original alpha = .81 and revised scale alpha =.80). Future prospective research should include separate scales to measure each construct for more rigorous explorations of constructs.

Second, analyses were limited only to suicidal ideation as there were low base rates of suicide attempt among participants. Future research should also examine risk factors for suicide attempt and relationships between ideation and attempt among individuals in a first-episode of psychosis. Lastly, self-report and social desirability are common concerns in mental health research and should be considered in the current study. Future research should consider the collection of information from multiple sources (i.e. participant's report, family report, medical records, and provider report).

In conclusion, these results point towards the implication that depression and positive symptoms of psychosis (particularly hallucinations and delusions) relate to the experience of suicidal ideation and should be evaluated for and treated in clinical practice. Future research is needed to further explore risk factors for suicide among individuals in a first-episode of psychosis to increase understandings of risk for both ideation and attempt, and ultimately inform interventions aimed towards reducing premature suicidal death.

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Table 1

Demographic characteristics of the RAISE sample at baseline

Characteristic	n	%
Age (M ± SD)	404	23.62 ± 5.06
Gender		
Male	293	72.5
Female	111	27.5
Race		
African American	152	37.6
White	218	54.0
American Indian or Alaska Native	31	5.2
Asian	12	3.0
Hawaiian or Pacific Islander	1	0.2
Ethnicity		
Hispanic	73	18.1
Not Hispanic	331	81.9
Marital Status		
Married	24	5.9
Single/unmarried	358	88.6
Divorced, widowed, or separated	22	5.4
Education		
Some high school or less	145	36.0
Completed high school	133	33.0
Some college or higher	125	31.0
Employment		
Currently working	58	14.4
Not currently working	346	85.6
Insurance Type		
Private	82	20.4
Public	127	31.7
Uninsured	192	47.9
Residence		
Independent living	72	17.8
Lives with family	287	71.0
Supported or structured housing	14	3.5
homeless, shelter, other	31	7.7
Medication Status		
Using antipsychotics	337	83.4
Not using antipsychotics	67	16.6
Months of untreated psychosis (M ± SD)	355	6.36 ± 8.62
Age of first psychiatric illness (M ± SD)	398	16.52 ± 6.32
Age of first psychotic symptoms (M ± SD)	392	19.15 ± 6.12

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Characteristic	n	%
Number of psychiatric hospitalizations (M ± SD)	314	1.94 ± 1.98
Diagnosis		
Schizophrenia	214	53.0
Schizoaffective bipolar	24	5.9
Schizoaffective depressive	57	14.1
Schizophreniform provisional or definite	67	16.6
Brief psychotic disorder	2	0.5
Psychotic disorder NOS	40	9.9

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Table 2

Clinical characteristics of the RAISE sample at baseline and differences by suicidal ideation incidence

Clinical Characteristic	All Participants (n=404)		Suicidal Ideation[1]				Sig[2]
			Yes (n =106)		No (n=298)		
	M	SD	M	SD	M	SD	
Symptoms of Depression	12.46	4.04	15.41	4.22	11.42	3.42	***
Symptoms of Psychosis	76.62	15.01	82.37	14.76	74.59	14.59	***
Positive Symptom Subscale	18.77	5.22	20.37	4.86	18.20	5.24	***
Negative Symptom Subscale	20.19	5.31	20.86	5.59	19.96	5.20	
General Psychopathology Subscale	37.66	8.04	41.14	7.71	36.43	7.80	***

[1] Incidence of suicidal ideation across full study period

[2] Significance between suicidal ideation groups examined with independent samples t-tests

*** p<.001

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Table 3

Binary logistic regression predicting incidence of suicidal ideation across full study period

Predictor	*B*	S.E.	Wald χ^2	*p*	Odds Ratio
Hallucinations	0.231	0.115	3.991	0.046	1.259
Delusions	0.247	0.084	8.633	0.003	1.28
Treatment group	−0.292	0.237	1.521	0.217	0.747
Antipsychotic status	−0.707	0.294	5.785	0.016	0.493