

ORIGINAL PAPER

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Risk of non-fatal suicide ideation and behaviour in recent onset schizophrenia**The influence of clinical, social, self-esteem and demographic factors**

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Abstract *Background* Suicide rates amongst schizophrenic patients are high. There are disadvantages in investigating successfully completed suicides which make suicidal ideation and previous attempts important proxy measures of suicidal risk. The aim of this study was to investigate factors associated with these risk measures. *Method* Fifty-nine patients suffering recent onset schizophrenia were assessed for suicidal ideation and history, and a range of demographic, clinical, social (including relatives' Expressed Emotion) and self-esteem measures. Univariate comparisons were made between those with and without suicide ideation and previous attempts. Path analysis was conducted to identify factors directly or indirectly associated with a composite scale of risk (low, medium or high). *Results* Approximately 25% of the sample reported a current desire to kill themselves and 47% had made one or more previous attempts. There were numerous significant univariate differences between those with or without ideation or history. Path analysis indicated that greater hopelessness (OR 1.22) and longer duration of illness (OR 1.13) increased risk. Hopelessness was associated with higher negative self-evaluation and social isolation. Negative self-evaluation was associated with more relatives' criticism which was associated with more negative symptoms. Being a male, unmarried and unemployed were all significantly associated with an increase in negative symptoms. Social isolation was associated with being unemployed, older, more positive symptoms and longer

illness duration. Duration of illness was not itself predicted by any other variables. *Conclusion* Non-fatal suicide ideation and behaviour are significantly associated with an array of demographic, clinical, interpersonal and psychological factors. To reduce risk of suicide, these factors need to be assessed and methods developed to reduce their influence.

Key words schizophrenia – recent-onset – suicide risk – suicide ideation and behaviour – Expressed Emotion – self-esteem

Introduction

“The most serious of all schizophrenic symptoms is the suicide drive”

(Bleuler 1911)

Suicide rates amongst those suffering schizophrenia are alarmingly high with 10–13% killing themselves, so that suicide is the highest cause of premature death among schizophrenic patients (Caldwell and Gottesman 1990; Siris 2001). Lindelius and Kay (1973) describe suicide as the most serious clinical problem in the management of schizophrenic patients. However, estimates of suicide rates do vary. In a review of studies completed before the mid-1970s, Miles (1977) estimated a rate of 10%, with a range from 0.03% to 18%. In the figures for ten more recent studies presented by Caldwell and Gottesman (1990), there was a mean rate of 4.99 (range 2.1–9.0). In the eight studies for which results were presented by gender, there was a mean rate for men of 5.7% (2.4–12.5) and 2.3% for women (0–4.6). This compared to 3% for males and 1% for females in the general population. Schizophrenia appears to diminish the inhibition to commit suicide seen in women generally (Seaman 1986).

Many of the earlier studies on suicide in schizophrenia suffered methodological shortcomings, although recent studies without many of the problems of the earlier

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studies reconfirm the risk factors reported in the older studies (De Hert and Peuskens 2000). The Chestnut Lodge Follow-up Study followed up a cohort of 322 patients (187 with schizophrenia) (Fenton et al. 1997). In all, 40% had experienced suicidal ideation, 23% had attempted suicide and 6% had successfully committed suicide. Suicides were characterised by lower negative symptom severity at index admission and elevated suspiciousness and delusions. The Denmark Nested Case-Control Study found that suicide risk was high after admission and discharge, particularly the first 5 days after discharge. Increased risk was associated with multiple admissions during the previous year, previous suicide attempts, previous diagnosis of depression, male gender, and previous admissions to general hospitals for physical disorders (Rossau and Mortensen 1997). The Finnish National Suicide Prevention Project recorded all suicides over a 12-month period and investigated all those diagnosed with schizophrenia (Heila et al. 1997). Active illness and depressive symptoms were highly prevalent immediately before suicide, and a history of suicide attempts (71%) was common. The Belgium Suicide in Schizophrenia Project, a case-controlled study on a large cohort (n=870) of young schizophrenic patients (De Hert and Peuskens 2000), indicated male gender, chronic illness with frequent relapses, numerous and short hospitalisations, family history of suicide, impulsive and aggressive behaviour, use of antidepressants, negative attitude to treatment, higher IQ and educational level, experience of early and recent loss, psychotic episode and depression were risk factors for suicide.

De Hert and Peuskens (2000) concluded that schizophrenic patients who commit suicide tend to do so at a young age. This was likely to be related to the stabilisation of the illness in conjunction with the experiences of loss related to the illness. The risk of suicide was 40 times that of the general population. Psychotic symptoms were a major risk factor, with some patients appearing to kill themselves in order to escape from distressing symptoms. Depression was also common, as was a negative attitude towards treatment and non-compliance with medication. Those that attempt suicide frequently did so with potentially lethal means and intended to die.

A survey of psychotic patients indicated that 19% had threatened or attempted suicide within the previous year (Steinwachs et al. 1992). Between 30% and 50% of schizophrenic patients made at least one suicide attempt, often with a potentially lethal method. The Epidemiological Catchment Area study reported that 28% of individuals with schizophrenia had attempted suicide (Robins and Regier 1991). Schizophrenic patients with recurrent suicidal thoughts and behaviour were generally more aware of their negative symptoms and delusions than were non-suicidal patients (Amador et al. 1996).

Caldwell and Gottesman (1990) in their review identify risk factors that the schizophrenic population have with the general population: in both populations being male, white and socially isolated resulted in added risk.

Personal risk factors common to general population and schizophrenic suicides were: depression; a sense of hopelessness; past history of suicide attempts, family history of suicide attempts; unemployment; deteriorating health with high level of pre-morbid functioning; recent loss or rejection; parental loss during childhood; limited external support; and family stress or instability. Specific risk factors for suicide among schizophrenic patients were: being young and male; chronic illness with numerous exacerbations; post-discharge course with high levels of psychopathology and functional impairment; a realistic awareness of deteriorative effects of illness and a non-delusional assessment of the future; a fear of further mental deterioration; and excessive treatment dependence or loss of faith in treatment. However, they conclude that detection of a set of characteristics shared by suicides in schizophrenic patients had yet to be successfully translated into a set of predictors useful for prevention. Depression, without hopelessness, was not in itself responsible for increased suicide risk (Drake and Cotton 1986).

Psychotic symptoms were very common in successful suicides. In a study of the clinical characteristics of suicide victims suffering from schizophrenia, 78% of a sample of 92 suicides were in "the active phase of their illness", 64% had depressive symptoms and 71% had a history of suicide attempts (Heila et al. 1997). Fenton et al. (1997) found that suspiciousness and delusions were especially common. In this study more positive symptoms and less negative symptoms were associated with suicide risk. In two (7%) of the 30 suicides investigated by Roy (1982), suicide appeared to be in response to command hallucinations. There is evidence of increased risk of suicide among schizophrenic patients early in the course of illness (Caldwell and Gottesman 1990).

Breier and Astrachan (1984) reported that schizophrenic patients tended not to communicate directly about their suicidal intent; however, Heila et al. (1998) found that in successful suicides 52% had previously communicated suicidal intent which was not different from non-schizophrenic suicides (55%). Suicides in sufferers of schizophrenia were less likely to be associated with stressful life events than was the case with non-schizophrenic suicides (Breier and Astrachan 1984; Heila et al. 1999). Compared to other patient groups, schizophrenic patients were twice as likely to use more violent suicide attempt methods (Nietoi et al. 1992). This use of more lethal means has been interpreted as indicative of less ambivalence (Breier and Astrachan 1984).

Theories of depression suggest that a negative view of the self increases vulnerability (e.g. Brown and Harris 1978). Low self-esteem, measured before the occurrence of a life crisis, has been reported as doubling the risk of depression once a provoking crisis had occurred, during a 1-year follow-up (Brown et al. 1986a). Only self-esteem reflected in negative comments (negative evaluation of self, NES) related to later depression (Brown et al.

1986b), although self-esteem related to positive comments did play some role in recovery (Brown et al. 1990). Self-esteem was measured by means of a semi-structured interview (SESS), based on the proposition that self-esteem is derived from a subject's evaluation of different aspects of his or her appraisal of themselves relevant to social comparisons, role performance and perception of self-attributes. Brown and colleagues (Andrews and Brown 1993) considered the interview more sensitive to the presence of the past and current adverse social circumstances that underpinned both current low self-esteem and vulnerability to depression than questionnaires. They demonstrated that self-esteem was significantly related to two main risk factors: early adversity and negativity in current close relationships. Both interview and questionnaire (Rosenberg self-esteem scale 1965) methods were related to risk factors, but only the former remained significant once depression was controlled for. Questionnaire measures of self-esteem, therefore, suffer from being overdependent on current mood state.

The quality of the interpersonal environment in which a schizophrenic patient lives has consistently been shown to be important in determining clinical outcome. Patients living with relatives rated as high on Expressed Emotion (EE) have significantly higher relapse rates than those living with those rated as low EE. This finding has been consistently replicated across countries and cultures (Butzlaff and Hooley 1998). High EE relatives tend to make more critical comments, exhibit more hostility, show less warmth or demonstrate more marked emotional over-involvement than low EE relatives. Poor medication compliance has been shown to be significantly associated with living with a high EE relative (Sellwood et al. 2003). Family stress and instability were identified by Caldwell and Gottesman (1990) as a risk factor for suicide in schizophrenic patients, which suggests that EE levels may well be a possible important measure in assessing risk. Recently, Barrowclough and colleagues (Barrowclough et al. 2003) have demonstrated that the impact of criticism on patients' positive symptoms was mediated by its association with negative self-evaluation (NES).

The aim of this study was to investigate the presence of suicidal ideation and history of suicide attempts in a sample of recent onset schizophrenic patients and to examine the relationship of these proxy measures of suicidal tendency to the patients' clinical symptomatology, self-esteem and interpersonal environment. We reasoned that both current suicidal ideation and past history of suicide attempts would provide the best measure of risk for future attempts. Specifically, we predicted that suicide risk would be associated with hopelessness, clinical measures including high levels of psychotic symptoms, low self-esteem especially negative evaluations, and contact with high EE relatives.

Subjects and methods

■ Participants and procedure

Patients were included in the study if they fulfilled the following criteria: clinical diagnosis of schizophrenia, schizophreniform or schizoaffective disorder in accordance with DSM-IV criteria (APA 1995) confirmed by two research assistants conducting a systematic chart review using a checklist of DSM-IV criteria; a history of illness of less than 3 years (so as to minimise the potential confounds of illness length on self-esteem); English-speaking; between the ages of 18 and 65; if recruited as an inpatient, then their psychotic symptoms had been stabilised for at least 6 weeks; contact with a relative or significant other of at least 10 h face-to-face contact per week; and able to provide informed consent to participate in the study. For patients with more than one relative, the person with the major carer role was selected for interview. Patients were interviewed on two occasions. Session one consisted of assessment of psychopathology and was carried out by a research assistant. Session two included the application of the Self-Evaluation and Social Support for Schizophrenia (SESS-sv) Interview and was carried out by a second research assistant blind to the psychopathology assessment. The relatives' assessments consisted of the Camberwell Family Interview (CFI) (Leff and Vaughn 1985) conducted within 2 weeks of the patient interviews. The CFI was audiotaped and provided the source material for rating the relatives' Expressed Emotion. EE was rated independently and blind to the patients' assessments.

■ Assessments

The modified Self-Evaluation and Social Support for Schizophrenia (SESS-sv) Interview and Scales

The SESS-sv is a semi-structured interview (Humphreys et al. 2001; Barrowclough et al. 2003) modified from the Andrews and Brown (1991) SESS. The SESS-sv takes approximately 45 min to administer and consists of six sections. The first five sections focus on different life domains: social and recreational; occupational; relationships; parenting; and homemaking. Questions in these sections involve both perceived competence and commitment in each possible role and responses are used in an overall rating of *Evaluation of Role Performance*. A further SESS-sv section concerns *Self* and has questions covering *Evaluation of Personal Attributes* – traits and characteristics such as physical attractiveness, intelligence and the ability to get on with people – and more general *Self Acceptance* – the individual's more generalised feelings about him- or herself such as the degree to which they are happy with themselves, and also specific feelings regarding their desire to be different. All ratings take into account the importance and salience of the roles/attributes to the individual.

Rating of the interview is made from audiotape assisted by guidelines for rating each component, anchor points, and rating examples. Five scales are used to assess self-evaluation employing a 4-point rating system: marked (4), moderate (3), some (2), little/none (1). Scores on these five scales are summed to obtain the two dimensions of self-esteem. The Negative Evaluation of Self dimension (NES) consists of the three scales of *Self Acceptance* (reverse scored) plus *Negative Evaluation of Personal Attributes* plus *Negative Evaluation of Role Performance* [score range from 12 (high NES) to 3 (low NES)]. Positive Evaluation of Self dimension (PES) consists of the two scales of *Positive Evaluation of Personal Attributes* and *Positive Evaluation of Role Performance* [score range from 8 (high PES) to 2 (low PES)].

The independence of the PES and NES indices was confirmed using a principal components factor analysis using varimax rotation on the five scales (Humphreys et al. 2001). Two factor patterns emerged showing a positive and negative scale. The negative scale consisted of negative evaluation of personal attributes, negative role performance and self acceptance. Positive evaluation of personal attributes and positive role performance loaded on the positive scale. The NES scale has acceptable internal reliability (Cronbach's alpha = 0.76). An alpha

coefficient was not computed for the positive scale since it constitutes only two items which showed a correlation of 0.18, demonstrating the independence of the two scales. Inter-rater reliability for the SESS-sv was determined by two independent raters calculated for 12 consecutive interviews using weighted Cohen's Kappa coefficients for each of the five scales. The coefficients showed good agreement ranging from 0.62 to 0.89. Inter-rater reliability for the two self-esteem scales (PES and NES) was also calculated on the same 12 interviews using intra-class correlations: NES scale 0.92 and PES scale 0.89. The stability of the scales was tested on a random selection of 14 patients who completed the assessments at two time points, approximately 3 months apart. Neither the NES nor the PES change scores differed significantly from zero (PES, $t = -0.89$, n. s., NES, $t = -1.33$, n. s.) indicating that the scales' test-retest scores were within the 95% limit of agreement.

Patient symptomatology

Psychotic symptomatology was measured by interview using the Positive and Negative Syndrome Scale (PANSS) (Kay et al. 1987), measuring 32 symptoms on 7-point Likert scales, deriving three composite subscales: positive, negative or general psychopathological symptoms. ICCs were calculated between the investigator and the average of three gold standard raters on 14 videotaped PANSS interviews: ICC positive scale 0.97, ICC negative scale 0.79, ICC general psychopathology scale 0.88. The PANSS depression scale (G7) was used to assess depression (score range 1–7).

Questionnaire measures

Beck Depression Inventory (BDI) (Beck et al. 1961) is a 21-item measure of the severity of depression (range 0–63).

Beck Hopelessness Scale (BHS) (Beck 1978) is a 20-item scale which measures negative attitudes about the future in which each item is a statement on how the respondent has been feeling over the last week rated as true or false. The scale was developed to discriminate between those who would attempt suicide and those who would not.

Beck Suicidal Ideation Scale (BSI) (Beck 1991) is a 21-item scale in which each item is scored on three points (0–2). The first five items consist of screening questions and are completed by all respondents. Items 4 and 5 indicate current desire for suicide, if the respondent scores 0 on these two items, then they skip to items 20 and 21 which ask about previous attempts, otherwise they complete all items. Pininti et al. (2002) demonstrated that the scale had good psychometric properties when used with schizophrenic patients. The BSI significantly discriminated between those having been admitted for suicide attempts and those not so admitted and for those who had previous attempts and those who had never attempted suicide.

Insight Scale (IS) (Birchwood et al. 1994) is an 8-item brief self-report scale designed to measure insight in psychotic patients recovering from acute psychosis, which consists of eight statements to which the subject responds in one of three ways: agree, disagree and unsure. It assesses three subscales: re-labelling symptoms, awareness of illness and need for treatment, and the results are expressed as a total score. It has good reliability and validity.

Relatives' EE

Expressed Emotion (EE) was measured from audiotaped Camberwell Family Interviews (CFI). The CFI (Leff and Vaughn 1985) was conducted with the patient's key relative. The EE scales of relevance in this study are those reflecting negative affect: criticism and hostility, marked emotional over-involvement (EOI) and those associated with positive affect: warmth and positive remarks. A trained rater administered the interview and rated the EE scales from the audiotape. Inter-rater reliability was 100% agreement on overall EE status and correlations of scale scores of: critical comments ($r = 0.99$); hostility ($r = 0.80$); EOI ($r = 0.98$); warmth ($r = 0.97$); and positive remarks ($r = 1.00$).

Analysis

We first investigated the associations between suicide ideation and previous history of suicide attempts separately with a range of clinical, social, self-esteem and demographic variables. We then constructed a 3-point composite variable of suicide risk by combining scores on the BSI with information on previous suicide attempts. A path analysis was then carried out by performing a series of regression analyses on each of the variables to identify variables significantly and independently associated directly and indirectly with the risk outcome. Univariate analysis was carried out with parametric statistical tests where data were normal and with distribution-free statistical tests where categorical or where data were not conforming to a normal distribution. Statistical significance was set at the conventional 5% level, but reported as a trend where results approached this level.

Results

Sample

Medical records from four NHS trusts were screened for potentially suitable patients. Between December 1998 and December 1999, 100 patients were identified as potentially eligible. Twenty were found not to meet the inclusion criteria (mainly because their duration of illness was found to be longer than 3 years) or were not contactable, and 11 did not have a suitable key relative available and were excluded. The recruited sample consisted of 69 diagnosed patients with an onset of illness of less than 3 years and, of these, 10 patients (14.5%) withdrew their consent during the assessment. This resulted in a total sample of 59 with the following diagnoses: schizophrenia ($n = 49$, 83%), schizophreniform disorder ($n = 7$, 12%) or schizoaffective disorder ($n = 3$, 5%), in accordance with DSM-IV criteria. The majority (45, or 76%) were male and the age range was from 18 to 48 years of age ($M = 27.2$, $SD = 7.6$). Twelve participants (20%) lived alone, 34 (58%) lived with their parents, 6 (10%) with partners, and 7 (12%) with friends or in other shared accommodation. Thirty-six (61%) had an illness duration of less than 1 year, 17 (29%) had a duration of 1–2 years, and 6 (10%) had a duration of 2–3 years. Twenty-three (39%) were inpatients at the time of recruitment.

Suicide ideation

Suicide ideation (BSI) scores ranged from 0 to 25. The average BSI score was 4.1 ($SD = 7.2$). Twelve participants (20.3%) reported a 'weak desire' to kill themselves and a further three (5.1%) reported a 'moderate to strong desire'. One in five participants (19%) had made one previous attempt at suicide, whilst even more (27.6%) had made two or more attempts. Just over half of all participants (53.4%) had not made any such attempt.

Of those who had attempted suicide at some point, the wish to die had been high for almost two-thirds (17 subjects, 63%). The remaining subjects were split equally between a low wish to die (5 subjects, 18.5%) and a moderate wish to die (5 subjects, 18.5%).

The mean BSI score for the 15 patients who reported the desire to kill themselves was 14.7 (SD = 6.7). Four of these had never before attempted suicide; 4 had attempted suicide once and 7 had made attempts on two or more occasions.

A dichotomous variable was created of those participants who reported some degree of suicide ideation (those who answered affirmatively to the statement 'I have a weak desire to kill myself' or 'I have a moderate to strong desire to kill myself' – questions 4 and 5 on the BSI) and those who had no such desire. Comparisons were made between the two groups using independent samples *t* tests and chi square analyses. Descriptive statistics and comparisons between those with suicide ideation (weak, moderate or strong desire) and those without are presented in Table 1. As can be seen demographic variables were not associated with suicidal ideation. All clinical variables, except for insight, did show significant associations. Illness duration (up to 3 years) was associated with suicidal ideation, although inpatient status and medication dosage were not. The three NES scales of negative evaluation of role performance and personal attributes and self-acceptance were associated with suicidal ideation; however, the positive evaluation scales were not. Of the EE scales, only the frequency of positive comments was associated with suicidal ideation, with less positive comments from key relatives being associated with a desire to commit suicide.

A dichotomous variable was also created of those participants who had previously attempted suicide ($n = 26$) and those who had not ($n = 30$). These groups were also compared using *t* tests and chi square analyses. The results of these comparisons can be found in Table 2. As with suicidal ideation, there were no significant demographic associations with past history of suicide attempts, although marital and employment status approached significance. Illness duration was associated with past attempts, but inpatient status and medication dosage were not. Clinical variables, excepting negative symptoms, were associated, although hopelessness only showed a trend. Insight was significantly associated with past history. Of the self-esteem variables, only the NES scale of negative evaluation of role performance was significant. In the EE dimensions criticism, EOI and warmth all showed a significant trend, with higher scores on warmth and EOI associated with no previous attempts.

It is interesting to note that although 43 patients denied having the desire to kill themselves, 12 (27.9%) reported either moderate hopelessness ($n = 9$) or severe hopelessness ($n = 3$) on the BHS.

■ Hopelessness and depression

Scores on the BHS ranged between 0 and 20. The average score was 7.8 (SD = 5.5), falling within the 'mild hopelessness' category. When the scores were broken down according to the established cut-offs, a quarter of all par-

ticipants (25.4%) fell within the normal range. More than a third (37.3%) were found to have 'mild hopelessness' and one in five (22%) had 'moderate hopelessness'. One in six participants (15.3%) was found to suffer from 'severe hopelessness'.

Scores on the BDI ranged between 1 and 46. The average score was 16.5 (SD = 12.7) and fell within the 'mild depression' range. When categorised according to the recommended cut-off, just over half of all participants (31 subjects, 52.5%) were found to be within the normal range (i. e. a score of between 0 and 13). A further one in five (12 subjects, 20.3%) were found to have mild depression (a score of 14 to 20). One in 20 (5.1%) had moderate depression (a score of 21–26), whilst another one in five (22%) was found to have severe depression (a score of 26 or more).

In total, just 11 subjects were within the normal range on both the BDI and BHS. The remaining 48 showed evidence of at least mild depression or hopelessness. Of the 9 subjects suffering from severe hopelessness, 7 also suffered from severe depression.

BDI, BHS and BSI scores were all found to be significantly correlated (BDI and BHS $r = 0.64$, $p < 0.001$; BDI and BSI, $r = 0.68$, $p < 0.001$; BHS and BSI, $r = 0.44$, $p = 0.001$). PANSS depression was significantly related to hopelessness ($r = 0.42$, $p = 0.001$) and suicide ideation ($r = 0.51$, $p = 0.000$).

■ Self evaluation

Scores from the SESS-sv indicated that participants as a group had moderately high negative self-evaluation (mean NES score = 7.9, SD = 2.1, possible range = 3–12) and moderately good positive self-evaluation (mean PES score = 5.3, SD = 1.0, possible range = 2–8). Using categories from Brown et al. (1990), we found that 24 people had high negative self-evaluation (NES score = 9–12), 33 had moderate self-evaluation (NES score = 5–8), and 2 had low self-evaluation (NES score = 3–4).

The correlations between self-esteem, depression, hopelessness and suicidal ideation are given in Table 3. As can be seen, there are positive correlations between NES and its subscales and the BDI, BHS and BSI; these are all significant. There are negative correlations between the PES and BDI, BHS and BSI, but these are only significant for hopelessness.

■ Expressed emotion

A total of 40 relatives (67.8%) were rated as high EE and 19 (32.2%) as low EE. Between them, they made 6.9 critical comments on average (SD = 5.3), and scored a mean of 0.8 (SD = 1.2) on hostility, 1.5 (SD = 1.5) on emotionally over-involved, 3.0 (SD = 0.8) on warmth and made a mean of 0.7 (SD = 1.0) positive comments. The correlations between the EE scales and the BDI, BHS and BSI

Table 1 Comparison of those with no suicide ideation on the BSI and those with some ideation

	No desire to commit suicide (n = 43)	Weak, moderate or strong desire to commit suicide (n = 15)	Statistics
<i>Demographics</i>			
Age			
Mean (SD)	27.4 (8.33)	26.3 (6.48)	t = 0.4, p = 0.656
Gender			
Male	32 (74.4%)	12 (80.0%)	$\chi^2 = 0.2$, p = 0.664
Female	11 (25.6%)	3 (20.0%)	
Marital status			
Single	37 (86.0%)	12 (80.0%)	$\chi^2 = 2.1$, p = 0.562
Married/cohabiting	4 (9.3%)	3 (20.0%)	
Divorced/separated	2 (4.7%)	0	
Living arrangements			
Living alone	9 (20.9%)	3 (20.0%)	$\chi^2 = 2.7$, p = 0.605
Living with spouse/partner	3 (7.0%)	3 (20.0%)	
Living with parents/family	26 (60.5%)	7 (46.7%)	
Other	5 (11.6%)	2 (13.3%)	
Employment status			
Employed	30 (69.8%)	8 (100.0%)	$\chi^2 = 2.0$, p = 0.153
Unemployed	8 (30.2%)	0	
Age completed full-time education			
Mean (SD)	16.9 (2.43)	18.1 (3.76)	t = 0.9, p = 0.389
<i>Treatment</i>			
Patient status			
Inpatient	18 (41.9%)	4 (26.7%)	$\chi^2 = 1.1$, p = 0.296
Outpatient	25 (58.1%)	11 (73.3%)	
Psychotropic medication (daily CPZ equivalence)			
Mean (SD)	413.7 (250.7)	463.9 (322.3)	t = 0.5, p = 0.611
Illness duration			
Mean (SD)	9.7 (9.9)	16.6 (10.6)	t = 2.3, p = 0.026
<i>Symptoms</i>			
BDI depression			
Mean (SD)	11.7 (9.6)	28.0 (9.3)	t = 5.2, p = 0.001
BHS hopelessness			
Mean (SD)	6.3 (4.9)	12.0 (5.6)	t = 3.4, p = 0.001
PANSS depression			
Mean (SD)	3.1 (1.6)	4.6 (2.1)	t = 3.0, p = 0.005
PANSS positive symptoms			
Mean (SD)	11.4 (4.8)	16.3 (6.9)	t = 2.9, p = 0.006
PANSS negative symptoms			
Mean (SD)	13.9 (4.8)	17.7 (4.7)	t = 2.4, p = 0.018
PANSS general psychopathology			
Mean (SD)	30.4 (7.4)	39.4 (9.3)	t = 3.5, p = 0.001
Insight			
Mean (SD)	9.2 (3.1)	8.4 (2.1)	t = 0.8, p = 0.406
<i>Self-Evaluation and Social Support</i>			
Positive evaluation of role performance			
Mean (SD)	2.8 (0.5)	2.4 (0.7)	t = 1.7, p = 0.111
Negative evaluation of role performance			
Mean (SD)	2.1 (0.7)	2.8 (0.9)	t = 2.6, p = 0.011
Positive evaluation of personal attributes			
Mean (SD)	2.67 (0.7)	2.4 (1.0)	t = 1.0, p = 0.302
Negative evaluation of personal attributes			
Mean (SD)	2.5 (0.9)	3.3 (0.5)	t = 4.3, p = 0.001
Self-acceptance			
Mean (SD)	2.9 (0.8)	3.4 (0.9)	t = 2.0, p = 0.050
<i>Expressed Emotion</i>			
Critical comments			
Mean (SD)	6.7 (5.6)	7.1 (4.9)	t = 0.2, p = 0.851
Hostility			
Mean (SD)	0.7 (1.1)	1.2 (1.5)	t = 0.9, p = 0.370
Emotional over-involvement (EOI)			
Mean (SD)	1.7 (1.6)	1.0 (1.4)	t = 1.5, p = 0.145
Warmth			
Mean (SD)	3.0 (0.9)	2.7 (0.7)	t = 1.4, p = 0.176
Positive comments			
Mean (SD)	0.7 (1.1)	0.3 (0.6)	t = 2.1, p = 0.050

Table 2 Comparison of those with and without previous suicide attempts

	No past attempts (n = 30)	At least one past suicide attempt (n = 26)	Statistics
<i>Demographics</i>			
Age			
Mean (SD)	28.5 (8.7)	25.6 (6.2)	t = 1.4, p = 0.163
Gender			
Male	23 (76.7%)	19 (73.1%)	$\chi^2 = 0.1, p = 0.757$
Female	7 (23.3%)	7 (26.9%)	
Marital status			
Single	26 (86.7%)	21 (80.8%)	$\chi^2 = 3.55, p = 0.085$
Married/cohabiting	2 (6.7%)	5 (19.2%)	
Divorced/separated	2 (6.7%)		
Living arrangements			
Living alone	6 (20.0%)	4 (15.4%)	$\chi^2 = 6.9, p = 0.139$
Living with spouse/partner	1 (3.3%)	5 (19.2%)	
Living with parents/family	21 (70.0%)	12 (46.2%)	
Other	2 (6.7%)	5 (19.2%)	
Employment status			
Employed	7 (25.9%)	1 (5.6%)	$\chi^2 = 3.1, p = 0.08$
Unemployed	20 (74.1%)	17 (94.4%)	
Age completed full-time education			
Mean (SD)	16.6 (1.9)	17.8 (3.5)	t = 1.4, p = 0.178
<i>Treatment</i>			
Patient status			
Inpatient	12 (40.0%)	9 (34.6%)	$\chi^2 = 0.2, p = 0.678$
Outpatient	18 (60.0%)	17 (65.4%)	
Psychotropic medication (daily CPZ equivalence)			
Mean (SD)	419.7 (238.4)	477.8 (367.9)	t = 0.5, p = 0.613
Illness duration (months)			
Mean (SD)	8.6 (9.9)	15.1 (10.3)	t = 2.4, p = 0.02
<i>Symptoms</i>			
BDI depression			
Mean (SD)	11.4 (10.1)	22.6 (13.5)	t = 3.5, p = 0.001
BHS hopelessness			
Mean (SD)	6.7 (5.7)	9.2 (5.3)	t = 1.7, p = 0.09
BSI suicide ideation			
Mean (SD)	1.3 (3.5)	7.7 (9.0)	t = 3.4, p = 0.002
PANSS depression			
Mean (SD)	2.8 (1.5)	4.1 (2.1)	t = 2.6, p = 0.012
PANSS positive symptoms			
Mean (SD)	10.6 (3.8)	14.4 (6.0)	t = 2.8, p = 0.007
PANSS negative symptoms			
Mean (SD)	14.2 (4.2)	15.0 (5.6)	t = 0.6, p = 0.524
PANSS general psychopathology			
Mean (SD)	29.8 (7.2)	35.7 (9.8)	t = 2.6, p = 0.012
Insight			
Mean (SD)	8.3 (3.0)	9.8 (2.5)	t = 2.0, p = 0.056
<i>Self-Evaluation and Social Support</i>			
Positive evaluation of role performance			
Mean (SD)	2.8 (0.5)	2.7 (0.6)	t = 0.8, p = 0.432
Negative evaluation of role performance			
Mean (SD)	2.0 (0.8)	2.5 (0.8)	t = 2.1, p = 0.041
Positive evaluation of personal attributes			
Mean (SD)	2.7 (0.8)	2.6 (0.9)	t = 0.4, p = 0.679
Negative evaluation of personal attributes			
Mean (SD)	2.5 (0.9)	2.9 (0.9)	t = 1.4, p = 0.162
Self-acceptance			
Mean (SD)	2.9 (0.9)	3.1 (0.8)	t = 0.6, p = 0.535
<i>Expressed Emotion</i>			
Critical comments			
Mean (SD)	5.7 (4.9)	8.1 (5.5)	t = 1.8, p = 0.082
Hostility			
Mean (SD)	0.5 (1.0)	1.0 (1.3)	t = 1.6, p = 0.109
Emotional over-involvement (EOI)			
Mean (SD)	1.8 (1.6)	1.1 (1.3)	t = 1.8, p = 0.076
Warmth			
Mean (SD)	3.1 (0.7)	2.8 (0.8)	t = 1.9, p = 0.065
Positive comments			
Mean (SD)	0.6 (1.0)	0.7 (0.9)	t = 0.2, p = 0.837

Table 3 Correlation between self-esteem scales and BDI, BHS and BSI scales

	BDI	BHS	BSI
Negative evaluation of personal attributes	$r = 0.538$ ($p = 0.001$)	$r = 0.425$ ($p = 0.001$)	$r = 0.370$ ($p = 0.004$)
Negative evaluation of role performance	$r = 0.325$ ($p = 0.012$)	$r = 0.459$ ($p = 0.001$)	$r = 0.301$ ($p = 0.022$)
Self-acceptance	$r = 0.449$ ($p = 0.001$)	$r = 0.357$ ($p = 0.006$)	$r = 0.255$ ($p = 0.054$)
Total NES	$r = 0.543$ ($p = 0.001$)	$r = 0.503$ ($p = 0.001$)	$r = 0.371$ ($p = 0.004$)
Positive evaluation of personal attributes	$r = -0.155$ ($p = 0.241$)	$r = -0.368$ ($p = 0.004$)	$r = -0.033$ ($p = 0.806$)
Positive evaluation of role performance	$r = -0.173$ ($p = 0.190$)	$r = -0.290$ ($p = 0.026$)	$r = -0.161$ ($p = 0.226$)
Total PES	$r = -0.208$ ($p = 0.113$)	$r = -0.432$ ($p = 0.001$)	$r = -0.108$ ($p = 0.419$)

are given in Table 4. EOI, warmth and positive comments are negatively associated with the three scales, but these are only significant for warmth and EOI with the BDI. Criticism and hostility are positively correlated with the three scales, but only criticism and the BDI are significantly associated.

■ Suicide risk path analysis

Path analysis, which involves the extension of multiple regression techniques, was used to identify those factors which influenced outcome. The advantage of using this technique is that it can be used to identify factors that are *indirectly* associated with the outcome (by being associated with a factor which is itself associated with the outcome) as well as factors that are directly associated with it, and it is used to build models from complex sys-

tems of variables. In the present study, the outcome measure of interest was suicide risk, a composite score which was created by combining scores on current suicidal ideation (BSI scores) with data on previous suicide attempts as follows:

- At *low risk* (no past attempts and no current ideation, $n = 27$)
- At *medium risk* (either weak current ideation or past attempts with no current ideation, $n = 19$)
- At *high risk* (moderate-strong current ideation with no prior attempts or weak or moderate-strong ideation with at least one past attempt, $n = 12$).

Path analysis involves two steps: the first step is to place independent variables into blocks where it is assumed that the variables in earlier blocks can have causal influence on later blocks. Table 5 shows how the variables were arranged into blocks for the present study. Vari-

Table 4 Correlations between the BDI, BHS and BSI scales and EE dimensions

	BDI	BHS	BSI
Critical comments	$r = 0.32$ ($p = 0.012$)	$r = 0.20$ ($p = 0.137$)	$r = 0.20$ ($p = 0.138$)
Hostility	$r = 0.13$ ($p = 0.327$)	$r = 0.14$ ($p = 0.311$)	$r = 0.18$ ($p = 0.183$)
EOI	$r = -0.28$ ($p = 0.032$)	$r = -0.19$ ($p = 0.145$)	$r = -0.12$ ($p = 0.374$)
Warmth	$r = -0.28$ ($p = 0.035$)	$r = -0.21$ ($p = 0.119$)	$r = -0.16$ ($p = 0.226$)
Positive comments	$r = -0.06$ ($p = 0.632$)	$r = -0.02$ ($p = 0.880$)	$r = -0.06$ ($p = 0.639$)

Table 5 Independent and outcome variables for path analysis

Block	Variables
1 Patient characteristics	Demographics (age, gender, marital status, employment status, age left full-time education)
2 Illness history	Length of illness
3 Symptoms	Positive symptoms (PANSS), Negative symptoms (PANSS)
4 Social environment	Social isolation, Expressed Emotion (critical comments, hostility, emotional over-involvement, warmth, positive comments)
5 Insight	Insight
6 Self-esteem	Negative self-esteem (NES), Positive self-esteem (PES)
7 Hopelessness and depression	Hopelessness (BHS), Depression (PANSS)
8 Suicide risk	High vs. medium vs. low risk

ables were chosen on an a priori basis depending on the research literature and from a theoretical perspective. This represented a best guess on appropriate ordering of these variables. The second step is to conduct multiple regressions to identify which variables are directly and indirectly associated with the outcome measure. The first regression uses all of the available variables to determine which of these are directly associated with outcome. More regressions are used to identify which variables from previous blocks are associated with the predictor variables from the first regression which then become dependent variables. As there were a large number of variables (19) for the sample size available (59), univariate analyses (ANOVA and chi square) were used to restrict the number of variables entered into the first regression. Variables were included in these regression analyses if there was a significant difference in the mean score of the outcome variable for each value of the independent variable or if chi square indicated a different distribution across the groups.

These univariate analyses identified five variables for inclusion in the first regression of the path analysis: illness duration, PANSS depression, PANSS positive symptoms, negative evaluation of self (NES) and hopelessness (BHS). All five were entered into a multi-nominal regression with suicide risk as the dependent variable. The reference group in this analysis was the 'low risk' group. Two significant predictors emerged: illness duration and BHS scores. Longer illness duration increased the risk of subjects being at medium risk of suicide ($B = 0.08$, $SE = 0.04$, $p = 0.045$, $\text{Exp}(B) = 1.08$) and of being at high risk of suicide ($B = 0.12$, $SE = 0.05$, $p = 0.016$, $\text{Exp}(B) = 1.13$) when compared to the low risk group. It should be noted that the maximum illness duration in this sample was 3 years as the sample was selected on the basis of recent onset. Higher BHS scores increased the risk of subjects being at medium risk of suicide ($B = 0.17$, $SE = 0.08$, $p = 0.030$, $\text{Exp}(B) = 1.19$) and of being at high risk of suicide ($B = 0.20$, $SE = 0.10$, $p = 0.050$, $\text{Exp}(B) = 1.22$) when compared to the low risk group.

Nagelkerke R squared for the equation (an approximation of the percentage of variance explained by linear regression) was 0.48.

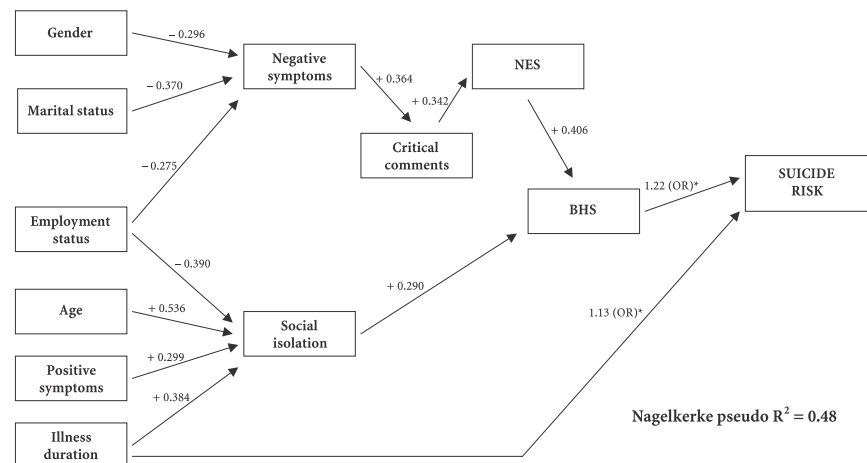
The next step in the analysis was to regress these two predictors on the variables in the blocks before them. Fig. 1 presents the resulting path analysis diagrammatically, including factors indirectly associated with suicide risk. Odds ratios are given for the variables that were directly associated with suicide risk (hopelessness and illness duration) and refer to the probability of being placed in the high risk group compared to the low risk group for each unit increase in the predictor variables. The other figures in the diagram represent beta-values; the sign represents the direction of the association and the number represents the strength of the association.

As Fig. 1 shows, hopelessness was associated with higher levels of negative evaluation of self (i.e. poorer self-esteem) and a higher level of social isolation. Negative evaluation of self was associated with more critical comments from the key relative which in turn was associated with more negative symptoms in the patient. Being a male, unmarried and unemployed were all significantly associated with an increase in negative symptoms. Social isolation was associated with being unemployed, older, having more positive symptoms and longer illness duration. Duration of illness was not itself predicted by any other variables.

Discussion

This study attempted to investigate factors that were associated with non-fatal suicide ideation and behaviour, assumed to be a proxy measure of risk. There are a number of disadvantages of investigating completed suicides which makes a proxy measure attractive. However, not all those who threaten or think about suicide will attempt it, nor will all those who attempt suicide kill themselves, but suicidal ideation and attempts are associated with completion and are in themselves undesirable. It is,

Fig. 1 Factors associated with suicide risk



* Odds ratios relate to the risk of being in the high risk group compared to the low risk group

therefore, important to investigate precursors of risk. As well as including standard measures of demographic and clinical measures, we have also included important psychological and psychosocial factors, such as self-esteem and relatives' Expressed Emotion. We have recently developed a robust interview-based measure of self-esteem for schizophrenic samples, which consists of two independent dimensions, negative and positive self-esteem. Negative self-esteem (NES) has been shown to mediate the effect of relatives' criticism on positive psychotic symptoms. We found in this study that NES was significantly correlated with measures of depression, hopelessness and suicidal ideation, whereas positive self-esteem (PES) was negatively correlated only with hopelessness. We also included the dimensions of EE. Criticism is probably the most important dimension of EE and this was significantly associated with depression only, whereas warmth and EOI, which are usually negatively correlated with criticism, also showed a significant negative correlation with depression.

In this sample of recent onset schizophrenic patients, just under half (47%) had made at least one previous suicide attempt. In making such an attempt, the wish to die had been high in about two-thirds (63%); thus, it appears that these were serious attempts. One-quarter reported a current desire to kill themselves. The mean BSI score in the total sample was 4.1 (SD 7.2), which is close to that reported by Pinninti et al. (2002) (4.9, SD 8.24). Those who had high levels of current ideation did not necessarily include those who had a history of past attempts; thus, we were justified in combining these two variables in our measure of risk. These results are in agreement with previous reports that those in the earlier stages of their illness are at high risk of suicide (Fenton 2000; Siris 2001).

In developing the model for the path analysis, we have included and ordered the variables in what we regarded as a logical progression. Basic characteristics of the patients and their illness were anticipated as having a more distal influence, while psychological states such as depression and hopelessness were regarded as proximal influences, with symptoms, social environment, insight and self-esteem being placed in between. The analysis indicated that illness duration had an independent influence on suicide risk with two other pathways acting through hopelessness. It should be remembered that illness duration is a maximum of 3 years in this sample. Depression was not included in the final model, which supports Drake and Cotton's (1986) assertion that depression in itself was not responsible for increased suicide risk. One pathway into hopelessness was via social isolation to which increased duration of illness, more positive symptoms, increased age and unemployment made a significant contribution. The other pathway to hopelessness was through high negative self-esteem, more criticism from relatives, increased negative symptoms to which being male, unmarried and unemployed made a significant contribution.

The increase in risk of suicide ideation and behav-

our with increased duration of illness is confirmed in this sample, even though they were of recent onset without extended illness histories. The other two pathways can be considered a situational path in which factors conspire to increase the patient's social isolation, and another psychological pathway in which factors increase the feeling of poor self-worth. Isolation and poor self-worth work through a common factor of hopelessness to increase suicide risk.

It may be possible to reduce suicide risk by intervening at different points with specifically focused interventions. For example, intervention could include an assertive out-reach mental health service response to prevent social isolation, psychological therapies to reduce hopelessness and lowered self-esteem, and family intervention to reduce criticism especially those that will affect feelings or self-worth. The important conclusion is that factors other than symptoms and demographics are highly influential in determining suicide risk. These need to be assessed and incorporated into a model of risk and methods devised to reduce these influential factors and so reduce risk in schizophrenic patients.

The study has a number of strengths in that semi-structured instruments based on clinical interviews were used rather than being solely reliant on questionnaires. Measures of psychopathology, self-esteem and Expressed Emotion were assessed independently and by researchers who were blind to the scores of the other measures. The measure of self-esteem was devised for use with this population and its psychometric properties were established and robust. Rater reliabilities were established and were acceptable on all interview-rated measures. The study had a strong conceptual basis.

The study, however, also has a number of weaknesses. The sample is relatively small and the results may not generalise; however, as far as we can ascertain, this sample appears to be relatively representative. The study is cross-sectional and it is unclear whether the model would have predictive value. It is not clear how precise the measure of suicide risk will be in accurately predicting future attempts at suicide and self-harm.

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