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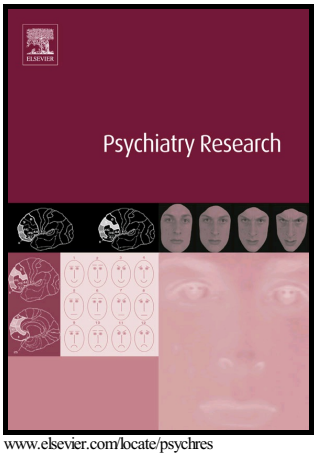

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Insight and suicidality in psychosis: a cross-sectional study

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Abstract

Aims: We aimed to test whether specific insight dimensions are associated with suicidality in patients with psychotic disorders. *Methods:* 143 patients with schizophrenia spectrum disorders were recruited. Suicidality was assessed by item 8 of

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the Calgary Depression Scale for Schizophrenia (CDSS). Insight was measured by the Scale of Unawareness of Mental Disorder (SUMD) and the Markova and Berrios Insight Scale. Bivariate analyses and multivariable logistic regression models were conducted. *Results:* Those subjects aware of having a mental illness and its social consequences had higher scores on suicidality than those with poor insight. Awareness of the need for treatment was not linked with suicidality. The Markova and Berrios Insight scale total score and two specific domains (awareness of "disturbed thinking and loss of control over the situation" and "having a vague feeling that something is wrong") were related to suicidality. However, no insight dimensions survived the multivariable regression model, which found depression and previous suicidal behaviour to predict suicidality. *Conclusions:* Suicidality in psychosis was linked with some insight dimensions: awareness of mental illness and awareness of social consequences, but not compliance. Depression and previous suicidal behaviour mediated the associations with insight; thus, predicting suicidality.

Key words:

Schizophrenia, schizophrenia spectrum disorders, insight dimensions, depression, suicidal ideation, suicide attempt

1. Introduction

As many as one in two patients with schizophrenia have had lifetime suicidal thoughts or attempted suicide (Bolton et al., 2007). Approximately 2-5% of these patients die from suicide (Palmer et al., 2005; Dutta et al., 2010).

Suicide in schizophrenia has been linked with some general suicide risk factors such as depression (Hawton et al., 2005; Pluck et al., 2012; Challis et al., 2013),

previous suicide attempts (Melle et al., 2012; Pluck et al., 2012; Barret et al, 2015), impulsive personality traits (Pluck et al., 2013), drug and alcohol misuse (Hawton et al., 2005; Pluck et al., 2012), and feelings of hopelessness (Melle et al., 2012). In addition, poor adherence to treatment (Hawton et al., 2005; Mork et al., 2012), greater number of previous hospital admissions (Popovic et al., 2014), less severe negative symptoms (Fenton, 2000), early phases of the illness (Fenton et al., 2000; Palmer et al., 2005; Dutta et al., 2010 Melle et al., 2012;), younger age at psychosis onset (Mork et al., 2012), being male (Hawton et al., 2005), longer "duration of untreated psychosis" (DUP) (Challis et al., 2013; Lopez-Moriñigo et al., 2014), higher premorbid intelligence quotient (IQ) (Pluck et al., 2012) and family history of self-harm (Pluck et al., 2012) have been specifically associated with an increased suicide risk in psychosis. In addition, some medication side effects such as akathisia have been related to suicide attempts (Scholten et al., 2005).

Mixed results have been reported regarding the relationship between insight and suicide, including both positive (i.e. insight as a risk factor for suicide) and negative studies (i.e. insight behaving as a protective factor for suicide) (Lopez-Morinigo et al., 2012). Moreover, findings from a recent 1-year follow-up first-episode psychosis (FEP) study suggest that this relationship may change over the course of the illness. Thus, insight at baseline was found to be associated with increased risk of suicidality at 1-year, whilst the increase in insight over the 1-year follow-up reduced the risk at that point (Barret et al., 2015).

Hence, while clinical insight has been classically linked to better long-term outcomes in psychosis via improved compliance (Bourgeois et al., 2004; Lincoln et al., 2007; Higashi et al., 2013), which has also been found to reduce suicide risk in schizophrenia (Hawton et al., 2005) and FEP (Barrett et al., 2015), concerns have been raised regarding a potential association of insight with suicidality via depression and hopelessness, i.e. the so-called demoralization syndrome (Drake and Cotton, 1986; Crumlish et al., 2005; Restifo et al., 2009). One possible explanation for these mixed findings may be related to the unidimensional approach to insight taken by some of these studies (Lopez-Morinigo et al., 2012) since over the last two decades insight has been demonstrated to be a multidimensional phenomenon (David et al., 1990; Amador et al., 1991; Amador and David, 2004), including: 1) awareness of having a mental disorder, 2) awareness of the effects of medication, 3) awareness of the social consequences of disorder, and 4) the ability to relabel psychotic experiences as

abnormal. In keeping with this, two clinical rater-based scales to assess insight multidimensionally have been validated to date: the Scale of Unawareness of Mental Disorder (SUMD) (Amador et al., 1991) and the Scale for Assessment of Insight (SAI) (David, 1990) and its expanded version (SAI-E) (Kemp and David, 1997). Thus, while some insight dimensions such as awareness of psychotic symptoms may behave as risk factors for suicide, awareness of the benefits from treatment appears to reduce suicide risk in schizophrenia (e.g. Amador et al., 1996).

In keeping with this, we found four recent studies which investigated the relationship between suicidality and insight from a multidimensional perspective. Interestingly, while the three cross-sectional studies (Flanagan et al., 2012, Sharaf et al., 2012; Lopez-Moriñigo et al., 2014) revealed positive associations of insight with suicidality, a 3-year follow-up FEP study failed to replicate such associations (Ayesa-Arriola et al., 2015).

In addition, there are further aspects of insight concerning the subjective and cognitive domains of the self, which can only be captured by self-rated scales such as the Markova and Berrios Insight Scale (Markova et al., 1992; Markova et al., 1995), which will be referred to as subjective insight hereafter. To the best of our knowledge, the relationship between these aspects of insight and suicide risk in psychosis has not been studied to date.

We aimed to investigate the association of multiple insight dimensions with suicidality, whilst adjusting the analyses for a set of sociodemographic and clinical variables. Specifically, we hypothesised that: (i) regarding clinical insight, while awareness of having a mental illness and awareness of the social consequences of the illness increase suicide risk, awareness of the need for treatment behaves as a protective factor; (ii) with regard to subjective insight, higher levels of "self-reported" insight is associated with increased suicidality.

2. Methods

2.1 Participants

Patients were recruited over March 2009-December 2014 from a publicly-funded general hospital in Barcelona (Spain), which provides secondary mental healthcare to a population of approximately 450.000 people. Both in- and

outpatients were approached and invited to participate in the study. The sample was therefore mixed in terms of demographics, but also illness severity, with a wide range of scores in the psychopathological assessments, thus demonstrating the real-world nature of our data. Inclusion criteria were as follows: age 18-80 years and fulfilling DSM-IV criteria for schizophrenia spectrum disorders, including schizophrenia and schizophreniform disorder ("schizophrenia spectrum disorders"), schizoaffective disorder, delusional disorder, brief psychosis and psychosis NOS (American Psychiatric Association, 1994). Diagnoses were made by the clinical team, which was led by a consultant psychiatrist. Clinical consensus meetings took place on a monthly basis. Patients with moderate to severe learning disabilities (IQ<65), a neurological illness and/or a history of severe head trauma were excluded. All participants provided written informed consent. The study was approved by the medical research ethics committee of the hospital (CEIC code 2006/510).

2.2 Assessments

Demographic variables included gender (male/female), age at the time of the assessment, education level (which was dichotomised: up to primary school vs. further levels), employment status (unemployed/employed), marital status (unmarried/married) and living status (alone/not alone).

2.2.1 Insight

Insight was assessed using two different scales. First, the Spanish version of the Scale of Unawareness of Mental Disorder (SUMD) (Amador et al., 1993; Ruiz et al., 2008) was administered to evaluate clinical insight. The SUMD assesses 'lack of' insight, i.e. the higher the score (ranging from 0 to 5), the poorer the insight, which provides scores on three insight dimensions: mental illness (IMI), need for treatment (INT) and social consequences (ISC). The sample was dichotomized into "poor insight" (all scores over 1) and "good insight" (scores of 1) for each insight dimension.

In order to evaluate subjective insight considering patients' views, the Markova and Berrios Insight Scale (MBIS) (Markova et al., 1992; Markova et al., 1995) Spanish version (Nieto et al., 2012) was also administered. This scale consists of 30 statements which are labelled by patients as true or false. Higher scores correlate with greater insight. Both total insight (scored by summing all the items) and the following insight dimensions were analysed: (MF1) awareness of disturbed thinking and loss of control

over the situation, (MF2) acknowledgment that things outside as well as within the individual feel different, (MF3) having a vague feeling that something is wrong and (MF4) attributing perceived changes to physical problems (Markova et al., 2003).

2.2.2 Psychopathology

Severity of positive and negative symptoms over the last week was assessed by the Spanish version of the Positive and Negative Syndrome Scale for Schizophrenia (PANSS) (Kay et al., 1987). The PANSS is a 30-item scale with scores ranging from 1 to 7 (i.e. the higher the score, the more severe the symptom), which can also be summed to obtain overall measures of psychopathology. Five symptomatic domains, including positive, negative, disorganization, excitation and depression, were considered based on a previous factor analysis (Lindenmayer et al, 1995).

2.2.3 Suicidality

Current (i.e. over the last two weeks) 'suicidality' was assessed by item 8 of the Calgary Depression Scale for Schizophrenia (CDSS) (Addington et al., 1992) Spanish validated version (Sarro et al., 2004), which ranges from 0 (no suicidal ideation at all over the last two weeks) to 3 (at least one suicide attempt or serious plan over this period). The presence of suicide attempts prior to the assessment (and the number of such suicide attempts) was taken from patient's records. A 'suicide attempt' was defined as 'a potentially self-injurious behaviour with a nonfatal outcome, for which there was evidence (either explicit or implicit) that the person intended to kill him/herself' (O'Carroll et al., 1996). However, neither the remaining CDSS items nor the total score were included in the analyses to evaluate suicidality (main outcome measure) and depression (one of the independent variables) with different scales, in order to avoid a potential bias related to multi-collinearity.

2.2.4 Other clinical variables

Other potential contributing factors to suicidal behaviour were considered. The validated Spanish version of the Drug Attitude inventory (DAI) was administered to participants (Robles García et al., 2004). DAI scale is a self-report scale which assesses attitudes (which can be positive or negative according to the total score) towards maintenance antipsychotic drug therapy (Hogan et al., 1983).

Some items of the *Udvalg for Kliniske Undersøgelser* side effect rating scale (UKU side effect scale) (Lingjaerd et al., 1987) were also taken. UKU scale measures

psychological, neurological and autonomic side effects with scores ranging from 0 (absent) to 3 (very severe).

Also, the validated Spanish version of the Screen for Cognitive Impairment in Psychiatry (SCIP) (Pino et al., 2006) was administered to assess general cognition. Results from the SCIP were dichotomized in a "moderate/severe impairment" group and a "mild or absent cognitive impairment" group.

Other clinical variables, such as DSM-IV diagnosis (F2: 'schizophrenia spectrum disorder' vs. 'other psychoses'), illness duration (years), family history of psychiatric illness (present/absent), alcohol and illicit drug use (present/absent) and pharmacological treatment (antipsychotics, clozapine and antidepressants: use vs. non-use), were also recorded.

2.3 Statistical analysis

Statistical analyses were performed using SPSS version 22.0 (SPSS Inc, Chicago, Il, USA).

First, we investigated potential bivariate associations of demographic and clinical variables with: (i) past suicidal history by using parametric and non-parametric tests depending on variable distribution (normal/non-normal), such as t-tests, Mann-Whitney U–tests and chi-square (applying Yates correction if necessary); (ii) the degree of suicidality, i.e. item 8 of the CDSS, over the two weeks preceding the assessment. These analyses formed the basis for further multivariable linear regression models with CDSS item 8 as the main outcome measure so they were unadjusted.

Second, a multiple hierarchical linear regression model (enter method) with suicidality (which was measured with item 8 of the CDSS) as the dependent variable was carried out to investigate predictors of suicidality, whilst adjusting the analyses for potential mediating/confounding demographic and clinical variables. No further CDSS scores were included in the model in order to investigate the influence of depression on suicidality by measuring it with a different instrument (namely, the PANSS factor). The change of the percentage of variance explained by each block of variables (Nagelkerke R^2) and the contribution of each independent variable to the model were investigated. All the above analyses were two-tailed and the level of significance was set at 5%.

3. Results

The sociodemographic and clinical characteristics of the sample (n=143) are summarised in Table 1. The sample was mixed (mean age at first contact: 38.4±11.9 years) and only 14 patients (9.8%) had a duration of illness shorter than one year. 92 individuals (64.3%) were diagnosed with schizophrenia. 38 patients (26.6%) had attempted suicide before the study entry (see Table 1).

The differences in background and baseline variables in relation to current suicidality, which was measured with the CDSS item 8, are presented in Table 2. Potential bivariate correlations between continuous variables and suicidality are also reported in Table 3.

The mean score for suicidality was 0.4±0.8. With regards to clinical insight, those subjects with good insight of mental illness and social consequences scored significantly higher on suicidality than those with poor insight into these dimensions as follows: 0.7±1.1 vs 0.4±0.7, p<0.001 and 0.6±0.9 vs 0.4±0.8, p=0.04, respectively (Table 3). In addition, total MBIS score (r=0.35, p<0.001) and MF1 (awareness of "disturbed thinking and loss of control over the situation") (r=0.36, p<0.001) and MF3 ("having a vague feeling that something is wrong") (r=0.20, p=0.02) were significantly associated with suicidality.

Also, the suicidality score was higher in those who were unemployed (0.5±0.8 vs 0.2±0.4, p=0.004) and single (0.5±0.8 vs 0.3±0.7, p=0.045). Depression measures such as the PANSS affective factor significantly correlated with suicidality: r=0.45, p<0.001. Also, the PANSS negative factor correlated significantly with suicidality (r=0.45, p< 0.001). Finally, those individuals on antidepressant treatment showed greater suicidality than those who were free of this medication (0.9±1.2 vs 0.3±0.7, p<0.001).

A multivariable regression analysis investigated suicidality (CDSS item 8) as the dependent variable. Unemployment, marital status, previous suicide attempts, PANSS Affective and Negative factors, awareness of mental illness (SUMD1), awareness of the social consequences of the illness (SUMD3) and the total MBIS score were added to the model. However, only depression (as measured by the PANSS factor) (p<0.001) and previous suicidal behaviour (p=0.02) remained as significant factors. This model explained 34.5% of the variance on suicidality (Table 4).

4. Discussion

4.1 Principal findings

We aimed to investigate the role of insight dimensions in suicidality in patients with schizophrenia and related disorders, whilst considering potential mediating/confounding factors, including a wide range of demographic and clinical variables. In line with our first hypothesis concerning clinical insight, we found that those patients with good insight into having a mental illness and insight into the social consequences had greater levels of suicidality at the time of the assessment, whereas awareness of the need for treatment did not show this relationship. However, no insight score survived the multivariable regression model, which found depression and previous suicidal history to predict suicidality, thus mediating the above relationships between insight dimensions and suicidality.

In keeping with our second hypothesis, two insight domains from the patient's perspective, namely "awareness of disturbed thinking and loss of control over the situation" and "having a vague feeling that something is wrong", were linked with suicidality. Again, contrary to our expectations, the relationships between subjective insight dimensions and suicidality did not remain significant in the final multivariable regression model, hence suggesting that depression and previous suicidal behaviour may mediate the above associations of subjective insight with suicidality.

4. 2 Clinical Insight dimensions and suicidality

Regarding clinical insight and suicidality, we found an association between two dimensions of clinical insight (Insight of mental illness and Insight of social consequences) and suicidality, which is consistent with previous literature (Lopez-Morinigo et al., 2012). In keeping with this, the first study investigating this complex association (Amador et al., 1996) reported symptoms relabeling to be associated with previous suicidal behaviour, which is consistent with a more recent FEP study which linked suicidality with recognition of mental illness and the ability to relabel psychotic symptoms as pathological (Flanagan et al., 2012). Interestingly, in our previous systematic review (Lopez-Morinigo et al., 2012) we concluded that insight was no longer significantly associated with greater risk of suicide after conducting multivariable regression analyses in at least six selected studies (Kim et al., 2003; Bourgeois et al., 2004; Evren et al., 2004; Bakst et al., 2010; Robinson et al., 2010; Kao

& Liu, 2011). Also, the multivariable regression analyses tended to find depression as the main contributor to suicide risk (e.g. Restifo et al., 2009; Baskt et al., 2010; Barrett et al., 2011). This is in full agreement with our present study which revealed that while Insight of mental illness and Insight of social consequences were associated with suicidality in the bivariate analyses, the multivariate models reported depression and previous suicidal history to determine suicidality, thus mediating the relationship between insight dimensions and suicidality. Indeed, insight in psychosis has been consistently linked with depression (Mintz et al., 2003, Belvederi Murri et al., 2015) and previous suicide attempts (Lopez-Morinigo et al., 2014).

Also, contrary to our hypothesis based on previous literature (e.g. Hawton et al., 2005), we failed to replicate the protective effect of Insight of need of treatment on suicidality, although these results were consistent with recent FEP studies (Ayesa-Arriola et al., 2015; Barrett et al., 2015). Finally, we showed different associations between suicidality and each insight dimension, which provides further support for the multidimensional model of insight (Amador and David, 2004)

4.3. Subjective insight and suicidality

In our study, we strengthened the measurement of insight by administering the MBIS which considers patient's self-report of insight. It has been postulated that insight might be a way of self-knowledge, i.e. how one feels and not just what is happening to one's self. Thus, when assessing insight this scale considers not only both aspects of the subjective experience (of psychosis), but also aspects of attribution and delusional interpretation of reality.

To our knowledge, no previous studies have investigated the relationships of suicidality and insight dimensions as assessed by the MBIS, which provides information on 'subjective insight'. However, in keeping with our results, a previous study reported a link between 'self-disorders', i.e. subtle disturbances of the person's spontaneous experiences of him/herself as a vital subject naturally immersed in the world (which is therefore a subjective insight domain), suicidality and depression in patients with schizophrenia (Haug et al., 2012).

4.4 Predictors of suicidality

Previous suicidal behaviour has been consistently found to be the strongest risk factor for suicide in schizophrenia (Hawton et al., 2005; Melle et al., 2012) and FEP (e.g. Barret et al, 2015), which was replicated by our results.

In keeping with previous literature concerning suicide and psychosis, in our sample we also replicated the association between suicidality and being single (Balhara et al., 2012) and unemployed (Sharaf et al., 2012). Similarly, previous studies had reported social isolation to be related to suicide risk (Pješčić et al., 2014).

In addition, we found that taking antidepressant treatment was related to suicidality. However, this finding may have been the result of putting high-risk patients on these medications to better manage their depression (Hawton et al., 2005; Pluck et al., 2012; Challis et al., 2013). Indeed, no conclusions about causality can be drawn from our cross-sectional study.

Although some previous reports found cognition to be associated with increased suicidality (Nangle et al., 2006; Delaney et al., 2012), our results did not replicate such an association, which is consistent with other groups (e.g. Barrett et al., 2011).

Of relevance, the predictors of suicidality that emerged from the multivariable regression model were depression and previous suicidal behaviour, which is in line with previous literature on suicide in schizophrenia (Hawton et al., 2005). Also, two meta-analyses (Mintz et al, 2003; Belvederi et al., 2015) have linked depression with awareness of mental illness and the social consequences of the illness, although no such associations were found with compliance. Although our regression model only explained 34.5% of the variance on suicidality, thus suggesting that other variables seem to play a role in suicidality in psychosis, awareness of having a mental illness showed a borderline association with suicidality. In the light of this result, further studies appear to be warranted in order to clarify the extent to which insight, particularly recognition of mental illness, contributes to suicidality in psychosis. It should be also noted that insight levels change over the course of the illness (Ayesa-Arriola et al., 2014). As a result, prolonged longitudinal studies looking at the association of insight levels with suicidality over the follow-up are needed (Barret et al., 2015).

4.5 Strengths and limitations

We have investigated the relationship between multiple insight dimensions and suicidality in psychosis. We recruited a relatively large mixed sample of patients with schizophrenia spectrum disorder from our catchment area who presented to both in- and

outpatient mental health services, thus reflecting real-world nature of our patients, rather than a convenience sample. Our study may therefore have overcome some of the potential limitations related to using 'FEP' samples. In addition, insight was assessed multidimensionally by using two different validated scales and potential mediating variables such as psychopathological symptoms, drugs abuse, patient attitude towards medication (DAI scale) and the presence of side effects (UKU scale) were properly evaluated.

However, several limitations of our study should be considered when interpreting our results. First, according to previous literature other non-tested variables such as DUP (Lopez-Morinigo et al., 2014), premorbid functioning (Barret et al., 2015), premorbid personality traits (particularly impulsivity) (Melle et al., 2012), premorbid adjustment (Ayesa-Arriola et al., 2015), family history of self-harm (Drake et al., 1986; Balhara et., al 2012; Pluck et al., 2013) and internalized stigma (Sharaf et al., 2012; Belvederi et al., 2015) may contribute to suicidality in psychosis. However, in our study these variables could not be included because they either had not been electronically recorded prior to the patient's assessment (e.g. DUP; Lopez-Morinigo et al., 2014) or they were not included in our initial protocol (e.g. premorbid adjustment; Ayesa-Arriola et al., 2015).

Second, the cross-sectional design of our study did not allow us to infer causality conclusions. Specifically, insight has been reported to evolve over time (Ayesa-Arriola et al., 2014). Therefore, the association of insight dimensions with suicidality may change over the course of the illness (Barrett et al., 2015). Third, a specific scale to assess suicidality may have been more sensitive in detecting subtle differences in suicidal ideation (Sharaf et al., 2012). Finally, further differences may not have been detected due to insufficient statistical power.

Further longitudinal studies with larger samples and more prolonged follow-up periods are needed in order to ascertain the multiple predictors of suicidality over time, including insight measures, with sufficient statistical power. In addition, given the well-known association of previous suicidal history with both future suicidal acts (Hawton et al., 2005) and insight levels (e.g. Lopez-Morinigo et al., 2014), further studies with large samples are warranted to allow secondary analyses by subgroups of patients with/without suicidal history, which may shed light on the complex association between previous suicidal history, insight levels and future suicidality.

4. 6 Clinical implications and conclusions

Interestingly, our findings do not appear to support the commonly held clinical view that insight is associated with an increased suicide risk in patients with psychosis. Specifically, we found bivariate associations of two insight dimensions (Insight of mental illness and Insight of social consequences) with suicidality, which links with the debate about the so-called 'Insight Paradox' (Lysaker et al., 2007). On the one hand, insight is associated with better outcomes via improved compliance (McEvoy et al., 2006; Lincoln et al., 2007). On the other hand, some, but not all, aspects of insight may be related to demoralization and increased suicidality (Drake and Cotton, 1986), despite recent literature (e.g. Ayesa-Arriola et al., 2015), including this study, not supporting this assertion. Moreover, it seems that those aspects of insight related to compliance and engagement appear to mediate the association of insight with depression, i.e. the greater the engagement, the weaker such an association (Belvederri Murri et al., 2015). We may therefore speculate that the greater the engagement, the weaker the association between insight and suicidality, although to the best of our knowledge this has not been investigated to date.

However, we replicated (see Lopez-Morinigo et al., 2012) that the relationships between insight dimensions and suicidality are mediated by other variables, namely depression and previous suicidal behaviour. Hence, more theoretical research is needed to determine the direction of causality between insight and depression (Belvederri Murri et al., 2015). In particular, it seems that internalised stigma (Lysaker et al., 2007; Sharaf et al., 2012), engagement, illness severity and socioeconomic status mediate the relationships between insight and depression (Belvederri Murri et al., 2015).

The replication of our findings concerning the lack of a direct association of insight dimensions with suicidality, or even its potential protective role (e.g. Barrett et al., 2015), may lead to the development and implementation of suicide prevention strategies in psychosis focused on certain insight dimensions. Truly, longitudinal studies are needed to demonstrate if an insight improving intervention may reduce suicide risk in patients with psychosis.

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Table 1. Background and baseline characteristics of the sample

	Total sample (*n*=143)	**Previous suicide attempts**		
		Previous suicidal history 38 (26.6%)	**Non-suicide attempters 105 (73.4%)**	**p-value**

	n (%)	*n (%)*	*n (%)*	
Gender (females)	54 (37.8)	18 (47.4)	36 (34.3)	0.154
Marital status (single)	114 (79.7)	32 (84.2)	82 (78)	0.422
Family psychiatric history	73 (51.4)	10 (26.3)	28 (26.7)	0.831
Living alone	88 (78.3)	20 (52.6)	68 (64.8)	0.143
Level of education (Primary school)	132 (92.3)	36 (94.8)	96 (91.4)	0.512
Job status (unemployed/working)	128 (90.8)	35 (92.1)	93 (88.6)	0.350
Illness duration shorter than one year	14 (9.8)	3 (7.9)	11 (10.5)	0.646
Diagnosis of schizophrenia	92 (64.3)	22 (57.9)	70 (66.7)	0.333
Alcohol use	34 (23.8)	25 (65.8)	9 (8.6)	0.988
Illicit drugs use	36 (25.2)	28 (73.7)	8 (7.6)	0.494
Depot	69 (48.3)	16 (42.1)	53 (50.5)	0.376
Clozapine	20 (14.0)	5 (13.2)	15 (14.3)	0.864
Antidepressant	**27 (20.8)**	**14 (36.9)**	**13 (12.4)**	**0.002**
Mood stabilizer	**24 (17.3)**	**11 (28.9)**	**13 (12.4)**	**0.025**
Insight mental illness	35 (24.5)	13 (34.2)	22 (21)	0.103
Insight need for treatment	61 (42.7)	15 (39.5)	46 (43.8)	0.645
Insight social consequences	36 (25.2)	9 (23.7)	27 (25.7)	0.805
Cognitive impairment (SCIP)	96 (75%)	27 (71.1)	69(65.7)	1.000
	Mean ± SD			
Age at assessment (years)	38.4± 11.9	39.6 ±11.3	37.9 ± 12.1	0.998
Lifetime hospital admissions	**3.6± 2.5**	**4.0±1.8**	**3.4±2.7**	**0.031**
Total Markova & Berrios Insight scale	**13.9± 5.5**	**15.9±5.2**	**13.1±5.4**	**0.008**
MF 1 (disturbed thinking)	**3.0±2.2**	**4.1±2.2**	**2.6±2.1**	**0.001**
MF 2 (things feel different)	3.1±1.0	3.2±0.9	3.1±1.1	0.425
MF 3 (something is wrong)	1.5±0.9	1.6±0.8	1.4±1.0	0.124
MF 4 (changes are due to physical problems)	1.0±0.7	0.9±0.7	1.0±0.7	0.932
Total PANSS	85.8 ± 25.6	90.6± 23.0	84.0± 21.0	0.473
PANSS-Positive	22.6 ± 6.7	22.8± 6.7	22.6± 6.8	0.727
PANSS-Negative	21.0 ± 9.5	23.3± 9.7	20.2± 9.3	0.799
PANSS-Disorganized	19.0 ± 6.8	19.6± 6.2	18.9± 7.0	0.401
PANSS-Depression	**12.4 ± 4.1**	**14.1±4.9**	**11.8±3.5**	**0.003**

PANSS-Excitation	10.7 ± 4.4	10.8±4.1	10.7±4.5	0.810
Suicidal ideation (item 8 CDSS)	**0.4±0.8**	**1.0±1.1**	**0.3±.6**	**<0.001**
DAI scale	15.8±2.3	16.0±2.2	15.7±2.4	0.479
UKU modified scale	5.8±4.5	5.9±3.5	5.8±4.8	0.127

SCIP: Screen for Cognitive Impairment in Psychiatry; PANSS: Positive and Negative Syndrome Scale for Schizophrenia; CDSS: Calgary Depression Scale for Schizophrenia; DAI: Drug Attitude inventory; MF: Markova & Berrios Insight scale; UKU: *Udvalg for Kliniske Undersøgelser* side effect rating scale

Table 2. Bivariate analyses: Relationships between nominal demographic and clinical variables, including clinical insight, and suicidality

		Suicidality (item 8 CDSS)	***p*-value**
Gender	Females	0.5 ± 0.9	0.07
	Males	0.4 ± 0.8	
Marital status	**Married**	**0.3 ± 0.7**	**0.04**
	Unmarried	**0.5 ± 0.8**	
Family psychiatric history	Present	0.4 ± 0.8	0.94

	Absent	0.4 ± 0.8	
Living status	Alone	0.4 ± 0.9	0.89
	Not alone	0.4 ± 0.8	
Education level	Low	0.3 ± 0.7	0.19
	High	0.5 ± 0.8	
Employment status	**Unemployed**	**0.5 ± 0.8**	**<0.001**
	employed	**0.2 ± 0.4**	
Illness duration <1 year	Present	0.3 ± 0.7	0.26
	Absent	0.5 ± 0.8	
Diagnosis of schizophrenia	Present	0.4 ± 0.8	0.91
	Absent	0.4 ± 0.8	
Previous suicidal behaviour	**Present**	**1.0 ± 1.1**	**<0.001**
	Absent	**0.3 ± 0.6**	
Alcohol consumption	Present	0.6 ± 0.9	0.10
	Absent	0.4 ± 0.8	
Drugs consumption	Present	0.5 ± 0.9	0.78
	Absent	0.4 ± 0.8	
On Depot antipsychotic	Present	0.4 ± 0.8	0.58
	Absent	0.5 ± 0.9	
On clozapine	Present	0.4 ± 0.8	0.47
	Absent	0.5 ± 0.8	
On antidepressant (yes/no)	**Present**	**0.9 ± 1.2**	**<0.001**
	Absent	**0.3 ± 0.7**	
On mood stabilizer	Present	0.4 ± 1.0	0.58
	Absent	0.4 ± 0.8	
Insight mental illness	**Good**	**0.7 ± 1.1**	**<0.001**
	Poor	**0.4 ± 0.7**	
Insight need for treatment	Good	0.4 ± 0.8	0.74
	Poor	0.4 ± 0.8	
Insight social consequences	**Good**	**0.6 ± 0.9**	**0.04**
	Poor	**0.4 ± 0.8**	
Cognitive impairment	Present	0.5 ± 0.9	0.38

Absent	0.4 ± 0.7

Table 3, Bivariate correlations of suicidality (CDSS item 8) with demographic and clinical variables, including subjective insight

	r	***p*-value**
Age at assessment (years)	0.02	0.84
Hospital admissions lifetime	0.03	0.77
Total Markova & Berrios Insight scale	**0.35**	**<0.001**
MF1 (awareness of disturbed thinking and loss of control over the situation)	**0.36**	**<0.001**

MF2 (acknowledgment things outside as well as within the individual feel different)	0.04	0.67
MF3 (vague feeling that something is wrong)	**0.20**	**0.02**
MF4 (attributing perceived changes to physical problems)	0.09	0.28
Total PANSS scale	**0.27**	**<0.001**
PANSS-Positive	0.10	0.24
PANSS-Negative	**0.31**	**<0.001**
PANSS-Disorganized	0.11	0.11
PANSS-Depression	**0.45**	**<0.001**
PANSS- Excitation	-0.02	0.84
DAI scale	0.08	0.38
UKU scale	0.10	0.24

PANSS: Positive and Negative Syndrome Scale for Schizophrenia; CDSS subtotal: Summary Calgary Depression Scale for Schizophrenia without item 8; DAI: Drug Attitude inventory;
MF: Markova & Berrios Insight scale; UKU: *Udvalg for Kliniske Undersøgelser* side effect rating scale

Table 4. Final multivariable linear regression model on suicidality, including significant and non-significant predictors of suicidality.

Predictors	R^2change	*B*	*SE*	*p*
Marital status (unmarried)	0.003	-0.011	0.051	0.833
Employment status (unemployed)	0.015	-0.177	0.218	0.418
Previous suicidal behaviour	**0.133**	**0.368**	**0.153**	**0.018**
Negative symptoms (PANSS factor)	0.056	0.011	0.007	0.160
Depression (PANSS factor)	**0.096**	**0.068**	**0.019**	**<0.001**
Insight mental illness	0.032	-0.274	0.163	0.095
Insight social consequences	0.003	-0.092	0.164	0.577
Total Markova & Berrios Insight scale	0.007	0.015	0.013	0.257
	34.5%			

PANSS: Positive and Negative Syndrome Scale for Schizophrenia

Highlights

- Suicidal behaviour in patients with psychosis represents a focus of concern.
- Suicide risk factors differ from the general population.
- There is no evidence to support a direct link of insight dimensions with suicidality.
- Depression and suicidal history predict further suicide attempts.