Insight Into Mental Disorders and Suicidal Behavior: A Qualitative and Quantitative Multimodal Investigation

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ABSTRACT

Objective: To investigate the association between insight into mental disorders and suicidal behavior.

Data Sources: English and French MEDLINE databases up to January 2014 were searched using *suicide* combined with *awareness*, *consciousness*, *insight* and *anosognosia*, *unawareness,* and *awareness of illness.* We also conducted a cross-sectional study comparing Mood Disorder Insight Scale (MDIS) and 24-item Hamilton Depression Rating Scale (HDRS-24), item 17, performance between 22 depressed (*DSM-IV-TR* criteria) suicide attempters and 22 patient controls.

Study Selection: Study selection was based on the STROBE checklist. Selected studies were published in an English- or French-language peer-reviewed journal, included at least 1 measure of insight, and included patients with a history of suicidal behavior. Thirty-two studies were reviewed, of which 12 were longitudinal.

Data Extraction: A review of the literature and meta-analysis of studies were conducted to compare insight in patients with versus those without a history of suicidal behavior.

Results: Most studies (25) were conducted in psychotic disorders. A small majority showed a positive association between 1 measure of insight and higher risk of suicidal ideas or acts in both psychotic and mood disorders. Our study found that suicide attempters, mostly female attempters, tended to have better insight into depression than patient controls according to the HDRS-24 ($P = .06$, effect size = 1.43 [95% CI, 0.77 to 2.09]) but not MDIS. Finally, a meta-analysis of 7 studies confirmed significantly better insight scores in suicide attempters, with a small effect size (Hedges $g = -0.16$ [95% CI, −0.3 to −0.03]).

Conclusions: Overall, a significant but weak association was found between insight and the risk of suicidal behavior. We also raised methodological and conceptual concerns and discussed new measures (eg, test based).

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According to the World Health Organization, 1 million people commit suicide and 10 to 20 times more attempt suicide each year in the world.[1] The current assessment of suicide risk relies primarily on the assessment of multiple sociodemographic and clinical variables with relatively poor predictive power. One of the main risk factors for suicidal acts is mental disorders.[2] Postmortem studies have reported the existence of mental disorders in more than 90% of cases of suicide victims.[2] However, more than 90% of individuals with mental disorders will never commit suicide,[3] suggesting that mental disorders may be necessary but not sufficient for carrying out suicidal acts. More *specific* factors must be sought to explain why some individuals commit suicidal acts during the acute phase of a mental disorder.

The stress-diathesis model of suicidal behavior, which postulates a vulnerability to suicidal acts (associated with genetic and early developmental components)[4] is generally supported by the literature. Deficient cognitive functioning, notably disadvantageous decision making or reduced cognitive control, has been suggested as a vulnerability factor.[5,6] Moreover, Joiner[7] proposed that feelings of being a burden to others or of thwarted belongingness are important risk factors for suicide in conjunction with acquired capacity for suicide. In light of these models, we propose that insight into mental disorders could be another vulnerability factor enabling suicidal acts.

For instance, poor insight has been recognized as an important risk factor for adverse outcome not only in schizophrenia[8–13] but also in depressive[14,15] and bipolar[16–18] disorders. One explanation could be low adherence to treatment due to the persistent belief of not being ill, which in turn facilitates recurrence of acute episodes. Adequate treatment of mental disorders has been associated with reduced risk of suicide[19]; therefore, persistent low adherence to treatment could increase the risk of suicide. Moreover, according to Joiner's model,[7] low insight may be related to the abnormally high subjective feeling of being alone and/or being a burden to others, increasing the risk of suicidal ideas. Equally, it is possible that *high* awareness of being ill in cases of severe mental disorders may lead to increased hopelessness, feeling of being a burden to family (eg, through objective negative consequences), and suicide risk.

Several studies have investigated the association between insight and suicidal behavior. While some studies have shown a significant association,[10,16,20–37] others have not.[38–49] In addition, many studies actually suggested that *better* insight is predictive of suicidal risk; therefore, a literature review on this topic is timely. Moreover, it is not clear if the link between insight and suicidal acts is specific to schizophrenia—in which many studies have been conducted—or if this is a transnosographic risk factor also affecting patients with mood disorders. This issue will also be examined as a part of our literature review.

Finally, insight is a complex construct. David[50] and Amador et al[12] have proposed a multidimensional conceptualization of insight in schizophrenia with 5 domains[51]: (1) awareness of illness, (2) capacity to relabel psychotic experiences as abnormal, (3) recognition of need for treatment, (4) attribution of symptoms to mental disorder, and (5) awareness of the social consequence of the illness.[11,50] Additionally, a "cognitive insight" encompassing the evaluation and correction of distorted beliefs and misinterpretations[52] has also been proposed. It is measured by the Beck Cognitive Insight Scale on 2 dimensions: self-certainty (certainty about being right and resistance to correction) and self-reflectiveness (expression of introspection and willingness to acknowledge fallibility).[32] In sum, it is not clear if one dimension of insight may be more associated to the risk of suicidal act than others.

To answer these 3 questions, we simultaneously ran 3 complementary approaches: (1) we systematically reviewed the literature regarding the association between insight and suicidality; (2) we empirically tested insight in depressed suicide attempters with a high level of suicidal intent and depressed patient controls; and (3) we conducted a meta-analysis of studies comparing insight in patients with versus without a history of suicidal acts. We, therefore, aimed at clarifying the qualitative and quantitative relationship between insight and the risk of suicidal behavior, as well as establishing the strength of this relationship.

Clinical Points

- The association between insight into mental illness and suicide risk should be clarified to improve prevention in both psychotic and mood disorders.
- Better insight, modulated by its different dimensions and other cognitive features, seems to play a significant but weak role in the risk of suicidal behavior.

METHOD

Systematic Review of Literature

Data sources. An English and French systematic MEDLINE literature search of clinical trial, cohort, case-control, and cross-sectional human studies published up to January 31, 2014, was performed. The following medical subject heading (MeSH) term *suicide* was combined with the MeSH terms *awareness* and *consciousness* and with the title and abstract terms *insight* and *anosognosia, unawareness,* and *awareness of illness.* An iterative process was used to ensure that all relevant articles were obtained. An additional manual search through the bibliographical references of extracted articles and existing reviews was conducted to identify potential studies not captured in the electronic database searches.

Study selection. Abstract selection was based on the Strengthening the Reporting of Observational studies in Epidemiology (STROBE) checklist, which describes items that should be included in reports of studies. Abstracts identified through the literature search were independently evaluated by 2 reviewers (M.V. and S.R.D.) and selected by a consensus from all authors.

Studies that met the following inclusion criteria were included in this systematic review: (1) published in an English- or French-language, peer-reviewed journal; (2) included at least 1 measure of insight; and (3) included patients with a history of suicide attempt or suicidal ideas. Full articles were then obtained for final review. The study selection process is shown on a chart flow diagram in Figure 1.

Of the 331 originally identified abstracts, 32 studies[10,16,20–49] met the inclusion criteria for this systematic review (Table 1).

The quality of each study was assessed independently by 2 reviewers (M.V. and S.R.D.) using the Crombie criteria adapted by Petticrew and Roberts.[53]

Cross-Sectional Study

Population and clinical assessment. This study was conducted at the Douglas Mental Health University Institute, Montreal (Quebec, Canada), and was approved by the local research ethics board. All participants signed an informed consent form prior to their participation.

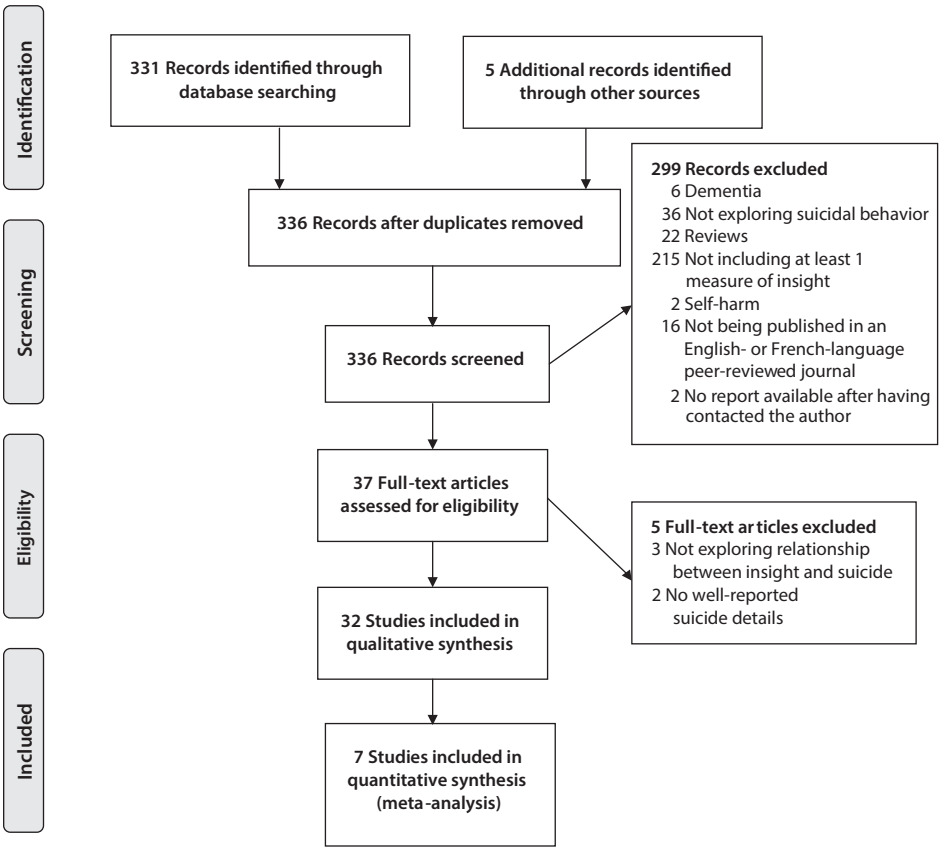
Two groups of participants aged between 18 and 65 years were recruited: (1) 22 outpatients with a current major depressive episode, major depressive disorder (according to *DSM-IV-TR* criteria), and a personal history of suicide attempt (suicide attempters) and (2) 22 outpatients with a current major depressive episode or major depressive disorder but without a lifetime history of suicidal act (patient controls). All participants were depressed at the time of assessment, with a score above 20 on the 24-item Hamilton Depression Rating Scale (HDRS-24).[54] Patients with schizophrenia, bipolar disorder, a history of alcohol/drug abuse or dependence over the last 6 months, or a history of severe general medical condition were excluded.

We used the most common definition of suicide attempt, ie, "any act carried out with a certain intent to die and different from self-mutilations."[4] In addition, to avoid including patients who committed only dubious or ambiguous acts and thus reduce possible heterogeneity, suicide attempters had to have committed at least 1 intentional act with a Suicide Intent Scale (SIS)[55] score above 15/30.

Information about personal and family history of suicidal behavior was obtained from medical files, an interview with the patient and the Colombia Suicide History Form. The Scale for Suicide Ideation (SSI)[56] and the SIS were used for the last and the most severe suicidal act. The Hamilton Rating Scale for Anxiety (HARS)[57] was additionally used to quantify anxiety levels. Verbal IQ was assessed with the National Adult Reading Test (NART).[58,59]

Insight assessment. Insight was assessed with the French or English versions of the Mood Disorders Insight Scale (MDIS)[60] and with the insight item of the HDRS-24.[54] The MDIS is an 8-item scale that measures 3 dimensions of

Figure 1. Flowchart for the Review of Literature Assessing the Association Between Insight and Suicidality



insight: awareness of illness, attribution of symptoms, and belief in the necessity of treatment. The MDIS items were presented as a series of statements, and the participants were asked if they agreed or disagreed with or were unsure about them. For example, the first item in the dimension "necessity of treatment" is "I need to be seen by a psychiatrist (or doctor)." If the subject disagrees with or is unsure about the statement, he or she will be further asked whether he or she agrees with the item "there was a time when I needed to be seen by a psychiatrist (or doctor)." A global score was also calculated. Higher MDIS scores indicate a better insight.

The HDRS-24 assesses insight with item 17 (self-criticism) as follows: 0 = acknowledges being depressed and ill; 1 = acknowledges illness but attributes cause to bad food, climate, overwork, virus, need for rest, or others causes; and 2 = denies being ill at all. Higher HDRS-24 scores indicate a lower insight. It therefore represents a mix of the 2 dimensions "awareness of illness" and "attribution of symptoms." The HDRS-24 item 17, by integrating awareness and attribution of symptoms, may have a better naturalistic validity than the MDIS, which artificially separates both dimensions. In addition, it is a much simpler measure.

Statistical analysis. The Shapiro-Wilk test showed a nonnormal distribution for most of the scores, so nonparametric tests were used. Mann-Whitney and Kruskal-Wallis tests were used to compare quantitative variables. A χ^2 test was used to compare qualitative variables. Spearman correlation tests were also used. A conservative P value = .01 was used, taking into account multiple comparisons (5 dimensions). All analyses were performed using SPSS 15.0 (SPSS, Inc; Chicago, Illinois).

Meta-Analysis

Of the studies selected for the review, we used those that met the additional inclusion criterion of comparing at least 2 groups of which 1 comprised patients with a history of suicide attempt and/or suicide ideations and 1 group of patients without any personal history of suicidal act or suicide ideations. Of the 32 studies used in the systematic review, 7 studies met this criterion, including our own study (see Table 3).

Data extraction and analyses. A standardized form was used to extract data, which included authors, date of publication, study design, settings, study population, insight scales used, definition of suicidal behavior, and insight (mean and standard deviation). Two groups were compared: Suicide attempters/ideators (patients with a personal history of suicide attempt or suicide ideations) and patient controls (ie, patients with no personal history of suicidal act but with a history of mental disorders).

Table 1. Studies Investigating the Association Between Insight and Suicidal Behavior

Study	Study Type and Population	Diagnosis Tool	Suicide Behavior			Insight Scale	Meds	SUD	Findings	Comments
			Definition	Period Assessed	Tools					
At least 1 dimension of insight as a risk factor for suicide										
Amador et al (1996)[37]	Cross-sectional study Schizophrenia (n = 218, mean age: 34.4 ± 11.3 y men: 66%) ▪ With suicidal behavior: n = 49, mean age: 31.7 ± 9.6 y ▪ Without suicidal behavior: n = 169, mean age: 35.1 ± 11.6 y	*DSM-III-R*	SI or SA	Most recent episode of illness	Clinical data and other sources	SAUMD	NA	NA	Higher insight of negative symptoms and delusions in schizophrenia with vs without suicidal behavior	No specific definition of suicide Multiple tests Smaller group of suicide attempters
Acosta et al (2012)[28]	Cross-sectional study (2-y period) Bipolar disorder (nonsyndromal condition) ▪ SA (n = 37, mean age: 46.5 ± 12.5 y, men: 18.9%) ▪ SI (n = 30, mean age: 45.3 ± 11.4 y, men: 30%) ▪ PC (n = 35, mean age: 48 ± 13.7 y, men: 54.3%)	*ICD-10*	SI or SA	Current and lifetime	Clinical and medical record, family	SAUMD; only the 3 global insight measures	Yes	NA	Independent association between SI (but not SA) and a higher level of insight into having a mental disorder	Retrospective design Survival bias No standardized instrument for suicide Multiple tests Small sample size
Flanagan and Compton (2012)[30]	Cross-sectional study (4-y period) Psychotic disorder (first-episode psychosis) (n = 109, men = 76.1%)	*DSM-IV*	SI	Past 2 wk	CDSS SCID-I	BIS	Yes	Yes	SI > PC: higher scores of the recognition of mental illness and ability to relabel psychotic symptom domains	Multiple tests
Ekinci and Ekinci (2013)[32]	Cross-sectional study Schizophrenia (n = 100) ▪ Without depression (n = 65, mean age: 37.8 ± 10.7 y, men: 60%) ▪ With depression (n = 35, mean age = 36.1 ± 6.4 y, men: 74.3%)	*DSM-IV-TR*	SI or SA	NA	CDSS item 8	BCIS SAUMD (only the first 3 items)	NA	No	Self-reflectiveness (cognitive insight) significantly positively correlated with suicidality subscores of CDSS (and hopelessness)	SAUMD is clinician-rated measure of insight, whereas the BCIS is a self-report scale Small sample size Secondary analysis
Barret et al (2010)[31]	Cross-sectional study (44 mo) Inpatients and outpatients with first episode of a psychotic disorder or affective disorders with mood-incongruent psychotic symptoms (n = 194) ▪ Suicidal patients (n = 89, mean age: 26.3 ± 8 y, men: 58.4%) ▪ Nonsuicidal patients (n = 105, mean age: 27.7 ± 9.1 y, men: 61.9%)	*DSM-IV*	SI or SA	Current (the past 2 wk)	CDSS item 8	PANSS lack of insight item	Yes	NA	Association between current suicidality and higher insight	One dimension assessment of insight, item of PANSS
Foley et al (2008)[29]	Cross-sectional study (2-y period) Inpatients and outpatients with first-episode psychosis (n = 107, men = 63%)	*DSM-IV*	SI or SA	Current (in the past month) or lifetime	SCID-I CDSS	BIS	Yes	Yes	Association between a history of SA and higher insight (subscale recognition of mental illness only)	Multiple tests

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Table 1 (continued). Studies Investigating the Association Between Insight and Suicidal Behavior

Study	Study Type and Population	Diagnosis Tool	Suicide Behavior			Insight Scale	Meds	SUD	Findings	Comments
			Definition	Period Assessed	Tools					
Harvey et al (2008)[27]	Cross-sectional study (2-y period) Psychotic disorder (first-episode psychosis, n = 486) ▪ Self-harm (n = 56, 46.4% were < 29 years old, men: 66%) ▪ No self-harm (n = 440, 49.3% were < 29 years old, men: 56.6%)	*ICD-10*	Self-harm: SA or bodily harm	Pretreatment phase	PPHS and medical record	SAI-E	Yes	Yes	Association between self-harm and a higher level of insight (especially higher levels of illness recognition) High levels of insight independently predict self-harm No association with compliance	Insight only available for 217 individuals (43.7%) Small group of self-harm Heterogeneous behaviors Multiple tests
Gonzalez (2008)[23]	Prospective study (6 mo) Schizophrenia (n = 1,009), bipolar I disorder (n = 297), recurrent major depression (n = 162) ▪ Recognition of illness (n = 175, mean age: 42.9 ± 10 y, men: 42.5%) ▪ Denial of illness (n = 293, mean age: 43.4 ± 11.2 y, men: 59.4%)	*ICD-9*	SI or SA	Past year and lifetime	Structured interviews	Present/ absent	NA	NA	A higher risk of future SI/SA when recognition of having a mental illness	No specific scale for suicide and insight
Schwartz-Stav et al (2006)[10]	Cross-sectional study Schizophrenia adolescents (n = 48, aged 13–19 y) ▪ Schizophrenia only (n = 16, mean age: 17.5 y, men = 62.5%) ▪ Schizophrenia with postpsychotic depression in the month following acute psychotic episode (n = 16, mean age: 17.5 y, men = 62.5%) ▪ Major depression only (n = 16, mean age: 17.5 y, men = 62.5%)	*DSM-IV*	SI or SA	2 wk to 1.5 mo from the beginning of their hospitalization	CSPS SRS	SAUMD	Yes	NA	Correlation between suicide risk and insight into psychotic symptoms but not for general unawareness in schizophrenia	Small sample size Multiple tests
Crumlish et al (2005)[26]	Prospective study (4 y) Schizophrenia or schizophreniform disorder (n = 101): ▪ Full PANSS insight data (n = 70, mean age: 27 ± 9 y, men: 69%) ▪ Subgroup with full BIS data (n = 38, mean age: 27 ± 9 y, men: 61%)	*DSM-IV*	≥ 1 SA since the last estimation	Baseline, 6 mo, and 4 y after	SCID-I	PANSS BIS	Yes	Yes	Recognition of mental illness score at 6 mo predicted SA at 4 y (BIS score) PANSS scores do not predict SA Insight improved over the time of follow-up	Small sample size No precise definition of SA Missing data
Schwartz and Smith (2004)[35]	Prospective study (4 mo) Patients (n = 170, mean age: 39.2 ± 9.8 y, men: 56%) ▪ Schizophrenia (n = 127) ▪ Schizoaffective disorder (n = 15) ▪ Schizophreniform disorder (n = 2) ▪ Delusional disorder (n = 1) ▪ Psychotic disorder not otherwise specified (n = 25)	*DSM-IV*	SI/SA and self-harm	Current	FARS	SAUMD; only the first 3 insight measures	Yes	NA	Insight into the need for treatment independently predicted suicidality No correlation between suicidality and insight into illness or insight into the consequences of the disorder	No distinction about subtype of illness

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Table 1 (continued). Studies Investigating the Association Between Insight and Suicidal Behavior

Study	Study Type and Population	Diagnosis Tool	Suicide Behavior			Insight Scale	Meds	SUD	Findings	Comments
			Definition	Period Assessed	Tools					
Cunningham Owens et al (2001)[25]	Prospective study (12 mo) Schizophrenia (n = 114, at least 1 previous episode) ▪ Control group (without educational intervention, mean age: 33.6 ± 10.8 y, men = 49.4%) ▪ Intervention group (mean age: 36.8 ± 10.4 y, men: 50.6%)	*DSM-III-R*	SI	At baseline and at first follow-up (2 wk)	MADRS	ITAQ (first follow-up only)	Yes	NA	Association between high insight level and higher level of suicidal ideation	Secondary analysis
Schwartz (2000)[33]	Cross-sectional study (6 mo) Outpatients with schizophrenia (any subtype, n = 267, mean age: 37.2 ± 10.2 y, men = 54%)	*DSM-IV*	SI, intent to harm oneself, current plan	Current	FARS	SAUMD (first 3 items)	NA	NA	Association between insight into the need for treatment and the social consequences of the disorder and suicidality (but not for general awareness)	Multiple tests
Schwartz and Petersen (1999)[34]	Cross-sectional study Schizophrenia outpatients (n = 223, mean age: 38.8 ± 10 y, men: 39%)	*DSM-IV*	SA or SI	Current	SCI-FARS	SAUMD	NA	NA	Association between suicidality and insight into need for treatment (but not into having a mental disorder or into the social consequences)	Multiple tests
Schennach-Wolff et al (2010)[36]	Cross sectional study (4 y) Inpatients with schizophrenia (n = 339, mean age: 34.6 ± 11.1 y) Paranoid, disorganized, catatonic or undifferentiated subtype schizophreniform or affective psychoses ▪ Suicidal patient subgroup (n = 75, mean age: 34.6 ± 10.6 y, men: 58.6%) ▪ Nonsuicidal patient subgroup (n = 264, mean age: 34.6 ± 11.3 y, men: 56.8%)	*DSM-IV*	NA	Current and lifetime (before/ at admission)	BADO items A5 and B17	PANSS insight item G12	Yes	No	At discharge and admission, patients with previous SA showed a greater insight	Suicidal vs nonsuicidal groups not matched Retrospective design Not multidimensional insight
Robinson et al (2009)[24]	Prospective study (2 y) First-episode psychosis (n = 661) Schizophrenia, schizophreniform, schizoaffective, delusional disorders, brief psychotic episode, and major depressive episode with psychotic features ▪ SA (n = 57, mean age: 21.5 ± 3.6 y, men: 56.1%) ▪ No SA (n = 601, mean age: 22.1 ± 3.4 y, men: 66.9%)	*DSM-IV*	SA or SC, and self-harm	Lifetime and during the follow-up	*ICD-10*	EPPIC Scale	Yes	Yes	Greater insight at entry was a predictive factor of SA during the follow-up	No quantitative insight measure Secondary analysis
Yen et al (2008)[20]	Case-control study (2 y) Bipolar disorder in remission (n = 96) ▪ SI or SA group (n = 9, mean age: 34.8 ± 8.3 y, men: 66.7%) ▪ No SI or SA group (n = 87, mean age: 41.4 ± 12.9 y, men: 50.6%)	*DSM-IV*	SI or SA	Over the previous year	VSAS	SAI SAI-E	Yes	No	Suicidal patients had higher insight scores on the 3 SAI dimensions and on the SAI-E compared with nonsuicidal patients	Very small group of SI or SA Lithium reduced suicidality Multiple tests

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Table 1 (continued). Studies Investigating the Association Between Insight and Suicidal Behavior

Study	Study Type and Population	Diagnosis Tool	Suicide Behavior			Insight Scale	Meds	SUD	Findings	Comments
			Definition	Period Assessed	Tools					
Insight as a protective factor										
Bourgeois et al (2004)[21]	Clinical trial (2 y) randomized Schizophrenia (n = 980), affective psychoses (n = 371) Mean age: 37.1 ± 10.3 y, men: 61.4%	*DSM-IV*	SA or hospitalization to prevent suicide but not ideation alone	Lifetime and past 3 y	Clinical monitoring of suicide-related events	SOF	Yes	NA	High insight into treatment significantly decreased the risk of suicide	No specific scale of insight High-risk patients closely monitored Secondary analysis
Steblaj et al (1999)[22]	Cross-sectional study (7-y period) Inpatients schizophrenia and affective psychoses ▪ Suicidal schizophrenia (n = 36, mean age [men]: 35.3 ± 12.8 y, mean age [women]: 38.3 ± 13.9 y) ▪ Suicidal affective psychoses (n = 23, mean age [men]: 45.1 ± 12.6 y, mean age [women]: 59.5 ± 14.3 y) ▪ Control group	*ICD-9*	SC, SA, SI	During inpatient treatment or during a leave, an outing, a trial discharge, or a stay in another hospital, and lifetime	Medical records	Present/absent	NA	Yes	High insight level was associated with decreased suicide during psychiatric hospitalization	Information based on medical records No standardized clinical instruments and scales Small sample size Secondary analysis
Yen et al (2008)[16]	Prospective study (2 y) Bipolar I disorder in remission (n = 65, mean age: 39.3 ± 11.9 y, men: 47.7%)	*DSM-IV*	Self-injury behavior or violent behaviors toward people or suicidal behavior	Lifetime	VSAS	SAI	Yes	No	High insight into treatments significantly decreased the risk of suicide	Small sample size
Studies failing to find any association between insight and suicide risk										
Sharaf et al (2012)[43]	Cross-sectional study (6 mo) Outpatients with stabilized schizophrenia, duration of illness < 10 y (n = 200, mean age: 30.4 ± 6.8 y, men: 83.5%)	*DSM-IV-TR*	SI or SA	Lifetime	SPS	BIS	Yes	No	No association between suicide risk and insight when covariate for depression or stigma included	Unrepresentative sample of patients with schizophrenia
Gale et al (2012)[41]	Cross-sectional study (1 y) Schizophrenia or schizoaffective disorder (n = 86, mean age: 46 y, 21- to 70-year-old men: 70%)	NA	SI or SA	Last week, last year, or other time period	CIS-R (suicidality)	ITAQ	Yes	Yes	No association between insight and suicidality	Small sample size Selection bias Secondary analysis
Kao and Liu (2011)[44]	Cross-sectional study (1 y) Inpatients with psychotic spectrum disorders (n = 104, mean age: 40.5 ± 14.5 y, men: 50%) ▪ Schizophrenia (n = 52) ▪ Affective disorder (n = 52)	*DSM-IV*	SA or SI	Lifetime and current	SSI	SAIQ	Yes	No	Greater insight into the need for treatment in suicidal patients than nonsuicidal patients But no significant difference after controlling for depressive symptoms	Only chronic inpatients
Yen et al (2009)[38]	Prospective study (1-y follow-up) Outpatients with depressive disorder (n = 174, CES-D > 17) 131 participants completed 1-year follow-up (mean age: 42.7 ± 12.9 y, men: 38.2%)	*DSM-IV*	SI or SA	Over the 1 previous year	VSAS	MDIS	Yes	No	Initial degree of insight did not predict the suicidal risk during follow-up	Changes in insight level not examined over the 1-y period Recall bias regarding SI and SA

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Table 1 (continued). Studies Investigating the Association Between Insight and Suicidal Behavior

Study	Study Type and Population	Diagnosis Tool	Suicide Behavior			Insight Scale	Meds	SUD	Findings	Comments
			Definition	Period Assessed	Tools					
Restifo et al (2009)[45]	Cross-sectional study Inpatients and outpatients with chronic schizophrenia (n = 164, mean age: 37.2 ± 11.8 y, men: 60%) Schizophrenia (n = 115) or schizoaffective disorder (n = 49) ▪ Attempters (n = 59) ▪ Nonattempters (n = 105)	*DSM-III-R*	SA	Current and past month	HASS	Present or absent	Yes	Yes	No association between insight and SA	No specific scale of insight
Bakst et al (2010)[48]	Prospective study (4 y) First-admission patients (n = 529, mean age: 29.2 ± 9 y, men: 59.6%) Schizophrenia (n = 171), affective psychoses (n = 30), schizophreniform disorder (n = 7), and other psychoses (n = 321), including bipolar disorder with psychotic features (n = 131), major depression with psychotic features (n = 93), other psychotic illnesses (n = 50), and other (mostly drug-induced) disorders (n = 47)	*DSM-IV*	SA or SI	Lifetime and current (6-, 24-, or 48-mo interviews during follow-up)	SCID *DSM-III-R* HDRS Medical record	HDRS	NA	Yes	No association between insight and SA	No specific scale of insight
Kim et al (2003)[49]	Cross-sectional study Chronic schizophrenia (n = 333) ▪ With lifetime suicidality (n = 200, mean age: 35 ± 8.2 y, men: 78.5%) ▪ Without lifetime suicidality (n = 133, mean age: 35.4 ± 11 y, men: 77.4%)	*DSM-III-R*	SI or SA or self-harm or suicidal threats or plans	Current and lifetime	SIS	SADS HDRS	Yes	Yes	Insight did not predict either current or lifetime suicidality in multivariate regression analysis	SADS assesses only insight into having a mental disorder No multidimensional assessment of insight
Yen et al (2002)[39]	Prospective study (1 y) Outpatients with schizophrenia in remission (n = 74, mean age: 32.9 ± 10, men: 55.4%)	*DSM-IV*	Planned to commit suicide or violent behaviors toward people or things	Previous year	VSAS	SAI SAI-E	Yes	No	No association between insight and suicide behavior	Confounding factors not taken into account Short follow-up Small sample size
Kamali et al (2000)[42]	Cross-sectional study (12-mo period) Schizophrenia and schizoaffective disorder (n = 102, mean age: 38.4 ± 12.2 y, men: 66.6%)	*DSM-IV*	SI	Current	BDI	BIS	Yes	Yes	No association between insight and SI	Retrospective design Only inpatients included
Robinson et al (2010)[47]	Prospective study (7.4 y) First-episode psychosis patients (n = 413, mean age: 23.3 ± 3) Schizophrenia, schizophreniform disorder, affective psychoses, delusional disorder, bipolar psychotic disorder, major depressive disorder with psychotic features, brief reactive psychosis/brief psychosis, and psychosis not otherwise specified. ▪ No SA (n = 221) ▪ One or more SA (n = 61)	*DSM-III* and *DSM-IV*	SI or SA or deliberate self-harm	At presentation, at remission or stabilization, 7 y after presentation, 2 y prior to interview	RPMIP	EPPIC Scale	Yes	No	No association between insight and suicidality at baseline and over the follow-up	Assessment of SA: relied on the participant's recall Insight assessment

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Table 1 (continued). Studies Investigating the Association Between Insight and Suicidal Behavior

Study	Study Type and Population	Diagnosis Tool	Suicide Behavior			Insight Scale	Meds	SUD	Findings	Comments
			Definition	Period Assessed	Tools					
Artiles et al (2009)[40]	Prospective study (1 y) Outpatients with stable schizophrenia (n = 57, mean age: 28, men: 82.5%) ▪ Suicidal patients (hospitalized due to SA and with background of 1 or more previous attempts, n = 27, men: 77.8%) ▪ Nonsuicidal patients (hospitalized for other reasons, with no background of SA, n = 30, men: 86.7%)	*ICD-10*	SA = with suicide intention, when suicide was the goal, although the patient did not clearly express it	Current (during all the follow-up) and lifetime	Clinical	First 3 items of SAUMD	Yes	Yes	None of the insight dimensions was associated with a higher risk of suicide over follow-up	Inadequate suicide definition Missing data Small sample size
Hu et al (1991)[46]	Prospective study Schizophrenia inpatients ▪ Completed suicide cases (n = 42, mean age: 26.9 ± 6, y men = 59.5%) ▪ Patients/controls (n = 84, alive at the time of the study, age and sex matched)	*DSM-III*	NA	NA	Family interviews Outpatient and community follow-up	Presence or absence	Yes	Yes	No between-group differences	Suicide completers Issue of insight measure based on family interview

Abbreviations: Meds = patient taking medication, NA = not available, PC = patient control, SA = suicide attempt, SC = suicide completion, SI = suicidal ideation, SUD = patients with substance use disorder.

ABBREVIATIONS AND REFERENCES FOR DIAGNOSTIC TOOLS AND RATING SCALES

BADO items A5 and B17 = psychiatric basic documentation system [trans German]; Cording C. Conceptual aspects in development and implementation of basic psychiatric documentation. *Psychiatr Prax*. 1998;25(4):175–178.

BCIS = Beck Cognitive Insight Scale; Beck AT, Baruch E, Balter JM, et al. A new instrument for measuring insight: the Beck Cognitive Insight Scale. *Schizophr Res*. 2004;68(2-3):319–329.

BDI = Beck Depression Inventory; Beck AT, Ward CH, Mendelson M, et al. An inventory for measuring depression. *Arch Gen Psychiatry*. 1961;4(6):561–571.

BIS = Birchwood Insight Scale; Birchwood M, Smith J, Drury V, et al. A self-report Insight Scale for psychosis: reliability, validity and sensitivity to change. *Acta Psychiatr Scand*. 1994;89(1):62–67.

CDSS = Calgary Depression Scale for Schizophrenia; Addington D, Addington J, Schissel B. A depression rating scale for schizophrenics. *Schizophr Res*. 1990;3(4):247–251.

CES-D = Center for Epidemiological Studies Depression Scale; Radloff LS. The CES-D scale: a self-report depression scale for research in the general population. *Appl Psychol Meas*. 1977;1(3):385–401.

CIS-R = Clinical Interview Schedule-Revised; Lewis G, Pelosi AJ, Araya R, et al. Measuring psychiatric disorder in the community: a standardized assessment for use by lay interviewers. *Psychol Med*. 1992;22(2):465–486.

CSPS = Child Suicide Potential Scale:
Ofek H, Weizman T, Apter A. The Child Suicide Potential Scale: inter-rater reliability and validity in Israeli in-patient adolescents. *Isr J Psychiatry Relat Sci*. 1998;35(4):253–261.
Pfeffer CR, Conte HR, Plutchik R, et al. Suicidal behavior in latency-age children: an empirical study. *J Am Acad Child Psychiatry*. 1979;18(4):679–692.

DSM-III = Diagnostic and Statistical Manual of Mental Disorders, Third Edition; American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*. Third Edition. Washington, DC: American Psychiatric Association; 1980.

DSM-III-R = Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised; American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*, Third Edition, Revised. Washington, DC: American Psychiatric Association; 1987.

DSM-IV = Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition; American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition. Washington, DC: American Psychiatric Association. 1994.

DSM-IV-TR = Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, Text Revision; American Psychiatric Association. *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition, Text Revision. Washington, DC: American Psychiatric Association; 2000.

EPPIC = Early Psychosis Prevention and Intervention Centre; Conus P, Cotton S, Schimmelmann BG, et al. The First Episode Psyhosis Outcome Study (FEPOS): pre-morbid and baseline characteristics of 704 first episode psychosis patients treated in EPPIC between 1998 and 2000. *Early Interv Psychiatry*. 2007;2:191–200.

FARS = Functional Assessment Rating Scale; Ward JC, Dow MG. *The Functional Assessment Rating Scale*. Tampa, FL: Florida Mental Health Institute, University of South Florida; 1994.

HASS = Harkavy Asnis Suicide Survey; Harkavy-Friedman JM, Nelson EA. Assessment and intervention for the suicidal patient with schizophrenia. *Psychiatr Q*. 1997;68(4):361–375.

HDRS = Hamilton Depression Rating Scale; Hamilton M. Rating scale for depression. *J Neurol Neurosurg Psychiatry*. 1960;23(1):56–62.

ICD-10 = International Classification of Diseases, 10th Revision; World Health Organization. *International Classification of Diseases*. 10th Revision. Geneva, Switzerland: World Health Organization; 1994.

ICD-9 = International Classification of Diseases, Ninth Edition; World Health Organization. *International Classification of Diseases*, 9th ed. Geneva, Switzerland: World Health Organization; 1977.

ITAQ = Insight and Treatment Attitudes Questionnaire; McEvoy JP, Apperson LJ, Appelbaum PS, et al. Insight in schizophrenia: its relationship to acute psychopathology. *J Nerv Ment Dis*. 1989;177(1):43–47.

MADRS = Montgomery-Asberg Depression Rating Scale; Montgomery SA, Asberg M. A new depression scale designed to be sensitive to change. *Br J Psychiatry*. 1979;134(4):382–389.

MDIS = Mood Disorders Insight Scale; Sturman ED, Sproule BA. Toward the development of a Mood Disorders Insight Scale: modification of Birchwood's Psychosis Insight Scale. *J Affect Disord*. 2003;77(1):21–30.

PANSS = Positive and Negative Syndrome Scale; Kay SR, Opler LA, Lindenmayer JP. Reliability and validity of the Positive and Negative Syndrome Scale for schizophrenics. *Psychiatry Res*. 1988;23(1):99–110.

PPHS = Psychiatric and Personal History Schedule; Jablensky A, Sartorius N, Ernberg G, et al. Schizophrenia: manifestations, incidence and course in different cultures: a World Health Organization ten-country study. *Psychol Med Monogr suppl*. 1992;20:1–97.

RPMIP = Royal Park Multidiagnostic Instrument for Psychosis:
McGorry PD, Copolov DL, Singh BS. Royal Park Multidiagnostic Instrument for Psychosis, part I: rationale and review. *Schizophr Bull*. 1990a;16(3):501–515.
McGorry PD, Singh BS, Copolov DL, et al. Royal Park Multidiagnostic Instrument for Psychosis, part II: development, reliability, and validity. *Schizophr Bull*. 1990b;16(3):517–536.

SADS = Schedule for Affective Disorders and Schizophrenia; Endicott J, Spitzer RL. A diagnostic interview: the Schedule for Affective Disorders and Schizophrenia. *Arch Gen Psychiatry*. 1978;35(7):837–844.

SAI = Schedule of Assessment of Insight; David AS. Insight and psychosis. *Br J Psychiatry*. 1990;156(6):798–808.

(continued)

Analyses were performed using the Comprehensive Meta-Analyses Version 2.0 (Biostat, Englewood, New Jersey) and IBM SPSS Version 20 (IBM Corporation; Chicago, Illinois). We used a random-effects model, as we assumed a priori that the true effect sizes most likely vary between the included studies.[61] Pooled Hedges *g* effect sizes for the subjects' insight scores and depression ratings were computed.[62] The obtained effect sizes are usually considered small if < 0.3, moderate if between 0.4–0.8, and large if > 0.8.[63]

Heterogeneity was assessed using the *Q* statistic and the I^2 index.[64] Values of $P < .10$ for the former and > 35% for the latter were deemed as indicative of study heterogeneity. Finally, we used funnel plots, Rosenthal's fail-safe N,[65] and Egger regression intercept[66] to test for the presence of publication bias.[64]

RESULTS

Systematic Review

The systematic literature review identified 32 studies (Table 1). Patients' mean ages ranged from 17.5 to 59.6 years, and the rate of men ranged from 18.9% to 86.7%.

Twenty-five studies included patients with psychotic disorders (both schizophrenia or schizophreniform disorder or delusional disorder or psychotic disorder not otherwise specified, and schizoaffective disorder).[10,21,22,24–27,29,30,32–37,39–47,49] In 6 of these studies, patients presented a first episode of psychosis[24,27,29–31,47] and in 2 of them, a mood disorder with psychotic features.[24,47] Four studies recruited patients with mood disorders, both euthymic bipolar disorders[16,20,28] and depressive disorders.[38] In 3 studies, diagnoses were mixed, including psychosis, bipolar and recurrent mood disorders together[23]; or psychosis, depressive disorder or bipolar disorder with psychotic features[31] and drug-induced disorders.[48]

Insight was assessed in 21 studies with 7 different specific, quantitative and multidimensional scales, including Scale to Assess Unawareness of Mental Disorder (SAUMD),[10,28,32–35,37,40] Birchwood Insight Scale (BIS),[26,29,30,42,43] Schedule of Assessment of Insight (SAI)[16,39] or SAI-Expanded version (SAI-E),[20,27,39] Insight and Treatment Attitudes Questionnaire (ITAQ),[25,41] Self-Appraisal of Illness Questionnaire (SAIQ),[44] and Mood Disorders Insight Scale (MDIS).[38]

Cognitive insight was assessed in addition to clinical insight (SAUMD) in 1 study using the Beck Cognitive Insight Scale (BCIS).[32] Insight was dichotomized into present or absent in 4 studies[22,23,45,46] and categorized into full, partial, or no insight in 3 studies based on the Early Psychosis and Intervention Centre intake mental state examination (EPPIC)[24,47] and Schedule for Affective Disorders and Schizophrenia (SADS).[49] Insight was also assessed using items of nonspecific scales, including HDRS-24 item 17,[49] Positive and Negative Syndrome Scale (PANSS) item G12,[31,36] and Scale of Functioning (SOF) item 12.[21] Among these measures, some map onto the global dimension of insight (SADS, PANSS, EPPIC, MDIS, SAI, SAI-E, SAUMD, HDRS-24, SOF, dichotomous scales), the recognition of mental illness (SAUMD, SAI-E, BIS, MDIS, SAI, ITAQ), the attribution of symptoms to disorder (SAUMD, SAI-E, BIS, MDIS, SAI), the recognition of the need for treatment (SAUMD, SAI-E, BIS, SAIQ, MDIS, SAI, ITAQ), or the beliefs about social consequences and outcome of disorder (SAUMD, SAIQ).

Twelve studies were prospective and 20 were cross-sectional and retrospective.

Table 1 (continued). Studies Investigating the Association Between Insight and Suicidal Behavior

SAI-E = Schedule of Assessment of Insight-Expanded version; Kemp R, David A. Psychological predictors of insight and compliance in psychotic patients. *Br J Psychiatry*. 1996;169(4):444–450.
SAIQ = Self-Appraisal of Illness Questionnaire; Marks KA, Fastenau PS, Lysaker PH, et al. Self-Appraisal of Illness Questionnaire (SAIQ): relationship to researcher-rated insight and neuropsychological function in schizophrenia. *Schizophr Res*. 2000;45(3):203–211.
SAUMD = Scale to Assess Unawareness of Mental Disorder; Amador XF, Strauss DH, Yale SA, et al. Assessment of insight in psychosis. *Am J Psychiatry*. 1993;150(6):873–879.
SCID = Structured Clinical Interview for *DSM-III-R*; Spitzer RL, Williams JB, Gibbon M, et al. The Structured Clinical Interview for *DSM-III-R* (SCID), I: history, rationale, and description. *Arch Gen Psychiatry*. 1992;49(8):624–629.
SCID-I = Structured Clinical Interview for *DSM-IV* for Axis I disorders; Spitzer RLWJ, Gibbon M, Williams JB. *Structured Clinical Interview for DSM-IV Axis I Disorders*. New York, NY: New York State Psychiatric Institute; 1994.
SCI-FARS = Structured Clinical Interview for the Functional Assessment Rating Scale; Ward JC, Dow MG, Saunders T, et al. *Structured Clinical Interview for the Functional Assessment Rating Scale*. Tampa, FL: University of South Florida, Department of Community Mental Health; 1995.
SIS = Suicide Intent Scale; Beck ATSD. *Development of Suicidal Intent Scales: The Prediction of Suicide*. Philadelphia, PA; Charles Press Publishers; 1974.
SOF = Scale of Functioning; Rapaport MH. Validation of the Scale of Functioning in older outpatients with schizophrenia. *Am J Geriatr Psychiatry*. 1996;4(3):218–228.
SPS = Suicide Probability Scale; Cull JG, Gill WJ. *Suicide Probability Scale (SPS) Manual*. Los Angeles, CA; Western Psychological Services; 1988
SRS = Suicide Risk Scale; Plutchik R, Van Praag H. The measurement of suicidality, aggressivity and impulsivity. *Prog Neuropsychopharmacol Biol Psychiatry*. 1989;13(suppl):S23–S34.
SSI = Scale for Suicide Ideation; Beck AT, Kovacs M, Weissman A. Assessment of suicidal intention: the Scale for Suicide Ideation. *J Consult Clin Psychol*. 1979;47(2):343–352.
VSAS = Violence and Suicide Assessment Scale; Feinstein R, Plutchik R. Violence and suicide risk assessment in the psychiatric emergency room. *Compr Psychiatry*. 1990;31(4):337–343.

Overall, a small majority of studies reviewed showed a significant association between at least 1 measure of insight and suicidal behavior: 17 studies (12 in psychotic disorders, 2 in mood disorders, and 3 in combined disorders) showed at least 1 measure of better insight as a risk factor for suicidal acts, whereas 3 (2 in psychotic and 1 in bipolar disorders) showed better insight in the necessity of treatment as a *protective* factor for suicide. Twelve studies failed to find any association: 9 in psychotic disorders, 1 in mood disorders, and 2 in combined disorders. More detailed results for each insight dimension are presented below.

Global insight. Four studies (including 2 prospective studies) found an association between better global insight and suicidal behavior in general in psychotic patients.[31,36] Insight was found as a risk factor for both suicidal ideations and suicide attempts in patients with diagnosis of schizophrenia, depressive, or bipolar disorders[23] and for self-harm, suicide attempts, and suicide completion in first psychotic episodes.[24]

However, 5 prospective studies did not find any significant association between general insight and suicidal behavior, including in depressive[38] and schizophrenic[26,39,40] disorders, and in first-admission patients with psychotic, mood, or drug-induced disorders.[48] Similarly, 2 prospective studies[45,49] and 2 retrospective studies[46,47] did not find any difference between suicide attempters and nonattempters in chronic psychotic disorders or in first-episode psychosis, even after multivariate analysis. Of note, among these negative studies, 4 had a small sample size,[26,39,40,45] which may have contributed to false-negative results.

Recognition of mental illness. Seven studies (including 2 prospective studies) showed a positive association between better recognition of mental illness and suicide attempts,[26] suicidal ideation,[25,30] mixed suicide attempts and suicidal ideation,[29] or self-harm and suicide attempts together[27] in patients with schizophrenia. Insight was found as a risk factor for both suicidal ideation and suicide attempts in bipolar patients.[20,28]

Nine other studies (including 3 prospective studies) reported no significant association in schizophrenic patients with suicidal behaviors,[34,37,39–41] suicidal ideas,[33,42] or self-harm,[35] including 1 study in adolescents.[10]

Multiple tests were used in several studies. Five negative studies and 4 positive studies had small sample sizes.

Attribution of symptoms to disorder. Four studies showed a positive association between higher recognition of psychotic symptoms and suicidal acts in schizophrenic[10,37] or bipolar patients[28] or of suicidal ideas in schizophrenic patients.[30]

Three studies (including 1 prospective) found no significant associations,[39,42] even after taking into account confounding factors, including depression or stigma[43] in patients with schizophrenia.

Three positive studies had a small sample size.[10,28,37] Three studies did not correct for multiple tests[10,30,37] that may have led to false-positives. One negative study had small sample size.[39]

Recognition of the need for treatment. Among 14 studies evaluating the need for treatment, 5 (including 2 prospective studies) reported greater recognition for requiring treatment in suicidal patients with schizophrenia[25,33–35] or bipolar disorders[20] compared to nonsuicidal patients; however, 3 of the studies[20,33,34] did not correct for multiple comparisons. Conversely, 3 studies (including 2 prospective studies) showed insight into treatment as being a *protective* factor, specifically, of future suicide attempts in schizophrenic patients over the 2-year period of follow-up,[21] of self-injury and suicidal acts in bipolar patients in remission at entrance,[16] and, in the retrospective study, of suicide attempts, suicide completions, and suicidal ideations.[22]

Seven studies reported no significant difference[27,37,41–44] or no predictive value of this dimension of insight[39] in schizophrenic patients.

Of note, 2 positive[16,22] and 4 negative studies[27,37,39,41] had a small sample size.

Beliefs about social consequences and outcome of disorder. In schizophrenic patients, 1 study[33] found a positive association (without taking into account multiple comparisons) between better recognition of the social consequences of the disorder and suicidal ideation or intent. Seven studies found no association[32,34,37,44] in schizophrenic patients (including 2 prospective studies[35,40]) or in bipolar patients.[28]

Of note, 4 studies[28,32,37,40] had a small sample size.

Cognitive insight. To our knowledge, only 1 study assessed cognitive insight and reported a positive association between suicidal behavior and higher "self-reflectiveness" (but not with self-certainty) of the cognitive insight scale in schizophrenic patients.[32] However, this study had a small sample size, and the relationship between suicidality and insight was a secondary analysis.

Cross-Sectional Study

The 2 groups were statistically similar in terms of age, gender, HDRS-24, HARS, and NART scores (Table 2). As expected, mean scores of suicidal ideation (SSI) were higher in suicide attempters than in patient controls.

Suicide attempters and patient controls were similar in terms of MDIS insight total score ($U = 195.5$; $z = -0.66$; $P = .5$) and for its 3 subscores (recognition of awareness of mental illness, attribution of symptoms, and need for treatment). A trend was found for better insight in suicide attempters compared to patient controls on HDRS-24 item 17 ($U = 187.2$; $z = -1.8$; $P = .06$) (Table 2), with a large effect size of 1.43 (95% CI, 0.77 to 2.09). Post hoc analyses revealed that this difference was mainly found in women ($U = 58.5$; $z = -2.1$; $P = .03$) and not men ($U = 33$; $z = -0.29$; $P = .7$). A 2-sided tailed power analysis with an α value = .01 showed 92% power for detecting significant differences.

No significant correlation was found between the HDRS-24 insight score and the total MDIS score ($\rho = 0.3$; $P = .8$) or with any of the 3 MDIS subscale scores: awareness ($\rho = 0.02$; $P = .9$), attribution of symptoms ($\rho = 0.1$; $P = .5$), and need for treatment ($\rho = -0.09$; $P = .6$). We found no correlation between the HDRS-24 insight score and the SIS in suicide

Table 2. Cross-Sectional Study: Demographic and Clinical Characteristics of Depressed Patients With and Without History of Suicide Attempts

Characteristic	Suicide Attempters (n = 22)	Patient Controls (n = 22)	U[a]	z	P[b]
Sociodemographic					
Age, mean ± SD, y	41.7 ± 9.2	41.3 ± 11.4	238	−0.09	.9
Female, n (%)	12 (54.5)	15 (68.2)	0.4[c]	…	.5
Clinical, mean ± SD					
NART ratio	73.4 ± 13.5	71.4 ± 13.6	181	−0.5	.6
HDRS-24 score	28.1 ± 8.7	29.6 ± 5.2	231.5	−0.2	.8
HARS score	17.3 ± 7.5	17.0 ± 3.4	216.5	−0.6	.5
SSI current score	12.2 ± 6.9	12.6 ± 6.6	107	−0.2	.8
SSI prior score	21.8 ± 6.7	13.8 ± 6.6	56.5	−3.1	**.002**
SIS score	18.6 ± 5.1				
Insight score					
MDIS score, mean ± SD					
Insight total score	10.8 ± 1.2	10.3 ± 2.0	195.5	−0.7	.5
Awareness of illness	3.8 ± 0.6	3.5 ± 0.9	192.0	−1.0	.4
Attribution of symptoms	3.3 ± 1.2	3.3 ± 1.0	216.5	−0.09	.9
Need for treatment	3.9 ± 0.7	3.5 ± 0.9	190.0	−0.7	.3
HDRS-24 self-criticism score, mean ± SD					
Self-criticism item 17	0.7 ± 0.5	0.1 ± 0.3	187.0	−1.8	.06
Women	0.6 ± 0.5	0.9 ± 0.3	58.5	−2.1	.03
Men	0.8 ± 0.4	0.9 ± 0.4	33	−0.3	.7

[a]Mann-Whitney U test.
[b]Value in bold is significant at $P < .05$.
[c]Pearson χ^2.
Abbreviations: HARS = Hamilton Anxiety Rating Scale, HDRS-24 = 24-item Hamilton Depression Rating Scale, MDIS = Mood Disorders Insight Scale, NART = National Adult Reading Test, SIS = Suicidal Intent Scale, SSI = Scale for Suicide Ideation.
Symbol: ... = not applicable.

Table 3. Studies Included in the Meta-Analysis[a]

			Suicide Attempters/Ideators				Patient Controls			
Study	Insight Scale	Diagnosis	Sample Size	Age, Mean ± SD, y	Men, %	Depression Scale	Sample Size	Age, Mean ± SD, y	Men, %	Depression Scale
Kim et al (2003)[49]	SADS	Psychosis	200	35.0 ± 8.2	78.5	21.1 ± 9.4[b]	133	35.4 ± 11.0	77.4	14.6 ± 6.1[b]
Yen et al (2008)[20]	SAI-E	Bipolar disorders	9	34.8 ± 8.3	66.7	≤ 6[b]	87	41.4 ± 12.9	50.6	≤ 6[c]
Schennach-Wolff et al (2010)[36]	PANSS item G12	Psychosis	75	34.6 ± 10.6	58.6	19.9 ± 8.7[b]	264	34.6 ± 11.3	56.8	14.2 ± 7.5[c]
Artiles et al (2009)[40]	SAUMD, first 3 items	Psychosis	27	31	77.8	3[c]	30	28	86.7	1[c]
Barrett et al (2010)[31]	PANSS item G12	Psychosis	89	26.3 ± 8.0	58.4	9[d]	105	27.7 ± 9.0	61.9	4
Acosta et al (2012)[28]	SAUMD, first 3 items	Bipolar disorders	37	46.5 ± 12.5	18.9	11.6 ± 11.7[e]	35	48.0 ± 13.7	54.3	8.8 ± 12.9[d]
Vilaplana et al, present study	HDRS-24 item 17	Depressive disorders	22	41.7 ± 9.2	58.3	28.1 ± 8.7[b]	22	41.3 ± 11.4	31.8	29.6 ± 12.9[b]

[a]Values in the Age and Depression Scale columns represent mean or mean ± SD.
[b]24-item Hamilton Depression Rating Scale.
[c]Calgary Depression Scale.[67]
[d]Calgary Depression Scale for Schizophrenia.[67]
[e]Beck Depression Inventory.
Abbreviations: HDRS-24 = 24-item Hamilton Depression Rating Scale, PANSS = Positive and Negative Syndrome Scale, SADS = Schedule for Affective Disorders and Schizophrenia, SAI-E = Schedule of Assessment of Insight-Expanded version, SAUMD = Scale to Assess Unawareness of Mental Disorder.

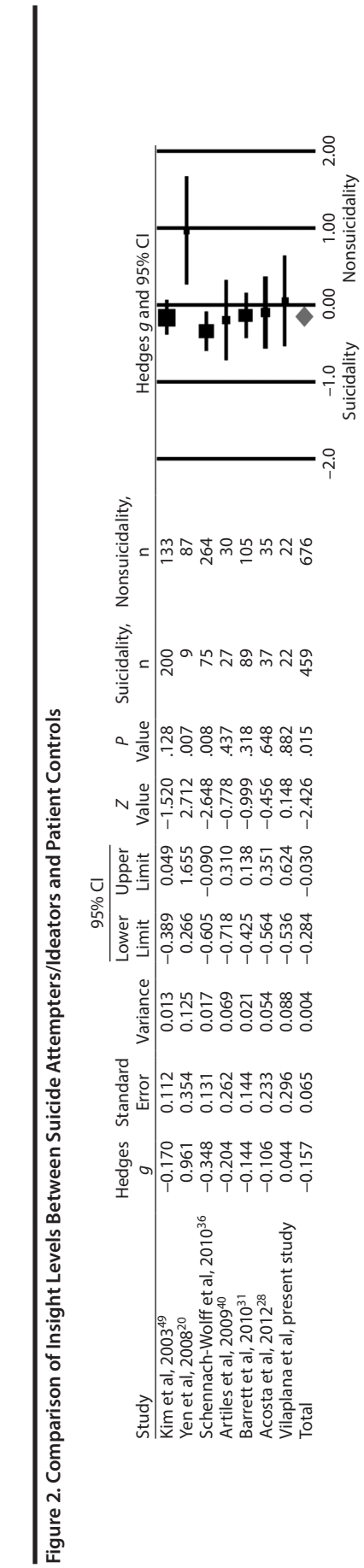
attempters (ρ = −0.02; $P = .9$) or the SSI in suicide attempters (ρ = −0.05; $P = .8$) or in patient controls (ρ = 0.3; $P = .2$).

Meta-Analysis

Seven studies[20,28,31,36,40,49] including our own study were included, comprising 1,135 participants, of whom 459 were suicide attempters or ideators (mean ± SD age = 35.9 ± 9.7 years; 59.6% males) and 676 were patient controls (35.8 ± 12.5 years; 59.9% males) (Table 3). The following scores were extracted from the different studies: the HDRS-24 insight score for our own study, the SADS score,[49] the SAI-E score,[20] the PANSS item G12 score,[31,36] and the scores from the 3 first items of the SAUMD.[28,40]

The pooled Hedges g effect size between suicide attempters/ideators and patient controls was −0.16 (95% CI, −0.3 to −0.03; $z = -2.42$; $P = .015$) (Figure 2), representing a significant but small effect size and indicating that suicide attempters/ideators had significantly better insight than patient controls. The fail-safe N, ie, the number of unpublished or missing null findings that would be needed to render the results nonsignificant, was 9. Heterogeneity exceeded that expected by chance at $P < .05$, implying that the variance among the effect sizes was greater than that expected by sampling error. The study by Yen et al[20] was most likely responsible for the heterogeneity related to the insight score. After excluding this study, the heterogeneity

Figure 2. Comparison of Insight Levels Between Suicide Attempters/Ideators and Patient Controls



disappeared and the result became more significant (pooled Hedges *g* effect size = −0.2 [95% CI, −0.32 to −0.06]; $z = -2.97$; $P = .003$). The funnel plot was reasonably symmetrical, suggesting a low risk of publication bias. Moreover, the more conservative Egger regression intercept suggested no publication bias.

DISCUSSION

In this multimodal investigation comprising a systematic qualitative review of literature, a cross-sectional study, and a quantitative meta-analysis, we found a significant but weak association between insight and suicidality. Our literature review revealed that a small majority of studies reported at least 1 dimension of insight being associated with either a history of suicide attempt or suicidal ideation in retrospective studies or a risk of suicide attempt or self-harm in follow-up prospective studies. Our own study showed a trend toward an association between insight as measured by the simple item 17 of the HDRS-24 and suicide attempt in women (but not the more complex MDIS). Finally, our meta-analysis of 7 studies, including 4 in psychosis, 2 in bipolar disorder, and 1 in depressive disorder, showed a significant but small effect size (pooled Hedges $g = -0.16$) in the comparison between suicide attempters/ideators and patient controls with similar comorbid diagnoses.

Commonly, the association between these variables suggests that *better* insight is a risk factor for suicidal ideation and acts. This is particularly true for the dimensions "recognition of mental illness" and "attribution of symptoms to the disease" and less often for "recognition of the need for treatment" and "beliefs about consequences." In addition, 3 studies (2 prospective and 1 retrospective) reported the opposite, showing *lower* "recognition of the need for treatment" as predicting suicidality (vs 5 studies which reported a positive association and 7 studies, no association).

Another question was the role of diagnosis in moderating the association, or the direction of the association, between insight and suicidality. This is relevant, as previous studies have suggested that diagnosis intervenes in the relationship between cognition and suicidal behavior. For example, low IQ scores have been associated with increased risk of suicidal behavior but only in nonpsychotic patients.[68] In addition, suicide attempters with schizophrenia tended to outperform nonattempters in executive functioning, namely attention and verbal fluency[69] and cognitive flexibility,[49,69] whereas depressed suicide attempters had worse executive performance compared to patients without such a history.[6] Moreover, psychiatric disorders are hypothesized to involve different mechanisms of insight.[70] In psychosis, impaired insight would be underpinned by a loss of contact with reality, whereas in nonpsychotic illness, it would be the result of a defense mechanism against an intolerable reality.[70] However, to our knowledge, there is no empirical argument to support these different mechanisms.

The restricted number of studies available in mood disorders, notably in comparison to psychotic disorders, prevents separate meta-analysis and limits any definite conclusions about potential moderating effects of diagnosis. However, positive associations between insight and suicidality were found in both psychotic disorders and mood disorders, including bipolar and depressive disorders. Studies reporting an increased risk of suicide among older adults diagnosed with dementia, especially during the early

course of the disease,[71,72] when insight is preserved,[73] also suggest a transnosographic association between insight and suicidal behavior. Several clinical examples show that good insight into the nature of dementia and its ultimate outcome increases suicide risk, even when depression is absent.[74]

Interpreting the association between insight and suicidality is not easy. The weakness of the effect size further suggests that additional processes have a mediating or moderating effect in this relationship. Suicidal behavior has indeed been associated with many cognitive deficits.[75] It is common to consider that better insight about the illness and its related consequences to life prospects may lead to greater hopelessness, resulting in a higher risk of suicidal ideas and acts. Specifically, this explanation has been proposed for young patients with schizophrenia. However, we did not find a strong link between insight of the consequences of disorder and suicidality. Possibly of greater consequence is the feeling that symptoms are attributable to an internal disorder and, therefore, it may be the individual himself/herself who is to be blamed rather than an external agent.

Additionally, the patient may have the feeling that nothing can be changed. This is suggested by 3 studies, [16,21,22] including 2 prospective studies,[16,21] showing *lower* recognition for treatment in at-risk patients. Depressed patients with a history of suicide attempts display a disconnection between what they "know" (explicit understanding) and what they "do"[76]: Those who know the advantageous options rarely choose them, contrary to patients without a history of suicide attempt. Preliminary analyses from our study suggest that patients with explicit understanding on the Iowa Gambling Task, a card game, have better insight on the HDRS-24 insight item than those who have no explicit understanding (mean scores = 0.8 ± 0.4 vs 0.4 ± 0.5; $U = 35$; $P = .052$). In line with the findings in decision making, the effect of insight (as a particular measure of explicit understanding) may be counterbalanced by the inability of these individuals to transform insight (eg, "I'm sick") into positive choices and acts (eg, "I need treatment and I will take it"). Although this interpretation does not explain why attempters would have better insight, it may explain the apparent disconnection between advantageous ideas and damaging choices in these individuals. These results also support the development of cognitive tests to measure insight beyond self-reports with the risk of desirability bias and the difficulty of self-examination and disclosure. More research in this field is required.

Limitations

Several important limitations have to be highlighted. First, scales used to measure insight varied and may therefore partly explain conflicting results, as stated in a previous meta-analysis[77] limited to insight in patients with schizophrenia. In our own study, we found no correlation between the MDIS and HDRS-24 insight scores. Different subscores have also been used to take into account the complexity of the construct. Moreover, the different scales do not always assess the exact same dimensions, which complicates any firm conclusion. However, 2 studies[8,78] suggest a moderate to high correlation between the SAUMD items and both the PANSS item G12 and the HDRS-24 insight score. Second, the majority of the studies, including ours, is retrospective and therefore only shows an association, not a causal relationship. Also, we cannot exclude a recall bias, as more insightful patients may be more likely to remember and report previous suicide attempts. Third, the small size of some samples[16,20,22,26,29,32,39,41] may have led to type I or type II errors. The use of noncorrected multiple tests in some studies[10,20,29,30,33,34,37] is also an important issue increasing the risk of type I errors and, therefore, should be addressed in future studies. Fourth, studies included numerous forms of suicidal behavior, from ideation to self-harm and suicide attempt, making it difficult to separate each for analysis and therefore to explore the contribution of insight to thoughts versus acts. Fifth, factors likely to influence insight, such as premorbid IQ,[79] stigma and depression severity,[43] hopelessness,[49] and number of previous episodes,[80] were often not taken into account. Finally, we had to pool different measures of insight in our meta-analysis, in addition to the fact that only 7 studies were found to compare patients with versus without a history of suicidal behavior. Meta-analyses have often been criticized for combining heterogeneous studies, for their potential of publication bias, and for the inclusion of poor-quality trials. In the present study, however, these concerns were addressed by the objective examination of both publication bias and heterogeneity.

CONCLUSION AND RECOMMENDATIONS

Better insight seems to play a significant but weak role in the risk of suicidal behavior. Psychological and neurobiological factors underlying the risk of suicidal behavior are explored, and insight may be one of the factors in the pathway to suicide. However, our study also raised methodological and conceptual concerns.

Future studies should combine global and dimensional measures (with multiple test correction), as the conceptualization of insight remains poor. Additionally, the development of neuropsychological tests putting participants in conditions where awareness may be objectively measured may bring valuable results. Second, the role of insight in suicidal behavior should be investigated in psychotic and nonpsychotic patients using the same methodology in order to shed light on common and specific mechanisms. Third, research on the neural and biological underpinnings of insight should be conducted. Fourth, as for many measures in psychiatry, it may be more relevant to investigate the long-term outcome of poor insight in prospective studies than focusing on cross-sectional group comparisons, where groups are usually heterogeneous. Fifth, the effect of insight may be modulated by sex, as suggested by our own study. More research is necessary in this direction. Finally, if insight is associated with suicide, it is only one of the several factors that contribute to the risk. Analyzing how different dimensions of insight and other cognitive processes combine to modulate the pathway to suicidal ideas and acts in large populations may shed light on the role of insight in this complex behavior.

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