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ORIGINAL ARTICLE

Suicidal ideation and subsequent completed suicide in both psychiatric and non-psychiatric populations: a meta-analysis

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Aims. Several authors claimed that expression of suicidal ideation is one of the most important predictors of completed suicide. However, the strength of the association between suicidal ideation and subsequent completed suicide has not been firmly established in different populations. Furthermore, the absolute suicide risk after expression of suicidal ideation is unknown. In this meta-analysis, we examined whether the expression of suicidal ideation predicted subsequent completed suicide in various populations, including both psychiatric and non-psychiatric populations.

Methods. A meta-analysis of cohort and case–control studies that assessed suicidal ideation as determinant for completed suicide in adults. Two independent reviewers screened 5726 articles for eligibility and extracted data of the 81 included studies. Pooled risk ratios were estimated in a random effects model stratified for different populations. Meta-regression analysis was used to determine suicide risk during the first year of follow-up.

Results. The risk for completed suicide was clearly higher in people who had expressed suicidal ideation compared with people who had not, with substantial variation between the different populations: risk ratio ranging from 2.35 (95% confidence interval (CI) 1.43–3.87) in affective disorder populations to 8.00 (95% CI 5.46–11.7) in non-psychiatric populations. In contrast, the suicide risk after expression of suicidal ideation in the first year of follow-up was higher in psychiatric patients (risk 1.40%, 95% CI 0.74–2.64) than in non-psychiatric participants (risk 0.23%, 95% CI 0.10–0.54). Past suicide attempt-adjusted risk ratios were not pooled due to large underreporting.

Conclusions. Assessment of suicidal ideation is of priority in psychiatric patients. Expression of suicidal ideation in psychiatric patients should prompt secondary prevention strategies to reduce their substantial increased risk of suicide.

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Introduction

Almost 90% of those who died by suicide contacted a health care professional in the 3 months prior to their death (De Leo *et al*. 2013*a*). Of those who had contact with a health care professional in the four weeks before their death, 22% expressed suicidal intent (Isometsa *et al*. 1995). Several authors claim that expression of suicidal ideation is one of the most important predictors for completed suicide (van Heeringen & Hengeveld, 2009; Posner *et al*. 2011; Batterham *et al*. 2013), but this association has not been firmly established (Large & Nielssen, 2012) with inconsistent previous reports. Most importantly, the risk of dying by suicide after expression of suicidal ideation is currently unknown.

Some of the previous studies reported a strong association between suicidal ideation and completed suicide (Taiminen *et al*. 2001; McGirr *et al*. 2007; De Leo *et al*. 2013*b*), whereas others found no association (Bradvik & Berglund, 1993; Bertelsen *et al*. 2007; Jollant *et al*. 2014). Previous meta-analyses (Large *et al*., 2011*a*, *b*; Hawton *et al*., 2005*a*, *b*; 2013; Chapman *et al*., 2015) that assessed this association also reported inconsistent results, with odds ratios

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ranging from 1.5 in bipolar disorder (Hawton *et al*. 2005*b*) to 29.8 in schizophrenia (Hawton *et al*. 2005*a*). These meta-analyses only investigated the effect of suicidal ideation within specific populations, without comparing effects between different populations or exploring other sources of clinical heterogeneity. Furthermore, the effects in the general population and several other psychiatric populations remain unknown (Runeson, 2002; Conwell, 2009).

Suicidal ideation is quite common, with a lifetime prevalence of 10% in the general population (Nock *et al*. 2008). Clinicians can only use suicidal ideation in their clinical risk assessment when they know the absolute risks of suicide for those who do and those who do not express suicidal ideation (Grobbee & Hoes, 2009). However, such summary statistics have not been provided by the aforementioned meta-analyses (Large *et al*., 2011*a*, *b*; Hawton *et al*., 2005*a*, *b*, 2013; Chapman *et al*., 2015). Furthermore, suicidal ideation is strongly correlated with other predictors of completed suicide like previous suicide attempts (Harris & Barraclough, 1997; ten Have *et al*. 2009) and it is not known whether it independently predicts completed suicide (Large & Nielssen, 2012).

Therefore, we conducted a systematic review and meta-analysis to assess whether the expression of suicidal ideation predicted subsequent completed suicide in various populations, including non-psychiatric and psychiatric populations. Secondly, we aimed to estimate the absolute risks of suicide after expression of suicidal ideation in these populations and to investigate whether the expression of suicidal ideation predicted subsequent completed suicide independent of the presence of past suicide attempts.

Method

Search strategy

Ten electronic databases (PubMed, Embase, Web of science, PsycINFO, PsycARTICLES, Psychology and behavioural sciences collection, Cochrane, CINAHL, Academic search premier and ScienceDirect) were searched until February 5, 2016 without language restrictions. A medical librarian was involved in formulating the search string (Supplement S1).

Eligibility criteria

Only journal articles fulfilling the following inclusion criteria were eligible for inclusion: (1) assessment of presence or absence of suicidal ideation as a distinct determinant (i.e. not combined with suicidal behaviour). Suicidal ideation was considered present when any form of ideation, ranging from death wish to suicide plans or threats, was expressed; (2) assessment of completed suicide (which could include open verdicts) as a distinct outcome measure; (3) comparison of suicidal ideation *v*. no suicidal ideation with respect to risk of subsequent completed suicide (4) cohort or case–control study design; and (5) mean age of the study population ≥18 years.

Next, the following exclusion criteria were applied: (1) presence of suicidal ideation was assessed after a suicide attempt; (2) comparison of suicidal ideation *v*. suicide attempt as determinant in a cohort study; or (3) comparison of those who died by suicide and those who survived an attempt as outcome in a case–control study.

For the assessment of the absolute risks of completed suicide, we included only cohort studies and nested case–control studies (with the size of the source population specified and random selection of controls from the source population) in which the number of suicides in the suicidal ideation group and the exposed person time could be extracted or estimated.

To determine whether suicidal ideation predicted subsequent completed suicide independent of the presence of past suicide attempts, articles that assessed the effect of suicidal ideation on subsequent completed suicide adjusted for previous suicide attempts were selected.

Study selection

All retrieved articles in the original search were screened independently by two of the three reviewers (A.A.M.H., S.M. and S.H.M.P.), first on title, then abstract and subsequently full-text evaluation to consider final eligibility. Disagreements with regard to final eligibility were discussed to reach consensus or, if necessary, another independent reviewer (E.J.G.) got involved. In addition, the reference lists of eligible articles and relevant review articles identified by the search strategy were examined by one of the reviewers to search for eligible studies. When multiple publications used (partially) overlapping study populations only the largest study or, when similar, the most recent study was included.

Data extraction

For each eligible article, two of the three reviewers (A.A.M.H. and S.M. or S.H.M.P.) independently extracted data using a standardised form. Disagreements were discussed or another independent reviewer (E.J.G.) got involved if needed. When information necessary to compute the effect size for the primary aim was missing, a request for the missing numbers was emailed to the corresponding author. In case of no response, the study

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was not included. Authors of eleven studies were emailed, two of them provided additional data and could be included in the meta-analysis (Appleby *et al*. 1999*b*; Dutta *et al*. 2011).

Risk of bias assessment

Two independent reviewers (A.A.M.H. and S.M. or S.H. M.P.) assessed four risk of bias aspects (Supplement S2), judged on the basis of adapted items from the Newcastle–Ottawa scale (Wells *et al*. n.d.) and Altman (2001).

Statistical analyses

A study protocol was written *a priori* (Supplement S1), but was not published or registered. The primary outcome of this meta-analysis was the pooled unadjusted risk ratio for the association between suicidal ideation and completed suicide in a random effects model according to the method of DerSimonian and Laird (Borenstein *et al*. 2009*a*). Due to the varying absolute risks of suicide among different populations (Nordentoft *et al*. 2011), the pooling of risk ratios was stratified for the following populations: affective disorders (including both in- and outpatients), (former) psychiatric inpatients (mixed diagnoses), schizophrenic patients (including both in- and outpatients), other mixed psychiatric populations (including people with substance use disorders, patients with borderline personality disorder and mixed diagnosis psychiatric outpatients [sometimes combined with inpatients]), general population and a residual category of non-psychiatric study populations that could not be grouped in one of the other categories. Studies in each subgroup were combined using a random effects model with separate estimates of tau-squared (Borenstein *et al*. 2009*b*). To pool results from different studies, odds ratios, risk ratios and incidence rate ratios were considered to approach the same value, which is reasonable given the low risk of completed suicide. When only χ^2 values or *p*-values were given in combination with a direction of the effect, these were used to estimate risk ratios. If the given *p*-value was <0.05, we assumed a *p*-value of 0.049. There were no eligible studies only reporting a *p*-value >0.05. When articles reported on multiple suicidal ideation determinants (e.g. thoughts and plans separately) we computed a combined effect across these different determinants (Borenstein *et al*. 2009*c*).

With regard to the risk of suicide after expression of suicidal ideation we were most interested in the suicide risk during the first year of follow-up. Since studies had varying follow-up times, and we did not expect a constant suicide rate over time, we conducted maximum-likelihood meta-regression analyses with mean study follow-up time as determinant and $\log_e$-transformed rates of completed suicide as outcome. Given the limited number of studies per population subgroup, analyses were stratified for psychiatric and non-psychiatric populations only. When one article assessed suicidal ideation at multiple time points, we only included the determinant that assessed suicidal ideation closest to baseline.

In order to assess whether suicidal ideation predicted completed suicide independently of previous attempts the past suicide attempt-adjusted risk ratios were extracted and used for estimation.

To check the robustness of the results, we restricted the analyses to: (1) studies with a low risk of bias (Supplement S2), (2) cohort studies (for the primary research aim only) and (3) studies that assessed suicidal ideation at baseline or in the preceding month (for the secondary research aim only). Only this last analysis was not pre-specified in the study protocol, but was conducted because of the large variation in suicidal ideation assessment periods, which could have influenced suicide risk. In addition, we stratified analyses of the primary outcome for studies with short (≤1-year) *v.* long (>1-year) timeframe between expression of suicidal ideation and completed suicide and suicidal ideation assessment method. Mean effects within subgroups were compared by testing for total between groups heterogeneity. Maximum likelihood meta-regression was applied to examine the effects of mean age and gender in the study populations.

Heterogeneity was assessed using the I^2 statistic, small study bias by inspecting the funnel plot and Egger's test for funnel plot asymmetry. A *p*-value <0.05 was considered statistically significant. *Post-hoc*, we changed the significance level for Egger's test for funnel plot asymmetry in the different subgroups to 0.10, given the limited number of studies that were included in these analyses and the relatively low power of the test. Statistical analyses were performed using Comprehensive Meta-analysis software version 2.0.064 (www.meta-analysis.com).

Results

Literature search and study characteristics

The literature search identified 5726 unique articles: 80 articles were finally included, which presented results of 81 studies (Fig. 1). The majority of the articles was published in English ($n = 75$), others in German ($n = 2$), Spanish ($n = 1$), French ($n = 1$) or South African ($n = 1$). Together these studies included 4 601 378 participants (median 216; range 14–4 045 993), with a total of 7729

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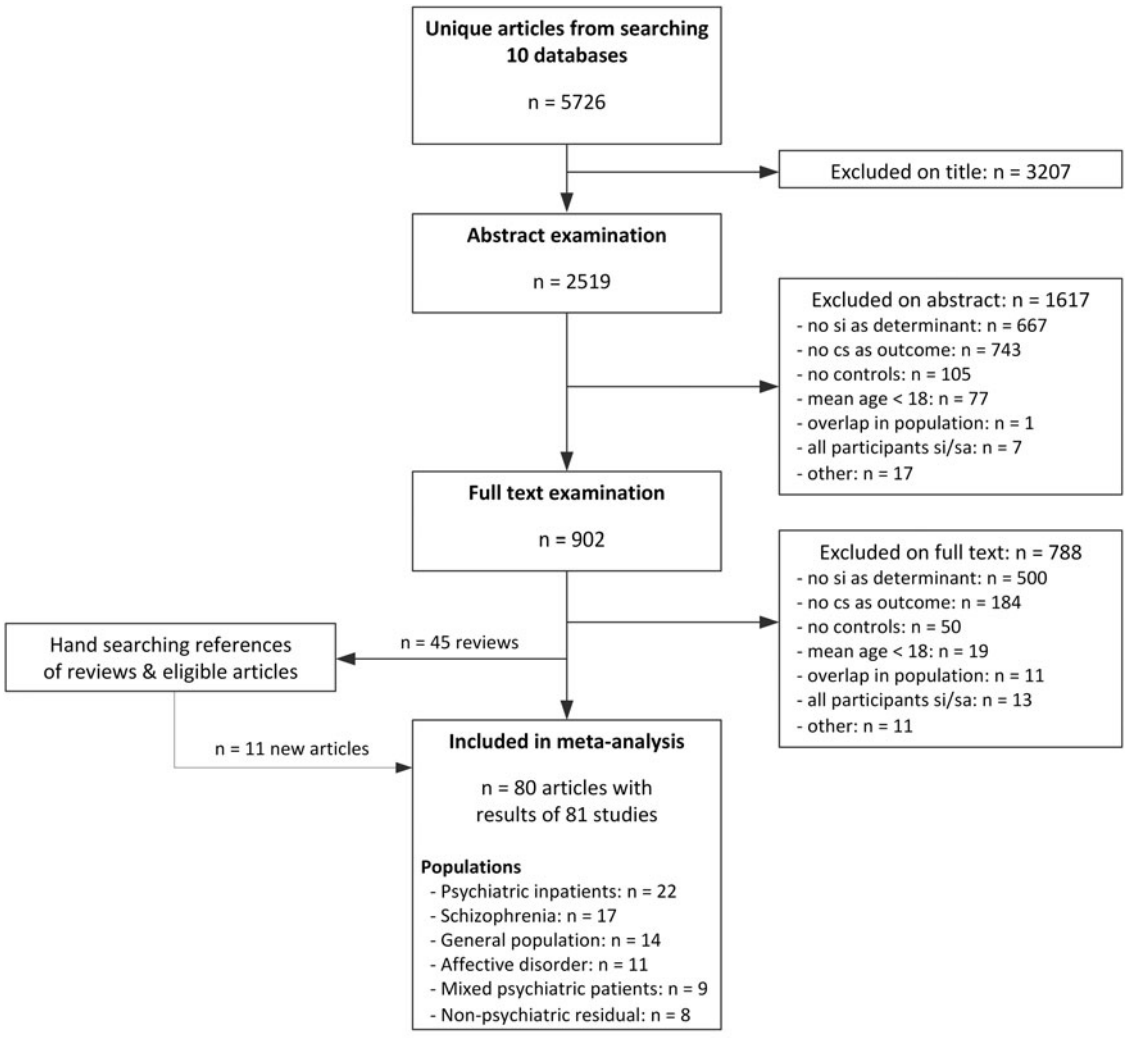

Fig. 1. Flowchart of the study selection process. Si indicates suicidal ideation; cs, completed suicide; sa, suicide attempts. Mixed psychiatric populations: $n = 9$; including three studies on people with substance use disorders, two on patients with borderline personality disorder, two on mixed diagnosis psychiatric in & outpatients, and two on mixed diagnosis psychiatric outpatients. Non-psychiatric residual category: $n = 8$; including two studies on military, one on veterans, one on stalkers, one on HIV infected males, one on survivors of childhood cancer, one on prisoners, and one on emergency department visitors.

completed suicides (median 60; range 3–1429). Suicidal ideation was assessed retrospectively by interviewing a next of kin or clinician of the deceased ($n = 19$), was extracted from medical records ($n = 45$) or was determined by asking the patient him/herself ($n = 16$) (missing: $n = 1$) (Supplement S3).

The majority of included studies were (nested) case–control studies ($n = 51$, 63.0%). In only 26 studies the absolute risk of completed suicide could be extracted. None of the 81 eligible studies assessed the effect of suicidal ideation on completed suicide with sole adjustment for previous suicide attempts. However, there were 46 studies that applied a multivariable model, but only 28 adjusted for previous attempts as a separate determinant in this model.

Association between suicidal ideation and subsequent completed suicide

For all population subgroups investigated in this meta-analysis, the pooled risk of suicide was significantly higher in study participants who had expressed suicidal ideation compared with study participants who had not. Whereas the overall risk ratio (RR) was 4.17 (95% confidence interval (CI) 3.29–5.27), the risk ratios per population subgroup varied substantially. The risk ratio was highest in the non-psychiatric residual subgroup, followed by schizophrenia, mixed psychiatric patients, the general population, psychiatric inpatients and affective disorder (Fig. 2). Overall, the risk ratio was significantly higher in non-

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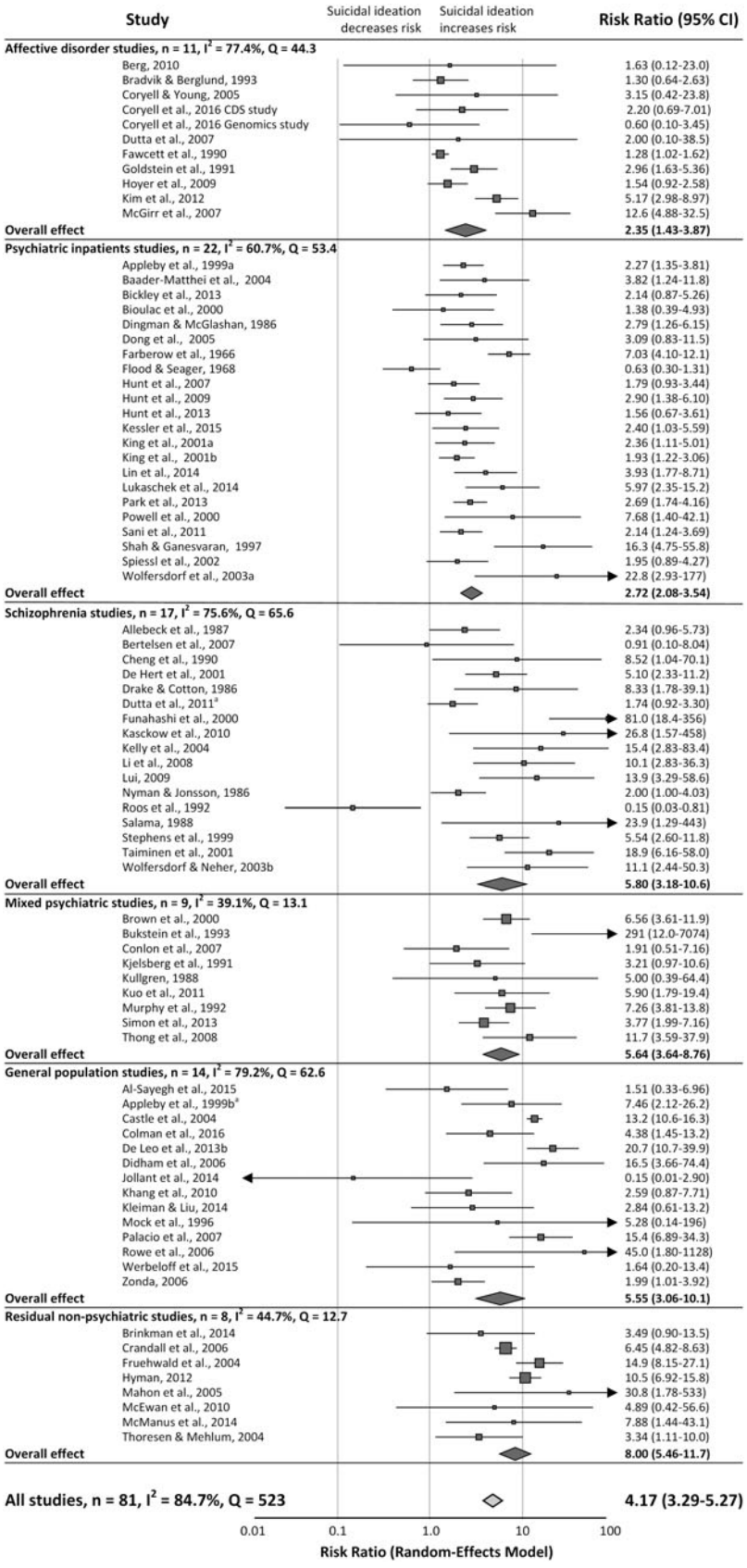

Fig. 2. Forest plot showing the association between suicidal ideation and subsequent completed suicide. CI, confidence interval.
[a]Authors provided additional data to compute effect size.

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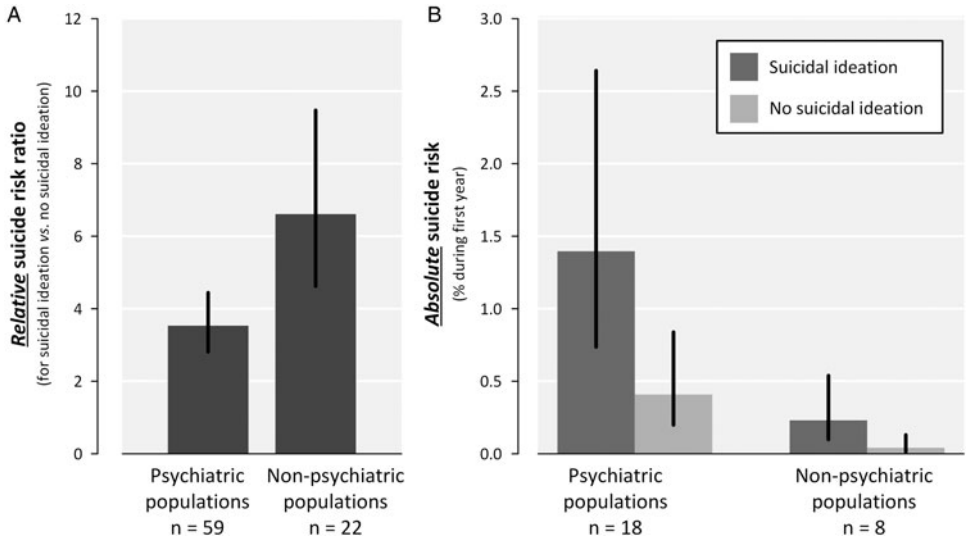

Fig. 3. Bar chart showing suicide risk ratio and the suicide risk (%) during first year of follow-up. Lines indicate 95% confidence interval. Numbers of studies included in (A) and (B) differ because in only 26 of the 81 studies the absolute risk of completed suicide could be extracted. A. Risk ratio for suicide after expression of suicidal ideation, stratified for psychiatric and non-psychiatric populations. B. Results specified separately for study participants who had expressed suicidal ideation and study participants who had not, stratified for psychiatric and non-psychiatric populations. Percentages calculated using maximum likelihood meta-regression analyses with mean study follow-up time as determinant and $\log_e$-transformed rates of completed suicide as outcome (see Fig. 4).

psychiatric populations (RR 6.61; 95% CI 4.62–9.47) than in psychiatric populations (RR 3.53; 95% CI 2.81–4.44) (p-value = 0.004) (Fig. 3).

Risk of completed suicide

Although the psychiatric subgroups had the lowest risk ratios, meta-regression analyses showed the suicide risk was highest in the psychiatric subgroups who had expressed suicidal ideation (risk during first year of follow-up 1.40%; 95% CI 0.74–2.64). This was clearly higher than the suicide risk in psychiatric patients who had not expressed suicidal ideation (risk during first year of follow-up 0.41%; 95% CI 0.20–0.84). In non-psychiatric study participants the suicide risk during the first year of follow-up was 0.23% (95% CI 0.10–0.54) in participants who had expressed suicidal ideation and 0.04% (95% CI 0.01–0.13) in participants who had not (Fig. 3 and Fig. 4). When grouping all studies, the suicide risk during the first year of follow-up after expression of suicidal ideation was 1.03% (95% CI 0.43–2.44) (data not shown).

Risk of bias assessment and sensitivity analyses

When restricting the analyses to studies that scored 'adequate' on all four risk of bias items (n = 34, 42.0%), the pooled risk ratio decreased slightly to 3.41 (95% CI 2.67–4.35) and the overall suicide risk during the first year of follow-up also decreased slightly (risk during first year of follow-up 0.77%; 95% CI 0.27–2.16). In addition, restricting the primary analysis to cohort studies resulted in a slight decrease in the risk ratio (RR 3.10; 95% CI 2.22–4.32). Restricting the secondary analysis to studies that assessed suicidal ideation in the month around baseline resulted in a similar risk (risk during first year of follow-up 0.99%; 95% CI 0.39–2.51).

Is suicidal ideation an independent predictor for completed suicide?

Of all studies that used a multivariable model for the prediction of suicide and adjusted for (among other predictors) the presence of a previous suicide attempt (n = 28), only 14 reported the adjusted effect size of suicidal ideation. In 11 of these studies, suicidal ideation was a significant independent predictor of completed suicide. The other 14 studies that included previous attempts in their multivariable model either did not include suicidal ideation as a separate predictor (n = 6), or did include suicidal ideation but did not report the adjusted effect size (n = 8), which was non-significant in seven of these studies. While in at least 11 studies suicidal ideation was a significant independent predictor of completed suicide, the 14 adjusted effect sizes were not pooled due to large underreporting of mainly non-significant results.

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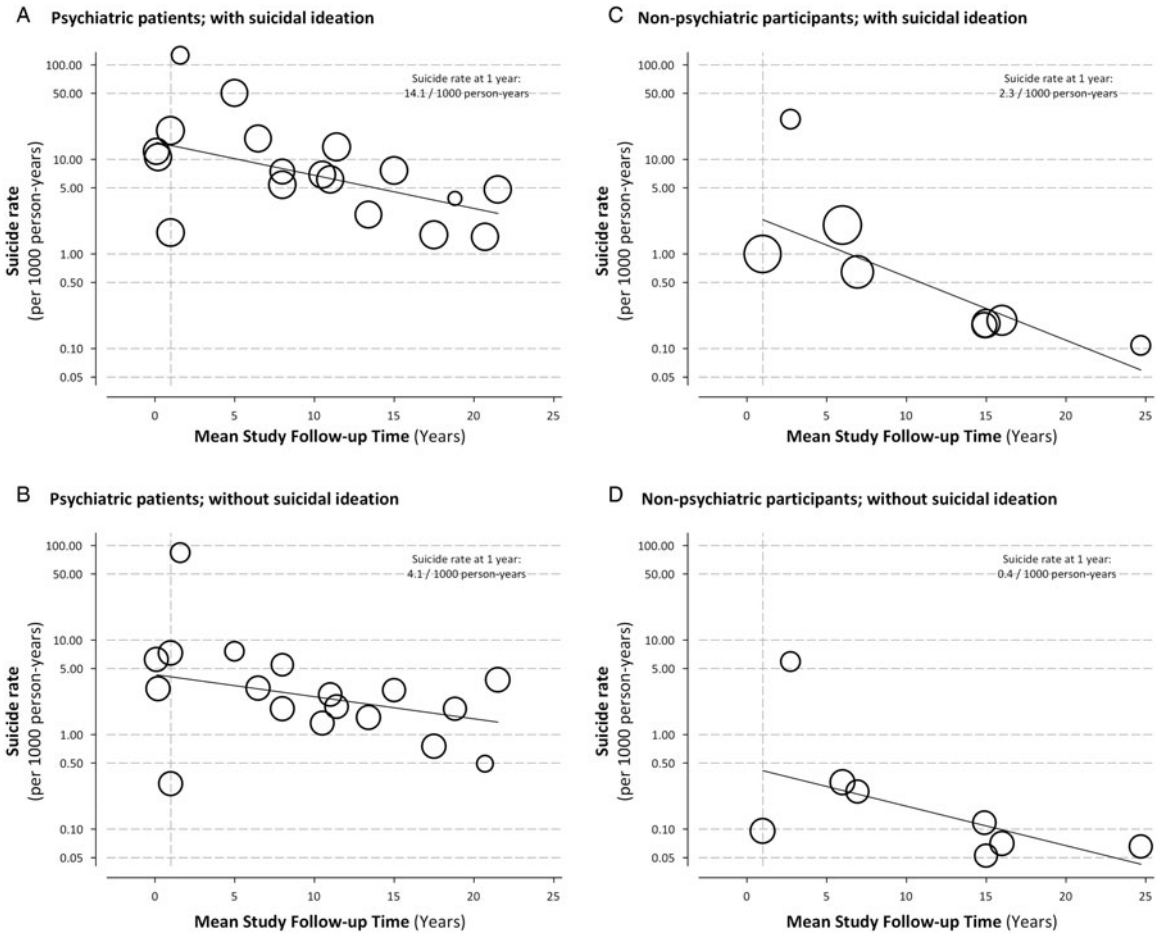

Fig. 4. Meta-regression of mean study follow-up time on suicide rate. Maximum likelihood meta-regression analyses with mean study follow-up time as determinant and $\log_e$-transformed rates of completed suicide as outcome presented on logarithmic scales. The bubble size is proportional to the study's weight. Vertical line indicates 1 year follow-up. The suicide risk can be calculated using the following formulas: suicide risk (during first year of follow-up) = $1 - e^{(-\text{rate per person-year at year 1})}$. Figure part A, B: Psychiatric subgroup included: Dingman & McGlashan, 1986; Drake & Cotton, 1986; Allebeck *et al.* 1987; Goldstein *et al.* 1991; Bradvik & Berglund, 1993; Stephens *et al.* 1999; Bioulac *et al.* 2000; de Hert *et al.* 2001; Spiessl *et al.* 2002; Coryell & Young, 2005; Dutta *et al.* 2007; Berg, 2010; Dutta *et al.* 2011; Kuo *et al.* 2011; Sani *et al.* 2011; Park *et al.* 2013; Simon *et al.* 2013. Lin *et al.* 2014; Figure part C, D: Non-psychiatric subgroup included: Crandall *et al.* 2006; Khang *et al.* 2010; McEwan *et al.* 2010; Hyman, 2012; Brinkman *et al.* 2014; Kleiman & Liu, 2014; Al-Sayegh *et al.* 2015; Werbeloff *et al.* 2015.

Subgroup analyses

There was considerable heterogeneity (I^2 for overall risk ratio = 84.7%, Q-value = 523), even when stratified for specific populations (I^2 range 39–79%, Q-values 12.7–65.6). The results of subgroup analyses can be found in Supplement S4.

Publication bias

The overall funnel plot (Supplement S5) for the primary research question showed a rather symmetrical funnel plot. However, visual inspection of some of the funnel plots of the subgroups showed there might be missing studies with negative effects. The overall Egger's test indicated no funnel plot asymmetry (two-tailed p-value = 0.94). Only in the general population subgroup, the Egger's test for funnel plot asymmetry was significant (two-tailed p-value = 0.04).

Discussion

Meta-analysing 81 eligible studies showed that overall, people expressing suicidal ideation are four times more likely to die by suicide than people not expressing suicidal ideation, with the highest relative risks in non-psychiatric populations. However, absolute suicide risks, rather than relative risks, are essential in suicide prediction, and were highest in psychiatric populations, with a suicide risk during the first year of follow-up of 1.4% compared with 0.23% in non-psychiatric populations.

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The results of this meta-analysis show an overall modest relationship, with moderate risk ratios for psychiatric subgroups and strong risk ratios for non-psychiatric subgroups (Rosenthal, 1996). The results are in line with previous meta-analyses on suicidal ideation and subsequent completed suicide (Large *et al*., 2011*a*, *b*; Hawton *et al*., 2005*a*, 2013; Chapman *et al*., 2015), which only assessed psychiatric populations. The highest relative risk was found in a meta-analysis restricted to schizophrenic patients (Hawton *et al*. 2005*a*; Chapman *et al*. 2015) followed by meta-analyses restricted to psychiatric inpatients (Large *et al*., 2011*a*, *b*) and depressed patients (Hawton *et al*. 2013; Chapman *et al*. 2015). Remarkably, in contrast to our study, one recent meta-analysis (Chapman *et al*. 2015) reported that the association between suicidal ideation and completed suicide was not significant in patients with a mood disorder, probably explained by the broader definition of suicidal ideation in our study and the fact that we excluded studies that compared expression of suicidal ideation in suicide completers *v*. attempters. Unfortunately, none of the previous meta-analyses (Hawton *et al*., 2005*a*, *b*; 2013; Large *et al*., 2011*a*, *b*; Chapman *et al*., 2015) assessed the absolute risks of suicide.

The expression of suicidal ideation was reported as a significant independent predictor of suicide more often than expected by chance. However, underreporting of non-significant effects refrained us from concluding to what extend suicidal ideation is an independent predictor of completed suicide. Many studies included in our meta-analysis did develop a prediction model for suicide, although it is widely accepted that it is very difficult to accurately predict suicide for an individual patient (van Hemert *et al*. 2012), and there is a lot of debate on whether or not clinical risk categorisation is helpful in preventing completed suicide (Large *et al*. 2011*c*; O'Connor *et al*. 2014). The low baseline rate of suicide results in low positive predictive values and in the majority of suicides occurring in the group that is classified as low-risk according to the prediction model (Large *et al*. 2011*b*; Madsen & Nordentoft, 2012; Paton *et al*. 2014). It was striking that only 60% of the studies that developed a prediction model for suicide included previous suicide attempts as a predictor, whereas this has been reported as one of the most important independent predictors of completed suicide (Large *et al*. 2011*c*). Future studies on suicide risk assessment should therefore include known predictors from the literature (e.g. previous suicide attempts) rather than only selecting predictors by univariable screening in the developmental dataset (Steyerberg, 2009).

Strengths and limitations

A major strength of our paper was the attempt to provide risk estimates for different subgroups. Moreover, we strictly excluded studies that might have combined suicidal ideation with behaviour, and included many studies for the primary research aim. There are also limitations that need to be considered. First, the majority of studies only provided long-term follow-up results, while the short-term risk has most clinical value. Although the provided suicide risks should be interpreted with caution due to the declining rates over time and the limited number of studies, especially with short-term follow-up, that could be included in the meta-regression analyses, results clearly show the risk of suicide is higher after expression of suicidal ideation, especially in psychiatric patients. Future studies should focus on short-term suicide risk in the different psychiatric populations. Second, only part of the large amount of heterogeneity could be explained for. Included studies often did not provide several patient characteristics that would be interesting in exploring/explaining this heterogeneity, like duration of suicidal ideation (ten Have *et al*. 2013) or behavioural traits (Turecki, 2014). We did not find a significant difference between suicidal ideation assessment subgroups, possible due to varying or lacking definitions of suicidal ideation and the large variation in suicidal ideation assessment methods within the subgroups. Unfortunately we could not further explore this variation due to insufficient reporting in the individual studies and study level confounding. Clear definitions of suicidal ideation and its assessment method are necessary (Silverman *et al*. 2007) and validated and standardised assessment methods should be used. Even within studies that used standardised assessment methods, the instruments used varied widely with only a maximum of two studies using the same instrument. This can also be a source of heterogeneity as different validated suicidal ideation assessment methods (Yigletu *et al*. 2004; Vuorilehto *et al*. 2014) can result in different suicide ideation prevalences, even in the same population at the same time point. The considerable heterogeneity that still exists between studies within the different population subgroups, but that supposedly also exists within individual studies, limits the generalisability of our findings to individual patients and will result in higher suicide risks in some patients and lower suicide risks in others. We recommend future studies to explore sources of clinical heterogeneity in more detail, especially with regard to suicidal ideation assessment method. Third, study level confounding (Hingorani *et al*. 2013) might have influenced the results of our subgroup analyses, e.g. resulted in a significant effect of gender on the association between suicidal ideation and completed suicide, as the percentage of females was lower in certain high-risk population subgroups like schizophrenia. Fourth, some required study parameters could not be directly extracted from the original articles. For example the exposed person-years were conservatively estimated when possible,

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which could have resulted in an underestimation of the suicide risk. Fifth, reporting bias cannot be ruled out. The power of Egger's test is relatively low (Sterne *et al*. 2011) and effects in the different population subgroups might have been underestimated as we did not attempt to access unpublished data or grey literature and due to underreporting of negative and non-significant effects. Sixth, studies that were published after February 5, 2016 were not included in this meta-analysis. Our meta-analysis especially has limited power on analyses regarding absolute suicide risk in psychiatric and non-psychiatric populations and the independent predictive effect of suicidal ideation. A future update of this meta-analysis should focus on studies that address these research questions.

Implications for clinical practice

For clinical psychiatric care, it is important to inquire about suicidal ideation in psychiatric patients given the substantial risk after expression of suicidal ideation, especially in the first period after expression. Although the relative risk was highest in non-psychiatric populations, the absolute suicide risk after expression of suicidal ideation in non-psychiatric populations was lower than in psychiatric populations, given their lower baseline suicide risk. However, even in psychiatric patients, suicidal ideation assessment should be placed in perspective as the suicide risk during the first year of follow-up among psychiatric patients who had not expressed suicidal ideation was 0.41%, which was higher than the suicide risk in non-psychiatric persons who had expressed suicidal ideation. Expression of suicidal ideation is one of the factors that clinicians take into account when assessing suicide risk in an individual patient (Popovic *et al*. 2014), which should of course not merely be based on a 'tick box' approach that classifies patients as either at high or low risk on the basis of a list of risk factors (van Hemert *et al*. 2012; O'Connor *et al*. 2014). The suicide risks provided in this meta-analysis can help clinicians in their clinical suicide risk assessment and stepped care approach, for example to decide whether burdensome secondary prevention measures such as (compulsory) admission are proportional to the risk of suicide.

In a patient who expresses suicidal ideation, follow-up inquiries are needed about the nature of these thoughts and the assessment of other known risk factors for suicide (Hawton & van Heeringen, 2009). As patients will not always express suicidal ideation spontaneously (van Hemert *et al*. 2012), it is important to ask them about suicidal thoughts. Actually, asking patients about suicidal ideation can reduce future suicidal ideation and follow-up inquiries can benefit long-term mental health (Dazzi *et al*. 2014). Patients often feel relieved by having an opportunity to talk about their suicidal ideas (Gliatto & Rai, 1999), especially if clinicians take time, show empathy, and acknowledge the suicidal feelings (Talseth *et al*. 1999). Remarkably, in several of the included studies that assessed the presence of suicidal ideation in medical records, this information was missing. This means that it was unavailable to clinicians and appropriate care might have been unnecessarily withheld from these patients (King *et al*. 2001*b*).

Fortunately, the majority of patients with suicidal ideation do not die by suicide. Nevertheless, assessment of suicidal ideation is of priority in people with psychiatric illnesses and when a patient expresses suicidal ideation, prompt secondary prevention strategies are necessary to reduce their substantial increased risk of suicide. Future suicide prediction studies should focus on absolute suicide risks and the independent predictive effect of suicidal ideation.

Supplementary Material

The supplementary material for this article can be found at https://doi.org/10.1017/S2045796016001049

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Conflict of Interest

None.

Availability of Data and Materials

Data supporting our findings can be found in Fig. 2 and Supplement S3.

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