

# **Prevalence of suicide attempt and clinical characteristics of suicide attempters with Obsessive-Compulsive Disorder: a report from the International College of Obsessive-Compulsive Spectrum Disorders (ICOCS)**

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## **Abstract**

**Objective:** Obsessive-Compulsive Disorder (OCD) is associated with a variable risk of suicide but its prevalence and risk factors have not been extensively investigated. The present study was aimed to assess prevalence of suicide attempt (SA) and associated socio-demographic and clinical features in a large international sample of OCD patients.

**Methods:** 425 OCD outpatients, recruited by the “international college of obsessive-compulsive spectrum disorders” (ICOCS) network, were assessed and categorized in groups with or without lifetime SA and their socio-demographic and clinical variables compared through Pearson Chi-squared and *t* tests. Logistic regression was performed to assess the impact of collected data on the SA variable.

**Results:** 14.6% of the sample reported at least one lifetime SA. Patients with SA had significantly higher rates of comorbid psychiatric (60% vs 17%,  $p < .001$ ) and medical disorders (51% vs 15%,  $p < .001$ ) as well as previous hospitalizations (62% vs 11%,  $p < .001$ ), compared with patients with no SA. With respect to geographical differences, European and South African patients showed significantly higher rates of SA (40% and 39%, respectively) compared to North American and Middle-Eastern individuals (13% and 8%, respectively) ( $\chi^2 = 11.4$ ,  $p < .001$ ). Logistic regression did not show any statistically significant predictor of SA among selected independent variables.

**Conclusions:** The present international multicenter study found a lifetime SA prevalence of approximately 15% in OCD patients, with higher rates of psychiatric and medical comorbidities and previous hospitalizations in patients with previous SA. Along with potential geographical influences, the presence of the above-mentioned features should recommend additional caution in the assessment of suicide risk in OCD patients.

**Key words:** Obsessive-compulsive disorder (OCD), suicide attempt (SA), prevalence, comorbidity, previous hospitalization.

## **Introduction**

Obsessive-compulsive disorder (OCD) is a highly disabling condition, often characterized by a chronic course, high rates of comorbidity and treatment refractoriness (Grabe et al., 2006; Fontenelle et al., 2006). Recently, the 5th Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) has allocated OCD in a separate chapter (American Psychiatric Association, 2013), which confirms its autonomy from anxiety disorders and, in turn, its leading role for other related disorders.

As for other disabling psychiatric disorders, suicidal behaviors represent the most severe and tragic evolution of OCD. The prevalence and clinical correlates of suicidal behaviors in OCD have been previously investigated, revealing heterogeneous results. In fact, data about suicidal behaviors among OCD patients are quite mixed and there is growing evidence that they could represent an underestimated phenomenon (Kamath et al, 2007). In this respect, a recent meta-analysis by Angelakis and colleagues reported an incidence of suicidality in OCD higher than in the general population, with a median rate of suicidal ideation and suicide attempt (SA) of 27.9% and 10.3%, respectively (Angelakis et al, 2015). Among factors accounting for variability in suicide rates, different geographical and cultural issues have been considered. Indirect evidence of genuine differences, within national suicide rates, emerged in studies from United States and Australia, which have shown significant rank correlations between the suicide rates of immigrants and those of their country of birth (Marusic, 2005; Burvill, 1998).

Suicidality in OCD patients has been linked to several conditions, such as early age at onset, presence of medical and psychiatric comorbidities (particularly mood disorders) (Lochner et al, 2014), generic risk factors for suicide (e.g., a positive history of SA or suicide ideation), emotional-cognitive aspects (e.g., hopelessness), severity of symptoms (particularly concerning aggressive, symmetry/ordering and sexual/religious obsessions) and treatment resistance (Balci et al, 2010; Angelakis et al, 2015; Dhyanani et al, 2013; Kamath et al, 2007; Gupta et al., 2014).

Recently, an Italian study indicated alexithymia as a potential risk factor for increased suicidality in OCD patients (De Berardis et al., 2015). In fact, the inability to recognize and deal with emotions has shown a prevalence of 20%–40% in patients with OCD (De Berardis et al., 2005) and has been linked to increased severity of illness and lower insight (Carpenter and Chung, 2011), resulting in a higher suicide risk (De Berardis et al., 2008). A suicidal act may, therefore, be a way of expressing an intolerable psychological pain (Pompili, 2010).

Recently, a link between serum lipid levels and suicidal ideation has been hypothesized, since some studies reported that serum lipid levels might be involved in neuropsychiatric disorders including OCD (Papkostas et al., 2004; De Berardis et al., 2014), this parameter being potentially identified as a biomarker of suicidality.

In light of previous observations, an additional characterization of suicide risk and behaviors in OCD patients appears of relevant clinical interest to implement an effective treatment and comprehensive management of individuals at risk. Therefore, the aim of the present multicenter study was to assess the prevalence of suicide attempts and associated socio-demographic and clinical features in a large international sample of OCD patients.

## **Methods**

Four hundred and twenty-five consecutive OCD outpatients of either gender and any age, attending different OCD clinics worldwide, participating to the “International College of Obsessive-Compulsive Spectrum Disorders” (ICOCS) (Dell’Osso et al, 2016) network were recruited. This network includes several OCD academic and tertiary Clinics (Menchon et al., 2016) from across the globe – i.e., America (Canada, the United States and Mexico), Africa (Libia and South Africa), Europe (Spain, Italy, Turkey, Bulgaria, UK), and the Middle East (Israel).

A written informed consent and a specific approval from local Ethics Committee/Institutional Review Board for using patients’ information for research purposes were obtained. Diagnoses were performed using the Structural Clinical Interview based on DSM-IV criteria (SCID-I and II) (First

et al., 1997; First et al., 2002 A and B). Socio-demographic and clinical variables were collected through a clinical interview, then included in a common web-database. In particular, for the present study, the following variables were analyzed: age, gender, age of onset, presence of comorbid psychiatric disorders and poly-comorbidity ( $\geq 2$  comorbid psychiatric disorders), medical comorbidity, OCD severity assessed with the Yale-Brown Obsessive Compulsive Scale (Y-BOCS) (Goodman et al., 1989), current pharmacological therapy and Cognitive Behavioral Treatment (CBT), lifetime psychiatric hospitalization and lifetime history of suicide attempt. OCD severity was also defined by means of a qualitative characterization, identifying a “high severity of illness” category, with a Y-BOCS score  $\geq 24$ .

Patients were categorized into two groups on the basis of a positive or negative history of SA and the aforementioned socio-demographic and clinical variables were compared between the two subgroups in order to identify any possible difference.

Pearson Chi-squared tests for categorical variables and *t*-test for continuous variables were used to perform this comparison among subgroups.

Furthermore, to assess potential confounders, binary logistic regressions were performed to investigate significant relationships between lifetime SA (dependent variable) and other variables (included as covariates).

All the statistical analyses were performed using SPSS 22 for Windows IBM software, with  $p < .05$  as level of statistical significance.

## **Results**

Socio-demographic and clinical variables of the sample are reported in Table 1.

The sample was characterized by 58% (n=245) of females and 42% (n=180) of males, a mean age of  $42.9 \pm 12.6$  years and a mean age at onset of  $19.2 \pm 9.9$  years.

Patients with a positive history of SA represented the 14.6% of the sample (n=62), showed a mean age at onset of  $17.9 \pm 9.7$  years and were represented for the 60% (n=37) by females.

Patients with lifetime history of SA showed a series of significant differences compared to patients with no previous SA. Psychiatric comorbidity, was significantly more present in patients with lifetime history of SA compared to individuals without previous SA (60% vs 17%,  $\chi^2=52.7$ ,  $p<.001$ ) (Figure 1). In particular, Tic Disorder (TD) was found to be significantly more represented than other psychiatric comorbidities (41.9%), followed by Major Depressive Disorder (MDD) (8.1%) and Tourette's Syndrome (TS) (1.6%) ( $\chi^2=109.2$ ,  $p<.001$ ) in patients with a lifetime history of SA. In addition, patients with vs without previous SA showed a significantly higher rate of medical comorbidity (51% vs 15%,  $\chi^2=42.4$ ,  $p<.001$ ) (Figure 1). Moreover, they showed a higher rate of previous psychiatric hospitalization (62% vs 38%,  $\chi^2=90.03$ ,  $p<.001$ ) (Figure 1).

No differences in terms of rates of presence/absence of current psychopharmacological treatment were found between patients with vs without previous SA, whereas patients with history of SA showed a higher rate of past/current CBT (66% vs 38%,  $\chi^2=16.2$ ,  $p<.001$ ).

With respect to geographical differences of Clinics involved in the network, European and South African patients showed significantly higher rates of positive lifetime history of SA (40% and 39%, respectively) compared to subjects from North America and Middle-East (13% and 8%, respectively) ( $\chi^2=11.4$ ,  $p<.001$ ).

In terms of OCD severity, no quantitative/qualitative differences in relation to Y-BOCS scores were found between patients with or without previous suicide attempts.

No differences were found in terms of age at onset between patients with or without previous SA, nor in terms of pre-adult (<18 years) and adult ( $\geq 18$  years) onset.

Variables that were entered into binary logistic regression, in order to assess which features were best associated with lifetime SA, included: age of onset, gender, Y-BOCS scores, comorbid psychiatric disorders and lifetime hospitalization.

Our model was valid (Hosmer & Lemeshow test:  $\chi^2=4.3$ ,  $df=8$ ,  $p=0.83$ ), and binary logistic regression was significant overall (Omnibus test:  $\chi^2=112.33$ ,  $df=12$ ,  $p<0.001$ ), predicting 90.5% of

cases. However, none of the selected independent variables could show a unique statistically significant contribution to the model.

## **Discussion**

To authors' knowledge, this is the first and largest international multicenter study investigating prevalence and correlates of SA in OCD. In fact, most of the studies in the field are limited by sample size and restricted geographical catchment area, without multicenter comparisons. Patients with a positive lifetime history of SA represented the 14.6% of the whole sample, with a higher rate compared to what was recently reported by a recent meta-analysis by Angelakis and colleagues, observing median rates of SA of 10.3% (Angelakis et al, 2015). It has to be noticed that our SA rate is positioned in the middle of the range indicated by the available literature, with rates of SA between 3% to 27% in OCD patients (Hollander et al 1996, 1998; Torres et al., 2007, 2011; Alonso et al., 2010; Kamath et al., 2007).

In the present study, significantly higher rates of lifetime history of SA were reported in OCD patients from Europe and South Africa (40% and 39%, respectively), compared to patients from North America and Middle-East (13% and 8%, respectively). Such differences might have been due to specific clinical features including higher severity of illness, presence of comorbidity, early onset and longer duration of illness but might also depend on cultural differences about implications of suicide and SAs for patients and their relatives (Goldsmith et al., 2002; Klonsky et al., 2016). The presence of geographical differences and, likely, cultural peculiarities in suicidal behaviors may explain the heterogeneity in the observed rates of SAs, reported by some recent and previous studies with OCD patients.

In terms of comorbidity, the 23% of our sample showed lifetime psychiatric comorbid disorders, highlighting the important role played by this variable in OCD (Lochner C et al, 2014). Of note, the group with positive history of SA, showed the presence of comorbidity in a rate of four times higher compared with the group with no history of SAs. Among psychiatric comorbidities, TD was the

most represented (41.9%), followed by MDD and TS (8.1% and 1.6%, respectively). In this respect, Viswanath and colleagues reported that OCD, when comorbid with MDD, was more severe and associated with higher suicidal risk (Viswanath et al., 2012). Moreover, MDD has been linked to the presence of hopelessness that, in turn, was found to be a strong predictor of suicidal ideation in OCD (Brezo et al., 2006). Nonetheless, TD represented the most frequently comorbid condition observed in patients with SA and, even though suicidal thoughts and behaviors have been poorly investigated in patients with TD, it is well established that OCD patients with comorbid TD have generally early onset, relevant disability and worse response to pharmacotherapy (Rosario-Campos et al., 2001). Taken as a whole, the above-mentioned features may contribute to a worse long-term outcome, including also a higher incidence of SAs. Of note, a recent multicenter American study investigating the frequency and clinical correlates of suicidal thoughts and behaviors in a sample of children and adolescents with chronic TD showed a significantly higher rate of suicidal thoughts and/or behaviors compared to community control sample (10% vs 3%). In addition, the study showed an association of suicidal attempts and behaviors with tic severity and severity of comorbid OCD, anxious-depressive symptoms and Attention-Deficit/Hyperactivity Disorder (Storch et al., 2015). Increased tic symptom severity and related impairment may, in fact, contribute to heightened distress, resulting in an increased amount of suicidal thoughts and higher risk of suicidal behaviors, potentially expressed in an impulsive manner, when patients feel upset or distressed. Similarly, increased suicidal behavior in TS was described in patients presenting with moderate to severe tics, self-injurious behaviors, comorbid affective disorders, OCD and impulsive-aggressive behaviors (Davila et al., 2010). In light of the above, our results seem to confirm that specific comorbid conditions, in particular TD, MDD and TS, may increase the overall burden and disability of OCD patients, contributing to an increased rate of SA.

Psychiatric poly-comorbidity did not show significant differences between the two groups, likely due to the presence of only few positive cases, even though the group with lifetime positive history of SA showed a rate that was twice higher compared to the other group (8% vs 4%).



Likewise, the significantly higher rate of medical comorbidities (51%) in patients with a positive history of SAs could be interpreted as an additional risk factor, further burdening the already relevant disability perceived by OCD patients. Data from literature emphasize the role of medical illness on suicidality and this relationship is often, but not always, explained by secondary depression (Sanna et al., 2014). Often, illness or physical pain may represent the trigger for suicide ideation in psychiatric patients (Lee et al., 2014). Nonetheless, this result has not been reported to date and to authors' knowledge and it represents a quite original finding in OCD, requiring future confirm.

Another noteworthy finding from the present study is represented by the lifetime psychiatric hospitalization rate. In fact, 18% of the whole sample showed at least one previous psychiatric hospitalization. This represents a higher rate compared to the 6.4% rate found by the National Comorbidity Survey study in the U.S. (Ruscio et al., 2008) and it may be related to the tertiary Clinic setting of the present study, likely reflecting a higher severity of illness of recruited patients. With respect to the subgroup of patients with a positive history of SA, a higher rate of previous psychiatric hospitalization (62%) was found compared to the other subgroup (11%). This result may be interpreted in several ways. First, hospitalization might be related to a globally more severe clinical picture, frequently involving both psychopathological and social aspects, as previously mentioned. Moreover, a specific influence of psychiatric comorbidities may, in turn, have contributed to hospitalization, especially in case of comorbid mood disorders. Ultimately, hospitalizations might have been the consequence of a SA. Actually, all these circumstances have already been described as possible causes of hospitalization in OCD patients (Brakoulias and Sara, 2011).

No differences between the subgroups were found in terms of current psychopharmacological treatment, while patients with a positive history of SA showed a higher rate of past/present CBT, compared to those without history no previous SA (66% vs 38%). CBT is considered among first-line treatments in OCD and medications tend to be reserved for more severe cases and/or to young

people, who fail to respond to psychotherapy (National Institute for Health and Clinical Excellence, 2005; Geller and March, 2012). However, it could be speculated that patients with a long duration of illness and a worse psychosocial impairment needed CBT, as sole or integrated therapy, to obtain larger benefit (Albert et al., 2012; Dell'Osso et al, 2013). Moreover, it has to be underlined that, in the study sample, psychopharmacological treatments were more commonly used than CBT, this phenomenon potentially reflecting the overall severity of illness of the sample.

In terms of severity of OCD, only non significantly higher qualitative and quantitative scores/rates were observed in patients with a lifetime history of SA, who might be considered as moderately severe, following Storch' recent classification (Storch et al., 2015). This result seems to suggest that suicidality in OCD may be the consequence of many risk factors, with severity of illness not necessarily playing the leading role (Alonso et al., 2010). Nonetheless, the observed non significantly higher mean Y-BOCS scores and higher rates of severe OCD as well as the earlier onset of OCD and the higher rate of pre-adult onset in patients with positive history of SA seem to converge in identifying an overall more severe and precocious profile of illness in these subjects compared to individuals with no history of SA. In addition, severity of illness was measured through the Y-BOCS which, in spite of being the more widely used scale in clinical practice, may capture only some specific aspects of the overall severity of illness.

The logistic regression did not find any specific predictor of SA amongst the main clinical and socio-demographic variables, suggesting that suicidality in OCD may likely be a multifactorial dimension, not recognizing single, major predicting factors.

The findings reported in the present study should be interpreted in light of some limitations. First, the present study investigated the presence of at least one previous SA and did not explore the overall number of SAs, methods used to attempt suicide, lethality of attempts or the presence of suicidal ideation *per se*, which might provide a more comprehensive scenario of the suicidal dimension in OCD.

The possible presence of recall bias should be taken into account, since some demographic data were retrospectively determined. In addition, it has to be noticed that Centers participating to the ICOCS network have well-established expertise in the field of diagnosis and treatment of OCD and it may be speculated that patients attending such services may have shown higher severity of illness and, therefore, do not necessarily reflect the clinical conditions of patients usually observed elsewhere. Furthermore, the severity of illness was measured through the Y-BOCS with no instruments assessing disability and quality of life and potentially showing different results across different groups. Finally, reported data may only apply to patients seeking treatment, such population being not necessarily representative of the entire population of OCD patients.

Further research is required to confirm the present epidemiologic results and to further explore the prevalence of SAs and clinical features of suicide attempters in OCD.

### **Acknowledgements**

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## Tables and Figures

**Table 1.** Socio-demographic and clinical variables of the total sample and subgroups divided on the basis of the presence of suicide attempt

	<b>TOTAL SAMPLE n=425</b>	<b>PAST SUICIDE ATTEMPT n=62 (14.6%)</b>	<b>NO SUICIDE ATTEMPT n=363 (85.2%)</b>
<b>GENDER (M:F)</b>	180 (42%):245 (58%)	25(40%):37(60%)	155(43%):208(57%)
<b>MEAN AGE ± SD (years)</b>	42.9 ± 12.6	43±11.8	42.9±12.8
<b>MEAN YBOCS SCORE ± SD</b>	21.7 ± 7.9	23.2±8.3	21.5±7.8
<b>MEAN AGE AT ONSET ± SD</b>	19.2±9.9	17.9±9.7	19.4±10
<b>ADULT ONSET</b>	182 (42.8%)	21 (33.9%)	161 (44.4%)
<b>PRE-ADULT ONSET</b>	243 (57.2%)	41 (66.1%)	202 (55.6%)
<b>HIGH SEVERITY OF ILLNESS (YBOCS≥24) (Y:N)</b>	172(43%):228(57%)	29(50%):29(50%)	143(42%):199(58%)
<b>PSYCHIATRIC COMORBIDITY (Y:N)</b>	<b>100(23%):325(76%)</b>	<b>37(60%):25(40%)**</b>	<b>63(17%):300(83%)</b>
<b>PSYCHIATRIC POLY-COMORBIDITY (Y:N)</b>	20(5%):405(95%)	5(8%):57(92%)	15(4%):348(96%)
<b>PSYCHIATRIC THERAPY (Y:N)</b>	293(88%):38(12%)	29(81%):7(19%)	264(90%):31(10%)
<b>CBT (Y:N)</b>	<b>174(42%):240(58%)</b>	<b>40(66%):21(34%)**</b>	<b>134(38%):219(62%)</b>
<b>LIFETIME PSYCHIATRIC HOSPITALIZATIONS (Y:N)</b>	<b>75(18%):340(82%)</b>	<b>37(62%):23(38%)**</b>	<b>38(11%):317(89%)</b>
<b>MEDICAL COMORBIDITY (Y:N)</b>	<b>81(20%):323(80%)</b>	<b>31(51%):30(49%)**</b>	<b>50(15%):293(85%)</b>
<b>GEOGRAPHICAL AREA</b>	<b>EUROPE 172 (42.5%) AMERICA 70 (17.3%) SOUTH AFRICA 95 (23.5%)* MIDDLE EAST 68 (16.8%)</b>	<b>EUROPE 25 (40%)** AMERICA 8 (13%) SOUTH AFRICA 24 (39%)** MIDDLE EAST 5(8%)</b>	<b>EUROPE 147 (42.9%) AMERICA 62 (18.1%) SOUTH AFRICA 71 (20.7%)* MIDDLE EAST 63(18.4%)</b>

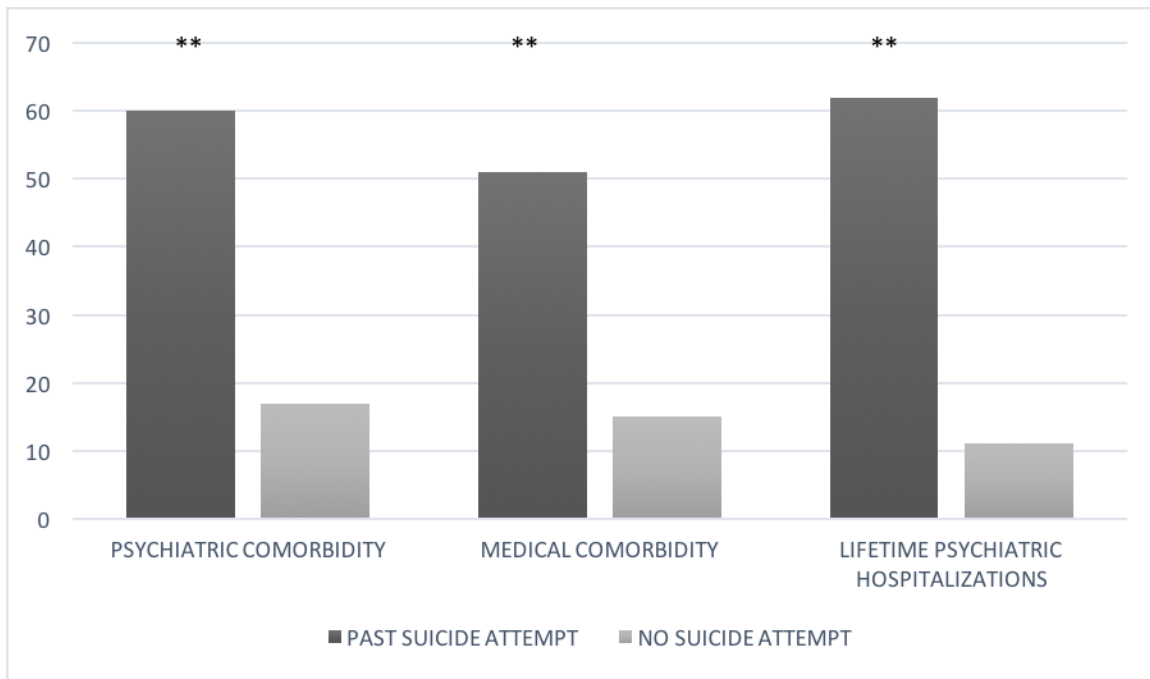
Values for categorical and continuous variables are expressed as N (%) and mean ± SD, respectively. Reported variables had a percentage of missing data ranging from 0% to 22%.

**Statistics:**

\*: p<.05; \*\* p<.001

Legend: Y-BOCS: Yale-Brown Obsessive Compulsive Scale; CBT: Cognitive behavioral therapy

**Figure 1.** Presence of psychiatric and medical comorbidities and hospitalizations in subgroups of OCD patients with and without positive lifetime history of suicide attempt, expressed in percentage



Statistics

\*\* :  $p < .001$

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