**Suicide in obsessive-compulsive related disorders: prevalence rates and psychopathological risk factors**

**Summary**

**Objectives**
To estimate prevalence rates of suicide attempts and suicidal ideation in individuals with a principal diagnosis of obsessive-compulsive related disorders (OCRDs); 2. to identify predictors of suicide risk among subjects with OCRDs (where available).

**Methods**
The systematic review was conducted by searching PubMed from the date of the first available article to December 31, 2018. The search terms [suicide] OR [suicidality] OR [suicide attempts] OR [suicidal ideation] OR [suicidal thoughts] were combined with the following: [BDD] OR [body dysmorphic disorder]; [HD] OR [hoarding disorder]; [trichotillomania] OR [hair pulling disorder]; [excoriation disorder] OR [skin picking disorder].

**Results**
In BDD, data concerning lifetime suicide attempts are consistent across studies: mean rate is 21.5% (range 9-30.3%). Mean rate of current suicidal ideation is 37.4% (range 26.5-49.7%) and mean rate of lifetime suicidal ideation is 74.5% (range 53.5-85%). BDD-specific factors such as early onset, severity, poor insight and muscle dysmorphia and comorbid disorders increase the risk of suicide attempts or suicidal ideation. Only 2 studies recruited individuals with DSM-5 HD: suicidality appears to be low, with rates of current suicidal ideation comprised between 5% and 10%, although 19% of individuals attempted suicide during their lifetime. Concerning the grooming disorders, lifetime rates of suicide attempts are low as compared to rates in other OCRDs; approximately 40% of individuals, however, reported lifetime suicidal ideation.

**Conclusions**
OCRDs taken together may be at risk for suicide attempts and suicidal ideation independently from comorbid disorders (and specifically independently from comorbid OCD); BDD remains the disorder more strongly associated with an increased risk for suicide, followed by HD and then the grooming disorders.

**Key words**
Suicide attempts • Suicidal ideation • BDD • HD • Trichotillomania • Skin Picking Disorder

**Introduction**
Recent systematic reviews and meta-analyses confirmed that Obsessive-Compulsive Disorder (OCD), historically considered to be associated with a relatively low risk of suicide, is actually in itself associated with considerable risk for lifetime suicide attempts and suicidal ideation \(^1\)\(^2\). Data from recent large epidemiological studies performed on National Registers, providing data on the longitudinal association between OCD and death by suicide and lifetime suicide attempts over a follow-up of several years \(^3\)\(^4\), confirmed that individuals with OCD are at greater risk for committing suicide as compared to the general population.
Less is known about suicidality and other DSM-5 Obsessive-Compulsive Related Disorders (OCRDs); in the new chapter, new disorders such as Hoarding Disorder (HD) and Skin Picking Disorder (SPD) and disorders once classified elsewhere (Body Dysmorphic Disorder – BDD – previously in the chapter of Somatoform Disorder, and Trichotillomania – TTM – previously classed among the Impulse Control Disorders) have been grouped together with the nosological organizer OCD. All disorders included in this chapter share similarities with OCD, although some appear to have a stronger cognitive component – and thus are closer to OCD – while others mainly consist of body-focused repetitive behaviors.

While several issues concerning phenomenological characteristics of these disorders have been studied, less attention has been devoted to suicidality. A recent systematic review and meta-analysis examined the strength and patterns of the association between suicidality and BDD, concluding that BDD is actually associated with increased odds for both suicide attempts and suicidal ideation. No similar studies are available for the other disorders of the OCRDs chapter.

Given the prevalence of these disorders in the general population and the impact in terms of psychosocial impairment associated with these disorders, the investigation of suicidality and the identification of potential socio-demographic and clinical factors that could increase the risk for suicide is, to our opinion, of particular clinical relevance. The aims of the present systematic review were: 1) to estimate prevalence rates of suicide attempts and suicidal ideation in individuals with a principal diagnosis of obsessive-compulsive related disorders; 2) to identify predictors of suicide risk among subjects with OCRDs (where available).

Methods

Search strategy

The systematic review was conducted using the PRISMA guidelines by searching PubMed from the date of the first available article to December 31, 2018. The search terms [suicide] OR [suicidality] OR [suicide attempts] OR [suicidal ideation] OR [suicidal thoughts] were combined with the following: [BDD] OR [body dysmorphic disorder]; [HD] OR [hoarding disorder]; [trichotillomania] OR [hair pulling disorder]; [excoriation disorder] OR [skin picking disorder].

Article selection and review strategy

Articles were identified and assessed for eligibility by two independent reviewers (UA and LP), who independently decided which identified articles to include according to clinical importance and eligibility criteria. In case of disagreement, a third author (GM) was consulted to mediate consensual decisions. Duplicate studies were excluded. Cross-references from the articles identified were also examined. Unpublished studies, conference abstracts or poster presentations were not included. The database search was restricted to English language papers.

Eligibility criteria

The inclusion criteria for the studies were the following: 1) studies with appropriate definition of the obsessive-compulsive related disorder (diagnosis made through specific structured interviews and/or established international criteria); 2) adolescents and/or adults; 3) cross-sectional or prospective designs; 4) performed in clinical samples or in the general population (epidemiological studies); 5) employed a quantitative measure of suicidality in order to derive prevalence rates of current/lifetime suicide attempts, suicidal ideation and/or family history of suicide attempts/completed suicide; and/or 6) reported an outcome measure of the association between suicidality and OCD (e.g. odds ratios) or examined factors associated with suicidality.

Results

Search results

The flowchart of studies selected and included in the systematic review for BDD is provided in Figure 1. In total, 24 studies were included in the qualitative synthesis (providing data on prevalence rates of suicide attempts, suicidal ideation). Additional 17 studies were retrieved from PubMed search and manual search providing data on suicidality and HD (N = 8), TTM (N = 4) and SPD (N = 5).

Body dysmorphic disorder

Table I reports prevalence rates of suicide attempts and suicidal ideation in individuals with BDD as from clinical studies; 17 studies provided information, although some of the studies included partially overlapping samples. Additional studies included exactly the same sample of Phillips et al. 2005 and thus were excluded from the table (see Appendix 1).

Concerning lifetime suicide attempts, data are consistent across studies: mean rate is 21.5% (range 9-30.3%; median value: 22.4%). Higher rates are reported in individuals with comorbid OCD (OCD+BDD: 40%) in Veterans with comorbid MDD (92% of the sample) (58.3%) and among inpatients (75% had comorbid Substance Use Disorder) (93.8%). Mean rate of current suicidal ideation is 37.4% (range 26.5-49.7%; median value: 36.9%) and mean rate of lifetime suicidal ideation is 74.5% (range 53.5-85%; median value: 77.9%).

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Studies performed in the general population confirmed that BDD is associated with a significantly higher risk of suicide attempts and suicidal ideation as compared to individuals without that diagnosis (Tab. II), although reported prevalence rates somewhat lower than those in clinical settings. When suicide risk was estimated in the general population using specific instruments, such as the
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Trichotillomania (hair pulling disorder) and skin picking disorder

Only four studies provided information concerning suicidality in individuals with TTM. These studies, moreover, suffered from the inclusion of few subjects whose diagnosis was made without structured interviews. In one study, data concerning suicidality in individuals with OCD and grooming disorders were provided without specifying whether it was TTM or SPD. Table V presents results of our review: lifetime rates of suicide attempts are low (3.7-12%) as compared to rates in other OCRDs; approximately 40% of individuals, however, reported lifetime suicidal ideation.

Concerning SPD, five studies provided prevalence rates of suicide attempts and suicidal ideation; however, only two studies included samples made of non-comorbid SPD (Tab. VI). The only study that investigated lifetime suicide attempts rate in individuals with SPD without comorbid disorders found a low prevalence (5.7%) 17. Approximately 40% of individuals reported lifetime suicidal ideation.

Discussion

Obsessive-compulsive disorder (OCD) has long been considered a disorder which did not carry a notable risk for suicide. Recent meta-analyses and systematized reviews, however, challenged this opinion and found that OCD may actually be considered at risk for suicidal ideation, suicide attempts and committed suicide. A recent systematic review from our research group 2 found a mean prevalence of current suicidal ideation in OCD of 25.9% (median: 15.6%); lifetime suicidal ideation of 44.1% (median: 36.4%) and lifetime suicide attempts of 14.2% (median 11-13).
<table>
<thead>
<tr>
<th>Author</th>
<th>Country</th>
<th>Design</th>
<th>BDD diagnosis</th>
<th>Screening for suicidality</th>
<th>Mode of suicidality</th>
<th>Sample N</th>
<th>Mean age</th>
<th>% males</th>
<th>Suicide attempts</th>
<th>Suicidality (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Veale et al., 1996 30</td>
<td>UK</td>
<td>Cross-sectional</td>
<td>BDDE</td>
<td>n/r</td>
<td>Lifetime suicide attempts</td>
<td>50</td>
<td>32.6</td>
<td>24</td>
<td>(range 19-58)</td>
<td>-</td>
</tr>
<tr>
<td>Perugi et al., 1997 31</td>
<td>Italy</td>
<td>Cross-sectional</td>
<td>DID</td>
<td>HSCCL-90</td>
<td>Current suicidal ideation</td>
<td>58</td>
<td>25 (SD 5.9)</td>
<td>-</td>
<td>45</td>
<td></td>
</tr>
<tr>
<td>Zimmerman &amp; Mattia, 1998 32</td>
<td>USA</td>
<td>Cross-sectional</td>
<td>SCID-I</td>
<td>n/r</td>
<td>Lifetime suicide attempts</td>
<td>16</td>
<td>31.6</td>
<td>25</td>
<td>(1 completed suicide)</td>
<td>-</td>
</tr>
<tr>
<td>Albertini &amp; Phillips, 1999 33</td>
<td>USA</td>
<td>Cross-sectional</td>
<td>SCID-I</td>
<td>BDD Form</td>
<td>Lifetime suicidal ideation &amp; lifetime suicide attempts</td>
<td>33 (adolescents)</td>
<td>14.9 (SD 2.2)</td>
<td>21</td>
<td>67</td>
<td></td>
</tr>
<tr>
<td>Altamura et al., 2001 24</td>
<td>Italy</td>
<td>Cross-sectional</td>
<td>SCID-I</td>
<td>BDD-YBOCS</td>
<td>Current suicidal ideation</td>
<td>30</td>
<td>28.5</td>
<td>-</td>
<td>49.7</td>
<td></td>
</tr>
<tr>
<td>Grant et al., 2002 25</td>
<td>USA</td>
<td>Cross-sectional</td>
<td>BDD-Q</td>
<td>Self-report screening measure for BDD SCID-I</td>
<td>Lifetime suicide attempts</td>
<td>AN+BDD: 16</td>
<td>27.4 (SD 9.7)</td>
<td>62.5</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Frare et al., 2004 26</td>
<td>Italy</td>
<td>Cross-sectional</td>
<td>SCID-I</td>
<td>ADPI</td>
<td>Current suicidal ideation</td>
<td>BDD: 34</td>
<td>24.7 (SD 5.6)</td>
<td>-</td>
<td>26.5</td>
<td></td>
</tr>
<tr>
<td>Phillips et al., 2005 7</td>
<td>USA</td>
<td>Cross-sectional</td>
<td>SCID-I</td>
<td>BDD-YBOCS</td>
<td>Lifetime suicidal ideation &amp; lifetime suicide attempts</td>
<td>200</td>
<td>32.6</td>
<td>27.5</td>
<td>78</td>
<td></td>
</tr>
<tr>
<td>Fontanelle et al., 2006 27</td>
<td>Brazil</td>
<td>Cross-sectional</td>
<td>SCID-I</td>
<td>Specific questionnaire</td>
<td>Current suicidal ideation &amp; lifetime suicide attempts</td>
<td>20</td>
<td>29.2</td>
<td>45</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>Phillips et al., 2007* 8</td>
<td>USA</td>
<td>Cross-sectional</td>
<td>SCID-I</td>
<td>BDD-YBOCS</td>
<td>Lifetime suicidal ideation &amp; lifetime suicide attempts</td>
<td>BDD: 45</td>
<td>36.5 (SD 12.7)</td>
<td>13.3</td>
<td>77.8</td>
<td></td>
</tr>
<tr>
<td>Conroy et al., 2008 29</td>
<td>USA</td>
<td>Cross-sectional</td>
<td>BDD-Q</td>
<td>SCID-I/P</td>
<td>Lifetime suicidal ideation &amp; lifetime suicide attempts</td>
<td>16</td>
<td>31.9</td>
<td>-</td>
<td>93.8</td>
<td></td>
</tr>
<tr>
<td>Phillips &amp; Kelly, 2009 28</td>
<td>USA</td>
<td>Prospective</td>
<td>BDD-YBOCS</td>
<td>HAM-D</td>
<td>Current suicidal ideation</td>
<td>BDD + OCD: 40</td>
<td>36.5 (SD 11.7)</td>
<td>40</td>
<td>85</td>
<td></td>
</tr>
<tr>
<td>Costa et al., 2012 30</td>
<td>Brazil</td>
<td>Cross-sectional</td>
<td>SCID-I</td>
<td>Questionnaire assessing suicidality</td>
<td>Lifetime suicidal ideation &amp; lifetime suicide attempts</td>
<td>OCD + BDD: 109</td>
<td>31.3 (SD 10.2)</td>
<td>23.8</td>
<td>53.5 (suicidal plans 36.6)</td>
<td></td>
</tr>
<tr>
<td>Bjornsson et al., 2013* 30</td>
<td>Iceland</td>
<td>Cross-sectional</td>
<td>BDD-YBOCS</td>
<td>BDDE</td>
<td>Suicide ideation &amp; lifetime suicide attempts</td>
<td>Sample 1: 184</td>
<td>16.7 (SD 7.3)</td>
<td>30.3-14.5*</td>
<td>81-69.4*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>BDD-PSR</td>
<td></td>
<td></td>
<td>Sample 2: 244</td>
<td>16.7 (72)</td>
<td>29.9-16.7*</td>
<td>83.9-79.7*</td>
<td></td>
</tr>
</tbody>
</table>

(continues)
TABLE I (follows). Suicidality in BDD: studies in clinical samples.

<table>
<thead>
<tr>
<th>Author</th>
<th>Country</th>
<th>Design</th>
<th>BDD diagnosis</th>
<th>Screening for suicidality</th>
<th>Mode of suicidality</th>
<th>Sample N</th>
<th>Mean age</th>
<th>% males</th>
<th>Suicide attempts</th>
<th>Suicidal ideation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hart et al., 2013*</td>
<td>USA</td>
<td>Cross-sectional</td>
<td>SCID-I</td>
<td>BDD-YBOCS BDD form</td>
<td>SCID-I</td>
<td>Lifetime suicidal ideation &amp; lifetime suicide attempts</td>
<td>Sample 1: 160&lt;br&gt;Sample 2: 115</td>
<td>28.80 (SD 11.04)&lt;br&gt;32.93 (SD 11.83)</td>
<td>41&lt;br&gt;30</td>
<td>29.4&lt;br&gt;28.2</td>
</tr>
<tr>
<td>De Brito et al., 2015</td>
<td>Brazil</td>
<td>Cross-sectional</td>
<td>BDDE Clinical assessment</td>
<td>n/r</td>
<td>Lifetime suicidal ideation &amp; lifetime suicide attempts</td>
<td>Sample 300</td>
<td>n/r</td>
<td>14.6</td>
<td>9</td>
<td>18.4</td>
</tr>
<tr>
<td>Kelly et al., 2015</td>
<td>USA</td>
<td>Cross-sectional</td>
<td>BDD-Q SCID-P</td>
<td>n/r</td>
<td>Lifetime suicidal ideation &amp; lifetime suicide attempts</td>
<td>Sample 12</td>
<td>n/r</td>
<td>36.4</td>
<td>7.6</td>
<td>66.7</td>
</tr>
</tbody>
</table>

n/r: not reported; *: partially overlap with Phillips 2005. The additional studies which used exactly the same cohort of participants are included in Appendix (not shown in the table); #: age of onset before 18 – age of onset after 18; BDDE: Body Dysmorphic Disorder Examination; BDD-YBOCS: Yale-Brown Obsessive-Compulsive Scale adapted for BDD; DID: Diagnostic Interview for Body Dysmorphia; DSS: Body Dysmorphic Symptom Scale; HSCL 90: Hopkins Symptom Checklist 90; SCID-I: Structured Clinical Interview for DSM-IV Axis-I Disorders; BDD-Q: The Body Dysmorphic Disorder Questionnaire; BDD-PSR: Psychiatric Status Rating Scale for Body Dysmorphic Disorder; SCID/P: Structured Clinical Interview for DSM-IV Patient Edition; ADPI: Adult Demographic and Personal Inventory; HAM-D: Hamilton Rating Scale for Depression.

TABLE II. Suicidality in BDD: epidemiological studies.

<table>
<thead>
<tr>
<th>Authors</th>
<th>Country</th>
<th>Design</th>
<th>BDD diagnosis</th>
<th>Screening for suicidality</th>
<th>Mode of suicidality</th>
<th>N BDD-samples</th>
<th>Mean age</th>
<th>% males</th>
<th>Suicide attempts</th>
<th>Suicidality (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hart et al., 2013*</td>
<td>USA</td>
<td>Cross-sectional</td>
<td>DSM criteria Clinical assessment SOMS-7</td>
<td>n/r</td>
<td>Current suicidal ideation &amp; lifetime suicide attempts</td>
<td>Sample 42&lt;br&gt;Sample 62</td>
<td>28.80 (SD 11.04)&lt;br&gt;21</td>
<td>40&lt;br&gt;36.4</td>
<td>7.2&lt;br&gt;58.3</td>
<td>78.0&lt;br&gt;66.7</td>
</tr>
<tr>
<td>Buhlmann et al., 2010</td>
<td>Germany</td>
<td>Cross-sectional</td>
<td>DSM criteria Specific questionnaire</td>
<td>n/r</td>
<td>Lifetime suicidal ideation &amp; lifetime suicide attempts</td>
<td>Sample 48.9&lt;br&gt;Sample 62</td>
<td>17.1 (SD 7.1)&lt;br&gt;13.6</td>
<td>37.7&lt;br&gt;21</td>
<td>22.2&lt;br&gt;49.6</td>
<td>31.0&lt;br&gt;66.7</td>
</tr>
<tr>
<td>Schieber et al., 2015</td>
<td>Germany</td>
<td>Cross-sectional</td>
<td>DSM-IV and DSM-5 criteria</td>
<td>PHQ-9</td>
<td>Current suicidal ideation</td>
<td>Sample 62</td>
<td>17.1&lt;br&gt;13.6</td>
<td>21&lt;br&gt;36.4</td>
<td>31.1&lt;br&gt;66.7</td>
<td></td>
</tr>
<tr>
<td>Moolman et al., 2017</td>
<td>Germany</td>
<td>Cross-sectional</td>
<td>DSM-5 criteria BDI</td>
<td>Items 10, 16, 17, and 18 from the FKS</td>
<td>Current suicidal ideation</td>
<td>Sample 11*</td>
<td>n/r&lt;br&gt;11</td>
<td>18.2&lt;br&gt;18.2</td>
<td>36.4&lt;br&gt;36.4</td>
<td>78.0&lt;br&gt;78.0</td>
</tr>
<tr>
<td>Shaw et al., 2016</td>
<td>USA</td>
<td>Cross-sectional</td>
<td>BDD-SS ACSS</td>
<td>BDD-SS ACSS</td>
<td>Current suicide risk</td>
<td>Sample 235&lt;br&gt;Sample 114</td>
<td>19.9&lt;br&gt;10.9</td>
<td>43&lt;br&gt;8%</td>
<td>87.1&lt;br&gt;91.1</td>
<td>33.7&lt;br&gt;90.9</td>
</tr>
<tr>
<td>Weingarden et al., 2016</td>
<td>USA</td>
<td>Cross-sectional</td>
<td>BDD-Q BDD-YBOCS SBQ-R</td>
<td>Current suicide risk</td>
<td>Sample 184&lt;br&gt;Sample 114</td>
<td>10.1&lt;br&gt;10.9</td>
<td>7.6&lt;br&gt;8%</td>
<td>90.1&lt;br&gt;91.1</td>
<td>79.7&lt;br&gt;90.9</td>
<td></td>
</tr>
<tr>
<td>Weingarden et al., 2017</td>
<td>USA</td>
<td>Cross-sectional</td>
<td>BDD-Q BDD-YBOCS SBQ-R BDD-SS</td>
<td>Current suicide risk</td>
<td>Sample 184&lt;br&gt;Sample 114</td>
<td>10.1&lt;br&gt;10.9</td>
<td>7.6&lt;br&gt;8%</td>
<td>90.1&lt;br&gt;91.1</td>
<td>79.7&lt;br&gt;90.9</td>
<td></td>
</tr>
</tbody>
</table>

§: N of BDD patients from the general population; *: adolescent population; SOMS-7: Somatoform Disorders Screening Symptoms-7; BDI: Body Dysmorphic Symptoms Inventory; BDD-SS: Body Dysmorphic Disorder Symptoms Scale; BDD-Q: The Body Dysmorphic Disorder Questionnaire; BDD-YBOCS: Yale-Brown Obsessive-Compulsive Scale adapted for BDD; PHQ-9: Patient Health Questionnaire-9; FKS: Fragothian Klinpseudomorph Symptom; ACSS: Acquired Capability Suicide Scale; SBQ-R: Suicide Behaviors Questionnaire Revised; INQ: Interpersonal Needs Questionnaire - INQ-burd: INQ perceived burdensomeness subscale; INQ-belong: INQ thwarted belongingness subscale.
Specific factors are more strongly associated with suicide in OCD patients; the severity of OCD, the unacceptable thoughts symptom dimension (aggressive, sexual, religious obsessions), comorbid Axis I disorder (bipolar disorder or major depressive disorder but also substance use disorder), the severity of comorbid depressive and anxiety symptoms, a previous history of suicide attempts, and some emotion-cognitive factors, such as alexithymia and hopelessness, all increase the risk of having suicidal ideation or attempting suicide. Our systematic review clearly showed that OCD is at a greater suicide risk, compared to the general population. Hence, clinicians should actively inquire about suicidal thoughts and attempts when interviewing a patient with OCD, keeping in mind that risk identification remains a crucial factor for establishing preventive strategies. The recognition that specific risk factors...
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Our systematic review found that approximately 20% of individuals with a primary diagnosis of BDD attempted suicide during their lifetime and 75% had suicidal ideation. Studies performed in the general population confirmed that BDD is in itself at greater risk for suicide as compared to the general population. Suicidality in BDD appears, then, even higher than among patients with OCD. Clinicians, then, should not overlook BDD as being not at risk for suicide and should actively inquire about past suicide attempts and current suicidal ideation in each patient with a diagnosis of BDD, independently from other comorbid disorders eventually present.

However, we found that BDD-specific factors such as early onset, severity, poor insight and muscle dysmorphia and comorbid disorders (mainly MDD, anxiety disorders or OCD) increase the risk of suicide attempts or suicidal ideation, and thus may constitute specific predictors of suicidality to be actively inquired and that clinicians could are associated with suicidal ideation and attempts among individuals with OCD could potentially lead to saving lives in the future.

Less research has been devoted to understanding suicidality among individuals with obsessive-compulsive related disorders; this group of disorders may share with OCD the high risk for suicide attempts and suicidal ideation. However, only for BDD systematic reviews and a meta-analysis are available on the topic. This lead us to perform the present systematic review including all papers on suicidality among individuals with OCRDs.

Concerning suicidality among individuals with BDD, our results are consistent with those of a previous systematic review and meta-analysis which, however, included only seventeen studies: a positive and statistically significant association was found between BDD and suicidality (attempts and ideation together, without differentiating between current and lifetime rates): OR = 3.63 (CI 2.62-4.63).

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### Table IV. Suicidality in HD (or in OCD subjects with hoarding symptoms).

<table>
<thead>
<tr>
<th>Author</th>
<th>Country</th>
<th>Design</th>
<th>Hoarding disorder symptoms diagnosis</th>
<th>Screening for suicidality</th>
<th>Mode of suicidality</th>
<th>Sample N</th>
<th>Sample Mean age % males</th>
<th>Suicidality (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balci &amp; Sevincok, 2010</td>
<td>Turkey</td>
<td>Cross-sectional</td>
<td>YBOCS</td>
<td>SSI</td>
<td>Current suicidal ideation</td>
<td>11* n/r n/r</td>
<td>-</td>
<td>36.4</td>
</tr>
<tr>
<td>Matsunaga et al., 2010</td>
<td>Japan</td>
<td>Cross-sectional</td>
<td>YBOCS</td>
<td>Self-report questionnaire</td>
<td>Lifetime impulsive behaviors (including suicide attempts)</td>
<td>54* 30.8 (SD 8.9) 44.4</td>
<td>41 (vs 18 non-hoarders, p &lt; 0.01)</td>
<td></td>
</tr>
<tr>
<td>Alonso et al., 2010</td>
<td>Spain</td>
<td>Prospective</td>
<td>YBOCS</td>
<td>Beck suicide intent scale</td>
<td>Lifetime suicide attempts</td>
<td>62* n/r n/r</td>
<td>6.45 (vs 5.91 in total OCD population)</td>
<td>-</td>
</tr>
<tr>
<td>Torres et al., 2011</td>
<td>Brazil</td>
<td>Cross-sectional</td>
<td>DYBOCS</td>
<td>Specifically created questionnaire</td>
<td>Lifetime and current suicidal ideation, lifetime suicidal plans &amp; lifetime suicide attempts</td>
<td>297* n/r n/r</td>
<td>13.1</td>
<td>11.5 (current) 39.4 (lifetime) 24.2 lifetime suicidal plans</td>
</tr>
<tr>
<td>Chakraborty et al., 2012</td>
<td>UK</td>
<td>Cross-sectional</td>
<td>SI-R</td>
<td>Clinical interview</td>
<td>Current suicidal ideation &amp; lifetime suicide attempts</td>
<td>20* 31.5 (SD 9.98) 50</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>Torres et al., 2012</td>
<td>Brazil</td>
<td>Cross-sectional</td>
<td>DYBOCS</td>
<td>Specific questions</td>
<td>Current and lifetime suicidal ideation, lifetime suicidal plans &amp; lifetime suicide attempts</td>
<td>528 (4 of them only HD)* 35.9 (SD 13.2) 40.2</td>
<td>12.7</td>
<td>12.3 (current) 38.9 (lifetime) 23.7 lifetime suicidal plans</td>
</tr>
<tr>
<td>Ayers et al., 2015</td>
<td>USA</td>
<td>Cross-sectional</td>
<td>DSM-5 criteria</td>
<td>n/r</td>
<td>Current suicidal ideation</td>
<td>71 67 (SD 5.8) 31</td>
<td>-</td>
<td>4.69</td>
</tr>
<tr>
<td>Archer et al., 2018</td>
<td>USA</td>
<td>Cross-sectional</td>
<td>SIHD</td>
<td>MINI</td>
<td>Current suicidal ideation &amp; lifetime suicide attempts</td>
<td>313 59 (SD 11.8) 25.9</td>
<td>19</td>
<td>10</td>
</tr>
</tbody>
</table>

* patients with OCD and hoarding symptoms as measured by the Dimensional YBOCS; # patients with OCD and hoarding symptoms. In all cases, hoarding was a primary problem, that is, not secondary to other OCD symptoms. YBOCS: Yale Brown Obsessive Compulsive Scale; DYBOCS: Dimensional Yale Brown Obsessive Compulsive Scale; SI-R: Saving Inventory Revised; UHSS: UCLA Hoarding Severity Scale; CIR: Clutter Image Rating Scale; SIHD: The Structured Interview for Hoarding Disorder; SSI: Scale for Suicidal Ideation; MINI: Mini International Neuropsychiatric Interview.
consider when planning treatment and visit schedules. Results of our systematic review are in accordance to those of previous reviews on the same topic.\(^6\) It has to be stated, however, that few studies specifically examined potential predictors of suicidality in BDD, and many of those studies are flawed by methodological biases, suggesting caution in the interpretation of these findings. It has to be noted, moreover, that some of the factors found to increase suicidality among subjects with BDD do also increase suicide risk in individuals with OCD.\(^2\) Risk identification and stratification of risk remain essential components of suicide prevention and should guide the clinical approach to subjects with OCD. Whether and how these risk factors for suicide work together, and whether the specific factors act as moderators or mediators, remains to be fully elucidated.

The evaluation of suicide risk in individuals with HD, Trichotillomania and SPD is hampered by the very low number of studies investigating suicidality specifically in samples of individuals with these DSM-5 disorders. The revision of the classification made by DSM-5 (with the creation of the OCD and related disorders new category and with the new disorders – HD and SPD) surely represented an advance for clinicians and researchers, but unfortunately very few studies at yet investigated whether individuals with these new disorders are at risk for committing suicide. When examining suicide risk and hoarding, moreover, we have still to rely on data gathered from samples of subjects

### TABLE V. Suicidality in trichotillomania.

<table>
<thead>
<tr>
<th>Author</th>
<th>Country</th>
<th>Design</th>
<th>TTM diagnosis</th>
<th>Screening for suicidality</th>
<th>Mode of suicidality</th>
<th>Sample N</th>
<th>Suicidality (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Streichenwein et al., 1995(^{13})</td>
<td>USA</td>
<td>Clinical trial</td>
<td>DSM-IV criteria</td>
<td>n/r</td>
<td>Lifetime suicide attempts</td>
<td>16</td>
<td>6.3</td>
</tr>
<tr>
<td>Seedad &amp; Stein, 1998(^{44})</td>
<td>South Africa</td>
<td>Cross-sectional</td>
<td>Specific questionnaire DSM-IV criteria YBOCS</td>
<td>Specific questionnaire</td>
<td>Current suicidal ideation &amp; lifetime suicide attempts</td>
<td>27</td>
<td>3.7</td>
</tr>
<tr>
<td>Lejoyeux et al., 2002(^{45})</td>
<td>France</td>
<td>Cross-sectional</td>
<td>MIDI</td>
<td>Specific questionnaire</td>
<td>Lifetime suicide attempts</td>
<td>3*</td>
<td>66.6</td>
</tr>
<tr>
<td>Lovato et al., 2012(^{46})</td>
<td>Brazil</td>
<td>Cross-sectional</td>
<td>SCID-I DYBOCS</td>
<td>n/r</td>
<td>Current suicidal ideation &amp; lifetime suicide attempts</td>
<td>121**</td>
<td>12.0</td>
</tr>
</tbody>
</table>

YBOCS: Yale Brown Obsessive Compulsive Scale; MIDI: Minnesota Impulsive Disorders Interview; SCID-I: Structured Clinical Interview for DSM-IV Axis-I Disorders; DYBOCS: Dimensional Yale Brown Obsessive Compulsive Scale; *: patients diagnosed with TTM taken from a sample of depressed patients; **: population with OCD and GD (grooming disorders, either skin-picking disorder or trichotillomania).

### TABLE VI. Suicidality in skin picking disorder.

<table>
<thead>
<tr>
<th>Author</th>
<th>Country</th>
<th>Design</th>
<th>SPD diagnosis</th>
<th>Screening for suicidality</th>
<th>Mode of suicidality</th>
<th>Sample N</th>
<th>Suicidality (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philipps et al., 1995(^{46})</td>
<td>USA</td>
<td>Cross-sectional</td>
<td>n/r</td>
<td>n/r</td>
<td>Lifetime suicide attempts</td>
<td>33*</td>
<td>33</td>
</tr>
<tr>
<td>Grant et al., 2006(^{47})</td>
<td>USA</td>
<td>Cross-sectional</td>
<td>SCID-I YBOCS</td>
<td>n/r</td>
<td>Lifetime suicide attempts</td>
<td>79*</td>
<td>25.3</td>
</tr>
<tr>
<td>Grant et al., 2010(^{48})</td>
<td>USA</td>
<td>Cross-sectional</td>
<td>proposed DSM criteria</td>
<td>n/r</td>
<td>Lifetime suicide attempts</td>
<td>53</td>
<td>5.7 (vs 13.7 in OCD)</td>
</tr>
<tr>
<td>Lovato et al., 2012(^{49})</td>
<td>Brazil</td>
<td>Cross-sectional</td>
<td>SCID-I DYBOCS</td>
<td>n/r</td>
<td>Current suicidal ideation &amp; lifetime suicide attempts</td>
<td>121**</td>
<td>12.0</td>
</tr>
<tr>
<td>Machado et al., 2018(^{50})</td>
<td>Brazil</td>
<td>Cross-sectional</td>
<td>Epidemiological</td>
<td>SPSQ PHQ-9</td>
<td>Current suicidal ideation</td>
<td>259</td>
<td>-</td>
</tr>
</tbody>
</table>

* *: individuals with BDD and SPD; **: population with OCD and GD (grooming disorders, either skin-picking disorder or trichotillomania); SCID-I: Structured Clinical Interview for DSM-IV Axis-I Disorders; YBOCS: Dimensional Yale Brown Obsessive Compulsive Scale.
with OCD as the primary diagnosis and prominent hoarding symptoms; it is not clear, then, whether suicidality is associated with HD in itself or whether it is associated with the specific subtype of OCD with hoarding symptoms. It is possible that HD, being usually associated with poor insight and then with a long delay from onset to help-seeking, is not at risk for suicide at the beginning of its history, and subsequently becomes associated with a higher risk when comorbid with OCD or MDD, or when the impairment associated with HD is huge. However, this is only a hypothesis that needs to be confirmed. Concerning the grooming disorders (TTM and SPD), too few studies are available to draw some conclusions; very preliminary data seem to suggest that suicide attempts are low in TTM and SPD as compared to other OCRDs. The inclusion of these disorders among the chapter of OCD and related disorders will for sure draw attention on such neglected disorders, and we will expect that more reliable data on suicidality will appear in the next future.

In conclusion, our present systematic review showed that like in the case of pure OCD, 3 OCRDs taken together may be at risk for suicide attempts and suicidal ideation independently from comorbid disorders (and specifically independently from comorbid OCD); BDD remains the disorder more strongly associated with an increased risk for suicide, followed by HD and then the grooming disorders. A greater awareness of such suicide risk should prompt clinicians to actively inquire about past suicide attempts and current suicidal ideation whenever a patient with one of the obsessive-compulsive related disorders presents for a visit.

Conflict of interest
The Authors have no conflict of interest to declare.

References

27. Fontenelle LF, Telles LL, Nazar BP, et al. A


Appendix 1

16 studies referring to the same sample of patients of Phillips 2005.


