Journal of Obsessive-Compulsive and Related Disorders 32 (2022) 100708

Contents lists available at ScienceDirect

Journal of Obsessive-Compulsive and Related Disorders

journal homepage: www.elsevier.com/locate/jocrd

Sexual obsessions in children and adolescents: Prevalence, clinical correlates, response to cognitive-behavior therapy and long-term follow up

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ARTICLE INFO

Keywords:
Obsessive-compulsive disorder
OCD
Sexual obsessions
Children
Adolescents

ABSTRACT

Sexual obsessions occur in pediatric and adult OCD including thoughts about sexual acts with family members, sexually inappropriate behavior, or homosexual orientation. They may remain undiagnosed because of embarrassment to report thoughts that are perceived as unacceptable. Prevalence studies of sexual obsessions in pediatric populations are rare. The present study investigated prevalence of sexual obsessions and treatment outcome compared to youth with OCD without sexual obsessions in a large sample. Sexual obsessions and OCD severity were assessed with the Children's Yale-Brown Obsessive- Compulsive Scale in all 269 participants of the Nordic Longterm OCD Treatment study (mean age 12.8 years, 48.7% boys) at baseline, after treatment and three years follow-up. Treatment consisted in individual manualized CBT with exposure and response prevention. Patients with and without sexual obsessions were compared on clinical characteristics and treatment outcomes. Sexual obsessions were reported by 18%, those with sexual obsessions were slightly older (13.5 versus 12.7 years). Both groups had no difference in treatment outcome, suggesting that if addressed, the response to CBT is similar in sexual, as in other obsessions. Clinicians need to be aware that children may need help to disclose and to identify these thoughts as obsessions to address them in treatment.

1. Introduction

Obsessive-compulsive disorder (OCD) is a disabling disorder characterized by disturbing recurrent thoughts (obsessions) and repetitive behaviors (compulsions) (American Psychiatric Association, 2013) affecting 0.5–3% of the childhood population (Heyman et al., 2001; Valleni-Basile et al., 1994; Verhulst, van der Ende, Ferdinand, & Kasius, 1997). OCD is associated with significant impairment (Piacentini, Bergman, Keller, & McCracken, 2003), reduced quality of life (Weidle, Ivarsson, Thomsen, Lydersen, & Jozefiak, 2015) and a chronic course in about 40–60% of cases (Fineberg et al., 2013; Micali et al., 2010; Skoog & Skoog, 1999; Stewart et al., 2004). Sexual obsessions occur in pediatric and adult OCD and may include thoughts about sexual acts with family members or young children, sexually aggressive behavior or homosexual acts or identity (Grant et al., 2006; Williams & Farris,2011). These thoughts are painful and unsettling to the patient but may as well be unsettling for parents and siblings who may be the objects of these obsessions. They occur often together with aggressive obsessions in an "unacceptable thoughts" group (Hojgaard et al., 2017).

Sexual obsessions often remain undiagnosed because of embarrassment to report thoughts that are perceived as unacceptable (Fernández de la Fernándezde la Cruz et al., 2013). In addition, young people may not be able to identify these thoughts as part of their OCD, even in the presence of other obsessions. Therefore, the diagnostic work-up requires sensitive and often repeated dialogues with the patient. During assessment it is crucial to ask specifically for sexual obsessions also in young

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https://doi.org/10.1016/j.jocrd.2022.100708
Received 8 September 2021; Received in revised form 10 January 2022; Accepted 11 January 2022
Available online 13 January 2022

children. To apply an interview technique where the clinician gives examples from other children, can be extremely helpful for the child, both for understanding the question and to make the content of the obsessions acceptable.

Clinicians need to be aware of the phenomenology to recognize the symptoms and to differentiate between symptoms related to sexual abuse or risk of sexually inappropriate behavior and sexual obsessions as part of OCD. Sometimes the differential diagnosis is complicated. Two pediatric cases of OCD onset following an incident of abuse and unwanted sex play with older peers are reported (Freeman & Leonard, 2000). In both cases obsessions included sexual images and a ritual of confessing thoughts to their mothers, in addition to a variety of non-sexual obsessions and compulsions. In a large Swedish population-based twin study (Vidal-Ribas et al., 2015), "sexual abuse'' was significantly associated with the severity of obsessive-compulsive symptoms, but the magnitude of the associations was small. Therefore, it is important to have in mind the possibility of sexual abuse in children presenting with sexual obsessions and OCD. A standard assessment procedure to screen for trauma history for example with the Child and Adolescent Trauma Screen (CATS) (Sachser et al., 2017) which includes questionnaires for both children and parents or the revised version of the Kiddie Schedule for Affective Disorders and Schizophrenia-Present and Lifetime version containing a trauma section including questions about sexual abuse (Kaufman et al., 2016) can be helpful. However, in the opposite and much more likely case of non-trauma related sexual obsessions (Healy, Fitzpatrick, & Fitzgerald, 1991), excessive questioning and investigations about suspected abuse or risk of inappropriate behavior may cause significant harm, "confirming" the child's most unpleasant obsessions and adding an even heavier load to the burden of guilt, self-blame, and worries. In the worst case it even can prevent a successful treatment response. Veale and coworkers offer advise how to assess intrusive sexual thoughts (Veale, Freeston, Krebs, Heyman, & Salkovskis, 2009) settling that difficulties in identifying intrusive thoughts as being related to OCD usually occur when the assessor lacks experience with the disorder. However, they acknowledge, that the ego-dystonic nature of obsessions may be especially difficult to assess in children and adolescents still in the process of sexual development and maturation, who may feel confused whether a sexual thought is wanted or unwanted, permitted or deviant.

1.1. Case vignettes

Fernandez de la Fernándezde la Cruz et al. (2013) described two cases of sexual obsessions being misinterpreted as posing risk of sexually inappropriate behavior. Because of the scarcity of descriptions of clinical pediatric examples in the literature, we add the following case vignettes, to expand on the range of phenomenology:

16-year-old girl, sexual obsessions started with "sexual thoughts and images" about young children (4–6 years of age), for example when she passed by a kindergarten and felt a kind of arousal leading to very unpleasant obsessions about turning out to be pedophile. Later her sexual obsessions included father, younger brother, other girls after superficial physical contact. The obsessions caused highly unpleasant and embarrassing feelings, confusion, rumination about becoming lesbian or having a wish of incestual relations and extensive avoidance of situations eventually leading to physical contact for example in gym/training. She had no other OCD symptoms. She was referred for "unclear symptoms" including suspected sexual abuse.

15-year-old girl, thoughts about sex with father or very young children. She had a previous history of having exposed her breast to a stranger on internet on a closed chatting channel and was referred from a general practitioner with suspected sexual abuse. She had several other (non-sexual) obsessions and compulsions.

10-year-old boy with OCD, ADHD and Tourette's syndrome and various OCD-symptoms including the following: Intrusive and unpleasant images of naked adult people, preoccupations about becoming gay ("get a boyfriend") and doing embarrassing actions, for example touch own private parts. He did not identify nor disclose his sexual obsessions during the initial evaluation, but during exposure therapy.

12-year-old girl, afraid of becoming homosexual, including the embarrassing thought that she might have prejudices against homophile people leading to even worse consciousness. Unrealistic fear of becoming pregnant even without sexual intercourse, sperms might have survived on a toilet seat, and somehow could cause pregnancy. She acknowledged that it might be not very likely, but "what if".

1.2. Why is it important to study sexual obsessions in pediatric samples?

A particular reason to take sexual obsessions seriously is their association with poorer treatment response reported from adult samples. The presence of sexual obsessions predicted poorer long-term outcome after combined treatment with serotonin reuptake inhibitors (SRIs) and behavioral therapy involving exposure and response prevention (Alonso et al., 2001), but were also associated with poorer response to pharmacotherapy with SRIs alone (Shetti et al., 2005). However, this was not confirmed in a large pediatric study (Fernández de la Fernándezde la Cruz et al., 2013); children and adolescents with sexual obsessions were just as likely to respond to CBT as those without such symptoms and independently of whether they were on SRIs medication or not.

Studies of sexual obsessions in pediatric OCD samples are rare; in adult OCD populations their prevalence is reported from about 16 to 25% (Alonso et al., 2001; Grant et al., 2006). In a study, primarily aimed to explore developmental aspects comparing children and adolescents (n = 101) to adults with OCD (n = 560), sexual obsessions were found to be present in 11% of children compared to 36% of adolescents and 24% of adults (Geller et al., 2001). The only study specifically exploring sexual obsessions in a large pediatric sample (n = 383) found a prevalence of 26,6% and they were more common in adolescents aged 15 and above, than in child patients, albeit present in children as young as eight years (Fernández de la Fernándezde la Cruz et al., 2013). In this study, the authors described limitations concerning generalizability and assessment methods. Their study was conducted in a specialist clinic for complicated, severe, or treatment refractory OCD with almost a half of the sample (46%) on medication, and therefore their results may not generalize to other samples. In addition, diagnostic assessment was based on routine clinical service without using structured diagnostic interviews. Also, the study of Geller et al. (2001) comes from a highly specialized OCD clinic. Thus, the current study, will examine sexual obsessions in a sample from generalized and specialized clinics, with standardized assessment procedures (Thomsen et al., 2013; Torp et al., 2015), which may show a different prevalence as well as different clinical correlates. In addition, we want to study the stability of sexual obsessions over time and whether they persist even in the context of remission of the other OCD-symptoms after treatment.

1.3. Aims

Given the clinical importance of the topic as outlined above and the paucity of studies in pediatric populations, the present study aims to add information about prevalence of sexual obsessions, clinical and demographic correlates, and outcome after treatment and over three years follow up, compared to children and adolescents with OCD, but without sexual obsessions. The information is derived from a large sample of patients collected in a multicenter study with both specialized and non-specialized treatment units and well-defined procedures for assessment and treatment.

2. Methods

2.1. Participants

All 269 children and adolescents included in the Nordic Long-term

OCD Treatment study (NordLOTS) participated in this study. The patients were recruited at five main study sites in Denmark, Norway, and Sweden. Assessment and treatment were performed in eighteen public community mental health clinics, with general referrals and at two specialized OCD clinics (Aarhus, Denmark, and Gothenburg, Sweden). Inclusion criteria were a primary OCD diagnosis according to DSM-IV criteria confirmed with the Kiddie Schedule for Affective Disorders and Schizophrenia, a Children's Yale-Brown Obsessive-Compulsive Scale total severity score ≥16, and no treatment with CBT or effective doses of SSRIs (>50 mg) six months prior to the start of the study. The presence of comorbid disorders was allowed, except psychiatric disorders with higher treatment priority (e.g., psychosis and severe depression). Inclusion procedures for the NordLOTS are described in detail elsewhere (Torp et al., 2015). The mean age of the participants was 12.8 (SD = 2.7) years, 48.7% were boys and 51.3% girls. Assessments were completed at intake, after treatment and during long-term follow-up.

2.2. Assessments and treatment

OCD severity was assessed with the Children's Yale-Brown Obsessive-Compulsive Scale (CYBOCS) (Goodman et al., 1989). The CYBOCS is a semi-structured interview developed for the assessment of OCD symptoms in children and adolescents. The instrument consists of a subscale for obsessions and one for compulsions, scored by the clinician, based on interviews with each child and each parent or caregiver informant. Subscale scores (range 0–20) are added to a CY-BOCS total score (range 0–40). The CYBOCS has high internal consistency (α = 0.87) and good to excellent inter-rater agreement (α = 0.84) for the total score (Scahill et al., 1997).

Sexual obsessions were assessed with the symptom checklist for obsessions of the CYBOCS, where the interviewer asks for the presence of repetitive, unwanted and disturbing sexual thoughts, specified in one or more of the four following areas: Forbidden or perverse sexual thoughts, images, impulses, thoughts with content involving homosexuality, thoughts about sexual behavior towards others (aggressive), unrealistic fears of becoming pregnant or other thoughts involving sexuality (open question to describe these thoughts). The item "unrealistic fears of becoming pregnant" was specified and not only summarized as "other unpleasant thoughts involving sexuality" in the Nordic adaptation of the CYBOCS, because of clinician's observation of relatively frequent reports of this obsession. The CYBOCS was administered as main outcome measure at baseline, at post treatment evaluation and at follow up.

Comorbidity was assessed at baseline with the Kiddie Schedule for Affective Disorders and Schizophrenia-Present and Lifetime version (K-SADS-PL) (Kaufman et al., 1997) which is a widely used structured diagnostic interview for the assessment of psychiatric disorders in children and adolescents. The instrument was used both to confirm OCD diagnoses according to the DSM-IV and to evaluate the presence of comorbidity. It was administered by interviewing the parent(s) and the child. The K-SADS-PL has good psychometric properties with an inter-rater reliability of 98% agreement, and a 1 to 5-week test-retest kappa of 0.80 for any anxiety disorder diagnosis ((Kragh et al., 2019; Lauth et al., 2010). Diagnoses elicited from an interview with the child and one from parents had excellent validity for most major child psychiatric disorders (Jarbin, Andersson, Råstam, & Ivarsson, 2017).

Treatment consisted in 14 sessions of individual cognitive behavioral therapy (CBT) with exposure and response prevention (E/RP) based on the study protocol of March et al. (March, Mulle, Foa, & Kozak, 2000), modified to include more family participation (Piacentini, Langley, & Roblek, 2007) and adapted to fit Nordic cultural conditions (Weidle et al., 2014) as first step. Adaptations included for example a more simplified approach, with a shorter preparation phase and earlier start of exposure work. Parents were encouraged to participate actively during the entire course of their child's treatment. Non-responders to step 1 CBT were randomized to either SSRI for at least 16 weeks or 10 additional sessions of CBT in a second step. Non-responders to Step 2 CBT were also offered SSRI. Assessments were performed before treatment, after 7 weeks of Step 1 (mid-treatment), at the end of Step 1, and 6, 12, 24, and 36 months after the end of Step 1 CBT. Details of the sample and procedures are described elsewhere (Torp et al., 2015).

2.3. Statistical analysis

Patients with and without sexual obsessions were compared on demographic and clinical characteristics using chi-square test. The total sample of 269 participants was included in the analyses according to intent-to-treat (ITT) principles. Attrition to follow-up assessments was 37.2% ($n = 100$) at the two-year follow-up and 37.5% ($n = 101$) at the three-year follow-up. Participants with missing and non-missing data were compared by baseline CY-BOCS total score, gender, age, age of onset, and socioeconomic status. None of these comparisons showed significant differences, nor were differences found when estimating treatment outcomes. Therefore, in subsequent analyses we assume that data were missing at random.

We applied piecewise regression (Ryan & Porth, 2007; Singer & Willet, 2003) to examine whether the presence of sexual obsessions during step 1 predicted immediate or long-term outcome measured by the CY-BOCS total score. This model evaluates whether a shift in the outcome trajectory occurs following the occurrence of a known event. In this paper, the known event is the end of the first-step CBT. Piecewise regression was used to examine the reduction in the CY-BOCS total score during first-step CBT compared to the three-year follow-up period.

To address how a reduction could affect a participant's outcome trajectory, we conducted a linear mixed-effects (LME) model that included random effects (intercept, weeks since baseline [time], and weeks since end of step 1 CBT [timespline]) and fixed effects (the presence of sexual obsessions and interaction of time/timespline and the presence of sexual obsessions). To this basic model, a series of discontinuous multilevel models for change were fitted to the data using restricted maximum likelihood estimation. The outcome modeled varied by the hypothesis under consideration and was evaluated by introducing to the "baseline" model a second level-1 individual growth trajectory with a discontinuity in both elevation and slope that marked the termination of the initial CBT treatment. The variable timespline, also a time-varying predictor, marked the passage of time following the start of follow-up. Tests were two-tailed, and a p-value of less than 0.05 was considered to indicate statistical significance.

Statistical analyses were performed in IBM SPSS (IBM, 2018), except for the LME, which was conducted in SAS Statistical Software, Version 9.4 (SAS, 2017).

2.4. Ethics

The study was approved by the Regional Committees for Medical and Health Research Ethics in Denmark, Norway, and Sweden. All parents gave written informed consent and the permission for their children to participate before inclusion in the study. The study was registered in Current Controlled Trials: Nordic Long-term Obsessive-compulsive disorder (OCD) Treatment Study (www.controlled-trials.com ISRCTN66385119).

3. Results

During the whole study period including three years follow up, sexual obsessions were reported by 48 patients (17.8%). During baseline and step 1 a total of 41 (15.2%) patients reported sexual obsessions, mostly just one obsession ($n = 21$), less frequently two (n = 10), three ($n = 6$), or four ($n = 4$). "Forbidden or upsetting sexual thoughts, images, and impulses", were reported most frequently (n = 24), while obsessions about homosexuality ($n = 14$), sexual behavior towards others (n = 12), or "unrealistic obsessions about getting pregnant" ($n = 10$) were less

common. Sexual obsessions occurred equally frequent in girls ($n = 22$, 16.1%); [$\chi 2$ (1.268) = 1.482, $p = .223$] and in boys ($n = 19$, $n = 14.5\%$). Girls ($n = 7$, 5.1%) had not more often [$\chi 2$ (1.268) = 0.125, $p = .724$] obsessions about pregnancy than boys ($n = 3$, 2.3%). Seven young people reported the presence of sexual obsessions not at baseline or during treatment, but for the first time at 6, 12, 24 or at 36 months follow up. These 7 were not included in the analyses, to allow for treatment response evaluation.

There were no differences in the reported symptom dimensions between children and adolescents with and without sexual obsessions, with one exception: Those with sexual obsession also rated a higher frequency of aggressive obsessions (Table 1).

Those with sexual obsessions were on average slightly older (13.5 years, SD = 2.2) (range 9–17 years) than those without (12.7 years, SD = 2.8) t (268) = −2.117, $p = .038$. Examination of the frequency of sexual obsessions by age showed increase at around age 11 (Fig. 1).

Comorbid disorders were present in about 40% with almost no differences between groups (Table 2).

Regarding treatment outcome (Fig. 2), there were no significant differences of the CY-BOCS total scores between the two groups at baseline ($p = .650$) or after fourteen sessions of CBT ($p = .116$). The two parallel lines in Fig. 2 show almost identical outcome. However, participants without sexual obsessions during step 1 CBT had a significantly lower score at 1-, and 2-year follow-up ($p = .040$) and (0.037). However, at 3-year follow-up the difference was not statistically significant ($p = .092$) (Table 3).

Of the 41 patients reporting sexual obsessions at baseline or step 1, only 11 did still report them after treatment, while 30 (including 5 missing) did not report them any longer. In eight of those 11, they disappeared during follow up. Only three patients reported sexual obsessions at 36 months follow up, including one, who had reported sexual obsessions at baseline, but not after treatment and during follow up, until they reappeared at the last follow up assessment at 36 months.

Table 1
OCD symptom dimensions in children and adolescents with and without sexual obsessions, n (%).

CY-BOCS symptom category	Sexual obsessions present ($n = 41$)	Sexual obsessions not present ($n = 228$)	Group difference (Chi-Square, p-value)
Contamination Obsessions	31 (75.6)	140 (61.4)	3.03 (.082)
Aggressive Obsessions	29 (70.7)	123 (53.9)	3.98 (**.046**)
Hoarding obsessions	9 (22.0)	48 (21.1)	0.02 (.897)
Magical Obsessions	17 (41.5)	76 (33.3)	1.02 (.314)
Somatic Obsessions	12 (29.3)	75 (32.9)	0.21 (.648)
Religious Obsessions	15 (36.6)	48 (21.1)	4.68 (.031)
Symmetry Obsessions	14 (34.1)	83 (36.4)	0.08 (.782)
Miscellaneous Obsessions	27 (65.9)	136 (59.6)	0.56 (.454)
Washing Compulsions	33 (80.5)	155 (68.0)	2.58 (.108)
Checking Compulsions	27 (65.9)	139 (61.0)	0.35 (.553)
Repeating Compulsions	26 (63.4)	110 (48.2)	3.20 (.074)
Counting Compulsions	13 (31.7)	70 (30.7)	0.02 (.898)
Symmetry/ Ordering Compulsions	19 (46.3)	87 (38.2)	0.98 (.324)
Hoarding Compulsions	8 (19.5)	52 (22.8)	0.22 (.641)
Magical Compulsions	15 (36.6)	70 (30.7)	0.56 (.456)
Involve Others in Compulsions	31 (75.6)	139 (61.0)	3.20 (.073)
Mental Compulsions	22 (53.7)	88 (38.6)	3.26 (.071)
Miscellaneous Compulsions	30 (73.2)	143 (62.7)	1.65 (.198)

Significant outcome is marked with bold; OCD = Obsessive-Compulsive Disorder; CY-BOCS = Children's Yale-Brown Obsessive-Compulsive Scale.

4. Discussion

The prevalence of sexual obsessions in our sample with 17.8% was lower than the 26.6% in the sample of Fernández de la Fernándezde la Cruz et al. (2013). This was expected due to differences between the samples, because their study was conducted in a specialist clinic receiving referrals for complicated, severe, or treatment refractory OCD, while our sample included patients from five main study sites with public community mental health clinics, with general referrals, as well as two specialized OCD clinics. Of the participants with posttreatment data in the Fernandez de la Cruz study, 34% also received medication for OCD in addition to CBT (SRIs and in a few cases also low doses of antipsychotics as an augmentation strategy), including some patients where medications were introduced, or doses changed during CBT. Furthermore, the medication group had a higher proportion of participants with sexual obsessions. In our sample none of the participants received medication for OCD (SRIs or antipsychotics) during first step CBT.

Correspondingly, in the study of Fernandez de la Cruz et al., OCD severity before treatment in terms of mean total CY-BOCS score was slightly higher with 27.7 (SD 6.6) in patients with sexual obsessions compared to 26.1 (SD 5.7) in those without, while the corresponding figures in our sample were 24.2 (4.5) for those with and 24.6 (5.2) without sexual obsessions.

Importantly, our results seem to be in line with the results of Fernandez de la Cruz. Also in our study treatment response was similar in both groups. In Fernandez de la Cruz' study, post-treatment mean total CY-BOCS scores were 15.2 in patients with sexual obsessions versus 14.1 in those without, while our figures had the same pattern with post treatment mean CYBOCS total score of 12 (95% CF 9.7, 14.3) in patients with sexual obsessions and 10.0 (95% CI 9.0, 10.9) in those without sexual obsessions.

Comparing age, we found the same pattern as Fernandez de la Cruz et al. Their participants with sexual obsessions were slightly older than those without sexual obsessions (mean age 14.8 versus 14.2 years). Participants in our sample were in general younger, but also those with sexual obsessions were on average a little older (mean age 13.5 years, SD 2.2) than those without (12.7 years, SD 2.2). The lower mean age of our sample may be another explanation for the lower prevalence of sexual obsessions, as Fernandez de la Cruz described an abrupt increase of these symptoms from around age 15. In our sample, examination of the frequency of sexual obsessions by age showed increase at around age 11 (See Fig. 1).

Interestingly, in our sample 17 patients did not report sexual obsessions at baseline, but during treatment or the follow up period. Ten of them reported sexual obsessions for the first time during treatment (week 7 or 14). Possible explanations could be underreporting sexual obsessions because of initial embarrassment or the inability to identify these thoughts as obsessions. Seven young people reported the presence of sexual obsessions for the first time during the follow up period (6–36 months). This might reflect their older age and illustrate the clinical experience, that not all adolescents are able to recognize these thoughts as sexual obsessions and to deal with them with exposure on their own, as they usually do with other obsessions.

In contrary to our acute outcome with no difference in treatment response, long-term follow-up data seem to modify this pattern. Participants without sexual obsessions during step 1 CBT had a slight, but significantly lower CYBOCS score at 1-, and 2-year follow-up (mean about 2 points) compared to those who have reported sexual obsessions.

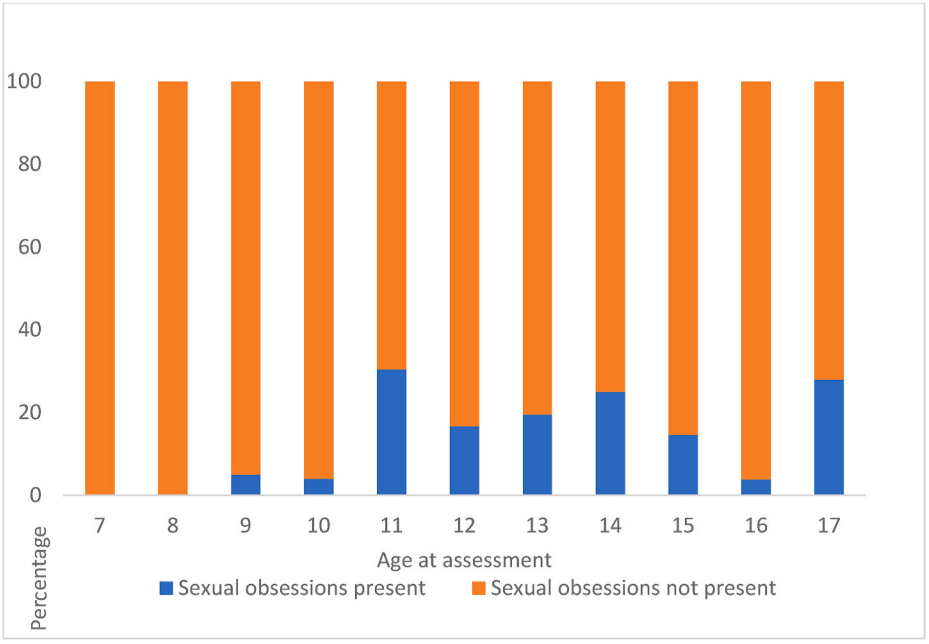

Fig. 1. Prevalence of sexual obsessions by age (n = 269).

Table 2
Presence of comorbidity in children and adolescents with and without sexual obsessions *n,* (%).

Comorbid disorder	Sexual obsessions present (n = 41)	Sexual obsessions not present (n = 228)	Group difference (Chi-Square, p-value)
Any comorbidity present	16 (39.0)	87 (38.2)	0.01 (.916)
Depressive disorders	2 (4.9)	8 (3.5)	0.18 (.670)
Anxiety Disorders	7 (17.1)	45 (19.7)	0.16 (.691)
ADHD	5 (12.2)	16 (7.0)	1.29 (.255)
Disruptive disorders	1 (2.4)	9 (3.9)	0.22 (.638)
Tic Disorders	9 (22.0)	42 (18.4)	0.28 (.595)

At 3-year follow-up the difference was not statistically significant. Both factors discussed above, i.e., the higher frequency of sexual obsessions at older age and the reported presence of sexual obsessions for the first time during the follow up period may have contributed to these results.

Fernandez de la Cruz described no differences in terms of presence of comorbid disorders (any comorbid disorder about 30% in both groups). However, details on type of disorder were not given, and diagnoses were made after clinical assessment as part of a routine clinical service, without using structured diagnostic interviews. However, to assess depressive symptoms, they administered the Beck Depression Inventory for Youth (BDI-Y) showing more severe depressive symptoms in their sexual obsessions group. In our sample, we had more comorbidity (any comorbid disorder 40.5%) in both groups. However, differences between groups were small and not significant (tab 1). Any comorbid disorder was present in 39% versus 38,2% of those without sexual obsessions. Depression was diagnosed in 4.9% versus 3.5%, while anxiety disorders were less frequent (17.1%) in those with sexual obsessions, compared to those without (19.9%). It is somewhat surprising that our younger and slightly less severe OCD sample was diagnosed with higher comorbidity, but the more systematic assessment procedure including confirmation of diagnoses with K-SADS could explain the difference.

4.1. Limitations

The main limitation in our study is the possibility of underreporting or disguising symptoms. As described, the nature of these embarrassing thoughts and their ego-dystonicity make it often difficult for young people to disclose the symptoms. This problem was mitigated, but not solved by using the structured CY-BOCS interview, with trained interviewers that were advised to inquire all potential obsessions and compulsions. In addition, our repeated measurements probably increased the reliability of the figures, since some young people did disclose their sexual obsessions first during treatment.

As described for the main study, the inability to understand one of the Nordic languages was an exclusion criterion. For this reason and the relatively homogeneous socio-demographic and cultural similarities of the population in the Nordic countries, the sample consisted mainly of highly educated families of Caucasian origin. This represents a clear limitation to the generalization value for other populations.

5. Conclusion

Sexual obsessions occurred in 17,8% of children and adolescents with OCD in our sample confirming and expanding the results of Fernandez de la Cruz from a specialist clinic with referrals for complicated, severe, or treatment refractory OCD to a more diverse and unmedicated sample. Our results suggest that a considerable number of children with OCD experience sexual obsessions, also those assessed in non-specialist health care services. If addressed and treated, the response to CBT is similar as in other obsessions. Sexual obsessions may add a significant load of distress and embarrassment to the burden of exaggerated worries present in OCD. CBT practitioners need to be aware that sexual obsessions might be disguised and not disclosed during assessment and the treatment course. To address sexual obsessions in treatment, clinicians need to assist the child to identify and disclose these obsessions with explicit questioning in a sensitive dialogue. Psychoeducation about the common nature of these obsessions including examples from other children can help the child, both to understand the question and to identify these thoughts as obsessions.

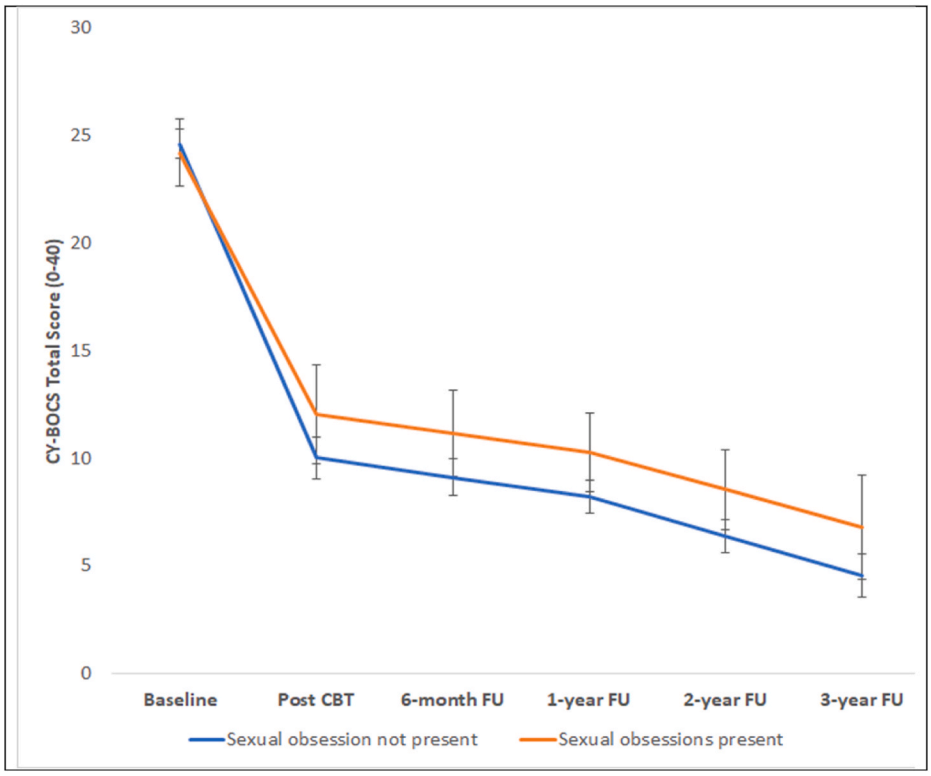

Fig. 2. Course of OCD during CBT for those with and without sexual obsessions using LME.

Table 3
OCD severity (mean CY-BOCS total score) during assessment, treatment and follow up in children and adolescents with and without sexual obsessions *n* (%).

	Mean	SE	95% CI: Lower Bound	95% CI: Upper Bound
Sexual obsessions present ($n = 41$)				
Baseline	24.2	0.8	22.6	25.8
Post CBT	12.0	1.2	9.7	14.3
6-month FU	11.2	1.0	9.1	13.2
1-year FU	10.3	0.9	8.5	12.1
2-year FU	8.5	1.0	6.7	10.4
3-year FU	6.8	1.2	4.4	9.2
Sexual obsessions not present ($n = 228$)				
Baseline	24.6	0.3	23.9	25.3
Post CBT	10.0	0.5	9.1	11.0
6-month FU	9.1	0.4	8.3	10.0
1-year FU	8.2	0.4	7.4	9.0
2-year FU	6.4	0.4	5.6	7.2
3-year FU	4.6	0.5	3.6	5.5

Note: Estimations of CY-BOCS severity score based on linear mixed-effects model. Post first-step CBT was measured at week 13. CBT= Cognitive behavior therapy; CY-BOCS =Children's Yale-Brown Obsessive-Compulsive Scale; FU= Follow-up; SE = standard error.

Author contributions

All authors have contributed to the article according to the Vancouver guidelines for authorship.

All authors have approved the final version to be published.

Ethics approval

The study has been approved by the appropriate ethics committees in Denmark, Norway and Sweden. This paper does not contain information that discloses the identity of participants of this study.

Consent to participate

Informed consent was obtained from all the participants in the study and their parents.

Consent for publication

All authors have given consent to publication.

Funding

No funding was received for this study.

Declaration of competing interest

Dr. Weidle has received royalties from book Publishers Gyldendal and Universitetsforlaget for co-authorship of books on OCD and Child and Adolescent Psychiatry. Dr. Thomsen has received royalties from book Publishers Gyldendal and Dansk Psykologisk Forlag for books on OCD and ADHD. He has received speaker fees within the last 3 years from Medicine and Shire. Declarations of interest for all other co-authors: The authors declare that they have no conflicts of interest.

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