

## PREDICTORS OF SLEEP DISTURBANCES IN TREATMENT-SEEKING OCD-PATIENTS

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### Abstract

**Objective:** Sleep disturbances are frequently undiagnosed in patients with mental disorders. The aim of the present study was to investigate the prevalence of sleep disturbances in a sample of treatment-seeking patients with obsessive-compulsive disorder (OCD).

**Method:** A total of 123 patients were screened, of whom 63 met diagnostic criteria for OCD and were further assessed with measures of sleep disturbances, obsessive-compulsive symptoms, depressive symptoms and metacognitive beliefs.

**Results:** The results showed that the sample was characterized by a high proportion of sleep problems, with 65 % of the patients having a PSQI global index indicative of insomnia. Sleep disturbances were significantly higher than in the normal population. A stepwise linear regression analysis showed that severity of compulsions explained the highest proportion of the variance in sleep disturbances, followed by depressive symptoms and negative metacognitive beliefs about uncontrollability of thoughts and danger.

**Conclusions:** The data suggest impaired sleep to be influenced by OCD-symptoms and possible clinical implications are discussed.

**Key words:** obsessive-compulsive disorder, insomnia, metacognitions, depression

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### Introduction

Obsessive compulsive disorder (OCD) is characterised by intrusive, unwanted thoughts, images or obsessions that the patient unsuccessfully tries to get rid of by performing overt or mental rituals (compulsions) or engaging in avoidance behaviour (American Psychiatric Association 2000). Life time prevalence of OCD is estimated to be 2-3% and if untreated the condition tends to become chronic (Kessler et al. 2005, National Collaborating Centre for Mental Health 2006). Co-morbid disorders like anxiety disorders and depression are common (Torres et al. 2006).

Despite clinical experience indicating that many OCD-patients complain about sleep problems (Havnen et al. 2013), the research literature on sleep disturbances in treatment-seeking OCD-patients is sparse (Paterson et al. 2013). Furthermore, the few studies show mixed results: Some studies report high prevalence of sleep disturbances in OCD-patients as compared to the normal population (Hohagen et al. 1994, Park et al. 2010, Voderholzer et al. 2007), whereas other studies indicate that an OCD-diagnosis per se does not predict sleep problems (Marcks et al. 2010). Also, it remains unclear whether sleep problems seen in OCD patients mainly can be regarded as part of comorbid depression

and depressive symptoms (Bobdey et al. 2002, Paterson et al. 2013).

Sleep problems are closely related to depression (Ford and Kamerow 1989), and it is also well known that insomnia is a frequent comorbid disorder to anxiety (Uhe et al. 2009), with the highest prevalence in generalized anxiety disorder (GAD; Monti and Monti 2000). Even though insomnia is often regarded as a product of anxiety or depression, longitudinal studies indicate that insomnia also may predict the development of future anxiety disorders (Neckelmann et al. 2007, Overland et al. 2008). Furthermore, untreated insomnia may contribute to a sub-optimal response to treatment of anxiety (Morin et al. 2011, Yang et al. 2009), and successful treatment of an anxiety disorder may also contribute to improvement of the sleep problems (Bélanger et al. 2004), although the evidence for the latter is mixed (Cervena et al. 2005, Zayfert and DeViva 2004).

One of the main features of insomnia is intrusive thoughts occurring at bed-time (Borkovec 1982, Harvey 2002), and it has been suggested that sleep-problems in OCD-patients may be specifically characterized by problems to initiate sleep (Bobdey et al. 2002, Harvey 2005, Turner et al. 2007) due to obsessive thoughts and time-consuming overt or mental rituals (Coles and Sharkey 2011). In accordance with this

idea, Mukhopadhyay et al. (2008) in a retrospective study found that the prevalence of delayed sleep phase disorder (DSPD) in patients with severe OCD was close to fifty per cent as compared to an estimated range in the normal population of 0.2% to 10% (Lack et al. 2009).

Of specific relevance for the assumption that intrusive obsessions are related to insomnia, is the concept of metacognitive beliefs (Wells 2008). According to Wells (2002) metacognitive beliefs are a given persons' assumptions related to appraisal of the thought process and to the controllability of thoughts (Wells 2009). There is research suggesting that especially negative metacognitive beliefs about the uncontrollability and danger of thought processes are associated with sleep disturbances, both sleep latency as well as quality (Harvey 2005, Schmidt et al. 2011). The assumption that negative metacognitive beliefs are related to insomnia in OCD-patients has, to the best of our knowledge, not been investigated.

Thus, the aims of the current study were to 1) Describe the prevalence of sleep disturbances in a large sample of treatment-seeking OCD patients, and 2) Investigate to what extent obsessive-compulsive symptoms, depressive symptoms and metacognitive beliefs are related to sleep problems. Specifically, it is hypothesized that the prevalence of insomnia is significantly higher in a treatment-seeking OCD patients as compared to the normal population. Furthermore, it is expected that sleep problems in treatment-seeking OCD-patients are related both to negative metacognitive beliefs and time-consuming rituals.

## Methods

### *Diagnostics and screening*

The current study is part of a standard quality control performed at our outpatient OCD-clinic. Patients included in the study were first referred from their general practitioner to the local district outpatient psychiatric facility. If the OCD, or suspected OCD, was considered a severe psychiatric condition requiring public health-care, patients were referred to the OCD-team. A total of 123 consecutively referred patients were potentially eligible for the current study. Patients first met for a clinical interview in order to establish a principal DSM-IV-TR diagnosis of OCD (American Psychiatric Association 2000) according to the administration of the Norwegian version of Mini International Neuropsychiatric Interview (M.I.N.I.; Leiknes et al. 2005). Based on this, 63 (51 %; 48 females) of the referred patients met diagnostic criteria for OCD and were invited to further evaluation.

### *Assessment*

Obsessive and compulsive symptoms were registered with the self-report Yale-Brown Obsessive-Compulsive Scale Symptom Checklist (Y-BOCS-CL; Goodman et al. 1989). The checklist has 58 items; items 1-37 cover different types of obsessions and items 38-58 cover subtypes of compulsions.

Severity of obsessive-compulsive symptoms was measured with the clinician administered Yale-Brown Obsessive-Compulsive Scale (Y-BOCS, (Goodman et al. 1989). Y-BOCS consists of 10 items, 5 cover the severity of obsessions and 5 cover the severity of compulsions. Each item is rated from 0-4, total score ranges between 0-40 with higher scoring indicating higher degree of severity. The Y-BOCS has good

psychometric properties with reported Cronbach's  $\alpha$  ranging from 0.88 to 0.91 (Goodman et al. 1989). Cronbach's  $\alpha$  in the present sample was 0.57.

Depressive symptoms were assessed with the Beck Depression Inventory (BDI; Beck et al. 1996). BDI has 21 items which are rated on a 0-3 scale, with higher total score indicating more severe depressive symptoms. The psychometric properties of BDI are well-established, with internal reliability ( $\alpha$ ) of 0.93 (Beck et al. 1996). In the present sample, Cronbach's  $\alpha$  was 0.87.

Subjective sleep quality was measured with the Pittsburgh Sleep Quality Index (PSQI; Buysse et al. 1989). Sleep quality is assessed with 19 items comprising seven subscales. Higher scores reflect poorer sleep quality. PSQI has sound psychometric properties with reported Cronbach's  $\alpha$  of 0.83 (Buysse et al. 1989). Internal consistency ( $\alpha$ ) for this sample was 0.75.

Metacognitions were assessed with the Metacognitions Questionnaire 30 (MCQ-30; Wells and Cartwright-Hatton 2004). This 30-item self-report scale has five subscales reflecting beliefs about thinking: 1) Positive beliefs about worry, 2) Negative beliefs about thoughts concerning uncontrollability and danger, 3) Cognitive confidence, 4) Need to control thoughts, and 5) Cognitive self-consciousness. Internal consistency is good with Cronbach's  $\alpha$  of 0.93 (Wells and Cartwright-Hatton 2004). Internal consistency ( $\alpha$ ) was 0.90 in the present sample.

All assessments used in the present paper were carried out before treatment initiation. The M.I.N.I. and Y-BOCS interviews were conducted by a clinical psychologist or psychiatrist with special training in performing these interviews. The remaining measures were self-reported questionnaires.

### *Statistical analyses*

Statistical analyses were conducted in SPSS version 22.0. The relationships between the investigated variables were assessed with Pearson's Product-moment correlations for continuous variables. For the Y-BOCS-CL the number of domains checked was pooled and analyzed as continuous variables. Based on the significant correlations obtained a stepwise multiple regression analysis was conducted with PSQI as the dependent variable and Y-BOCS (compulsions), BDI and MCQ-30 (uncontrollability/ danger subscale) as predictor variables to test the relationship between these variables.

## Results

The sample had a mean age of 33.9 (SD=11.2). Y-BOCS rated severity of OCD-symptoms showed a mean score of 25.9 (SD=3.8), mean subscores for obsessions and compulsions were 13.0 (SD=2.2) and 12.7 (SD=2.5), respectively. Severity of depressive symptoms measured with the BDI showed a sample mean score of 18.2 (SD=10.0). Mean scores on MCQ-30 for the subscales positive beliefs and uncontrollability/ danger were 10.4 (SD=4.4) and 16.4 (SD=3.9), respectively.

A total of 41 patients (65%) of the sample had a PSQI total score of >5, which indicates insomnia (Buysse et al. 2006). Mean PSQI global score was 7.71 (SD=3.94). Comparisons between the PSQI scores from the present sample and healthy controls are presented in **table 1**. The OCD sample had significantly higher rates of sleep disturbances as compared to controls in an American

**Table 1.** Mean PSQI scores of OCD sample and comparisons with Norwegian and American healthy controls

Component	OCD ( <i>n</i> = 63)	Norw. controls ( <i>n</i> = 506)		Am. controls ( <i>n</i> = 52)	
	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>t</i>	<i>M</i> ( <i>SD</i> )	<i>t</i>
Quality	1.35 (0.73)	1.10 (0.71)	2.63 <sup>a</sup>	0.35 (0.48)	8.46 <sup>c</sup>
Latency	1.42 (1.12)	1.39 (0.97)	0.23	0.56 (0.73)	4.72 <sup>c</sup>
Duration	1.03 (0.97)	0.56 (0.69)	4.85 <sup>c</sup>	0.29 (0.50)	4.96 <sup>c</sup>
Efficiency	0.86 (0.98)	0.81 (0.98)	0.38	0.10 (0.30)	5.37 <sup>c</sup>
Disturbances	1.49 (0.63)	1.12 (0.50)	5.37 <sup>c</sup>	1.00 (0.40)	4.80 <sup>c</sup>
Medication	0.62 (1.05)	0.13 (0.48)	6.43 <sup>c</sup>	0.04 (0.28)	3.87 <sup>b</sup>
Dysfunction	1.30 (0.69)	0.97 (0.60)	4.05 <sup>c</sup>	0.35 (0.48)	8.39 <sup>c</sup>
Global score	7.71 (3.94)	5.99 (2.93)	4.21 <sup>c</sup>	2.67 (1.70)	8.58 <sup>c</sup>

Note. Norw. controls = Norwegian controls (Sample 3, Pallesen et al. 2005); Am. controls = American controls (Buysse et al. 1989). <sup>a</sup>  $p < 0.01$ , <sup>b</sup>  $p < 0.001$ , <sup>c</sup>  $p < 0.0001$ .

sample (Buysse et al. 1989) and significantly higher rates on the global index as well as on the majority of subscales as compared to a Norwegian sample (Pallesen et al. 2005).

An explorative correlational analysis was conducted to investigate the relationship between PSQI and the variables BDI, MCQ-30 (positive beliefs), MCQ-30 (uncontrollability/ danger), Y-BOCS-CL (number of obsession-subtypes), Y-BOCS-CL (number of compulsion-subtypes), Y-BOCS-CL (number of checking compulsions), Y-BOCS-CL (total items checked), Y-BOCS (obsessions), Y-BOCS (compulsions) and Y-BOCS (total score). The correlational analysis (see **table 2**) showed significant correlations between PSQI and BDI, MCQ-30 (uncontrollability/ danger), Y-BOCS-CL (compulsion items), Y-BOCS-CL (total items), Y-BOCS (compulsions) and Y-BOCS (total score).

Based on expected relationship between sleep-

disorders, depression as well as disorder specific symptoms like obsessions, compulsions and metacognitive beliefs a stepwise multiple regression analysis including all significantly correlating variables was conducted with PSQI as the dependent variable.

The results from the stepwise multiple regression analysis are presented in **table 3**. At step 1 of the analysis Y-BOCS (compulsions) contributed most to the prediction, explaining 28.0% of the variance of sleep quality ( $F_{1,45}=17.08$ ,  $p<0.0001$ ). At step 2 BDI was entered, explaining an additional 16 % of the variance ( $F_{1,44}=12.50$ ,  $p<0.001$ ). At step 3 MCQ-30 (uncontrollability/ danger) was entered, explaining a further 6% of the variance ( $F_{1,43}=5.80$ ,  $p=0.021$ ). The remaining variables did not enter into the equation and were excluded. Thus the stepwise regression analysis showed that the predictor variables explained a total of 50.2% of the variance in sleep quality.

**Table 2.** Summary of intercorrelations between PSQI and BDI, MCQ-30, Y-BOCS-CL and Y-BOCS

Measure	PSQI
BDI	.37 <sup>b</sup>
MCQ (positive)	.20
MCQ (negative)	.42 <sup>b</sup>
Y-BOCS-CL (obsessions)	.19
Y-BOCS-CL (compulsions)	.34 <sup>b</sup>
Y-BOCS-CL (checking compulsions)	.12
Y-BOCS-CL (total)	.27 <sup>a</sup>
Y-BOCS (obsessions)	.17
Y-BOCS (compulsions)	.47 <sup>b</sup>
Y-BOCS (total)	.40 <sup>b</sup>

Note. MCQ (positive) = MCQ-30 positive beliefs; MCQ (negative) = MCQ-30 uncontrollability/ danger; Y-BOCS-CL = Yale-Brown Obsessive-Compulsive Scale Symptom Checklist. <sup>a</sup>  $p < 0.01$ , <sup>b</sup>  $p < 0.001$ .

**Table 3.** Stepwise multiple regression of predictors of sleep quality (only significant predictors are included)

Variable	Multiple R	<i>B</i>	Standard error <i>b</i>	Beta	<i>t</i>
Y-BOCS (compulsions)	3.31	0.67	0.17	0.43	3.94 <sup>c</sup>
BDI	2.95	0.12	0.04	0.32	2.76 <sup>b</sup>
MCQ (negative)	2.80	0.30	0.12	0.27	2.18 <sup>a</sup>

Note. Y-BOCS (compulsions) = Yale-Brown Obsessive-Compulsive Scale (items 6-10); BDI = Beck Depression Inventory; MCQ (negative) = MCQ-30 uncontrollability/ danger. <sup>a</sup>  $p < 0.05$ , <sup>b</sup>  $p < 0.001$ , <sup>c</sup>  $p < 0.0001$ .



## Discussion

The results from the present study indicate that sleep problems are a common problem in treatment seeking OCD-patients, as 65 % of the sample reported clinically significant sleep problems and the sample had significantly higher global PSQI score than the normal population, both when compared to a Norwegian sample as well as an American sample. As expected, depression was strongly related to sleep problems (Ohayon and Roth 2003). In line with our hypotheses, there was also a significant relationship between the severity of compulsive symptoms and impaired sleep, but contrary to expectations this was not related to checking compulsions in particular, which might indicate that the compulsions interfering with sleep-onset are not overt but mainly mental rituals. Importantly, the present study implies that sleep disturbances in OCD-patients may not only be due to comorbid depression, but may also be influenced by the obsessive-compulsive symptoms per se. Previous research has shown that sleep problems are rarely detected by clinicians (Kallestad et al. 2011), and based on the current findings we recommend clinicians to assess patients' degree of sleep disturbances and evaluate to what extent this should be directly addressed during treatment of OCD.

Clinically, the significant effects OCD-symptoms have on sleep may reflect the uncontrollable intrusive thoughts and the time-consuming mental rituals patients experience in the pre-sleep period. The sample did not differ significantly from healthy controls on sleep latency in a Norwegian sample, which may indicate that OCD patients do not have more difficulty falling asleep, but experience more reduced sleep quality overall, as evident from the greater daytime dysfunction reported in the sample compared to controls. Further, our analysis showed that positive metacognitive beliefs did not have any significant effect on sleep disturbances. A reason for this might be that positive beliefs only contribute to the persons assumptions about the advantages of worrying, something that is not a problem in itself. As proposed by the metacognitive model, the negative beliefs concerning uncontrollability and danger of thoughts complete the worrying circle and prohibit the patient from disengaging from the intrusive worrying thoughts, and this makes it difficult for the patient to initiate sleep.

The findings are important, since previous research has demonstrated that untreated sleep disorders in themselves can contribute to impairment in everyday functioning, as well as have a significant negative impact on the outcome of treatment of anxiety disorders (Yang et al. 2009). Furthermore, despite some mixed findings, previous research has demonstrated that the treatment of an anxiety disorder might positively influence sleep problems (Bélanger et al. 2004, Cervena et al. 2005, Zayfert and DeViva 2004). It is thus recommended that OCD-patients are screened for sleep disturbances prior to treatment. In order to address whether adequate treatment of the OCD also has significant effects on the sleep problems, both longitudinal effect-studies, as well as controlled studies that systematically explore the temporal relationships between OCD and sleep disturbances are needed.

The major limitation of the present study is the lack of objective sleep assessment. Future studies should combine self-reported sleep quality and objective measurements (e.g. laboratory-based polysomnography) to secure unbiased data. The strength of the current study is the application of well-validated measures in a large clinical sample consisting entirely of treatment-seeking OCD-patients.

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