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Review Article

Sleep in obsessive–compulsive disorder: a systematic review and meta-analysis

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ABSTRACT

The aim of this study was to determine whether there are differences in sleep between people with and without obsessive–compulsive disorder (OCD), and, if so, whether such differences are associated with comorbid depressive symptoms or other conditioning factors. We conducted a search for articles published until March 2013 in PubMed, Web of Knowledge, PsycINFO, Scopus, Trip Database, Dissertation Abstracts, and OpenSIGLE. We retrieved 9658 records, which were assessed against the inclusion and quality criteria. Six studies were included in the review and four were included in the meta-analysis. They were all cross-sectional studies with medium methodological quality. All studies except one were polysomnographic. The total sample of the meta-analysis consisted of 111 patients with OCD and 141 controls. The synthesis of results showed differences in sleep between people with and without OCD. The presence of comorbid depression was a key issue in the amount and type of differences found. Nevertheless, in order to support these results, longitudinal studies should be conducted with larger sample sizes and different age ranges.

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1. Introduction

Obsessive–compulsive disorder (OCD) is an anxiety disorder characterized by the presence of repetitive obsessions and compulsions that are senseless and out of control, and that generate anxiety and distress in those who experience them and interfere with their daily activities. Obsessions are intrusive ideas, thoughts, or images of various types, and compulsions are acts or behaviors that individuals perform to suppress the anxiety generated by obsessions. Although OCD is characterized by a heterogeneity of symptoms, the most common obsessions are associated with the following issues: fear of causing harm to others or to oneself, being contaminated, and making mistakes or exhibiting inappropriate behaviors; the need for order and symmetry; and sexual or religious ideas or beliefs. The most common compulsions are checking, cleaning, repeating words, counting, and hoarding [1–4].

OCD is one of the most serious and disabling diseases [3], and it has an estimated prevalence of about 2% in the general population

[5]. Although the exact cause of its onset is unknown [1], it can appear as much in childhood as in adulthood, without important differences in symptoms between older and younger individuals. However, there are differences in sex and comorbidity between child and adult populations [4]. Comorbid diseases are very frequent among people with OCD. The most usual comorbidities are depression, eating disorders, Tourette's syndrome, substance abuse, and certain anxiety disorders [3]. A relationship between OCD and certain sleep disturbances has been also found, although the results of studies carried out on this question are contradictory.

Although the results of some studies suggest differences between people with and without OCD regarding sleep continuity, such as in sleep duration and time awake before or after sleep [6–8], the results of other studies show differences in relation to sleep architecture. For instance, Kluge, Schussler, Dresler, Yassouridis, and Steiger [9] found that participants with OCD spent a lower amount of time in stage 4 sleep than controls. Some authors have also pointed out a relationship between OCD symptoms and insomnia or delayed sleep phase disorder [10,11]. However, other authors, conversely, did not find differences in any sleep variable assessed between people with OCD and people without OCD [12]. Moreover, in some studies, changes in sleep in some participants may have been due to a greater severity of their disease or to the presence of concomitant depression. This type of depression, similar to other psychiatric and neurodegenerative diseases, has already been associated with sleep and circadian rhythm disorders [13].

It is important to consider sleep patterns in clinical diseases because they are a key factor in people's health and quality of life.

Abbreviations: Chi², heterogeneity test; DSM, Diagnostic and Statistical Manual of Mental Disorders; I², heterogeneity index (%); ICD, International Classification of Diseases; OCD, obsessive–compulsive disorder; REM, rapid eye movement; SIGN, Scottish Intercollegiate Guidelines Network; SD, standard deviation; SMD, standardized mean difference; SR, systematic review; Y-BOCS, Yale-Brown Obsessive Compulsive Scale; Z, test for overall standardized mean difference.

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In fact, there is a relationship between sleep patterns and various physical, mental, and social impairments [14–20]. There are also reasons to believe that sleep disturbances can aggravate the course and treatment of various diseases [21].

Given the influence of sleep on various aspects and the current controversy about its relationship with serious illnesses such as OCD, a systematic review (SR) was needed to clarify the issue and allow a better prognosis and quality of life for patients with OCD. Although an SR was conducted recently in order to resolve that question [8], the inclusion of studies in which participants with OCD were not compared with a control group does not allow definitive conclusions to be obtained. In addition, some of the studies included in that SR did not provide data regarding comorbidities or medication. Therefore, it cannot be known if people with OCD really suffer from sleep disturbances, or if there are other conditioning factors in this relationship that have not been taken into account. Above all, the influence of depression comorbidity in sleep disturbances of people with OCD could not be elucidated. As a result, it was necessary to conduct an SR analyzing available studies from a more specific approach in order to answer this question. Particularly, there was a need to compare people with OCD and people without OCD (and any other mental disorder) in sleep, taking into account comorbid depression as well as any other variable that may have an impact on the sleep disturbances found between both groups of people.

Considering this, the overall objective of this SR or theoretical study [22] was to determine, following the criteria established by Perestelo-Perez [23], whether there are differences in sleep between people with OCD and people without OCD and, if so, whether such differences are associated with comorbid depression or other conditioning factors.

2. Methods

2.1. Search strategy

We conducted a literature search for articles published until March 2013 in PubMed, Web of Knowledge, PsycINFO, Scopus, Trip Database, Dissertation Abstracts, and OpenSIGLE. We used the following search terms: <<sleep* OR polysomnography OR actigraphy OR sleep, REM OR wak* OR circadian rhythm OR biological clocks OR circadian clocks OR sleep* stages OR sleep* deprivation OR sleep dis* OR dys?omnias OR parasomnias OR sleep* initiation and maintenance dis* OR dis* of excessive somnolence OR REM sleep* parasomnias OR sleep* dis*, circadian rhythm OR chronobiology dis* OR sleep* dis*, intrinsic OR sleep-wak* transition dis* OR sleep* arousal dis* AND obsessive compulsive dis*>>. The search terms were in Spanish or in English depending on the database, and they were limited to the title, abstract, and keyword fields. We did not set any search limits regarding language or publication year in order to be comprehensive in the information retrieval. Subsequently, we also conducted a manual search, analyzing each of the journals where the selected articles had been published and reviewing the references of each article in case they included another study of interest that had not been identified.

2.2. Selection criteria

Studies were selected based on the following criteria: (1) studies including patients with OCD – according to the Diagnostic and Statistical Manual of Mental Disorders (DSM), the International Classification of Diseases (ICD), or any other diagnostic manuals – in whom the disorder was not due to the direct physiological effects of a substance or a medical illness; if patients had another disorder, the content of their obsessions or compulsions should not be limited to the other disorder; (2) comparative studies (randomized

or nonrandomized) in which the control group was composed of people without OCD or any other psychiatric disorder and the evaluation had been performed simultaneously in both groups by the research team itself; (3) studies considering the existence or non-existence of differences in sleep and the type of differences as outcome measures; 4) studies providing data on age, sex, severity of disease, medication, and concomitant diseases of participants; and (5) articles that were not just abstracts or conference papers.

2.3. Study selection

The titles and abstracts of the studies identified were screened to verify whether they met all the selection criteria discussed above. When there were any doubts, the full text of the study was reviewed.

2.4. Assessment of risk of bias and methodological quality

We assessed the risk of bias of studies identified using the Scottish Intercollegiate Guidelines Network (SIGN 50) checklist developed for cohort studies [24], whose efficiency has been demonstrated by Bai, Shuckla, Bak, and Wells [25]. To avoid any bias, the identifying data of studies were removed and studies were assigned a number by an external person prior to the assessment. According to the degree of compliance of their items, studies were classified into three groups: (1) high quality, low risk of bias; (2) medium quality, moderate risk of bias; and (3) low quality, high risk of bias. As some items were not applicable to the type of studies selected, we obtained a weighted score by subtracting one degree of quality from the score obtained. We only included studies classified into the second group according to the weighted score.

2.5. Data collection and statistical analysis

After selecting the articles, we obtained relevant information from each one using a form that included data concerning the article itself, the methodology used, the most important characteristics of participants, and the main differences found between both groups.

Next, we performed a meta-analysis following the steps proposed by Botella and Gambará [26], and including only those studies in which the same assessment measure of sleep had been employed: polysomnography. We selected the variables to be analyzed considering the most common variables among the studies and others that were significant or of interest in some studies and could be inferred from other variables in studies where they were missing. We explored the relationship between exposure to OCD as a risk factor and the following sleep parameters: sleep period time, total sleep time, sleep latency, sleep efficiency, time awake, stage 1 sleep, stage 2 sleep, slow-wave sleep, rapid eye movement (REM) sleep, and REM latency.

We conducted the meta-analysis using Review Manager 5.2 software, with a fixed-effects model and a 95% confidence interval (CI). We calculated the following: (1) the standardized mean difference (SMD) as a measure of effect size or summary statistic, with the correction proposed by Hedges [27] to avoid bias due to sample size; (2) the pooled SMD or weighted mean effect size according to the inverse variance method; (3) the chi-squared and I^2 statistics [28], to assess and quantify the heterogeneity between the studies; and (4) the Z statistic, to verify the statistical significance of the overall SMD.

Later, in order to verify whether sleep disturbances were due to OCD or only to the presence of a comorbid depression, we performed a second meta-analysis following the same procedure. This time, we only included studies in which participants with OCD did not have comorbid depression in order to compare the results of both meta-analyses.

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