



## Original Article

## Sleep disturbances in a clinical forensic psychiatric population

Jeanine Kamphuis<sup>a,\*</sup>, Julie Karsten<sup>a</sup>, Al de Weerd<sup>b,c</sup>, Marike Lancel<sup>a,c</sup><sup>a</sup> Department of Forensic Psychiatry, Mental Health Services Drenthe, Assen, The Netherlands<sup>b</sup> Sleep Centre, SEIN Zwolle-Groningen, The Netherlands<sup>c</sup> Centre for Sleep and Psychiatry Assen, Mental Health Services Drenthe, Assen, The Netherlands

## ARTICLE INFO

## Article history:

Received 11 December 2012

Received in revised form 1 March 2013

Accepted 5 March 2013

Available online 14 September 2013

## Keywords:

Forensic psychiatry

Sleep disorder

Insomnia

Sleep hygiene

Personality disorder

## ABSTRACT

**Objective:** Poor sleep is known to cause detrimental effects on the course of diverse psychiatric disorders and is a putative risk factor for hostility and aggression. Thus, sleep may be crucial in forensic psychiatric practice. However, little is known about the prevalence of sleep disturbances in these complex psychiatric patients.

**Methods:** In this study we investigated the presence of sleep disorders and subjective sleep quality using the Sleep Diagnosis List (SDL), the Pittsburgh Sleep Quality Index (PSQI), interviews addressing the causes of sleep complaints, and file information on sleep medications in 110 patients admitted to a forensic psychiatric hospital.

**Results:** Almost 30% of the participants suffered from one or more sleep disorders, especially insomnia. An even larger proportion of the participants (49.1%) experienced poor sleep quality. Interestingly, patients with an antisocial personality disorder or traits were particularly dissatisfied with their sleep. The most common causes of sleep problems were suboptimal sleep hygiene, stress or ruminating, negative sleep conditioning, and side effects of psychotropic medication. Of the poor sleepers, 40.7% received a hypnotic drug.

**Conclusion:** Despite intensive clinical treatment, sleep problems are experienced by a large number of forensic psychiatric patients. It would be worthwhile to examine the effects of pharmacological and non-pharmacological sleep interventions on both psychiatric symptoms and reactive aggressive behavior in forensic patients.

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## 1. Introduction

Sleep disturbances are common in individuals with psychiatric disorders [1]. For example, sleep problems are present in approximately 80% of patients with a major depressive disorder (MDD) [2], in 30% to 80% of patients with schizophrenia [3], and in at least 55% of individuals with active substance abuse [4,5]. Although these sleep disturbances often are secondary to the psychiatric illness, recent observations strongly suggest that sleep disorders should be actively treated parallel to the psychiatric disorder. The few studies regarding this matter indicate that separate treatment of comorbid sleep disturbances exerts positive effects on the course of the psychiatric disorder and may prevent relapses [6]. For instance in female sexual assault survivors, imagery rehearsal therapy with a focus on nightmares was found to alleviate both insomnia and other symptoms of a posttraumatic stress disorder (PTSD) [7]. In schizophrenic patients, music relaxation played at

bedtime has been shown to reduce subjective and objective insomnia complaints as well as total psychopathology score on the Positive and Negative Syndrome Scale [8]. Moreover, studies in patients with MDD showed that pharmacological and cognitive behavioral treatment of sleep disturbances may enhance the antidepressant response to psychopharmacologic drugs [9–11].

Because a lack of sleep is associated with emotional instability, short temperedness, hostility, and aggression [12], sleep disturbances may be particularly detrimental for aggressive populations, such as forensic psychiatric patients. Anecdotal evidence suggests that treatment of sleep disturbances can reduce aggression [13–15]. Although clinical observations suggest that sleep problems are common in forensic psychiatric patients, epidemiologic studies on this topic are lacking. The aims of this study, therefore, were to examine in a clinical forensic psychiatric population i) the prevalence of sleep disorders, ii) sleep quality and sleep problems, iii) the association between poor sleep and psychiatric disorders, iv) perceived causal and perpetuating factors of sleep difficulties, including sleep hygiene behavior and v) the treatment of sleep disturbances.

\* Corresponding author. Tel.: +31 592 334800; fax: +31 592 334402.

E-mail address: [Jeanine.Kamphuis@ggzdrenthe.nl](mailto:Jeanine.Kamphuis@ggzdrenthe.nl) (J. Kamphuis).

## 2. Methods

### 2.1. Participants and procedure

Participants were recruited from two forensic psychiatric hospitals in the Netherlands, the Forensic Psychiatric Centre (Dr. S. Van Mesdag) in Groningen and the Forensic Psychiatric Hospital in Assen. Patients who were present at the weekly group meetings on their unit received written and oral information from the first author. It was made clear to them that they had the right to refuse participation and that this would not affect future treatment. After 2 weeks of consideration, participating patients gave written informed consent. The participants completed questionnaires that assessed the presence of sleep disorders and sleep quality. Each participant also underwent a semistructured interview to obtain additional information on their sleep problems, possible causes, and sleep hygiene behavior. Participants received a financial compensation of €5. The research proposal was approved by the local ethics committee (Hospital Ethics Committee of the Isala Clinics in Zwolle, Netherlands).

Of the 205 patients who were asked to participate in our study, 110 agreed and completed all required questionnaires (total response rate, 53.7%).

### 2.2. Questionnaires

The Sleep Diagnosis List (SDL) was used to assess the presence of sleep disorders and sleep-related problems, including insomnia, hypersomnia, periodic leg movements (PLMs), restless legs syndrome (RLS), sleep-related breathing disorders, and negative sleep conditioning. The SDL is derived from the Sleep Diagnostic Questionnaire [16,17] and consists of 75 randomly distributed questions regarding sleep during the last 6 months. The questions are answered on a five-point scale ranging from 1 (never) to 5 (very often or always). A category score  $\geq 3$  indicates the presence of a sleep disorder [16,17]. The SDL has been validated in Dutch participants with sleep disorders [18].

The Pittsburgh Sleep Quality Index (PSQI) was used to assess subjective sleep quality and sleep problems over the preceding month. It has been shown to be a reliable and valid instrument in psychiatric populations [19]. The 19 individual items of the PSQI are grouped to seven component scores, including subjective appreciation of sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbing factors, use of sleep medication, and daytime dysfunctioning. Each component obtains a value between 0 (no difficulty on this particular component) and 3 (severe difficulty). We considered a score of three as clinically relevant. All component scores were summed to generate a global score between 0 and 21, with higher global scores indicating worse sleep quality. A cutoff global score of five (PSQI > 5) was used to identify participants who were dissatisfied with their sleep (poor sleepers) [19].

### 2.3. Semistructured interview

The semistructured interview took 30 to 45 minutes. In this interview the participant was asked if he or she currently experienced sleep problems. If a sleep problem was present, inquiries were made with respect to its history, the type of sleep problem, frequency of occurrence, possible causal factors, and earlier interventions. Sleep hygiene was assessed in a semistructured way by asking about daytime napping, behavior during the hour preceding bedtime, caffeine usage, and smoking habit.

### 2.4. Medical file information

Information concerning sociodemographic data, mental health (Diagnostic and Statistical Manual of Mental Disorders, 4th Edition [DSM-IV] classification), and medication were collected from files. With respect to diagnostics, psychiatric disorders are diagnosed based on clinical interviews by experienced forensic psychiatrists and psychologists and lengthy observations on the wards by multidisciplinary teams in both hospitals. In the majority, (part of) the diagnostic process including DSM-IV classification is already performed elsewhere as a part of the criminal trial and is reevaluated when the participant is admitted to the hospital. Psychologic tests are not performed on every patient, only if it is indicated to support the clinical diagnostic assessment. With regard to medication, we categorized hypnotics (especially those prescribed for sleep), sleep-promoting medications (prescribed for other purposes than sleep), and medications with a sleep disrupting effect. Benzodiazepines, the so-called Z drugs (e.g., zolpidem, zopiclone) and antipsychotic and antidepressant medications with sedating properties (e.g., clozapine, risperidone, olanzapine, quetiapine, mirtazapine) were considered as sleep-promoting medications or hypnotics, depending on the indication [20–22]. Thus, melatonin was included in the group of hypnotics. Serotonin-reuptake inhibitors and stimulant drugs (e.g., methylphenidate, dextroamphetamine) were considered to have a sleep-disrupting effect [20,21,23,24]. We also took into account other well-known side effects of psychopharmacologic drugs when exploring possible causes of sleep disturbances, as many atypical antipsychotic medications and some antidepressant medications cause weight gain [25,26], which increases the risk for a sleep-related breathing disorder [27]. In addition these drugs may cause or exacerbate RLS [28–30].

### 2.5. Statistical analyses

Descriptive analyses and  $\chi^2$  tests were performed to describe the study group and their scores on the different outcome measures. Logistic regression analyses models were used to investigate if poor sleep was related to certain psychiatric disorders. A PSQI > 5 was the outcome variable and the presence of different psychiatric disorders were used as predictors. Use of sleep-promoting (including hypnotics) and sleep-disrupting medication also were added as predictors, as these constitute potential confounders for the association of certain psychiatric diagnostic categories with an adequate or poor sleep quality. When a psychiatric disorder significantly predicted sleep quality, we investigated the differences on the PSQI component scores with two-sided independent Student *t* tests to analyze how the sleep differed from that of participants without such a diagnosis. As a final step, we explored perceived causal and perpetuating factors of sleep difficulties, including sleep hygiene behavior and the treatment of sleep disturbances in patients reporting sleep problems. Alpha levels of  $p < .05$  were used to define statistical significance. All analyses were conducted with use of PASW Statistics 18.

## 3. Results

### 3.1. Participant characteristics

Characteristics of the participants are shown in Table 1. The majority of the sample were men (97.3%). The mean age of the sample was  $36.6 \pm 10.2$  (standard deviation) years, ranging from 21 to 77 years. Nearly all participants were sentenced by the criminal court for a violent offence. More than 40% of participants did not enter or finish high school. At the time of the investigation, the average duration of admission in the hospital was  $28.9 \pm 32.1$

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