

# Relationships of psychiatric disorders with sleep duration in an adult general population sample

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## Abstract

The objective was to explore psychiatric disorders as potential predictors of sleep duration. A cross-sectional survey study with a probability sample of residents of a northern German area was carried out. There were 4075 study participants, aged 18–64 years, with a participation rate of 70.2%. Face-to-face in-home computer-aided interviews (Composite International Diagnostic Interview) provided diagnoses of nicotine and alcohol dependence, alcohol abuse, depressive, anxiety and somatoform disorders according to the Diagnostic and Statistical Manual of the American Psychiatric Association (DSM-IV), and included questions about sleep duration. Results show that subjects with a short sleep duration of 5 h or less had significantly increased odds ratios (OR) for current nicotine dependence (OR 1.9; confidence interval, CI, 1.2–2.9), alcohol dependence (OR 2.6, CI 1.2–5.6), depressive disorder (OR 3.0, CI 1.7–5.4) or anxiety disorder (OR 2.1, CI 1.3–3.4) compared to individuals who never had the respective psychiatric disorder after adjustment for sex, age, and school education in a multinomial regression analysis. The conclusion is drawn that current nicotine or alcohol dependence, depressive, and anxiety disorders may add to short sleep duration in this random adult general population sample.

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## 1. Introduction

Evidence from general population samples show that sleep duration (SLD) is related to mortality and morbidity in a curvilinear function. An increased mortality was found for individuals who slept 6 h or less and also for individuals who slept more than 8.5 h (Kripke et al., 2002). However, little is known about factors that may be involved in the SLD–disease relationship (Ayas et al., 2003; Krueger and Majde, 2003; Spiegel et al., 1999), particularly about psychiatric disorders although part of them have been shown to be related to an in-

creased mortality risk (John and Hanke, 2002). Only limited research exists whether short sleep duration (SSLD) or long sleep duration (LSLD) depends on psychiatric disorders, particularly substance use, depressive, anxiety or somatoform disorders. Prevalence rates for one or more of these turned out to be higher than 40% during lifetime and higher than 20% during the last 12 months (Meyer et al., 2001).

Particularly little evidence exists about the relationship between SLD and nicotine or alcohol dependence. It is well-known from clinical practice that sleep duration is reduced among alcohol dependent individuals, and subjective sleep disturbances in more than half of the patients have been shown in a sample of treated alcohol dependent patients (Foster et al., 2002). The underlying mechanism of the disease is that the time

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since the provision of nicotine or alcohol to the body is crucial for developing withdrawal symptoms; in particular, this is the case during sleep when mean SLD surmounts the usual time until substitution of nicotine or alcohol in a considerable part of the dependent subjects. Thus, given a sufficient severity of dependence, SSLD may be expected. In a community sample of Swedish men aged 30–69, the number of risk factors, including alcohol misuse according to a screening questionnaire, predicted insomnia: The odds ratio (OR) for insomnia was raised from 1.4 for individuals with one risk factor to 3.1 for individuals with three or four risk factors (smoking, alcohol misuse, obesity, lack of physical activity; Janson et al., 2001). Sleep duration might be influenced via the high comorbidity between alcohol or nicotine dependence and depressive and anxiety disorders (de Graaf et al., 2002; John et al., 2004). On the other hand, the individual may drink alcohol to induce sleep or to maintain sleep. This should be primarily represented by constant drinking amounts; a part of these drinkers may become alcohol dependent.

Research about psychiatric disorders and sleep in the general population focused on insomnia and depressive disorders (Ohayon and Roth, 2003; Riemann and Voderholzer, 2003). Longitudinal studies revealed that insomnia predicted an increased risk of depressive disorders (Riemann and Voderholzer, 2003). In comparison to insomnia or hypersomnia, SLD is a simple measure which does not include complaints from lack of sleep, and it differs from insomnia or hypersomnia insofar, as these do not necessarily include the total hours of sleep. Studies suggested a relationship between psychiatric disorders and SLD. Depressive patients presented less stage-4 sleep indicating a less sound sleep after recovery than during the acute phase of depression (Steiger et al., 1989). Sleep characteristics such as short rapid eye movement (REM) latency might be predictive of a major depressive disorder (Lauer et al., 2004, 1998).

According to anxiety disorders, increased arousal which may be indicated by difficulty falling or staying asleep is part of the diagnostic criteria of stress disorders that belong to the anxiety disorders, and sleep disturbance is part of the diagnostic information for the generalized anxiety disorder. Furthermore, the anxiety disorder may be closely related to nicotine or alcohol dependence, as is the case in substance-induced anxiety disorder (American Psychiatric Association, 2000). In a random sample of Swedish males and females aged 20–45, males with an anxiety disorder according to the Hamilton Anxiety and Depression scale revealed a slightly longer SLD than males without an anxiety disorder (Lindberg et al., 1997).

Altogether, little is known about the relationship of SLD to psychiatric disorders in general population samples using diagnoses according to the Diagnostic and Statistical Manual of the American Psychiatric

Association (DSM-IV; American Psychiatric Association, 2000), and almost nothing is known about psychiatric disturbance including nicotine and alcohol dependence with respect to SLD, although these disorders are highly prevalent in the general population and although SSLD is known to become part of the disease in the long run. Since psychiatric disorders tend to be highly comorbid (de Graaf et al., 2002), evidence is needed about determinants of SSLD and about the potential co-acting of psychiatric diseases according to SLD in multivariate analyses.

The goal of the present study was to cross-sectionally explore relationships between nicotine and alcohol dependence or abuse, depressive, anxiety, and somatoform disorders with SSLD and to estimate the probability of SSLD and LSLD among individuals who show a current diagnosis of the aforementioned disorders and among individuals who have remitted from such a disorder. According to the evidence, we hypothesized that individuals with nicotine dependence, alcohol dependence or abuse, depressive, anxiety or somatoform disorders are more likely to have SSLD, not however LSLD, compared to subjects who never had such a disorder. This relationship should be more likely for those with a current than for those with a former disorder.

## 2. Methods

Individuals aged 18–64 years living in the northern German 217,000-inhabitant city of Lübeck and 46 surrounding communities were eligible for the present study (Transitions in Alcohol Consumption and Smoking, TACOS; Meyer et al., 2001). A random sample was drawn from the communities' resident registration files, in which the address and further personal data of everybody have to be included. Of the eligible subjects, 4093 completed the baseline interview (participation rate: 70.2%), and the data of 4075 subjects could be analysed. Reasons for non-participation were refusal, no contact to the individual, or severe disease (Meyer et al., 2001). The individuals were representative for the defined population with respect to demographic characteristics (Federal Statistics Office, 1999). Among the 4075 individuals there were 107 who did not provide any information about SLD. Thus, our final sample included 3968 subjects.

The interview was conducted as a computer-aided personal interview, in 91.5% of the participants at their home. The study followed the most recent version of the Declaration of Helsinki and the ethical principles of the American Psychiatric Association (1992). Individuals received written information about the study and were informed that they were free to participate and could withdraw at any time. The study design had been

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