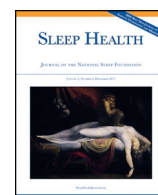




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The association between insomnia and bedroom habits and bedroom characteristics: an exploratory cross-sectional study of a representative sample of adults

Bjørn Bjorvatn, MD, PhD ^{a,b,*}, Siri Waage, PhD ^{a,b}, Ståle Pallesen, PhD ^{a,c}

^a Norwegian Competence Center for Sleep Disorders, Haukeland University Hospital, Norway.

^b Department of Global Public Health and Primary Care, University of Bergen, Norway.

^c Department of Psychosocial Science, University of Bergen, Norway.

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ABSTRACT

Objectives: Major age and sex differences are reported in bedroom habits and bedroom characteristics. However, few studies have investigated whether such bedroom habits and characteristics differ between patients with chronic insomnia disorder and good sleepers.

Methods: We assessed the association between several bedroom habits (i.e. electronic media use, bed sharing) and bedroom characteristics (i.e. bedroom temperature, blackout curtains) and chronic insomnia disorder among 1001 randomly selected adults responding to a telephone survey in Norway. Response rate was 63%. Insomnia symptoms were evaluated with the validated Bergen Insomnia Scale (with ICSD-3/DSM-5 criteria).

Results: Chronic insomnia disorder was associated with reporting worse bed comfort, having newer beds, more noise stemming from both within and outside the building, higher bedroom temperature during the summer, and not preferring the supine position when trying to sleep. However, we found no associations between chronic insomnia disorder and electronic media use in bed, reading in bed, how important the mattress, pillow and comforter were rated, bed sharing, bedroom temperature during winter, open or closed bedroom window, use of blackout curtains, and most self-reported preferred body positions for sleep.

Conclusion: We found few and small differences in bedroom habits and bedroom characteristics between respondents with and without chronic insomnia disorder. Future studies with experimental and longitudinal designs should investigate whether and how such habits and characteristics are causally and temporally linked to insomnia.

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Introduction

Sleep hygiene includes recommendations like avoiding caffeine and nicotine in the evening, avoiding going to bed hungry, regularizing bed- and rise times, but also recommendations about having a comfortable mattress and pillow, enforcing a comfortable bedroom temperature, keeping the bedroom dark as well as avoiding noises in the bedroom.^{1–3} Furthermore, during the last years an increased focus has been on avoiding use of electronic media in the bedroom,

since such use is associated with poor sleep habits (i.e. later bed-times) and impaired sleep.^{4–6} Another bedroom habit is reading in bed, which most sleep clinicians discourage.^{2,3} Still, some people claim it works as a sleep aid.

Few studies have focused on how the different sleep hygiene recommendations affect sleep problems or insomnia symptoms, especially in non-clinical populations.¹ In the previous version of the International Classification of Sleep Disorders (ICSD-2), inadequate sleep hygiene was considered as one subtype of insomnia.⁷ Based on this, it is reasonable to expect that patients with insomnia may violate sleep hygiene recommendations more often than good/normal sleepers. However, in terms of e.g. perceived mattress quality, no difference was reported between good and poor sleepers.⁸ Similarly, good and poor sleepers do not seem to differ regarding how many

* Corresponding author at: Department of Global Public Health and Primary Care, University of Bergen, Kalfarveien 31, N-5018 Bergen, Norway. Tel.: +47 55586088; fax: +47 55586130.

E-mail address: bjorn.bjorvatn@uib.no (B. Bjorvatn).

read in bed.⁸ In contrast, one study reported that patients with insomnia had poorer sleep hygiene, as evidenced by an increase in prevalence of smoking close to bedtime and increased use of alcohol, compared to age- and sex-matched controls. They also reported more naps per week and sleeping in on days not working compared to controls.⁹ Interestingly, another study showed that patients with insomnia had better sleep hygiene knowledge than controls, albeit they followed sleep hygiene recommendations to a smaller degree than controls.¹⁰ Still, few studies on the effects of sleep hygiene recommendations have been conducted. In line with this, a recent review concluded that the clinical efficacy of many of the sleep hygiene recommendations is inconclusive.¹

Recently we reported major age and sex differences in several specific bedroom habits and preferences.¹¹ For instance, daily use of electronic media in bed after bedtime is much more common among individuals aged 18 to 29 years (62%) compared to individuals aged 60+ years (4%), but such use shows no sex difference. In contrast, reading in bed after bedtime is more common with increasing age, and more common among females compared to males.¹¹ Older age is associated with colder bedrooms, and during the winter season nearly 50% of individuals 60+ years reported a bedroom temperature of 12°C or lower. Many participants keep their bedroom window always open at night. This is more common with increasing age, but with no sex difference.¹¹ We also reported that females more often than males report that the comforter, pillow and mattress are important for their sleep, and older people consider these bed characteristics as more important than younger people. Use of blackout curtains in the bedroom may be of importance for sleep and insomnia symptoms, especially in regions where sunlight may be present late at night and/or early in the morning. Too much light in the bedroom may cause sleep onset problems, and too much light in the morning may cause early morning awakenings.¹² In a previous paper, we reported no sex difference, but an age-dependent reduction in use of blackout curtains.¹¹ Considering these major age and sex differences in such bedroom habits and characteristics, and also the fact that the prevalence of insomnia differs in relation to age and sex,¹³ we may expect differences in these habits and characteristics between good and poor sleepers.

Against this backdrop, the aim of the present study was to assess the association between several bedroom habits and bedroom characteristics and chronic insomnia disorder in a large representative sample of adults from the general population. Where most studies on sleep hygiene have focused on the behavioral components (e.g. smoking, alcohol consumption) that may impact on sleep, few have focused, in-depth, on aspects of the sleep environment. The objective was therefore to focus specifically on certain bedroom habits and bedroom characteristics not commonly studied. Our hypotheses were that individuals with unfavorable bedroom habits (i.e. more reading in bed) and bedroom characteristics (i.e. less use of blackout curtains) would more often report having chronic insomnia compared to individuals without such unfavorable habits/characteristics.

Methods

Design and study population

A total of 4602 potential participants aged 18 years or older were randomly drawn from the National Population Registry of Norway (a registry that includes all inhabitants of Norway). A simple random sampling technique was used where each individual was chosen randomly and entirely by chance, and where each individual in the population had an equal probability to be included in the sample. All these potential participants received a letter informing them that a study concerning sleep habits would be conducted by the Norwegian Competence Center for Sleep Disorders in the near future, and that

they might be contacted for a telephone interview by an opinion-research institute (Respons Analyze AS). The aim of the study was to include about 1000 participants. In order to obtain that number, the opinion-research institute had to call a total of 4199 telephone numbers. Of these, the institute did not obtain contact with 2415 individuals and 185 individuals were excluded for different reasons (eg, not fluent in Norwegian, hearing disabilities, illnesses preventing participation). Of the 1599 potential participants the institute reached, 598 refused to participate. This yields a study sample of 1001 participants and a response rate of 63% (1001 of 1599). According to the opinion-research institute, this procedure makes the study sample as representative as possible of the general adult population of Norway. The potential participants accepted or rejected participation before being asked any specific question. Due to these procedures, and the fact that participants remained anonymous (the interviewers gathered only the research-relevant data without recording any personally identifiable information), the survey was exempted from review by The Regional Committee for Medical and Health Related Research Ethics in Western Norway as research on anonymous data are exempted from such reviews. The sample consisted of 49.8% males and 50.2% females. The mean age was 47.5 years ($SD = 17.9$, range = 18–91 years), with 205 participants being below 30 years, 271 participants 30–44 years, 252 participants 45–59 years, and 273 participants 60 years or older.

Variables

The participants were asked about several bedroom habits and bedroom characteristics: “How many days per week (0 to 7) do you use electronic media like television, computer, cell phone, tablet or game console in your bed after bedtime?” “Do you read in bed after bedtime?” (“never”; “less than monthly”; “1–3 days per month”; “1–6 days per week”; and “every day”). “How important for your sleep is the type of comforter/pillow/mattress you use?” (“very important”; “quite important”; “indifferent”; “quite unimportant”; and “very unimportant”). “How comfortable is your bed?” (“very good”; “quite good”; “average”; “quite bad”; and “very bad”). Responses to the question “How old is your bed?” were collapsed into “0–5 years”; “6–10 years”; and “more than 10 years”. “Do you share your bed with a bedpartner?” (“daily”; “weekly”; “monthly”; “less than monthly”, and “never”). Two questions concerned noise levels (one *within* and one *outside* the building): “Consider the noise level during the last three months – how bothered have you been with noise that stems from within/outside your building when attempting to sleep?” (“not bothered”; “a bit bothered”; “somewhat bothered”; “very bothered”; and “extremely bothered”). “What temperature is it usually in your bedroom during summer/winter?” (“12°C or lower”; “13–17°C”; “18–22°C”; “23–27°C”; “28°C or higher”; “not sure”). “Do you use blackout curtains in the bedroom?” (“yes”/“no”). “How is your bedroom window usually at night?” (“always open”; “always closed”; “open during summer, closed during winter”; “open during

Table 1

Self-reported sleep duration and sleep need among a representative sample of adults (n = 1001) in Norway with and without chronic insomnia disorder

Characteristics	Chronic insomnia disorder (minutes (SD))		t-test	p-value ¹
	Absent	Present		
Sleep duration weekday	421 (63)	381 (88)	7.3	<0.001
Sleep duration weekend	468 (76)	437 (110)	4.7	<0.001
Sleep need	453 (70)	470 (85)	2.9	0.004

Significant results are indicated in bold.

¹ Independent t-test.

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