**Abstract** This is the first nation-wide face-to-face survey on the prevalence of well-defined severe insomnia and its impact on quality of life in the general population of Germany. The survey was part of an international epidemiological study, which was also conducted in Belgium, Great Britain, Ireland and Sweden. A representative sample of 1913 adults aged 18 years and over were interviewed in all parts of Germany according to the quota method. Subjects with symptomatic insomnia were identified using an algorithm compatible with the principal criteria for severe insomnia defined in the fourth revision of the Diagnostic and Statistical Manual of Mental Diseases (DSM-IV). Subjects provided data on quality of life using the Short Form 36 Health Survey (SF-36) questionnaire and on health care consumption.

Prevalence of severe insomnia in Germany was found to be 4%, which was lower than in other European countries (6–22%). Severe insomnia was more prevalent among women, the unemployed, those living alone after divorce or separation, and those in large cities, but not more frequently in the elderly (aged 65 years and over). The majority of subjects had chronic complaints, with 74% of them suffering from severe sleep problems for over a year’s duration (average 56 ± 23 months). Consultations with general physicians, medication usage, medical tests and hospitalisation were greater among severe insomniacs compared to subjects who had no sleep complaints. The question regarding overall appreciation of quality of life was rated as bad in 22% and good in 28% of severe insomniacs compared to 3% (bad) and 68% (good) in subjects with no sleep complaints. Despite this, only 55% of severe insomniacs had ever discussed their sleep problem with a doctor and the proportion who consulted their doctor specifically regarding sleep problems in the previous 12 months was even lower (36%). The vast majority (73%) was not taking hypnotic or sedative medications.

In conclusion, insomnia, even when severe, is a common and chronic complaint in Germany. This trial suggests that while, on the one hand, sleep disorders have a significant impact on patient's quality of life and consumption of health care, it is, on the other hand, a condition that is poorly recognised and for which patients are, for unknown reasons, reluctant to seek treatment.

**Key words** Sleep disorder · Insomnia · Epidemiology · Prevalence · Quality of life · Health care consumption · Germany

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**Introduction**

It is well established that poor sleep quality or insufficient sleep is a common complaint in the general population. However, the true extent and impact of insomnia amongst the general population in western industrial countries remains unclear. Reported prevalence rates have varied from 10% to nearly 50% (e. g. Mellinger et al. 1985, Ford et al. 1989, Quera-Salva et al. 1991, Gallup 1995, Ohayon 1996, Ohayon et al. 1997, Hatoum et
al. 1998). The differences are mainly due to the use of differing definitions, methods, diagnostic criteria and classification systems of insomnia in previous epidemiological surveys of different populations from various countries. Within Germany the picture in the general population is not much clearer as the available epidemiological studies were performed with restricted populations. Either studies were restricted to certain regions of the country: Upper Bavaria or West Germany as it was (Weyerer and Dilling 1991, Simen et. al. 1995, 1996), or they only included patients consulting a general practitioner (Hohagen et al. 1993, Weyerer 1996), or they selected patients from selected demographic groups such as elderly patients in Berlin (Englert and Linden 1998).


This survey took as an underlying assumption the notion that insomnia will cause significant and relevant impairment if it is severe. Insomnia is classified clinically as severe when it occurs frequently and in particular when it affects daytime functioning (American Psychiatric Association 1987, 1994; World Health Organization 1991). Surveys in Germany have estimated that the prevalence of severe or chronic insomnia is approximately 7–25 % (Weyerer and Dilling 1991, Hohagen et al. 1993, Simen et al. 1995, 1996, Weyerer 1996, Englert and Linden 1998). As yet, however, too little is known about the consequences of severe insomnia on quality of life and the health care consumption. Further, no previous study has ever studied insomnia and its consequences in unified Germany using face-to-face interviews. Therefore, this survey was targeted to provide information about the nationwide prevalence, the impact on quality of life and the consumption of health care services amongst subjects in the general population who report, in particular, severe insomnia.

Methods

Survey techniques

This epidemiological survey of severe insomnia was conducted in five European countries (Belgium, Germany, Great Britain, Ireland and Sweden) in March and April 1997. The results of the international comparison will be presented elsewhere (Nutt et al. in progress). The current article reports on the national results for Germany.

The first step involved the screening of national samples to measure the prevalence of severe insomnia. The samples were weighted in order to match national census data for age, sex and region. This was followed by the second step which was an extensive and focused survey of people who were diagnosed as having severe sleep disturbance using the same diagnostic criteria that had been used in the first step. Data were collected on specific features of sleep disorders, quality of life and health care consumption. In a third step subjects with no sleep complaints in the first step and those with mild and moderate sleep disturbance were surveyed. Comparisons with the group who had mild to moderate insomnia will be reported elsewhere.

Screening of prevalence in the general population

A large sample of the population aged 18 years or older was interviewed after a selection process that used proven random route sampling techniques commonly employed in opinion polls and market research. Screening questions were asked during a face-to-face interview conducted by trained interviewers in the subject’s home and were part of an omnibus survey that addressed several different topics in the same interview. This method is thought to provide greater motivation for people to answer and to ensure more neutral responses to sensitive medical questions. No remuneration or rewards were offered. The demographic criteria used to categorise the patients were sex, six age categories and regional stratification based on the 13 German regions (“Bundesländer”). Some of the regions are sparsely populated rural areas with high unemployment and a recent history of political, social and economic upheaval, while others are highly industrialised and are characterised by densely populated conurbations. The number of subjects selected from each demographic group (gender and age) and regional category mirrors the percentages provided in the official census data for Germany (Statistisches Bundesamt 1995) as closely as possible. Weighting was employed if imbalances compared to the census data had to be corrected.

Detailed survey of subjects with severe insomnia

Data for this step were gathered in interviews and from questionnaires. The questionnaires were completed in a second interview in subjects who were identified as having severe insomnia during the first step of the survey. Pre-existing data suggested that a sample size of between 1600 to 2000 interviewed subjects would yield a minimum of 150 subjects reporting severe sleep disturbance per country in the study. Since prevalence rates were lower the number of surveyed subjects was enlarged for a detailed analysis of accompanying features of insomnia. Methods and diagnostic criteria used to identify respondents were the same as for the study of prevalence. The pool of respondents was randomly selected; no matching was attempted and no weighting process was applied to the results.

Survey of control group

The pool of subjects with no sleep complaints, gained in the last step, were used to provide a comparison group to the subjects with severe complaints. This was done by randomly surveying a group of subjects with no sleep complaints identified in the first phase. A weighting process based on gender, age and geographical distribution was applied to the results of the control group to ensure comparability with the group of subjects with severe insomnia.

Diagnostic instruments used during screening in the general population

Subjects with severe insomnia were identified using a specific screening algorithm which consisted of four questions adapted from DSM-III-R (American Psychiatric Association 1987) and DSM-IV (American Psychiatric Association 1994). This provided a measure of the prevalence of severe insomnia. The algorithm specified that during the previous month, the subject must have experienced at least two of the following symptoms at least three times per week every week: difficulty falling asleep; spontaneous waking up at night and an insufficient number of hours of sleep per night. In addition, the subject must have experienced detrimental effects during the day related to sleep deficit, examples given were tiredness or irritability. The algorithm differs from DSM criteria in that DSM-III-R and DSM-IV only require one of the three symptoms to be present, and not two.