ORIGINAL PAPER

**Sleep disorders among attorneys**

**ABSTRACT**

Introduction: Sleep disorders are common, and studies have shown that about 50% of people in the general population suffer from insomnia. However, little is known about sleep disorders among Polish attorneys.

Material and methods: The study covered 206 attorneys. The degree of occurring sleep disorders was verified using the author’s questionnaire, in which questions referred to demographic data and factors affecting sleep disorders. In addition, the Epworth Sleepiness Scale (ESS) was used to determine daytime sleepiness and the SEN-Eval questionnaire to determine sleep quality.

Results: A reduced quality of sleep (SQ index >29 pts) was found out in 38.35% of attorneys. The cumulative average SQ index – the total number of points from the evaluated sleep parameters – was 28.13(SD=6.03). Daytime sleepiness occurred in 11.5% of respondents, including severe daytime sleepiness in 1.46%. The mean ESS score was 6.07 (SD=3.58). The most frequently reported complaint, occurring in 94% of attorneys, was sleeping less than 6 hours a day as well as variable and irregular sleep.

Conclusions: The study is the first evaluation of sleep disorders among attorneys in Poland. Sleep disorders were found to be significantly prevalent among attorneys. Attorneys constitute a professional group that is reluctant to submit to research and at the same time is at a high risk of sleep problems, particularly a shorter time of sleep, sleep irregularity and fatigue upon waking. There was a correlation between the propensity to daytime sleepiness with age but no correlation between the number of hours spent at work and the length of service, marital status, sex and body mass. There is a need for prophylactic sleep hygiene programs to improve attorneys' quality of life.

Key words:

insomnia, sleep disorders, attorneys, sleep quality index

# INTRODUCTION

This study is the first assessment of sleep disorders among - attorneys in Poland.

Sleep disorders are a common medical condition. According to studies, sleep disorders in the general population affect one third of the population [1]. The most common cause of sleep disorders, i.e., insomnia, occurs in approximately 50% of cases [2,3,4,5]. Women [6], the elderly, people from the lower social strata and those with a lower income are more frequently affected by sleep disorders [3,7,8]. The prevalence of insomnia according to socioeconomic status has been confirmed in many studies, including British [9], American [3] and Polish ones [2]. The dependence of insomnia on the socioeconomic status seems significant because individuals who frequently and very frequently have difficulties falling asleep include 33% of persons with primary education, 17% with higher education, 11% of private entrepreneurs, 14% of management staff, and 32% of unskilled workers [10]. In contrast, little is known about sleep disorders among - attorneys. In the world literature there is a small number of reports concerning sleep disorders in this occupational group, whereas in the Polish literature there is no information concerning this subject. Given the results of a recent study on elevated levels of stress, anxiety, depressive disorders, and somatization among - attorneys, a higher exposure to sleep disorders compared to the general population can also be expected [11].

The knowledge of the causes of sleep disorders and their serious consequences in specific occupational groups may contribute to the attempt to construct algorithms for the prevention and treatment of sleep disorders, and especially to draw attention to sleep hygiene.

Currently, the following three classifications of sleep disorders are known: ICD developed by WHO, DSM created by the American Psychiatric Association and ICSD [3,12]. According to the DSM-5 classification, sleep-wake disorders include diseases or groups of disease such as insomnia, hypersomnia, narcolepsy, sleep disorders associated with sleep-disordered breathing (SDB), circadian rhythm sleep-wake disorders (CRSWD), NREM (non-rapid eye movement) sleep, restless legs syndrome (RLS), and substance/drug-induced sleep disorder.

Insomnia is the most common of all sleep disorders. Women suffer from insomnia more frequently than men; the ratio is 1.44:1 [3]. Insomnia refers to difficulty falling asleep, waking up frequently during the night, or sleeping for too a short period of time [13]. Insomnia can be a stand-alone condition as well as a comorbidity accompanied by a somatic or mental illness. Patients with insomnia complain of daytime malaise, fatigue, lack of drive, and daytime sleepiness [14]. Sleep deprivation leads not only to health problems but also reduces work efficiency, concentration and affects job performance [3,15].

The most common causes of sleep disorders include occupational problems and lifestyle factors [16,17,18]. Shift work, air travel, and the change of time zones also have a severe impact on the development of sleep disorders [19]. The burden of medical and social consequences attributable to sleep disorders stresses the importance of understanding, diagnosis, and treatment of the above-mentioned disorders [20,21,22]. Sleep is essential for proper functioning of the brain; its deprivation contributes to dementia and cognitive impairment. Sleep cycle disorders and sleep fragmentation decrease the adaptive capacity of the brain [23], impair concentration, memory, as well as are the cause of making mistakes at work.

Sleep disorders, depending on the aetiology, may be a symptom of certain diseases or may emerge secondary [24] to already existing diseases. The said disorders are most frequently associated with heart failure, hypertension, asthma, COPD, hyperthyroidism, depressive disorders, and chronic kidney disease [25,26,27,28,29].

Taking into account the scale and prevalence of sleep disorders and their effect on human functioning, especially the reduction of work efficiency and interpersonal relations [30,31], it seems important to develop prophylactic and therapeutic programs as well as to have tools for the early diagnosis of disorders.

# MATERIALS AND METHODS

After obtaining a written approval from the Dean of the District Bar Council, its members were asked to complete anonymous questionnaires regarding screening assessment for sleep disorders. Out of the 1,000 questionnaires distributed to -attorneys, 206 individuals, including 102 women and 104 men aged between 29-84 years, returned properly completed questionnaires. The mean number of years of work in the profession was 15.22 (SD=11.41), while the mean number of working hours was 50.53 hours per week (SD=10.37). The mean age of the respondents was 43 years. Most of the respondents worked in their own law firms or were partners in a law firm. The characteristics the respondents are shown in Table I.

**Table I.** Characteristics of studied group

|  |  |
| --- | --- |
| **Variable** | **Respondents (N=206)** |
| **M±SD** | **min–max** |
| Age (years) | 43.07 ± 11.81 | 29–84 |
| Body weight (kg) | 76.30 ± 16.91 | 47–134 |
| Body height (cm) | 173.55 ± 9.06 | 156–200 |
| BMI (kg/m2) | 25.15 ± 4.42 | 17.35–40.45 |
| Number of years in the profession | 15.22 ± 11.41 | 1–63 |
| Average number of working hours per week (h) | 50.53 ± 10.37 | 9–80 |
| Marital status of respondents |
| Married 56.31% | Divorced 22.81% | Single 20.87% |
| BMI – body mass index, M – mean, SD – standard deviation, min – minimum value, max – maximum value |

To verify the degree of sleep disorders, a proprietary questionnaire, whose questions concerned demographic data and factors affecting sleep disorders, was used together with the following scales:

- **the Epworth Sleepiness Scale (ESS)** [32] – a commonly used scale that is used to determine the degree of individual sleepiness. The said scale determines the likelihood of dozing during the daytime in eight different typical situations, i.e., from the most to the least conducive situation to falling asleep.

- **Sleep Quality Scale** (SQS) [33], in which sleep parameters are assessed using a 14-point scale. The scale consists of 14 statements related to sleep disorders, sleep quality and directly to insomnia. Due to the fact that the subjective assessment of one's own sleep plays a predominant role in the case of sleep disorders, the questionnaire was created based on the Fourth International Classification of Mental Disorders (DSM IV). Particular problems were verified by means of the respondents' attitude to specific constative sentences. For instance, dissatisfaction with sleep quality was verified by means of the statement: "I think that my sleep is not what it should be". The problem with falling asleep was verified by the statement "When I go to sleep, at least half an hour passes before I fall asleep". All the statements were assessed by the respondents by providing answers using a four-point scale: 1 – never, 2 – rarely, 3 – often, 4 – always. Before they gave their answers, the respondents became familiar with the scale described in the instructions. The obtained results were assessed as a cumulative sleep quality index (SQI), which is the sum of the answers of the assessed sentences. The higher the final SQS score, the poorer the respondent's sleep quality.

The obtained data were statistically analysed using the Statistica 10 package. The qualitative variables were described by means of their number and percentage. In the case of quantitative variables, the basic parameters of descriptive statistics such as the mean and standard deviation, were calculated and both the minimum value and maximum value were given. The parametric methods were selected according to the group size. Pearson's linear correlation coefficient together with a test of significance for the said coefficient were applied to analyse the relationship between the variables. Intergroup comparisons (women vs. men) were performed using Student's t-test for independent variables. In the event of failure to meet the assumption of homogeneity of variance, the Cochran–Cox test was used. The significance level was assumed as α = 0.05. The results were considered statistically significant when the calculated test probability (p) satisfied the inequality p < 0.05.

# RESULTS

Using the ESS the respondents assessed (on a scale of 0-3) the likelihood of falling asleep in 8 everyday situations. The level of sleepiness is determined by the sum of the scores given to all eight statements. A score of 10 or more indicates the presence of daytime sleepiness. The analysis showed the presence of daytime sleepiness in nearly 10% of the respondents, while severe sleepiness occurred in 1.46% of the respondents. The mean ESS score was 6.07 (SD = 3.58) (Table. II).

**Table II.** Epworth Sleepiness Scale (ESS) among - attorneys

|  |  |  |
| --- | --- | --- |
| **ESS – interpretation** | **Number of subjects** | **Percentage (%)** |
| No sleepiness | 183 | 88.83 |
| Daytime sleepiness | 20 | 9.71 |
| Severe daytime sleepiness | 3 | 1.46 |
| TOTAL | 206 | 100.00 |

**In the conducted analysis, a statistically significant correlation was observed between the propensity for daytime sleepiness and age** (p = 0.048, r = -0.14) (Fig. 1). The ESS value correlates neither with the length of service (Fig. 2) nor with the number of hours worked by -attorneys per week (Fig. 3). There were no differences between women (mean ESS score was 6.35, SD = 3.31) and men (mean ESS score was 5.8, SD = 3.83) either.

**Fig. 1.** Correlation between ESS and age of - attorneys; 0.95 confidence interval (CI)

**Fig. 2.** Correlation between ESS and length of service of respondents.

**Fig. 3.** Correlation between ESS and number of hours spent at work per week; number of working hours (per week).

The study also assessed disturbances in normal sleep quality (Table III). The most frequently reported complaints, occurring in over 90% of - attorneys, were less than 6 hours of sleep per day, as well as variable and irregular sleep. In the surveyed group, 89% of the respondents experienced fatigue upon waking, while the lack of satisfaction with sleep occurred in 88% of the respondents. Nearly 70% of the respondents needed to take a nap during the daytime, and 68% experienced daytime sleepiness and possibly involuntary sleep episodes.

**Table III.** SQS –prevalence of sleep quality disturbances expressed in %

|  |  |
| --- | --- |
| I think that my sleep is not what it should be | 88.83 |
| I sleep less than 6 hours per day | 93.69 |
| My sleep duration is variable and irregular | 92.23 |
| When I go to bed, at least half an hour passes before I fall asleep | 73.79 |
| I wake up at night at least three times and then I have a hard time falling asleep | 64.08 |
| I dream of disturbing and unpleasant things | 75.73 |
| I wake up early in the morning and I can't go back to sleep | 69.9 |
| When I get up in the morning, I feel tired | 89.32 |
| I go to bed at very different (irregular) times of day | 87.38 |
| During the daytime I feel sleepy and sometimes I fall asleep involuntarily | 67.96 |
| My sleep is light, and I feel like I am not sleeping at all | 56.31 |
| I have already had sleep problems that persisted for more than a few days | 44.66 |
| I voluntarily nap during the day | 69.9 |
| I get up at very different (irregular) times of day | 83.98 |

Nearly half of the respondents previously had sleep problems that persisted more than a few days.

The cumulative mean SQ score, which is the sum of points from the assessed sleep parameters, was 28.13 (SD = 6.03). Its range was from 14 to 43 points (Fig. 4).

Fig. 4. SQI distribution; histogram; number of persons.

**Poor sleep quality, i.e. an SQI of more than 29 points, was present in 38.35% of -attorneys.** There was no correlation between SQI, and age, sex or hours worked per week among -attorneys.

For both scales, the correlation between sleep disorders and marital status of -attorneys was analysed by dividing the respondents into categories such as single, married, and divorced. There was no statistically significant correlation for either the ESS (p < 0.611) or SQI (p < 0.282).

The BMI analysis of the study group showed that 46.6% of the respondents were overweight or obese. The remaining 53.40% of the respondents had a normal body weight (Table. IV).

**Table IV.** BMI analysis of study group

|  |  |  |
| --- | --- | --- |
| **BMI – interpretation** | **Number** | **Percentage** |
| Standard | 110 | 53.40 |
| Overweight | 69 | 33.50 |
| Class I obesity | 19 | 9.22 |
| Class II obesity | 7 | 3.40 |
| Class III obesity | 1 | 0.49 |
| Total | 206 | 100 |

The analysis of the correlation between BMI and the ESS index or SQI showed no links between the variables (BMI & SQI r = 0.04, = 0.584 and BMI & ESS r = 0.01, p = 0.837) (Fig. 5 and Fig. 6).

**Fig. 5.** Correlation between BMI and ESS index.

**Fig. 6.** Correlation between BMI and SQI.

# DISCUSSION

The present study is the first data in Poland that enable assessment of the scale of the phenomenon of sleep disorders among -attorneys. This study indicates that the above-mentioned occupational group is more vulnerable to stress and somatic disorders than the general population [11]. The pressure of responsibility for human fates, time pressure, pressing deadlines, court appearances, as well as the enormous competition on the legal services market are some of the factors generating stress in the legal profession. Legal opponents often force a sudden change in the conduct of the hearing, which involves a great deal of stress. Taking into account these facts, examining the scale of the occurrence of sleep disorders was also important for the health risk assessment of -attorneys.

Two different scales were used in the presented study, which made it possible to clarify the causes and types of sleep disorders in the studied group. ESS showed a correlation between the propensity for daytime sleepiness and the age of the respondents. In contrast, SQI did not correlate with age, sex or the number of hours spent at work.

The study by Sara Arber[33] examined the impact of sex and marital status on sleep quality. Women reported significantly more sleep problems than men, as it was in the case of divorced and widowed respondents compared to married ones. From the perspective of physiology, such a result seems surprising because hormonal changes contribute to better quality of sleep in women. The differences in sleep between men and women become apparent after the onset of puberty. Menstrual cycles, pregnancy and menopause can alter sleep architecture [34]. During the second half of the menstrual cycle, i.e. when progesterone levels rise, sleep improves in women. Meanwhile, the above-mentioned study challenges the primacy of physiological explanations underlying the differences in sleep between the sexes. In the cited study, the differences regarding the correlation between marital status and sleep disorders were greater among men than women, with men who had been previously in a romantic relationship reporting particularly poor sleep quality. That study pointed out that the differences between sex and marital status were partially due to the lower socioeconomic status of women and individuals who were previously in a romantic relationship.

In the author's own study, the lack of differences between men and women in the prevalence of sleep disorders was confirmed by both scales. In the case of marital status, the results of the author's own study did not show a statistically significant result indicating a correlation between sleep disorders and the marital status of -attorneys either.

The difference between the reports from other studies and the author’s own study is perhaps a result of the specificity of the studied occupational group, and its higher socioeconomic status. It also requires considering the results of previous studies concerning -attorneys, who were confirmed to have increased values of stress, anxiety and depression, which entail further health consequences [11]. The indicated dissimilarity of this occupational group compared to the general population may also result from the increased alcohol consumption or cigarette smoking among attorneys [34].

According to numerous reports, individuals with a higher BMI sleep longer and their sleep quality is worse than in those with a lower BMI [35]. Too few hours of sleep increase the concentration of leptin (which increases appetite) and decrease the concentration of ghrelin, which in turn increases the secretion of gastric acid. Ghrelin has a wide range of physiological effects on all body systems and has many functions in physiological and pathological conditions [36]; among others, it is responsible for addiction to foods that bring pleasure.. Lytle A. et al. [37] point out that poor sleep quality can be both a cause and a consequence of overweight and obesity. A change in sleep duration implies a simultaneous change in body weight and body fat, which may suggest that metabolic, hormonal or behavioural factors are changing and affecting both sleep and body weight. In the presented study, there was no statistically significant correlation between body weight and the ESS index or SQI. It is likely that the difference for this occupational group is explained by the important role of occupational stress in inducing sleep disorders.

**The prevalence of sleep problems (SQI, Table III) is the basis for the assumption** that - attorneys are a high-risk group for insomnia and other sleep disorders. In the presented study, over 90% of the participants complained of variable and irregular sleep and sleep lasting less than 6 hours. **The consequences of sleep disorders, especially insomnia, include an increased risk of making mistakes, lower work efficiency, and occupational burnout. The long-term consequences include depression, hypertension, myocardial infarction, diabetes, and dementia.** As an occupational group, -attorneys are **3.6 times more prone to depression [38] than other studied professionals and the general population [11]. Perhaps the implementation of both prevention programs targeting the problems of this occupational group and training in the field of sleep hygiene would contribute to reducing the negative impact of sleep disorders on health.**

The essence of the clinical diagnosis of sleep disorders is the patient's individual subjective feelings about the course of sleep. A point of concern is that such a large percentage of the respondents report at least one symptom related to insomnia. The vast majority of -attorneys report difficulties in both falling asleep and maintaining sleep throughout the night. Ineffective sleep is associated with a lack of regeneration of the body during sleep and may contribute to cognitive disorders [39]. The failure to maintain sleep throughout the night may significantly disrupt social and professional activities in a clinically significant way.

The lack of a correlation between the cumulative SQI value and age, sex, and the number of working hours indicates that it is not possible to identify a group particularly vulnerable to sleep disorders among -attorneys. Both young and experienced-attorneys reported the same sleep disorders with a similar prevalence. In the conducted assessment, poor sleep quality (SQI) was present in 38.35% of -attorneys, which makes sleep disorders more prevalent in this occupational group than in the general population and twice as prevalent compared to individuals with higher education.

In the studied group, the analysis of sleepiness showed the occurrence of daytime sleepiness in 11.5% of the respondents. Because of its universality and low costs, ESS could be used as a screening tool for individuals with excessive sleepiness.

# CONCLUSIONS

1. This study is the first Polish assessment of sleep disorders among attorneys.
2. A significant prevalence of sleep disorders was found among - attorneys.
3. -Attorneys comprise an occupational group that is reluctant to partake research. At the same time, they are a high-risk group for sleep problems, especially shortened and irregular sleep as well as feeling tired upon waking.
4. A correlation was found between the propensity for daytime sleepiness and age, however, there was no correlation between the number of working hours and years of service, marital status, sex or body weight.
5. There is a need to implement preventive programs concerning sleep hygiene to improve the quality of life of -attorneys.

**Limitations of the presented study**

The presented study is subject to limitations. First of all, it should be stressed that this was a pioneering study. Attorneys were reluctant to participate in the study. Out of 1,000 surveys distributed to -attorneys, 206 were returned properly, which constitutes 20.6%. In this occupational group, the study participants were not randomly selected. The questionnaires were completed only by those -attorneys who agreed to participate in the study.

An additional limitation was that no sleep study using actigraphy was performed among the -attorneys. Such research, however, was not selected because each measurement of sleep parameters using the above-mentioned method takes three nights and the number of available actigraphs was limited. If 1,000 individuals were initially intended to be surveyed, such a study would have to be set up for many years.

Nevertheless, it should be emphasised that the most important data are those obtained from the questionnaires. The reason is that only such data were published in few scientific articles concerning sleep disorders among - attorneys. In this way, it was possible to refer to the research of other authors on this subject.