Prevalence of self-reported insomnia in general population of Poland

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Summary

Aim. The aim of this paper is to present the subjective insomnia prevalence. Assessment of sleep problems was a part of NATPOL study conducted to explore the risk factors for cardiovascular diseases.

Methods. The study group consisted of 2,413 people (1,245 females and 1,168 males) aged 18–79 and it was representative for the Polish population. Questions concerning sleep were included in the questionnaire designed specifically for the NATPOL study, which assessed cardiovascular risk factors. The questionnaire was applied personally by trained nurses at place of residence of study subjects. Only results concerning sleep complaints are presented in this paper.

Results. The prevalence of sleep complaints was 50.5% (58.9 % in women, 41.4% in men). Subjective insomnia was most prevalent in women aged 60–79 and it was reported by

74.8%. Difficulties in falling asleep were reported by 60.2%, difficulties in falling asleep by 45.5 % and early morning awakenings by 26.4% of respondents.

Conclusions. Study results suggest that self-reported insomnia is a common problem in general population of Poland. The most common sleep problem is impaired sleep initiation. Insomnia complaints are most prevalent in women and in the older age groups.

Key words: insomnia, epidemiology, population study

Introduction

Sleep disorders, particularly insomnia, impact several aspects of life, especially in highly-developed communities. Due to their prevalence and potential consequences they have become a problem exceeding the competences of the healthcare system and thus grown into a social concern [1, 2]. Therefore, there is a need to conduct multidimensional studies, including the epidemiological ones, to obtain the complete assessment of the sleep disorders phenomenon.

There is very well documented relationship between insomnia and many somatic disorders, especially cardiovascular ones [3–8]. That is why insomnia as a syndrome or even insomnia symptoms are included in the cardiovascular risk assessment [3–6, 8, 9].

The example of this approach to the subject of sleep disorders might be including them in cardiovascular risk factors epidemiology studies (NATPOL) conducted as a part of National Programme of Prophylaxis and Treatment of Cardiovascular Diseases in Poland [10]. Although the purpose of NATPOL study was the assessment of cardiovascular risk factors, sleep complaints were included in the questionnaire to assess their prevalence in general population. This study was not designed to assess the epidemiology of insomnia defined according to ICD-10 or DSM-IV; the questions concentrated on subjective insomnia complaints and functional impairment declared by the respondents. Sleep complaints are more common that clinical insomnia and because of their length and symptoms severity, they might be underestimated. That is why the questions included in NATPOL study concentrated on self-reported insomnia and functional impairment.

Material

Study group was a representative sample of adult population of Poland, consisting of 2,413 people: including 1,245 females and 1168 males aged 18–79. Study group characteristic is presented in Table 1. Study group structure considering age groups and gender was equivalent to the structure of adult Polish population according to the Central Statistical Office of Poland data at the time of conducting this study. The group was collected by means of stratified sampling according to the place of birth, age and gender. The sample was grouped in territorial branches of average 11 subjects. The sample group selection was a three-stage process. In the first step 248 communi-

ties were sampled. There were three kinds of communities included: urban, rural and urban-rural. In the second stage, the streets in urban and villages in rural communities were sampled. In the third stage, single persons were selected to receive an invitation to participate in the study. This sampling was made in collaboration with the Ministry of Internal Affairs and Administration and was based on Personal Identification Number (PESEL). Subjects were then substratified with regards to gender and age. Due to anticipated response ratio, selected sample was five times larger in number than expected study population. There was a basic set of respondents (addresses) and additional, back-up ones, which were used in case of difficulties in reaching the respondents from the basic set.

The invitation to participate in the study was sent to 4,420 people. In 786 cases the address was incorrect, there was another person living at this address or potential respondent was dead. In the group of 3,634 addresses we were not able to contact 661 people despite three attempts. Next 560 people (295 men and 265 women) directly refused to participate in the study.

There were 2,413 people participating in this study and out of them 12 did not manage to complete blood and urine sampling. Considering the people who were able to participate in the study, the response ratio was 66.5% (65% in men and 68% in women).

The sampling process was described in detail in a separate publication [10].

The study protocol was approved by Ethical Committee of Medical University of Gdansk. The study was conducted accordingly to provisions of the Declaration of Helsinki.

Table 1. **Study population characteristics**

	Women		Men		Total	
	n	%	n	%	n	%
Age						
18–39	497	39.9	477	40.8	974	40.4
40–59	405	32.5	444	38.0	849	35.2
60–79	343	27.6	247	21.1	590	24.5
Education						
Incomplete elementary – incomplete secondary	405	32.5	551	47.2	956	39.6
Secondary–higher	840	67.5	617	52.8	1,457	60.4
BMI*						
Normal range	603	51.4	374	34.9	977	43.5
Overweight	308	26.2	409	38.2	717	31.9
Obesity	263	22.4	289	27.0	552	24.6
Place of residence						

Village	496	39.8	617	52.8	1113	46.1
Town <50,000 .	213	17.1	146	12.5	359	14.9
Town 50,000–200,000	209	16.8	201	17.2	410	17.0
City >200,000	327	26.3	204	17.5	531	22.0
Total	1,245	100.0	1168	100.0	2,413	100.0

BMI – Body Mass Index

* – some respondents did not provide data on BMI

Methods

The questionnaire designed specifically for the NATPOL study focused on the assessment of risk factors in cardiovascular diseases. It consisted of 83 questions and 5 elements concerning anthropometrics and blood pressure values. Six questions concerned administrative and demographic data and 5 concerned education, marital status and employment. The next part of the questionnaire concerned medical issues. There were 64 open questions and 8 closed ones. Questions were about specific symptoms, methods of current treatment, family history of somatic illnesses, smoking, physical activity, and sleep problems. The additional element was the Beck Depression Inventory. Results of this inventory were discussed with the respondents during the second meeting [10]. The following questions were used to assess the sleep problems:

Have you ever experienced problems with sleep? – Yes/No –

a) For a few days (3–4)
b) For a period shorter than 2 weeks
c) For a period longer than 2 weeks

What was the nature of your sleep problems?
a) Difficulties in falling asleep
b) Difficulties in maintaining sleep
c) Early morning awakening

What is the degree of your daily functioning impairment caused by sleep problems (currently or in the past)?
a) Sleep problems severely impair my daily functioning
b) Sleep problems moderately impair my daily functioning
c) Sleep problems mildly impair my daily functioning
d) Sleep problems have no effect on my daily functioning.

All the fieldwork, that is conducting the interview and the questionnaire, antrophometric and blood pressure measurements as well as collecting blood and urine samples were made by trained nurses living in respondent's area.

Statistical analysis

All the statistics were made with SPSS 19 statistical software. The results shown in the contingency tables present information on the general number of people (exact to 100) in a specific category, as well as its percentage characteristics. Confidence Interval for all the percentage calculations was 95%. All the calculations were made with the consideration of two-step (stratified and group) sampling. In order to measure the differences in prevalence between selected categories we used the Chi-square test for the contingency tables.

Results

The results of the survey are summarised in Table 2.

Table 2. **Prevalence of subjective insomnia in study population**

	Subjective insomnia	Falling asleep	Sleep maintenance	Early morning awakening
Women				
Total n = 1,245	58.9(55.8–61.9)	60.7(56.6–64.7)	49.1(45.3–52.9)	23.0(19.7–26.5)
Age 18–39 n = 497	44.3(39.4–49.4)	71.8(64.8–77.9)	43.8(37.3–50.6)	18.3(13.3–24.6)
Age 40–59 n = 405	65.5(60.9–69.8)	55.8(48.8–62.6)	50.6(44.5–56.6)	28.7(23.4–34.6)
Age 60–79 n = 343	74.8(69.4–79.6)	55.6(48.4–62.6)	52.5(45.6–59.4)	20.1(15.5–25.7)
Men				
Total n = 1,168	41.4(38.2–44.8)	59.5(54.6–64.2)	40.0(35.6–44.6)	31.5(27.0–36.4)
Age 18–39 n = 477	32.1(27.5–37.0)	73.7(66.3–80.0)	41.1(33.2–49.4)	31.9(23.9–41.1)
Age 40–59 n = 444	47.4(42.6–52.3)	52.6(44.7–60.4)	40.6(34.0–47.7)	30.3(24.0–37.5)
Age 60–79 n = 247	52.9(46.5–59.3)	50.2(39.5–60.8)	37.2(27.9–47.6)	33.2(24.7–43.0)
Total n = 2413	50.5(48.2–52.7)	60.2(57.0–63.3)	45.5(42.5–48.4)	26.4(23.7–29.3)

Results shown in percentage.

Sleep problems were reported by 50.5% of study population. Prevalence of self-reported insomnia was 58.9 % in women and 41.4% in men (Table 2). Self-reported insomnia was most common in women aged 60–79 years (74.8%). The most common type of sleep complaints, irrespective of age and gender, were problems with falling asleep (60.2%).

Multidimensional analysis showed that age and gender are the most important factors for prevalence of self-reported insomnia. There was no correlation between self-reported insomnia and body mass index, level of education or place of residence (Table 3).

Table 3. **Logistic regression of subjective insomnia in Polish population**

Influencing factor	OR	95% CI
Age (reference age 18–39)		
Age 40–59	2.21	1.81–2.70
Age 60–79	3.1	2.43–3.95
Education (reference secondary–higher)		
Incomplete elementary–incomplete secondary	1.02	0.85–1.22
Gender (reference: women)		
Men	0.52	0.43–0.61
BMI (reference BMI < 25)		
BMI 25–29	0.91	0.75–1.12
BMI ≥ 30	0.96	0.76–1.21
Place of residence (reference: city over 200,000 inhabitants)		
Village	0.81	0.65–1.01
Town < 50,000	0.88	0.67–1.17
Town 50–200,000	0.83	0.64–1.08

BMI – Body Mass Index; CI – confidence interval; OR – odds ratio

Discussion

The results of several worldwide studies on sleep disorders prevalence (particularly insomnia) are inconclusive. It is described in a wide range from 4.4% to 48%. This may be a result of the differences in insomnia definitions, which was noted by Ohayon [11].

The prevalence of insomnia complaints reaching 50.5% of the adult population in Poland is relatively high, in other epidemiological studies it was estimated in a range 4.4–48% [11–13]. According to the results of previous Polish studies, prevalence of insomnia in Poland used to be approximately 24% [14, 15]. There are also suggestions that, in fact, the prevalence of insomnia may be higher and reach 39% [16]. Differences in results of these studies imply conducting further research.

Apart from the differences in insomnia definitions between studies, another important factor influencing the inconsistency of the results may be related to differences in methodology. All questions were asked personally by the interviewer. We cannot rule out that personal contact allowed including all of sleep complaints, including those lasting for 3–4 days, described in the questionnaire as "insomnia lasting for a few days". The majority of people do not consider this kind of disturbances as a problem and do not declare them in the questionnaires or surveys sent by post. This trend can be observed in National Sleep Foundation data obtained in the USA, where 69% of

the interviewed people did not seek for help with their sleep disturbances [17]. On the other hand, in the study conducted in Switzerland which also based on personal contact with the respondent, the prevalence of insomnia was also high and reached 44% [17].

There may also be a strong correlation between changes in lifestyle related to social, political and economical transformation in Poland. Increase in pace of life also accompanied by lack of stabilisation, concerns about future of oneself or significant others, increasing prevalence of mental disorders, including depression may also be factors explaining increasing prevalence of insomnia. Another factor that may account for that may be an increase in number of elderly people in general population.

During the discussion of differences in insomnia prevalence results it has to be noticed, that in "classic" definition of insomnia the main diagnostic criterion is daytime functioning impairment. In our study 67.7% of people with subjective insomnia declared impairment of daytime functioning. The detailed characteristics of this problem will be presented in separate paper.

Another reason of differences in sleep disorders classification (particularly insomnia) may be quantitative differences in diagnostic criteria. Including all types of sleep problems in this study, especially insomnia lasting for few days, could explain the higher prevalence of subjective insomnia, which is a broader term than clinical insomnia.

The results of the present study concerning insomnia symptoms prevalence due to age and gender are consistent with other studies [11, 14, 15, 18–20]. They prove that insomnia is most common in women and in older age groups. The most common type of sleep complaint in our study, irrespective of age and gender, were difficulties in falling asleep. The results of studies conducted in Italy, USA and Japan suggest that the most common sleep complaints are difficulties in maintaining sleep. Moreover a significant number of people report mixed complaints. In most cases they are difficulties in falling asleep and maintaining sleep [12]. Results of previous Polish studies are also inconsistent. According to one study, prevalence of problems with falling asleep is 70% and maintaining sleep 52% [16]. In the study made by CBOS for Psychiatry Clinic of Medical University of Warsaw, the most common sleep complaint were problems with maintaining sleep, declared by 29%. Problems with sleep initiation were declared by 24% [15]. The superiority of problems with sleep initiation in our study may be a result of including all sleep complaints, especially the short-lasting ones, which are in most cases related to problems in falling asleep. The prevalence of early morning awakening is similar to the results of study conducted by Szelenberger [15].

Results of the study conducted by Kiejna et al. indicated higher prevalence of sleep problems in people with lower education and in inhabitants of urban communities [14]. Results of our study do not confirm these correlations. We may assume that it is associated with increase of general prevalence of subjective insomnia and greater representation of elderly people in rural communities. Further studies are needed to explain the nature of these differences.

Conclusions

1. Self-reported insomnia is a common problem in general population of Poland.
2. The most common sleep problem is impaired sleep initiation.
3. Insomnia complaints are more common in women than in men and dominate in older age groups.
4. There is a need to conduct further studies on sleep disorders in Polish population.

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