



Linguistic and cross – cultural adaptation of the Lithuanian version of Insomnia Severity Index

¹Miglė Šostakaitė-Babenskienė, ¹Živilė Vaičekauskytė, ¹Evelina Pajėdienė,

¹Department of Neurology, Kaunas Clinics, Hospital of Lithuanian University of Health Sciences, Kaunas, Lithuania.

ABSTRACT

Background: the Insomnia Severity Index (ISI) has been developed to assess the severity of the disorder, and has been shown to be a reliable and valid instrument to detect patients with insomnia. Lithuanian version of ISI (ISI – L) would facilitate insomnia diagnostics.

Aim: to adapt the Lithuanian version of Insomnia Severity Index and evaluate its psychometric properties.

Materials and methods: 324 adults from general population at age 18 to 64 who fulfilled the inclusion criteria and signed the informed consent participated in the study. All subjects completed the questionnaires that included sociodemographic information, Pittsburgh sleep quality index (PSQI), Hospital Anxiety and Depression Scale (HADS) and the Epworth sleepiness scale (ESS). The reliability of the questionnaire was examined by calculating its internal consistency with Cronbach's α (statistically significant when Cronbach's $\alpha > 0.7$).

Results: high internal consistency coefficients were obtained for the ISI (Cronbach $\alpha = 0.863$). Subthreshold severity insomnia could be suspected for 99 participants (30.6%). Moderate severity insomnia – for 34 participants (10.5%). Severe insomnia – for 4 participants (1.2%). Total mean ISI score for all participants was 7.32 (SD 5.369, median 6). Significant correlation of ISI scores and PSQI ($p < 0.005$), with HADS anxiety, with HADS depression was detected.

Conclusions: according to the adjusted ISI – L, insomnia could be suspected for nearly half of participants.

High internal consistency of the ISI – L showed that this scale is reliable and can be adapted for the use in Lithuania.

Keywords: Insomnia, Insomnia Severity Index, validation, adaptation.

Introduction

Insomnia is one of sleep disturbances, that changes the patient's baseline sleeping pattern and decreases the number of hours slept. This sleep disturbance causes clinically significant distress or impairment in social, occupational, educational, academic, behavioral, or other important areas of functioning. Insomnia nowadays is a prevalent complaint and highly affects quality of life. Intense fatigue, poor attention and concentration, daytime sleepiness induce educational or vocational dysfunction, increase accidents. Due to inability to get rest at night patients suffer from mood disturbance, decreased motivation and energy, behavioral problems which leads to social dysfunction (1).

Manifestation of insomnia increases with age and is more common among women than men (2). The prevalence of insomnia, as a disorder, in Europe varies from 5.7% in Germany (Schlack et al., 2013) to 19% in France (Leger et al., 2000) (3). In Lithuania there are no statistics about the predominance of insomnia in the whole country. The Andriuškienė et al. study of Palanga city (takes twentieth place in Lithuania according to the population) is the only study with insomnia prevalence in Lithuania. It presents that almost half (49.0%) of 1602 participants suffer from poor sleep (4). In Lithuania diagnostic process of insomnia is lacking more sensitive and validated instruments. Basing on European guideline for the diagnosis and treatment of insomnia (Riemann et al., 2017) the diagnostic procedure involves a clinical interview (sleep history: sleep hygiene, sleep habits, sleep environment), sleep diary, the Pittsburg Sleep

Quality Index (PSQI), Insomnia Severity Index (ISI), the Bergen Insomnia Scale, the Sleep Condition Indicator. If another sleep disorder that affects sleep quality can be suspected, the polysomnography, actigraphy is indicated to exclude them (3). ISI has been shown to be a reliable and valid instrument in suspicion of insomnia showing significantly better psychometric properties in comparison with the Bergen Insomnia Scale (Pallesen et al., 2008) and the Sleep Condition Indicator (Espie et al., 2012) (3). The ISI consists of 7 questions assessing severity of problem in beginning of sleep, staying asleep, waking up too early, satisfaction with sleep, interference with daytime functioning, noticeability of impairment, and concern caused by the sleep problems (5). Each question is scored from 0 to 4 points and a total score can be from 0 to 28 points. ISI total score categories: no clinically significant insomnia (0 – 7 points), subthreshold insomnia (8 – 14 points), moderate severity insomnia (15 – 21 points), and severe insomnia (22 – 28 points). More than 7 points shows that insomnia can be suspected. ISI was prepared and validated in 2001 by Bastien et al. in Canada (5). Several countries have already translated ISI to their language, validated and successfully use it in their medical practice. Different studies showed that reliability and psychometric characteristics vary in each country. The internal reliability coefficient Cronbach's alpha vary from 0.78 (Persian version of ISI) to 0.88 (Sweden version of ISI) (3, 6 – 10). Lithuanian version of ISI (ISI – L) would facilitate insomnia diagnostics and early detection also therapy initiation. This is the first study helping to gather data

about the prevalence of insomnia in Lithuanian population and compare with the prevalence of insomnia in other countries. In addition, the study enables to adjust the ISI – L and evaluate its psychometric characteristics. As well as, to assess ISI – L correlation with another common scales, related to sleep and emotional status such as Pittsburg Sleep Quality Index (PSQI), Hospital anxiety and depression scale (HADS) and Epworth sleepiness scale (ESS) results.

Methods

The protocol of this construct and criterion validity study was approved by Bioethics Centre of Lithuanian University of Health Sciences (No.BEC-MF-115). Permission to translate ISI into Lithuanian and to use it was given by authors of the original ISI. ISI was translated from English to Lithuanian, then the perspicuity of a primary version of ISI-L was evaluated by the local speakers of Lithuanian language, then the back translation to English was made and reviewed by the native speakers. All subjects anonymously completed ISI questionnaire, as well as four other questionnaires. In addition to ISI the following questionnaires were used:

- 1) Self-made questionnaire about sociodemographic data – age, sex, occupation, etc.
- 2) PSQI - consisting of 19 questions and assesses sleep quality over one-month interval (11). The translated and validated version of PSQI in Lithuania was used.
- 3) HADS –consisting of 7 questions related to anxiety and 7 questions related to depression (12). The translated in Lithuanian language and validated version was used.

- 4) ESS – consisting 8 questions where respondents are asked how likely are they to fall asleep in different situations (13).

Participants

324 adults from general population at age 18 to 64 were involved by a snowball technique (7). Participants who fulfilled the inclusion criteria and signed the informed consent participated in the study. Participant inclusion criteria were: none diagnosed sleeping disorders, no use of medications affecting sleep and not traveling among more than two time zones during past month.

Measures

The Kolmogorov–Smirnov test was used to evaluate the normality of the distribution. Descriptive statistics are represented by percentages for qualitative variables and by median, minimum and maximum values, means and standard deviations for quantitative variables. The reliability of the questionnaire was examined by calculating its internal consistency with Cronbach's α (statistically significant when Cronbach's $\alpha > 0.7$). Pearson correlation was used for parametric variables, while Spearman's correlation – for nonparametric, p value less than 0.005 was used to evaluate the level of significance.

Results

324 adults from general population (219 females, mean age 27.47 [SD 12.73] years, range 18- 63 years, median 21; 105 males, mean age 30.63 [SD 13.45] years, range 18- 64 years, median 24) were examined by random selection (Table 1). Total mean ISI score for all participants was 7.32 (SD 5.369, median 6, min 0, max 26). Subthreshold severity insomnia was diagnosed for 99 participants (30.6%), moderate severity insomnia was diagnosed for 34 participants (10.5), severe insomnia was diagnosed for 4 participants (1.2%). (Table 2)

Subthreshold severity insomnia was diagnosed for 99 participants (30.6%): 67 (67.7%) students, 10 (10.1%) working students, 21 (21.2%) workers. Moderate severity insomnia was diagnosed for 34 participants (10.5%): 24 (70.59%) students, 4(11.76%) working students, 6 (17.65%) workers. Severe insomnia was diagnosed for 4 participants (1.2%): 2 (50%) students, 1 (25%) working student, 1 (25%) worker (Table 2). High internal consistency coefficients were obtained for the ISI (Cronbach $\alpha = 0.863$). Significant correlation of ISI scores and PSQI (Spearman's rho 0.707, $p < 0.005$), HADS anxiety (rho 0.523, $p < 0.005$) and HADS depression (rho 0.438, $p < 0.005$) was detected, i.e. high ISI scores tended to show higher PSQI and HADS scores as well. Correlation with ESS was not significant (rho 0.149, $p = 0.007$). ISI scores correlated significantly with age (T-Test correlation -0.226, $p < 0.005$), education (Spearman's

rho -0.150, $p < 0.005$). Mean ISI scores were not significantly distributed according to gender (males (6.82, SD 5.222, Median 6 and females (7.56, SD 5.434, Median 6), (T-Test correlation 0.064, $p = 0.247$)).

Bad habits, such as higher alcohol consumption or inappropriate sleep hygiene tended to show significantly higher ISI scores ($p < 0,005$). According to coffee consumption, ISI scores tended to be higher among participants drinking more than 6 cups of coffee per day than nondrinkers but were not statistically significant. According to tobacco consumption, ISI scores tended to be higher among participants smoking more than 20 cigarettes per day than nonsmokers but were not statistically significant.

	Male		Female		Total
	n	%	n	%	n
Total number of participants	105	32.4	219	67.6	324
Mean age (years)	30.63 [SD 13.45]		27.47 [SD 12.73]		
Students	45	24.6%	138	75.4%	183
Working students	14	53.8%	12	46.2%	26
Workers	44	42.3%	60	57.7%	104
Secondary education	57	27.9%	147	72.1%	204
Technical education	20	42.6%	27	57.4%	47
University education	27	37.5%	45	62.5%	72
0 cups of coffee per day	14	70%	6	30%	20
0-3 cups of coffee per day	67	28.3%	170	71.7%	237
4-6 cups of coffee per day	18	39.1%	28	60.9%	46
>6 cups of coffee per day	6	30%	14	70%	20
No alcohol	30	22.9%	101	77.1%	131
0-20g alcohol per day	45	36.6%	78	63.4%	123
20-40g alcohol per day	13	34.2%	25	65.8%	38
>40g alcohol per day	17	53.1%	15	46.9%	32
Non smokers	71	28.3%	180	71.7%	251
1-10 cigarettes per day	19	34.5%	36	65.5%	55
11-20 cigarettes per day	13	81.3%	3	18.7%	16
21-40 cigarettes per day	2	100%	0	0%	2

Table 1. Demographic data and habits of participants (n=324).

		No clinically significant insomnia	Subthreshold insomnia	Moderate severity insomnia	Severe insomnia	
Students (n=183; 28.70%*)	n	90	67	24	2	
	%	49.18	36.61	13.11	1.09	
Working students (n=26; 4.63%*)	n	11	10	4	1	
	%	42.30	38.46	15.38	3.85	
Workers (n=104; 8.64%*)	n	76	21	6	1	
	%	73.08	20.19	5.77	0.96	
Jobless (n=11; 0.31%*)	n	10	1	0	0	
	%	90.91	9.09	0	0	
Total (n=324)	n	187	99	34	4	
	%	57.72	30.56	10.49	1.23	
Sex	Male	n	67	26	10	2
		%	63.81	24.76	9.52	1.90
	Female	n	120	73	24	2
		%	54.79	33.33	10.96	0.91

Table 2. Distribution of insomnia severity in accordance with occupation, sociodemographic data.

*percent of participants with suspecting insomnia from whole sample.

Conclusions

According to the adapted Lithuanian version of ISI, insomnia could be presumed for nearly half of participants.

High internal consistency of the Lithuanian version of ISI showed that this scale is reliable and can be adapted for the use in Lithuanian healthcare practice.

Discussion

According to our study results, insomnia can be suspected in nearly half of all participants. Meanwhile prevalence of insomnia in Europe varies from 5.7% to 19% (3). Results depend on different methods of the studies and questionnaires to estimate insomnia, season (the data of this study was gathered in the winter), perception of sleep disorders in people of working age, cultural differences, etc.

This study was the first that investigated epidemiology of insomnia in Lithuania and it showed that insomnia could be suspected for 42.3% of randomly selected participants from the general population, which is higher prevalence than in other European countries. Moreover, the study revealed, that higher ISI scores were related to higher HAD depression and anxiety scores, as well as worse overall sleep quality shown by PSQI.

Consequences of untreated insomnia decreases work efficiency, life quality, emotional and physical health. Every patient should be given recommendations about non – pharmacological insomnia treatment, such as improving sleep hygiene and reducing alcohol and coffee consumption, giving up smoking.

Lithuanian version of ISI showed higher internal consistency than Spanish, Persian and German versions of ISI, but lower than Swedish version of ISI (6 – 9). These minor differences may occur because of the translation features, although Lithuanian

translation of ISI was mentioned by participants as clear and understandable.

Lithuanian version of ISI, showing good psychometric characteristics, could be a very useful tool helping to suspect and diagnose insomnia disorder both in primary care and sleep specialists' practice.

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