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VERIFICATION OF PSYCHOMETRIC PROPERTIES OF THE INSOMNIA TYPE QUESTIONNAIRE (ITQ) IN THE CZECH POPULATION

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Abstract

Insomnia is one of the second most common mental disorders and is one of the primary risk factors for developing depression. The global prevalence of insomnia symptoms ranges from 30-35% and the course of the disease is often chronic. Clinically significant insomnia is reported by 10–23% of college students. Sleep deprivation among college students has been associated with increased alcohol consumption, a higher incidence of somatic illness, risky sexual behavior, and traffic accidents. Researchers have identified significant heterogeneity in the clinical and biomarker characteristics of insomnia leading to subtypes without sufficient validity. The Dutch Insomnia Type Questionnaire (Blanken et al., 2019) aims to identify robust subtypes and thus reduce heterogeneity among insomnia. The aim of our research is to adapt the Insomnia Type Questionnaire into the Czech sociocultural environment and verification of its psychometric characteristics and mapping of subtypes of insomnia. The identification of insomnia subtypes is a potential benefit for clinical practice, as it could allow the selection of high-risk individuals for early preventive intervention. Reducing previously unrecognized insomnia heterogeneity through subtyping can then help elucidate the mechanisms of insomnia and the development of personalized insomnia treatment.

Keywords: *Insomnia, sleep, insomnia type questionnaire, subtyping.*

1. Introduction

The Dutch Insomnia Type Questionnaire (Blanken et al., 2019) aimed to identify robust subtypes and thus reduce heterogeneity among insomniacs. The questionnaire was developed using a large sample (N=4,322) of which 2,224 individuals met the ISI score (cut of score 10) for insomnia. The remaining individuals served as a control group. The questionnaire was able to identify 5 subtypes of insomnia: highly anxious, moderately anxious but sensitive to rewards (with intact reactions to pleasant emotions), moderately anxious insensitive to rewards, moderately anxious with higher reactivity (to the environment and life events), moderately anxious with low reactivity.

2. Objectives

The aim our study was to validate the psychometric characteristics of the Czech adaptation of the Insomnia Type Questionnaire (Blanken et al., 2019) and to map insomnia subtypes in the Czech population.

3. Methods and results

The data collection took place in two waves through the dissemination of an online questionnaire in the social networking environment, from 22 February 2021 to 19 January 2022. A total of 1,051 respondents completed the questionnaire, including 613 persons in the first wave and 438 persons in the second wave of data collection.

The research sample included a total of 1051 people, of whom 839 were women (79.8%), 211 were men (20.1%) and one respondent who did not indicate gender (0.1%). The largest number of respondents was in the 20-25 age group (N = 607; 57.8).

ITQ reliability verification

We checked the internal consistency of the items of the sub-questionnaires that make up the ITQ. These results could contribute to estimating the reliability of the questionnaire. The resulting internal consistency of the items for the Mini-IPIP scale indicated lower reliability of this scale. This could be due to the attempt to measure broad characteristics with only four items. For the FIRST questionnaire, we discarded item 5 ("After watching a scary movie or show") because only a smaller half of probands responded to this item. After discarding this item, the internal consistency value of the FIRST scale did not change. Other results showed relatively high internal consistency across scales. In the next step, we tested the reliability of the scales using the split-half method.

The correlation analysis of the variables

In the correlation analysis of the variables close positive correlations were observed between action control and the experience of satisfaction, as well as between feelings of happiness, extraversion, positive rumination and positive attunement. A close positive correlation was found between neuroticism, negative attunement, and perfectionistic rumination. Variable severity of insomnia was moderately positively correlated with pre-sleep arousal, fatigue, insomnia as a response to stress, rumination, and humiliation. According to the results, there was a close negative relationship between neuroticism, action control and feelings of happiness, and a weakly close relationship between extraversion and neuroticism. Medium-tight negative correlations emerged between behavioral activation, positive rumination, extraversion, and experiencing satisfaction. Results indicated that there were weakly close negative correlations between insomnia severity, positive attunement, positive rumination, feelings of happiness, and action control. These relationships indicated that the aforementioned variables were unlikely to contribute to the development of insomnia symptoms. Conversely, variables that were strongly positively correlated with insomnia severity, such as pre-sleep arousal, fatigue or rumination, may promote the development of insomnia.

Based on the results of the correlation analysis, we were interested in what a model predicting insomnia severity from the variables pre-sleep arousal, fatigue or insomnia in response to stress would look like. Together, these three predictors explained 48.5% of the variability in insomnia, which was 6.9% more than for pre-sleep arousal as a single predictor.

Factor analysis

By calculating the resulting scores of each questionnaire, we obtained a total of 20 variables for which we were interested in their factorial affiliation. We converted the resulting variables into Z-scores. Factor analysis identified five components that explained 61.8% of the variance in the original variables.

The factor analysis yielded five components that divide the outcome variables into their respective groups. The first component is strongly characterized by clinging thinking, neuroticism, rumination, and overall negative attitudes. It is negatively correlated with feelings of happiness and control of action (activity). Symptoms of insomnia in this case may be related to the experience of stress, increased fatigue, but also increased pre-sleep arousal. We have labeled it generally as "Negative Experiencing" for the purpose of further analysis.

According to the factor structure, the second component corresponds to experienced feelings of happiness, positive attunement and positive clinging. It is positively correlated with extraversion and very closely negatively correlated with behavioral activation and weakly correlated with neuroticism. We have labeled it as "Positive Experiencing."

The third component shows a strong association with childhood traumatization and experienced parental pressure. Negative moderate relationships were found in relation to agreeableness, experiencing satisfaction, feelings of happiness and positive rumination. We labeled this component as "Childhood trauma, parental pressure."

The fourth component, named "Organization, Perfectionism", is characterized by high organization and control of activities. It may also be related to experiencing feelings of happiness, friendliness, positive rumination, and overall positive attunement.

The fifth component is characterised by very close relationships between severity of insomnia, pre-sleep arousal, and fatigue, as well as moderately close positive relationships of perfectionistic rumination, humiliation, and overall negative attunement. There were weakly close positive relationships with agreeableness and experienced pleasure.

Correlational analysis showed that the components were barely correlated or negatively correlated with each other, supporting the assumption that they could be separate categories of variables representing a particular group of characteristics.

Cluster analysis

Using factor analysis, we obtained five groups of variables. These groups of variables were tested by cluster analysis, which showed that respondents could be classified into five different groups, or subtypes, based on their responses and characteristics. We compared these subtypes with the results of the original research.

The first group of people did not display many characteristics, the most prominent being perfectionistic traits, control and experienced parental pressure. Persons in this group experienced fewer positive emotions and pleasures, and were more likely to be negatively attuned. This description could correspond to subtype 5: slightly distressed, low reactive. For the second group of persons, experiences of happiness, extraversion and generally positive tuning were prominent, along with organization, perfectionistic rumination and insomnia in response to stress. Similar features were found for subtype 2: moderately distressed, reward sensitive. The third group showed some positive attunement, but generally negative experiences predominated. There was increased fatigue and difficulty sleeping due to increased arousal before falling asleep. Similar characteristics are found in subtype 3: moderately distressed, reward insensitive. The fourth group was dominated by childhood trauma, generally negative experiences, but also some degree of activity control. This group could probably correspond to subtype 4: slightly distressed, highly reactive. The last group is characterised by strong negative experiencing, lack of experienced happiness or pleasure and perfectionism. This last group could correspond to the subtype highly distressed (1: highly distressed).

The representation of people in each subtype was relatively even. Group 2 was the largest group with 277 persons, followed by Group 5 with 231 persons and Group 1 with 206 persons. The smallest group was group 4 with 154 persons and the slightly larger group 3 with 183 persons.

Validity

To test validity, we compared our results with those of the original research by Blanken et al. (2019), to determine whether the ITQ questionnaire battery could be a reliable indicator of insomnia subtypes.

Evidence 1: The factor structure of the variables showed the relationships we would expect between the variables, which could be seen as one evidence of construct validity of the questionnaire.

Evidence 2: Cluster analysis resulted in the probands being classified into five groups approximately corresponding to the distribution of subtypes in the original research.

4. Conclusions

The research focused on the psychometric properties of the Czech version of the ITQ. It provided evidence of the reliability and validity of this questionnaire, confirmed different subtypes of insomnia, and thus could contribute to improving the quality of treatment and care for patients with insomnia in Czech Republic. This research is based on data collected by self-report questionnaire method. Therefore, the limitation may be intentional or unintentional distortion of data by respondents due to fatigue or other subjective factors.

References

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