Validity and Reliability of the Mini Sleep Questionnaire-Persian Version (MSQ-P)

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ABSTRACT

Objectives: The purpose of this study was to evaluate the reliability and validity of Mini Sleep Questionnaire (MSQ) has been translated into several languages and is used after it is approved.

Methods: This study is an observational and case-controls, with a sample size of 121 people were performed. The validity and reliability of the Persian version of the MSQ were done based on Pittsburgh Sleep Quality Index-Persian (PSQI-P).

Results: α -Cronbach's was performed to evaluate the reliability of MSQ-P and is equal 0/753. The face validity and content validity of the MSQ - P was approved. The Pearson correlation coefficients between the both questionnaire were calculated and the results. All express the validity of the MSQ have been translated into Persian.

Conclusions: reliability and validity of MSQ-Persian version confirmed and can be used in the population of Persian language.

Keywords: Mini Sleep Questionnaire (MSQ); Pittsburgh Sleep Quality Index (PSQI); Persian

INTRODUCTION

Every year, thousands of articles related to sleep and sleep disorders in medical and psychological issues show that there are more than 80 different sleep disorders. Sleep quality depends on sleep duration, quality of sleep stages and number of awakenings during the night (which can be primary or secondary to sleep apnea syndrome or periodic limb movement disorder) [1]. Poor sleep is associated with adverse outcomes and could potentially be life threatening [2]. Severe drowsiness in the United States of America is the second cause of car accidents and are the main cause of accidents for commercial vehicles such as trucks [3,4].

Poor sleep can affect immune function [5] and can reduce the respiratory response to hypoxia compared to normal people and also caused hypercapnia and hypoventilation in hospitalization [6,7]. Sleep duration may be inversely associated with blood pressure and coronary artery calcification [8,9]. The America Cancer Society between 1959 and 1960 more than 1 million Americans with many questions regarding sleep habits studied. The results showed that the mortality rate among people who sleep more or less than normal was significantly increased [1].

Based on the importance of quality sleep and the need for screening people with sleep disorders, we planned to assess validity and reliability of Mini Sleep Questionnaire (MSQ) of a Persian translated version of this questionnaire. MSQ is one of the frequently used questionnaire was designed to determine the sleep quality and so far has been translated in various languages.

METHODS AND MATERIALS

This study was done as an observational study and case-control. Data was collected over a period of about two months in the autumn of 2019. Sampling method was simple random. In studies to determine the validity and reliability, there is no general formula for determining the sample size.

The most widespread method used to calculate the sample size used in these cases, the product of the number of questions in the questionnaire number of options per question. Others minimum sample size between 50 and 500 questionnaires have suggested to the ability to analyze information. MSQ included 10 questions and each question included seven options, then we need to 70 samples to evaluate the validity and reliability of the questionnaire. Given the existence of different opinions in the calculation of sample size, sample size is our choice to assess the validity and reliability of the questionnaire included 121 cases [10-12].

Our study population was a Hospital's staff of university of medical sciences who were working in different parts.

To evaluate the reliability of the questionnaire, our study was performed in two phases with an interval of about 30 days. In the first stage of two-stage plans, purpose and how to complete the questionnaire explained to the participants. The individual's personal information was kept confidential. The second phase might also want participants to complete the questionnaire again (given the right to leave the study) was completed.

MSQ is used in clinical studies that have been translated into several languages. The questionnaire consisted of 10 questions. Every question has 7 options based on the Likert-Scale. Each option has the lowest score is from 1 to 7 that is the highest points score. Insomnia is related questions include: difficulty falling asleep, waking up early or mid-sleep and sleep-inducing drugs, Mini Sleep Questionnaire-Insomnia (MSQ-I). Hypersomnia related questions include: snoring, feeling tired when waking up, excessive sleepiness during the day, excessive movement during sleep, falling asleep during the day and morning headaches, Mini Sleep Questionnaire-Hypersomnia (MSQ-H). The global score represents the sum of all items. The Technion MSQ was developed by Zomer et al. For screening sleep disturbances in clinical populations. The original of the questionnaire contains seven questions that express the hypersomnolence and an item is associated with sleep maintenance. Subsequently, three other options that are associated with insomnia were added to the questionnaire [7,8,13]. Pittsburgh Sleep Quality Index (PSQI) composed of 19 questions and this item divided into seven subgroups to scoring was rated. Each subgroup is given a rating from 0-3. The 7 groups together the Points and an overall score are obtained from the PSQI. Score cutoffs for the questionnaire are considered 5. As a result, more than a score of 5 indicates subjective insomnia.

In addition to the 7 subgroups of the PSQI and the total score of the PSQI three factors is defined to validity assessment [6,7,8,13]. Reliability of the Persian version of the PSQI validated by calculating α-Cronbach's and approved. The validity of the questionnaire by comparing the total scores with high scores and lower scores of the PSQI questionnaire General Health

Questionnaire-12 (zero to 12 points) has been confirmed [15]. According to the same studies, validation and reliability of MSQ-persian version based on PSQI-persian version was done.

Translated English version of MSQ into Persian was done, then retranslated it back into English in order to choose more true words transferring more accurate concept.

Data Analysis

Data analysis was done by SPSS version 24. To evaluate the reliability of the MSQ-persian version we used three tests: test-retest, half-split and calculating α-Cronbach. MSQ-Persian version validity was measured by Pearson correlation coefficient calculation.

RESULTS

To evaluate the reliability of the MSQ-P, three statistical tests were used. In the first method that was used, test-retest correlation coefficient is equal to 0/918. In the second method, to test reliability, the method half-split is used. Based on this test, the results collected during the first phase, the correlations between the tests scores 0/598 and reliability of the test in accordance with the formula Spearman-Brown is 0/748. The same test was also performed for the second phase. The results of the second phase collected correlation were 0/689 and 0/816 reliability of the test. In the final test, α-Cronbach's was performed to evaluate the reliability of both phase collected questionnaires completed were equal to 0/753 and 0/769. All the tests used to test reliability, confirming the reliability MSQ-P.

After a short sleep questionnaire translated into Persian, by the relevant experts, the face validity and content validity of the MSQ-P was approved. In terms of statistical analysis when new tests (MSQ-P) and available test (PSQI-P) to measure the same constructs (which in this case is the quality of sleep) is made, if the correlation is high, the new test (in this case MSQ-P) is valid.

This validity is called convergent validity. The Pearson correlation coefficients between the both questionnaires were calculated and the results are listed in Tables 1 and 2.

Table 1: The Pearson correlation coefficients between the PSQI-P and MSQ-P (phase 1).

PSQI-P	MSQ-I	MSQ-H	MSQ – Total score
Sleep Duration	0/254	0/108	0/198
Sleep Disturbance	0/502	0/421	0/528
Sleep Latency	0/527	0/305	0/487
Daytime Dysfunction	0/180	0/226	0/239
Sleep Efficiency	0/278	0/221	0/285
Sleep Quality	0/447	0/435	0/511
Hypnotic Medication Use	0/504	0/239	0/410
PSQI – Total Score	0/653	0/450	0/624
Factor 1	0/309	0/188	0/278

Factor 2	0/709	0/439	0/644
Factor 3	0/374	0/370	0/432

Table 2: The Pearson correlation coefficients between the PSQI-P and MSQ-P (phase 2).

PSQI-P	MSQ-I	MSQ-H	MSQ – Total score
Sleep Duration	0/219	0/109	0/183
Sleep Disturbance	0/541	0/455	0/570
Sleep Latency	0/553	0/345	0/506
Daytime Dysfunction	0/261	0/262	0/302
Sleep Efficiency	0/341	0/223	0/319
Sleep Quality	0/427	0/383	0/465
Hypnotic Medication Use	0/565	0/255	0/456
PSQI – Total Score	0/699	0/478	0/667
Factor 1	0/324	0/190	0/290
Factor 2	0/703	0/440	0/645
Factor 3	0/467	0/423	0/512

According to several factors that were assessed in the questionnaire, all express the validity of the MSQ have been translated into Persian. So MSQ-P is reliable and valid.

DISCUSSION

Previously, PSQI has been translated into Farsi and verified its validity and reliability [15]. In this project, we intend to evaluate the reliability and validity of MSQ, which has been translated from English into Persian. In this project, after MSQ translated to Persian, face and content validity was evaluated and approved. Then MSQ-P and PSQI-P was distributed among participants in two stages and was completed within 30 days. To test reliability, the α -Cronbach, test-retest and half-split test were used. The result of all three tests indicates the reliability of the MSQ-P. To check the validity of MSQ-P, the correlation between sub-groups, three factors and total score of PSQI-P and sub-groups of MSQ-P were evaluated. The result represents the correlation between sub-groups of the PSQI-P and MSQ-P. The highest correlation was between factor 2 PSQI-P and its total score and MSQ-I. The

lowest correlation was between sleep duration subgroup of PSQI-P and MSQ-H. Consequently, our study confirms the validity and reliability of the Persian version of MSQ. This questionnaire is a useful tool for screening patients with sleep disorders in the population of Persian language.

REFERENCES

1. Benjamin JS, Virginia AS, Pedro R. Kaplan and Sadock's Comprehensive Textbook of Psychiatry. 2009.

2. Johnson LC. Sleep deprivation and performance. In: Webb WB, John Wiley and Sons. Biological Rhythms, Sleep and Performance. 1984.

3. Mitler MM, Dinges DF, Dement WC. Sleep medicine, public policy, and public Health. In: Kryger MH, Roth T, Dement WC. Principles and Practice of Sleep. Philadelphia, Sauders. 1944.

4. Rechtschaffen A, Bergmann BM, Everson CA. Sleep deprivation in the rat: X. Integration and discussion of the findings. Sleep. 1989;12(1):68-87.

5. Pack AI, Maislin G, Staley B, et al. Impaired performance in commercial drivers: role of sleep apnea and short sleep duration. Am J Respir Crit Care Med. 2006;174(4):446-454.

6. White DP, Douglas NJ, Pickett CK, Zwillich CW, Weil JV. Sleep deprivation and control of ventilation. Am Rev Respir Dis. 1983;128(6):984-986.

7. Schiffman PL, Trontell MC, Mazar ME, Edelman NH. Sleep deprivation decreases Ventilator response to CO2 but not load compensation. Chest. 1983;84(6):695-698.

8. Knutson KL, Van Cauter E, Rathouz PJ, et al. Association between sleep and blood pressure in midlife: the CARDIA sleep study. Arch Intern Med. 2009;169(11):1055-1061.

9. King CR, Knutson KL, Rathouz PJ. Short sleep duration and incident coronary artery calcification. JAMA. 2008;300(24): 2859-2866.

10. Cattell RB. The Scientific Use of Factor Analysis in Behavioral and Life Sciences. 1978.

11. Everitt BS. Multivariate analysis: The need for data, and other problems. The British Journal of Psychiatry. 1975;126(3):237-240.

12. Gorsuch RL. Factor Analysis, London: Lawrence Erlbaum Associates. 1983.

13. Bowes G, Woolf GM, Sullivan CE, Phillipson EA. Effect of sleep fragmentation on ventilatory and arousal response of sleeping dogs to respiratory stimuli. Am Rev Respir Dis. 1980;122(6): 899-908.

14. Kripke DF, Simons NR, Garfinkel L, Hammond EC. Short and long sleep and sleeping pills: Is increased mortality associated? Arch Gen Psychiatry. 1979;36(1):103-116.

15. Farrahi Moghaddam J, Nakhaee N, Sheibani V, Garrusi B, Amirkafi A. Reliability and validity of the Persian version of the Pittsburgh Sleep Quality Index (PSQI-P). Sleep Breath. 2012;16(1): 79-82.