

Validity of a sleep disorder screening questionnaire for Indian population

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Abstract

Introduction: Sleep disorders are common but remain undiagnosed due to lack of awareness among masses as well as physicians. There is a need for a sleep questionnaire which is specific to Indian population, quick to understand as well as is a reliable screening device.

Objective: To validate a sleep questionnaire as a basic screening tool.

Material and Method: The questionnaire was prepared taking different situations into consideration, translated into Marathi as well as English. Ten subjects were randomly chosen and the test was administered over an interval of one month by two experts to determine its intra-observer as well as inter-observer reliability. The validity was further confirmed with NPSG (Nocturnal Polysomnogram) as a gold standard.

Results: The kappa statistic was 0.92 for intra as well as inter-observer reliability. Validity was determined by evaluating fifty five subjects by way of self administered questionnaire followed by a NPSG (Nocturnal Polysomnogram). The sensitivity and specificity were found to be 80% and 75% by Baye's rule.

Conclusion: The reliability of the questionnaire is excellent. By Landis method there is almost perfect agreement between Expert 1 and Expert 2. Also there is good sensitivity and specificity observed. It appears to be useful screening tool for identifying presence of sleep disorders.

Introduction

Sleep disorders and chronic sleep loss are associated with increased health problems. Though the branch of sleep medicine has been growing leaps and bounds, its awareness among the general masses and

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various health care professionals is still not upto the mark.¹ There is a need for simple screening questionnaire which will help to screen people with sleep disorders. In India, there is paucity of data as well as good screening tools which can help doctors to effectively screen people with sleep disorders³. Also these screening questionnaires should be easily accessible as well as simple to help the doctors and patients with sleep disorders. Epworth sleepiness scale though easily available, is not very commonly employed by non sleep specialists.² Also some questions are not seen in the Indian context eg. driving, sitting quietly after lunch etc⁵ hence we propose this questionnaire which is being used clinically but has not been validated. This questionnaire will be a value

addition and help in quick screening. It being easy to understand, the patients can give appropriate answer even in the absence of a qualified expert. Also its simplicity and direct approach can be useful as a screening tool for sleep as well as non sleep specialists.

Methodology

The patients were recruited through various awareness camps as well as there were patients presenting to International Institute of Sleep Sciences, Mulund. The response rate was 100%. The questionnaires were easy to fill and minimal clarifications were required.

The questions were translated into English, Hindi and Marathi by the authors and were found to convey the meaning and were easy to understand and relate with. The questionnaire (consisting of 10 questions) was administered within a period of 1 month, thrice to 10 subjects by the experts on one to one basis. Fifty five subjects were subsequently evaluated and sensitivity and specificity was calculated against NPSG and experts opinion which were taken as a gold standard.

Statistical Analysis

Ten subjects were evaluated over a period of one month. The test retest reliability was calculated using kappa statistic. Validity was determined by calculating sensitivity and specificity by Baye's theorem.

Results

To calculate test-retest reliability they were assessed thrice by each expert. The group consisted of two females and eight males. The mean age was 48 ± 7.8 . The mean BMI (kg/m^2) was 27.72 ± 3.73 . The kappa value was 0.92. It indicates that there is almost perfect agreement between the two experts⁴. Hence reliability of questionnaire is excellent.

For determining validity, a study group of fifty five subjects was formed. The mean age was 45 ± 10.4 . The mean BMI (kg/m^2) was 26.51 ± 4.62 . Twenty nine patients were healthy subjects ($\text{BMI} 24.71379 \pm 2.54$) and twenty six were patients (28.7 ± 5.08) with sleep disorders. There were seven females and forty eight males in the group. The sensitivity and specificity were found to be 80% and 75% respectively.

Table 1: Demographic Details of study group

	Reliability testing (n=10)	Validity testing (n=55)
Age (yrs) \pm mean (SD)	48 ± 7.8	45 ± 10.4
BMI (kg/m^2) \pm mean (SD)	27.72 ± 3.73	26.51 ± 4.62

Discussion

The questionnaire exhibited good test, retest ($k=0.92$) and inter-observer reliability. There was good sensitivity and specificity of 80% and 75% respectively.

In spite of having a sensitivity and specificity of 94% and 100% for excessive daytime sleepiness in Western population⁷, ESS has a low sensitivity and specificity for screening of OSA.⁵ Hence a modified version has also been developed for the same for the Indian population.^{5,8}

Dr. M. Bhatia et al has also devised a modified version of a Case Western Health

Reserve and the Sleep Disorders Questionnaires (SDQ)⁶. Its sensitivity and specificity were found to be in range of 70-91% and 80-100% respectively.

There are many questionnaires available to evaluate sleep disorders like STOP bang questionnaire for evaluating obstructive sleep apnea, Pittsburg sleep index for evaluating insomnia and OSA and many others which have been validated in the Western Population⁸.

The main strength of this study is that the expert opinion is based on NPSG studies.

This questionnaire is general, in nature, will act as a basic screening tool and will help in classifying the population as positive or negative in terms of having any kind of sleep disorders. However a large number of study group is required to further validate this questionnaire as well as determine specificity and sensitivity of individual questions. This can be used for screening large populations by general physicians.

Annexure

There were total 10 questions. The questions were very simple to understand and answer. The presence of daytime sleepiness, snoring, sleeping while driving/

travelling, inability to sleep, unrefreshing sleep, late sleep onset, unable to maintain sleep etc were some of the questions addressed by the questionnaire. For all the questions the responses were based on binary format i.e. a yes/ no response. Those with answers >4 were considered to be positive and symptomatic.

The sleep quiz

1	I feel sleepy during the day; even when I get a good night's sleep.	YES	NO
2	I get very irritable when I can't sleep.	YES	NO
3	I wake up at night and have trouble falling back to sleep at least twice a week.	YES	NO
4	It usually takes me a long time to fall asleep.	YES	NO
5	I often wake up very early and can't fall back to sleep.	YES	NO
6	I usually feel achy and stiff when I wake up in the morning.	YES	NO
7	I often seem to wake up because of the dream.	YES	NO
8	I sometimes wake up gasping for breath.	YES	NO
9	My spouse/family says my snoring keeps her/him/ them from sleeping.	YES	NO
10	I've fallen sleep during driving/traveling.	YES	NO

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