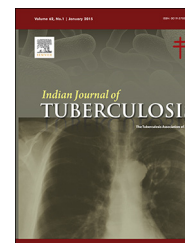


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## Original Article

# Emerging applications: Screening OSA by Modified Pictorial Epworth Sleepiness Scale in Indian subjects

Azmat Karim, V.K. Arora<sup>\*</sup>, M.B. Gupta

Santosh Medical College and Hospital, Ghaziabad, U.P., India

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OSA (obstructive sleep apnoea)

AHI (apnoea and hypopnoea index)

Receiver operating curve

Area under curve

## ABSTRACT

**Background:** The Epworth Sleepiness Scale (ESS) is a widely used scoring to measure excessive daytime sleepiness. This scale was designed to be self-completed by the subjects, but unfortunately in a developing country with low literacy this had affected its outcome interpretation. The Traditional ESS has been translated into a Modified Pictorial version for easy comprehension by the patients.

**Method:** Subjects were evaluated for their competence to self-complete the ESS (Conventional and Pictorial) in Sleep Clinic at Respiratory Department of Santosh Medical College and Hospital, Ghaziabad. Modified Pictorial representations were designed along with 5 newer questions incorporated as sub-questions in 8 original domains prepared and labelled as Pictorial Scale. The Traditional (ESS) and Pictorial (Modified) representations were compared for agreement by receiver operating curve and the area under curve.

**Results:** It was found that time taken to complete the Traditional ESS was significantly higher in comparison to Modified Pictorial Epworth Sleepiness Scale with reduced errors (Pictorial ESS 4.67 min than Traditional ESS 14.43 min).

**Conclusions:** Modified pictures scale showed statistically significant improvements over ESS and hence can be used as an alternative for subjects with low literacy level.

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## 1. Introduction

Obstructive sleep apnoea-hypopnoea (OSAH) is characterised by recurrent episodes of upper airway collapse and obstruction during sleep. These episodes of obstruction are associated with recurrent oxyhaemoglobin desaturations and arousals from sleep. OSAH associated with excessive daytime sleepiness (EDS) is commonly called obstructive sleep apnoea-hypopnoea syndrome (OSAHS). Despite being a common disease, OSAHS is under-recognized by most primary care physicians in India. Comorbidities like hypertension and

diabetes further exacerbate the symptoms of obstructive sleep apnoea (OSA) and make control of blood pressure and sugar more difficult.

Pictures or pictorial aids are a useful adjunct to medical information and aid the transfer and comprehension of written and spoken information. It has been observed and proven that instruction of medication or any utility, manual understanding of instructions has been shown to be better when pictures are used in conjunction with, or instead of, the written words. Even in those with normal literacy skills, such interventions are important as they can improve both understanding and compliance with medical treatment.

<sup>\*</sup> Corresponding author. Tel.: +91 9818001160.

E-mail address: [vijaykumar1945@gmail.com](mailto:vijaykumar1945@gmail.com) (V.K. Arora).

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Keeping in view of the socio-economic factors and high illiteracy in our country, it was decided to translate the Traditional Epworth Sleepiness Scale (ESS) into Pictorial scales and customizing it as per the needs of the Indian rural as well as urban class of population.

## 2. Methods

The study was carried out in tertiary care hospital, Santosh Medical College & Hospital, Ghaziabad, U.P. Data were

<b>Modified Epworth Sleeping Scale</b>					
Patient Name: _____		ID No.: _____		Date: ____/____/____	
In contrast to just feeling tired, how likely are you to doze off or fall asleep in the following situations? Even if you have not done some of these things recently, try to work out how they would affect you. Use the following scale to choose the most appropriate number for each situation.					
Situation	<input type="checkbox"/> Please tick box	0 No chance of dozing	1 Slight chance of dozing	2 Moderate chance of dozing	3 High chance of dozing
1 बैठने और पढ़ने समय	<input type="checkbox"/>				
2 टेलीवज़िन देखने के दौरान	<input type="checkbox"/>				
3a एक सार्वजनिक स्थान में नशिक्रिय बैठे दौरान (उदाहरण: एक थिएटर या एक बैठक)	<input type="checkbox"/>				
3b सुरक्षा गेट पर नशिक्रिय बैठे हुए	<input type="checkbox"/>				
3c कक्षेत्र में नशिक्रिय बैठे हुए	<input type="checkbox"/>				
4 एक बरेक के बनिा एक घंटे के लिए एक कार में एक यात्री के रूप में	<input type="checkbox"/>				
5 परस्थिति की अनुमति जब दोपहर में आराम करने के समय	<input type="checkbox"/>				
6 बैठ कर और किसी से बात करते हुए	<input type="checkbox"/>				
7 एक दोपहर के भोजन के बाद चुपचाप बैठे हुए शराब के बनिा	<input type="checkbox"/>				
8a यातायात में कुछ मनिट के लिए एक बंद कर कार में	<input type="checkbox"/>				
8b यातायात में कुछ मनिट के लिए एक बंद ऑटो में	<input type="checkbox"/>				
8c रक़िशा में नशिक्रिय बैठे हुए	<input type="checkbox"/>				
8d गाडी में नशिक्रिय बैठे हुए	<input type="checkbox"/>				

Fig. 1 - Modified Pictorial Scale of Azmat Karim and Vijay Kumar Arora.

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