Can study subjects who malinger be identified with the Epworth Sleepiness Scale

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INTRODUCTION

When a non-creditable presentation of a disease is conscious and with the purpose of personal gain, it is referred to as malingering. Malingerers influence the public's perception of disease as well as the treatments. Another consequence of malingering is the cost on society for unnecessary assessments and treatments. In clinical research, by providing inaccurate information, malingerers may be inappropriately randomized and could contribute to placebo response resulting in larger sample sizes along with the commensurate costs. In the literature, rates of malingering range from 8-48% based on failure rates on performance validity tests, which is much higher than the prevalence pathologies such as ADHD (8.8% in children, 4.4% adults). [1,2]

Studies have shown self-reported questionnaires such as those used in diagnosing ADHD are easily faked by college students, and therefore are frequently not useful in identifying malingerers.[3] These sorts of questionnaires usually interrogate acute symptoms.

For this project a computerize version of Epworth Sleepiness Scale (ESS) was utilized in an attempt to identify malingerers. The questionnaire was developed by Murray Johns, PhD to measure components of daytime sleepiness, which have developed across weeks, months and years rather than independent changes from day to day. It is not a measure of acute of symptoms. Therefore the responses should be relatively unchanged across days or a week between surveys. There are no publications regarding the use of the Epworth Sleepiness Scale as an indicator for malingering. ESS is a validated 8-question questionnaire, which measures daytime sleepiness.[4] ESS has been used extensively with high test-retest reliability ranging from 0.82-0.93 when tested weeks to months apart. [4,5,6] With high test-retest reliability, malingerer identification could be based on low reproducibility within 24 to 48 hours after initial screening.

It is known malingerers cannot preserve their malingering strategy when taking neurocognitive tests a week apart. [7] This study looks at patient reported outcomes rather than test performance.

OBJECTIVES

Determine whether a computerized version of Epworth Sleepiness Scale (ESS) can identify malingerers when administered twice over a short period of time.

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TABLE 1 Epworth Sleepiness Scale questionnaire and scoring scale

Situation	Chance of Dozing
1. Sitting and reading	
2. Watching TV	
3. Sitting, inactive in a public place	
4. As a passenger in a car for an hour without a break	
5. Laying down to rest in the afternoon when circumstances permit	
6. Sitting and talking to someone	
7. Sitting quietly after a lunch without alcohol	
8. In a car, while stopped for a few minutes in traffic	

0 = would never doze
1 = slight chance of dozing
2 = moderate chance of dozing
3 = high chance of dozing

Score	Interpretation
0-5	Lower Normal Daytime Sleepiness
6-10	Higher Normal Daytime Sleepiness
11-12	Mild Excessive Daytime Sleepiness
13-15	Moderate Excessive Daytime Sleepiness
16-24	Severe Excessive Daytime Sleepiness

TABLE 2 ESS score mean and standard deviation for 24 hour, 48 hour and normal groups (5 month)

Mean			Correlation
Arm	Baseline Test	Second Test	r^2
24 hour	10.2	12.2	0.621
48 hour	8.7	9.1	0.578
5 month*	7.4	7.6	0.822

Standard Deviation		
Arm	Baseline Test	Second Test
24 hour	3.86	4.52
48 hour	2.86	3.27
5 month*	3.9	3.8

Cronbach's α		
Arm	Baseline Test	Second Test
24 hour	0.5996	0.7711
48 hour	0.4498	0.5911
5 month*	0.73	N/A

*Johns MW. Reliability and factor analysis of the Epworth Sleepiness Scale. Sleep, 1992; 15: 376-381.

METHODS

- Subjects (n=36) were randomly assigned to complete the tests after a period of 24 hours, "1 DAY" (n=19) or 48 hours, "2 Day" (n=17).
- All participants signed an informed consent and a data release form.
- Each participant completed a battery of 6 CNS Vital Signs, computer-based cognitive subtests and a subjective Epworth Sleepiness Scale on two separate days.
- Prior to each test administration, subjects read a scenario in which they were instructed to attempt to feign ADHD symptoms, without tripping built-in test validity indicators.
- Statistics and correlations were calculated using SAS JMP Pro 12

RESULTS

Comparison between EES scores of 36 individuals on two separate occasions, either 24 or 48-hour wash out period, estimated test-retest reliability for coached malingerers. The baseline for the 24 hour group resulted in a mean ESS score of 10.2 ± 3.86 and 24 hours later a mean of 12.2 ± 4.52 (Table 2). In the second group, the mean baseline ESS score was 8.7 ± 2.86 and 48 hours later 9.1 ± 3.27. According to the developer of ESS, in a 5 month study, the mean baseline ESS score for healthy volunteers was 7.4 ± 3.9 and 7.6 ± 3.8 on the second, thus showing ESS scores did not change significantly and were highly correlated when tested 5 months later.[4] The mean paired difference between the paired scores for Dr. Johns' study was 0.20 ± 2.3 compared to 2.83 ± 2.94 and 2.29 ± 1.59 for 24 and 48-hour groups respectively. [4]

CONCLUSION

The ESS questionnaire has shown to be reliable and internally consistent, is designed to not measure acute changes in sleepiness from day to day. When given to a group of coached malingerers, both groups were unable to reproduce their score after a 24 or 48-hour wash out period. At baseline, the subjects attempted to malingerer and were unable to consistently reproduce their responses after 24 or 48-hours. Therefore, ESS is a possible tool to identify malingering when given 24 or 48 hours from initial test.

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