

May 15, 2020

# Effects of singing bowl exposure on Karolinska sleepiness scale and pupillographic sleepiness test: A randomised crossover study.


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**1** Works for me [dx.doi.org/10.17504/protocols.io.bge9jth6](https://dx.doi.org/10.17504/protocols.io.bge9jth6)

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## ABSTRACT

This study evaluated the influence of a struck singing bowl on subjective and objective sleepiness during daytime compared to a relaxation period in a silent singing bowl. Subjective sleepiness was significantly lower after relaxation above a struck singing bowl. After gender stratification, the difference was still significant in women. Objective sleepiness was not different in both groups. Finally we can only speculate if women may be more susceptible to subjective improvements in case of sleepiness and show another perception of relaxation in a struck singing bowl compared to men.

## SAFETY WARNINGS

Please do not share any identifiable data.

### Identify participants

- 1 Inclusion criteria  
Participants can be included in this study if they:
  - are aged between 20 and 60 years.

### Identify participants

- 2 Exclusion criteria  
Participants cannot be included in the study if they:
  - have a body mass index > 30 kg/m<sup>2</sup>,
  - report less than six hours of sleep the night before the assessment,
  - report insomnia, defined as subjective difficulty to initiate and/ or maintain sleep,
  - report excessive daytime sleepiness, defined as ESS score > 10/24 points,
  - have known pupillary afferent or efferent lesions,
  - had more than three glasses of alcohol the prior evening,
  - had caffeine, nicotine, benzodiazepines, or stimulants the morning of the assessment.

### Demographic information and clinical data

- 3 Each participant should be given an anonymous ID.
  - Age of the participants in years at the time of enrolment in the study.  
Missing data should be marked with 99.
  - Sex of the participants.  
If male, code as 0.  
If female, code as 1.  
Missing data should be marked with 99.

- Height and weight of the participants at the time of the enrolment in the study.  
Height in centimeters.  
Weight in kilograms.  
Missing data should be marked with 99.
- Mean reported sleep duration on work-days (hours).  
Sleep duration in hours.  
Missing data should be marked with 99.
- Mean sleep duration the night before the assessment (hours).  
Hours of sleep the night before the assessment.  
Missing data should be marked with 99.
- Sleep deprivation the night before the assessment.  
Less than six hours of sleep the night before the assessment.  
If yes, code as 1.  
If no, code as 0.  
Missing data should be marked as 99.
- Report of insomnia (Subjective difficulty to initiate and/ or maintain sleep).  
If yes, code 1.  
If no, code 0.  
Missing data should be marked with 99.
- Epworth Sleepiness Score (ESS)  
Points as total score.  
Missing data should be marked with 99.
- Report of excessive daytime sleepiness, representing an Epworth Sleepiness Score (ESS) of more than 10 points.  
If yes, code 1.  
If no, code 0.  
Missing data should be marked with 99.
- Prior eye disease (known pupillary afferent or efferent lesions).  
If yes, code 1.  
If no, code 0.  
Missing data should be marked with 99.
- Alcohol consumption prior to the investigation (more than three glasses of alcohol the prior evening before the investigation).  
If yes, code 1.  
If no, code 0.  
Missing data should be marked with 99.
- Intake of alcohol, caffeine, nicotine or stimulants in the morning of the investigation.  
If yes, code as 1.  
If no, code as 0.  
Missing data should be marked with 99.

#### Study Design and Study Procedures

- 4 By means of a coin toss, participants were randomised into one of the two groups regarding the order of the investigations. Participants changed groups, when they came back for the second investigation. The two assessments were performed one week apart, at the same time interval (between 11:00 and 18:00) at the bell foundry Grassmayr, Innsbruck, Austria.  
In one experimental session, the singing bowl was struck.  
The other experimental session included an opportunity to rest without striking of the singing bowl.  
  
If struck singing bowl, code as 0.  
If silent singing bowl, code as 1.
- Struck singing bowl session: The participants lay down on a hammock over the singing bowl. The singing bowl was

struck seven times, with intervals of 30 seconds. After the striking of the bowl, the volunteers spent 20 further minutes lying over the bowl relaxing.

Measures:

Karolinska Sleepiness Scale before the relaxation period as total score.

Pupillary unrest index before the relaxation period as mm/min.

Karolinska Sleepiness Scale after the relaxation period as total score.

Pupillary unrest index after the relaxation period as mm/min.

- Silent singing bowl session: Participants in the second group rested without the sound waves of the singing bowl. They spent 20 minutes in the hammock over the singing bowl.

Measures:

Karolinska Sleepiness Scale before the relaxation period as total score.

Karolinska Sleepiness Scale after the relaxation period as total score.

Karolinska Sleepiness Scale after the relaxation period as total score

Pupillary unrest index after the relaxation period as mm/min.