

# Mobile Technology and Fitness Heart Rate Monitors Make Large Scale Self-Sleep Evaluation Possible

Baharav A.<sup>1,2</sup>, Eyal S.<sup>2</sup>, Dagan Y.<sup>2</sup>

<sup>1</sup>Sleep Laboratory, Wingate Institute, Netanya, Israel

<sup>2</sup>HypnoCore LTD, Petach Tiqva, Israel

## Introduction:

Artificial light, media, and communication technology, including mobile phone and internet, became integral part of modern society and brought profound changes in work and sleep-rest schedules, as well as in habits and lifestyle. The western society accumulates sleep debt and the consequences include increased daytime sleepiness, decreased performance and increased morbidity. We have to understand how to reconcile between basic physiological needs and the new culture. To start with, people have to be able to evaluate their sleep.

**Objective:** To offer an accurate and affordable sleep evaluation tool.

**Methods:** A new software HCC was developed and validated. HCC is based on a previously validated product that allows sleep and sleep apnea diagnosis based on ECG and oxygen saturation only. HCC analyses instantaneous Heart Rate (HR) Variability and provides accurate Total Sleep Time (TST), sleep efficiency and fragmentation, SWS, REM and Light Sleep times, and sympato-vagal balance. HR is obtained from available HR belts, stored on an iPhone and sent for processing in the cloud. Results are returned to MySleepRate (MSR) internet application.

## Results:

MSR has been offered free of charge to any interested owner of a suitable HR belt and iPhone. These are the results based on 1652 good quality recorded nights between February 25<sup>th</sup> and September 19<sup>th</sup>, 2012.

### Bed time

22:30-00:30 in 54% and  
10:00-01:00 in 74%

### Wake up time

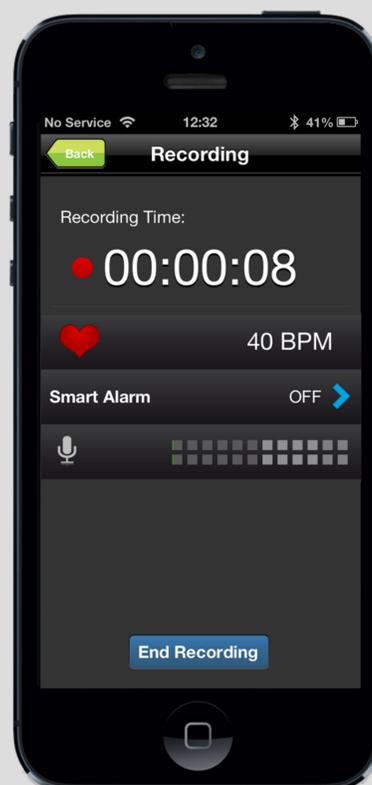
05:00-08:00 in 74%

### TST

5:56  $\pm$ 1:06  
7-8 hours a night in 13%

### Sleep Latency

less than 20 min in 42%



## Conclusion:

The results regarding total sleep time, bed time and wake up time corroborate with those of the National Sleep Foundation Survey 2011 and indicate a mean sleep time around 6 hours, suggesting a severely sleep deprived population. However, the question is what is normal, since only 13% of the population meet the "normal" sleep time values.