Exploring the universe of sleep

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Artist

• Reversed calendar
Sleep is hard

- Late social activity?
- Evening sport?
- Late food?
- Screen time?
Aim
What I tracked about my sleep

- Time in bed
- Time sleeping
- Time awake
- Deep sleep
- REM sleep
- Light sleep
- HRV evening
- HRV morning
- Sleep rating

**Emfit QS – The Key to Winning™**

*Electronics with Wi-Fi can be placed far away to avoid disturbance to sleep.*

*Sensor is installed under the mattress.*

**Emfit QS** is under matress installed, all automatic sleep monitor with web application. Because it is Heart-Rate-Variability enabled, it will help you train all the way to your limits and improve strength, power, conditioning, and fitness!
What I tracked about my behavior

• sport start- end
• meeting start - end
  • perception of meeting
• calorie intake
• stress level during the day
• happiness level during the day
• screen time duration
How I tracked my behavior

- **Start time sport**
  - Time

- **End time sport**
  - Time

- **Start time social meeting**
  - Time

- **End time social meeting**
  - Time

- **Feeling social meeting**
  - Positive
  - Neutral
  - Negative
Working with Emfit data

- Export per night
- Reconstruct night
- Convert from minute notation to decimal notation
Design
Nights as planets
Visualizing variables

• Calories
• Stress & mood
• Recovery
• Evening activities
• Ratings
Calories
Stress & mood
Evening activities
Sleep ratings
Average night

- Calories
- Awake
- Light
- Deep
- REM
- Screen time
- Sport
- Social time

Stress Mood
Rating Recovery
Art & Science
## Correlations

<table>
<thead>
<tr>
<th>Variable 1</th>
<th>Variable 2</th>
<th>Correlation</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Awake</td>
<td>Morning HRV</td>
<td>-.493**</td>
<td>Not sleeping is bad for HRV</td>
</tr>
<tr>
<td></td>
<td>Systole blood pressure</td>
<td>.396*</td>
<td>Not sleeping raises systole bp the following morning</td>
</tr>
<tr>
<td></td>
<td>REM, light sleep</td>
<td>negative</td>
<td>No correlation found with deep sleep</td>
</tr>
<tr>
<td>REM sleep</td>
<td>Morning systole blood pressure</td>
<td>-.378*</td>
<td>REM sleep lowers systole bp</td>
</tr>
<tr>
<td></td>
<td>In sleep, light sleep</td>
<td>Positive**</td>
<td>No correlation found with deep sleep</td>
</tr>
<tr>
<td></td>
<td>Subjective sleep appreciation</td>
<td>.521**</td>
<td>The more REM sleep the better I rate my sleep</td>
</tr>
<tr>
<td>Light sleep</td>
<td>In sleep</td>
<td>.902**</td>
<td>Most of my time is spend in light sleep</td>
</tr>
<tr>
<td></td>
<td>Subjective sleep appreciation</td>
<td>.658**</td>
<td>The more light sleep the better I rate my sleep, has even more impact than REM</td>
</tr>
<tr>
<td>Deep sleep</td>
<td>Evening calorie intake</td>
<td>-.494**</td>
<td>The more calories I eat in the evening the less deep sleep I get</td>
</tr>
<tr>
<td>Evening calorie intake</td>
<td>HRV evening &amp; HRV morning</td>
<td>Negative*</td>
<td>The more I eat in the evening the lower my HRV in the evening and morning</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
Unexpected correlations

• Awake time - Systole blood pressure positive
• REM sleep - Systole blood pressure negative
• Meditation no correlation
Sleep & calorie intake

• Calorie intake effects deep sleep
• Calorie intake effects HRV
Sleep appreciation

- Light sleep
- REM sleep
I learned: tracking sleep is hard
I learned:
Screen time may not be the culprit
I learned:
Calories count
I learned: Calories count
I learned:
I love Statistics.
I learned:
The joy of creating