Persuasive Strategies in e-Coaching for Insomnia

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1. Background
2. Sleep therapy
3. Coaching
4. SleepCare system
5. Wrap up
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Goal

Development of computerized strategies to improve exercise adherence

Proof of concept

*Fully automated e-coaching system* in the domain of sleep therapy
Types of strategies

Tunneling
Triggering
Adaptation
Simplification
Commitment
Authority
...

[Images of polar bears and a hand reaching for an apple]
Our dream
Our reality
Three lines of R&D

Empirical validation  Prototyping  Modeling
Why sleep therapy?

• Sleep is important
• >10% of population suffers from insomnia
• Proven therapy
• Adherence rates are low
• Large variation in exercises
CBT for Insomnia

- Bedtime restriction
  - use bed for sleeping only
  - do not sleep outside the bed
  - build up sleep pressure

Relaxation

Sleep hygiene

Stimulus control

Bedtime restriction

Cognitive restructuring
Typical advice:
‘Go to bed at 12 and get up at 5! Practice for five weeks’
We need a coach
Coaching process

Collaborative practice
→ the coach gives advice and supports
→ both coach and coachee learn in interaction

Individual experience
→ the coachee is an active contributor
Coaching process

High degree of uncertainty

→ usually the coach is not the expert
→ frequent feedback and adaptation of the process
SleepCare

CBT-I exercises
• sleep restriction
• relaxation
• sleep hygiene

Assignments
• in bed, out bed
• fill in sleep diary
• relaxation exercise
• consult
Adaptation Feedback

Exercise

Alignment → Plan & Commit → Task execution → Evaluation → Closure
SleepCare

Interface metaphor

Talk

Tools
SleepCare
Interface metaphor

Talk

Tools
Persuasive strategy in sleep restriction

Negotiation
Shared planning
Shared decision making
Shared commitment
Shared agreement
Personalization
Tailoring
Alignment
Expectation management
Autonomy protection
This week we will start the sleep restriction exercise. You have to keep regular bed times and should shorten the total time in bed. Because you have less time to sleep, you will be more tired and that helps for a better sleep.

Would you like to know more before we start?

Let’s start!
- What do I have to do?
- What can I expect?
How long would you like to stay in bed?

- 6:00
- 5:30
- 6:30

We will now determine your bedtimes. On the basis of your sleep diary I advice a total time in bed of 5 hours. Do you agree?

- Yes
- I prefer a little longer
- I don’t want bedtime restriction

How long would you like to stay in bed?

- 5:30
- 6:00
- 6:30

Planning and commitment
You suggested 6:30 hours. The exercise works better when you stay in bed as long as your mean sleeping time last week. So, I suggest that the total time in bed will be 5:30. Do you agree?
Next week, you want to stay no longer than 6:15 hours in bed. That is fine, I agree.
## Sleep Restriction
### scenario’s and negotiation space

<table>
<thead>
<tr>
<th>Average Time In Bed</th>
<th>Average SleepTime</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8.5</td>
</tr>
<tr>
<td>10</td>
<td>[8.5;9]</td>
</tr>
<tr>
<td>8</td>
<td>X</td>
</tr>
<tr>
<td>6</td>
<td>X</td>
</tr>
<tr>
<td>4</td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>X</td>
</tr>
<tr>
<td>1</td>
<td>X</td>
</tr>
</tbody>
</table>

X = impossible
[r ; s] negotiation, min = r, max = s
Persuasive strategy in assignments

Feedback
Awareness
# Assignments Schedule

<table>
<thead>
<tr>
<th>Status</th>
<th>Past</th>
<th>Today</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not-completed</td>
<td>Missed</td>
<td>Actual/near miss</td>
<td>Planned</td>
</tr>
<tr>
<td>Completed</td>
<td>Completed</td>
<td>Completed</td>
<td>Impossible</td>
</tr>
</tbody>
</table>
Choose length of exercise

1 minute

2 minutes

4 minutes
What do we have?

• Generic framework for e-Coaching
  – talk and tools
• RCT-ready prototype for sleep coaching
• Experimental infrastructure
• Experimental results
  – reminders help!
Persuasive Strategies

Tunneling
- activity schedule, notifications, reminders

Adaptation
- alignment, frequent feedback loops

Simplification of assignments
- handling sleep data, scheduling, relaxation

Increasing motivation
- showing (non-)adherence, performance and progress, shared decision making, explicit user commitment, explanation of therapy and exercise rationale, expectation management
Currently RCT
Remember:
The quality of sleep does not only depend on the quality of the mattress...