Better sleep: the secret to employee mental health

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Jenna Carl PhD, Medical Director at Big Health

March 2017
Agenda

1. The sleep and mental health connection
2. Improving employee sleep with Sleepio
3. Why start with sleep
4. Results of program rollout
Big Health

We are a digital medicine company

• Highly personalized behavioral medicine programs for mental health
• As scalable as drugs, as effective as in person therapy
• Backed by gold-standard clinical research
What are the consequences of poor sleep?

- Irritability
- Concentration problems
- Fatigue
- Reduced empathy
- Illness
- Accidents/ errors
- Lower productivity
But, the dirty secret is that the biggest impact of poor sleep is on mental health
1 out of 5 adults has a significant mental health disorder

- Insomnia: 20%
- Anxiety: 18%
- Depression: 10%

Source: Roth et al. (2011) Biol Psychiatry - 23% is the 12-month prevalence of Insomnia in US adults; NIMH – 18.1% is the 12-month prevalence of Anxiety Disorders in US adults; NIMH – 9.5% is the 12-month prevalence of Mood Disorders in US adults.
It turns out, they are highly interrelated and overlapping

Sleep and mental health has a complex, bidirectional relationship

Sleep - > Anxiety: 17x risk
Sleep - > Depression: 10x risk
Anxiety - > Sleep
Depression - > Sleep

What is insomnia?

1. Repeated difficulty falling asleep, staying asleep, or waking early
2. Occurs despite adequate opportunity for sleep
3. Results in daytime impairment
4. 3 nights/wk for 3 months or more
5. Causes significant problems in functioning
Insomnia is a vicious cycle of hyperarousal – perpetuated by unhelpful thoughts and behaviors

Stressful trigger

Beliefs about poor sleep

“I will never sleep again”
Worry about consequences

Emotional disorders

Anxiety
Depression

Physical / functional problems

Fatigue
Inability to concentrate
Stress-related illness

Unhealthy sleep behavior

Excess time in bed
Irregular schedules
Late naps
Caffeine, alcohol

Hyper arousal

Racing thoughts
Muscle tension, raised blood pressure, brain hyperactivity
The impact is huge – both for individuals, and for employers

Top five health conditions by annual healthcare expenditure and lost productivity costs

- Depression & anxiety
- Obesity
- Arthritis
- Back & neck pain
- Other cancer

The scientific literature indicates that individuals with insomnia each year cost their employers in healthcare expenditure...

1.75 x $3,855

that of a good sleeper more than good sleepers

How is insomnia being addressed today?

Self-medication
- Alcohol and OTC aids

Sleeping pills
- Hypnotic drugs

Sleeping pills have risks, side effects, and are not intended for long-term use

Sleeping pills...

Frequently lead to dependence and rebound insomnia

Contribute to daytime drowsiness and dizziness

Associated with substantial increased risk of falls in the elderly, leading to a strong recommendation to avoid by the American Geriatric Society

Associated with increased risk of motor vehicle accidents, ED visits, and all-cause mortality

And... they don’t actually improve sleep nearly as much as most people think

Fortunately, a solution exists
recommend Cognitive Behavioral Therapy for Insomnia as the first line treatment

Cognitive Techniques
- Imagery
- Paradoxical intention
- Tackle –ve patterns
- Put the day to rest
- Challenge beliefs
- Mindfulness

Behavioral Strategies
- Relaxation techniques
- Sleep restriction
- Stimulus control
- Wind down time
- Sleep diaries
- Sleep hygiene
But how can 215 certified sleep specialists deliver CBT for insomnia to 50 million sleepless Americans?
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Our solution: *Sleepio*

A digital Cognitive Behavioral Therapy (CBT) sleep improvement program which delivers improved mental health at population scale
Sleepio works by providing everyone with the level of help they need, when they need it

1. **Sleep awareness campaign**
   We work in partnership with employers to create fun and engaging sleep awareness campaigns with impact

2. **Personalized light sleep help**
   Our validated sleep test enables us to deliver personalized advice for each employee to help them with their specific sleep issues

3. **Scientifically proven Cognitive Behavioral Therapy program**
   Persistent poor sleepers will be directed to Sleepio’s clinically proven full course of Cognitive Behavioral Therapy (CBT)
Backed by gold standard clinical evidence: 18 published papers including 5 randomized controlled trials (RCTs)

Placebo controlled trial of digital CBT for Insomnia
Espie et al. (2012)
Sleep Medicine

Sleep & productivity benefits of digital CBT for Insomnia
Bostock et al. (2016)
JOEM

Treatment of anxiety and depression with digital CBT for Insomnia
Luik et al. (2016)
Behavioral & Cognitive Psychotherapy

Helping Employees Sleep Well: Effects of Cognitive Behavioral Therapy for Insomnia on Work Outcomes
Barnes et al. (2016)
Journal of Applied Psychology

UNIVERSITY OF OXFORD
Henry Ford Health System
NHS
KAISER PERMANENTE®
In a placebo-controlled randomized trial, 76% of insomnia sufferers using Sleepio achieved healthy sleep.

Reference:
Espie et al., 2012 (A randomized, placebo-controlled trial of online cognitive behavioral therapy for chronic insomnia disorder delivered via an automated media-rich web application. Average change in CBT group: SOL: 47 → 21 mins, WASO: 76 → 28 mins); Lancee et al., 2016.

“About as effective as CBT delivered in person”

“About as effective as CBT delivered in person”

“A proven intervention for sleep disorders”

THE LANCET
Beyond sleep: in a study with UK’s National Health System, Sleepio helped 68% of depression and anxiety sufferers move to recovery.

Source: Luik et al. (in press) Change in depression and anxiety during treatment (number of observations per session: baseline n=89; assessment 1 n=84; assessment 2 n=65; assessment 3 n=56; assessment 4 n=48; assessment 5 n=34; assessment 6 n=66). Panel A reflects the change in score on the Patient Health Questionnaire (PHQ-9) and Generalised Anxiety Disorder (GAD-7); panel B reflects the percentage of persons who experience symptoms at a clinical level on the PHQ-9 and GAD-7.
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Key facts about The Hartford

• Founded in 1810
• Approximately 17,000 employees
• Headquarters: Hartford, Conn.
• With more than 200 years of expertise, The Hartford is a leader in property and casualty insurance, group benefits and mutual funds.
• The Hartford sells its products primarily through a network of independent agents and brokers.
• For more than 30 years, The Hartford has been the only nationally endorsed direct auto and home insurance program for AARP’s 37 million-plus members.

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<thead>
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<th>Business Insurance</th>
<th>Personal Lines</th>
<th>Employee Benefits</th>
<th>Mutual Funds</th>
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<tr>
<td>• Workers’ compensation</td>
<td>• Home</td>
<td>• Group disability, life and AD&amp;D</td>
<td>• Equity, fixed income and asset allocation funds</td>
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<td>• Property</td>
<td>• Auto</td>
<td>• Absence management</td>
<td>sub-advised by Wellington Management</td>
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<td>• General liability</td>
<td>• Renters</td>
<td>• Voluntary benefits, including critical illness and</td>
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<td>• Professional liability</td>
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Sleep is a destigmatized way of addressing mental health

How did you sleep last night?
Poor sleep was very common among employees

Our employee health risk assessment showed us…

40% of employees were consistently sleep deprived

… which we knew leads to significant impacts on health & wellbeing

Sleep deprived – receiving less than 7 hours of sleep on average as recommended by the National Sleep Foundation.
We learned that insomnia was very expensive

A claims analysis told us...

11%

have an insomnia-related claim

2.5x

more expensive than good sleepers

Insomnia-related claim = insomnia diagnosis or insomnia treatment prescription in last year.
Those with insomnia were significantly more expensive across every category of healthcare spend

+$6,636 additional spend per insomnia claimant

Insomnia-related claim = insomnia diagnosis or insomnia treatment prescription in last year.

Outpatient
- $1,153
- $2,779

Inpatient
- $980
- $2,464

Professional
- $1,506
- $3,397

Pharmacy
- $930
- $2,565
Why Sleepio?

Clinically validated: 17 published peer-reviewed scientific papers

Relevant for all employees, good sleepers and poor sleepers alike

Behavioral component, not just sleep tracking and sleep hygiene

Engaging & entertaining program
Since launching Sleepio a year ago…

~4,100 employees have completed the Sleepio sleep test

Note: total sleep tests = 4,107 (23% of the workforce)
Based on these responses, ~60% of employees are troubled by their sleep; about 1 in 5 seriously so.

Employees troubled by their sleep
Over the past month, to what extent has poor sleep troubled you in general?

- Not at all: 8%
- A little: 33%
- Somewhat: 37%
- Much: 15%
- Very much: 7%

41% No / minimal worries about sleep
37% Moderate worries about sleep
22% Serious worries about sleep

Note: total sleep tests = 4,107 (23% of the workforce)
Employees who are seriously troubled by their sleep are...

**Mental health**
6 x more likely to often feel stressed

**Physical health**
2 x more likely to report their health as only ‘poor’ or ‘fair’

**Productivity**
2 x more likely to miss time at work each week

Note: total sleep tests = 4,107 (23% of the workforce)
To address the problems they’re having, large numbers of employees are using sleeping pills and sleep aids.

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<thead>
<tr>
<th>OTC sleep aids</th>
<th>Sleeping pills</th>
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<td>Used by</td>
<td>Used by</td>
</tr>
<tr>
<td>22%</td>
<td>8%</td>
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<tr>
<td>of employees surveyed</td>
<td>of employees surveyed</td>
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Note: n=1,946, all employees completing the detailed sleep test
3,401 employees made use of the personalized light sleep help and 1,479 started the CBT program

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<thead>
<tr>
<th>Step</th>
<th>Service Offered</th>
<th>Total Number</th>
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<tr>
<td>1.</td>
<td>Sleep awareness campaign &amp; sleep test</td>
<td>4,107</td>
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<tr>
<td>2.</td>
<td>Personalized light sleep help</td>
<td>3,401</td>
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<tr>
<td>3.</td>
<td>Cognitive Behavioral Therapy program</td>
<td>1,479</td>
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</table>
Those starting the CBT program typically remain engaged for long periods

Of all those using the CBT program...

77% have used Sleepio for over 8 weeks

204 days the average number of days active in the Sleepio program

Note: n=1,479, all employees who have used the CBT program
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Did Sleepio actually work?
Employees have seen meaningful improvements in their sleep pattern

They are now…

… falling asleep

54% faster

27 min ➔ 13 min

… spending

36% less time awake at night

25 min ➔ 15 min

Note: n=716, employees completing the CBT program
Leading to substantially more sleep overall

7 hours additional sleep each week

6.1 hrs → 7.1 hrs Each night

Note: n=716, employees completing the CBT program
With better sleep, there was less of a need for sleeping pills

...in the number using either type of medication in the previous 2 weeks

OTC sleep aids
31% reduction

Sleeping pills
37% reduction

Note: n=716, employees completing the CBT program
And considerable improvements in absenteeism and productivity

Those using the CBT program have seen improvements in measures of...

Absenteeism  Presenteeism

Reduction in employees missing time at work

68%  64%

Reduction in employees stating poor sleep has an impact >20% of the time

Note: n=716, employees completing the CBT program
As we had hoped, there were also meaningful improvements in stress and mental health.

Those completing the program saw improvements in…

**Stress**
-74%  
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<th>From</th>
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<td>9%</td>
<td>2%</td>
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% often unable to control the important things in life

**Anxiety**
-56%  
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<tr>
<th>From</th>
<th>To</th>
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<tbody>
<tr>
<td>1.1</td>
<td>0.5</td>
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based on Generalized Anxiety Disorder questionnaire (GAD-2)

**Depression**
-54%  
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<th>From</th>
<th>To</th>
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<tr>
<td>0.9</td>
<td>0.4</td>
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based on Patient Health Questionnaire (PHQ-2)

Note: n=716, employees completing the CBT program
Most importantly, employees loved it

88% recommended Sleepio

“Sleepio helped big time...The #1 thing you did for me was allow me to stop worrying about my sleep.”

“I don't have a real problem but the segment on "waking up at night" and what to do really helped.”

“I feel that I was not in a terrible state when I started, but I now get 30 minutes more GOOD SLEEP each night. That is a very good and valid improvement. Thanks all”

“Love the Prof & his dog friend... his accent and little red jacket would make me smile during sessions! I will miss them! :)

Note: n=716, employees completing the CBT program