Sleepless in Singapore: Causes, Consequences and Challenges for the Singaporean Youth Athlete

Singapore Sport Science Symposium 2018, Singapore, 8 Nov 2018
3-4 hours  
? hours  
14-20 hours
3-4 hours  
7-9 hours  
14-20 hours
We don’t all sleep the same way!
Dolphins/Wales have unihemispheric sleep
We don’t all sleep the same way!
Dolphins/Wales have unihemispheric sleep
Sleep stages & sleep cycles

Stage 1 (Light): 5%, Stage 2 (Light): 45%, Stage 3 (Deep): 25%, REM: 25%
“I woke up with a lovely tune in my head.”

-Sir Paul McCartney on writing “Yesterday”
Dmitri Mendeleev
Avoidance of high sugar/fat

Healthier food choices

Improved body composition
- Lowered body fat
- Increased lean muscle mass
But doesn’t sleeping more mean I’m less productive?
Long Working Hours Does Not Equate to Higher Productivity

A point of diminishing returns is reached when work hours reaches 60 hours per week.

Replacing sleep hours for work may lead to poorer workplace productivity.

(Pencavel, 2014; CNBC, 2015)
USA

US $411 Billion per year

2.3% of GDP
Japan
US $138 Billion per year
2.9% of GDP
Leading cause of death in U.S. teenagers
ABS technology resulted in 20-25% reductions in accident rates
Delaying school start times (7.35 to 8.55am) reduced accidents by 70%
Insufficient sleep results in...

- Malignant Neoplasm
- Heart & Hypertensive Diseases
- Cerebrovascular Diseases
- Diabetes
- Transport Accidents
- Alzheimer's

(Kochanek et al., 2014; Ooms, 2014)
Can sleep help in school?
Sleep

No sleep

Haresh T Suppiah, PhD
Sleep

Expected a test

Did not expect a test

No sleep

Expected a test

Did not expect a test
Memory recall

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep/Expected</td>
<td>115*</td>
</tr>
<tr>
<td>Sleep/Unexpected</td>
<td>105*</td>
</tr>
<tr>
<td>No sleep/Expected</td>
<td>95</td>
</tr>
<tr>
<td>No sleep/Unexpected</td>
<td></td>
</tr>
</tbody>
</table>
Sleep improves fine-motor performance

- Improved performance on finger-tapping task
- No improvement without sleep

(Tamaki et al., 2013)
“4-1-3-4-2-4-4-3-1-2-3-1-4-4-2-3-3-1......”
"4-1-3-4-2-4-4-3-1-2-3-1-4-4-2-3-3-1......."
“4-1-3-4-2-4-4-3-1-2-3-1-4-4-2-3-3-1……..”
Learning continued during sleep

20X the original task speed

2002, Lee & Wilson
Adolescents that slept <8 hours were 1.7 times more likely to have an injury

(Milewski et al., 2014)
25% increased risk following DST onset

21% decreased risk following DST offset

(Sandhu et. al, 2014)
37.5% increased risk of injuries following DST

(He & Suppiah, In press)
The need to consider context & culture

RESEARCH ARTICLE

SLEEP RESEARCH

A global quantification of “normal” sleep schedules using smartphone data

Olivia J. Walch, Amy Cochran, Daniel B. Forger

(Walch, Cochran, & Forger, 2016)
Does our standard time coincide with solar time?
The Time Zone Dilemma

Sun sets later in Singapore

Primed to sleep at later timing (due to delayed melatonin secretion)

Attend school/work same time as GMT+8 counterparts

Experience lower quantity and quality of sleep
“You just have to sleep earlier!”
We don’t all sleep the same way!
Dolphins/Wales have unihemispheric sleep
Melatonin influences “drive” to sleep

Adolescents have later melatonin onsets
Light from electronic devices further delay melatonin release in adolescents

(Chang, 2015)
At Nanyang Girls' High School, classes now begin 45 minutes later than most schools, at 8.15am.
The impact on their students has been telling.
READ MORE: http://bit.ly/2pxYt5L

“I was in the toilet and I fell asleep. I fell down and hurt myself.”

For a long time, we know that our girls are not sleeping enough.
Sleep in Singaporean Youth Athletes

7 in 10 Singaporean youth get insufficient sleep

4 in 10 suffer from excessive daytime sleepiness

(Suppiah et al; In press)
How do we shape the habits of a nation?