

Power napping for performance improvement in sports and at work

FIRSTBEAT HRV SUMMIT 2019

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SPORT & EXERCISE PHYSICIAN

nap@work

I am...

Powernap
2 Perform

- ▶ Recreational athlete
- ▶ Sport & exercise physician
 - Specializing in sleep & recovery
- ▶ Researcher
 - PhD Sports, lifestyle & health group
- ▶ Nap@Work
 - Consultant sleep & recovery for performance
- ▶ Author
 - ▶ Out now **'Powernap paradox'**



ARKO sports media

Short Quizzz

Powernap
2 Perform



'I sleep during the day, in between training sessions, and I go to bed every night at 9pm.'

**3 questions
think fast and respond**

1. Who is having a power nap here?

Powernap
2 Perform

WC 2018: gold



2. How many hours does a Dutch elite athlete sleep?



- A. 7 h
- B. 8 h
- C. 9 h
- D. 10 h

B. 8 h Thesis Knufinke et al 2018

3. When sleep deprived, for how many hours can a powernap of just 10 min improve fatigue and cognitive performance?

- A. 1 h
- B. 2 h
- C. 3 h
- D. 4 h

C. 3 hours!

SLEEP RESTRICTIONS AND SLEEP DEPRIVATION

A Brief Afternoon Nap Following Nocturnal Sleep Restriction: Which Nap Duration is Most Recuperative?

Amber Brooks, PhD; Leon Lack, PhD

School of Psychology, Flinders University, Adelaide, SA, Australia

Study Objectives: The purposes of this study were to compare the benefits of different length naps relative to no nap and to analyze the electroencephalographic elements that may account for the benefits.

Design: A repeated-measures design included 5 experimental conditions: a no-nap control and naps of precisely 5, 10, 20, and 30 minutes of sleep.

Setting: Nocturnal sleep restricted to about 5 hours in participants' homes was followed by afternoon naps at 3:00 PM and 3 hours of postnap testing conducted in a controlled laboratory environment.

Participants: Twenty-four healthy, young adults who were good sleepers and not regular nappers.

Measurements and Results: The 5-minute nap produced few benefits in comparison with the no-nap control. The 10-minute nap produced immediate improvements in all outcome measures (including sleep latency, subjective sleepiness, fatigue, vigor, and cognitive performance), with some of these benefits maintained for as long as 155 minutes. The 20-

minute nap was associated with improvements emerging 35 minutes after napping and lasting up to 125 minutes after napping. The 30-minute nap produced a period of impaired alertness and performance immediately after napping, indicative of sleep inertia, followed by improvements lasting up to 155 minutes after the nap.

Conclusions: These findings suggest that the 10-minute nap was overall the most effective afternoon nap duration of the nap lengths examined in this study. The implications from these results also suggest a need to consider a process occurring in the first 10 minutes of sleep that may account for the benefits associated with brief naps.

Keywords: Brief naps, napping, acute sleep restriction, alertness, performance

Citation: Brooks A; Lack L. A brief afternoon nap following nocturnal sleep restriction: which nap duration is most recuperative? *SLEEP* 2006; 29(6):831-840.

Powernap 2 Perform: evidence in sports?



Conclusion: Under certain circumstances, like sleep deprivation, power napping has a positive effect on recovery, specific physical performance, alertness, responsiveness and mood in athletes.

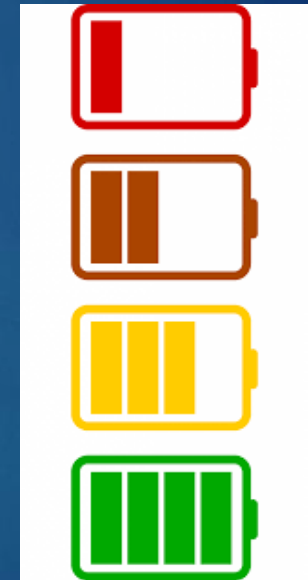
Discussion and recommendations: The quality of studies on power napping in athletes varies widely, the number of participants is limited and the definitions used vary. Therefore, further research is needed.

POWERNAP: 10-25min

Fall asleep & wake-up: only light sleep

Compelling research on:

- ▶ Improved alertness & focus *
- ▶ Effective against fatigue
- ▶ Improved short term memory
- ▶ Enhances learning (cognitive + motor tasks)



* Alertness management: *strategic naps* in operational settings. Rosekind MR et al. NASA Ames Research Center, Moffett Field, California, USA, 1995

Oops-I-fell-a-sleep... 30-70mins



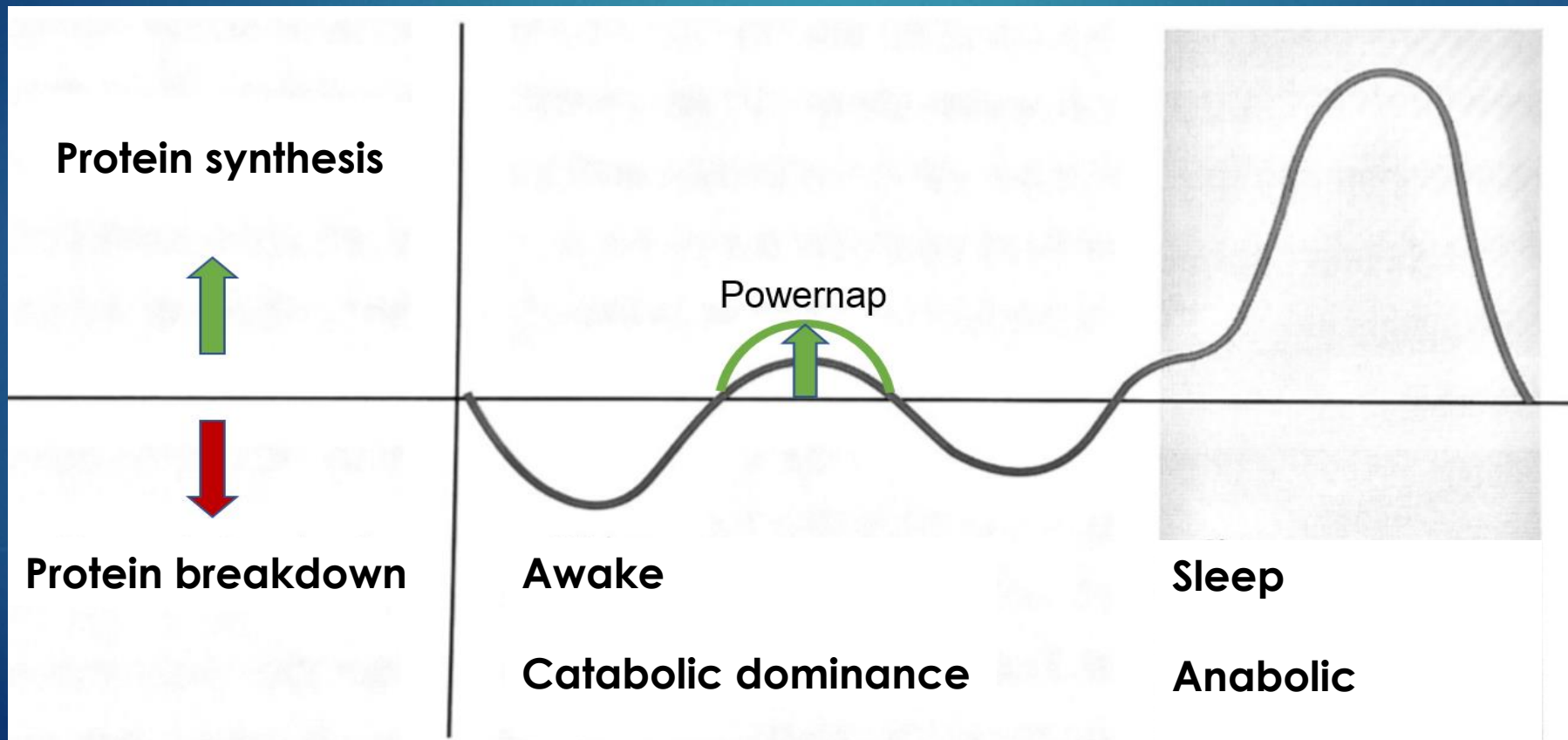
Awake from deep sleep

You feel jet-lagged!

It can take 30-45 min
to get back to normal

FULL-CYCLE NAP: 70-90min

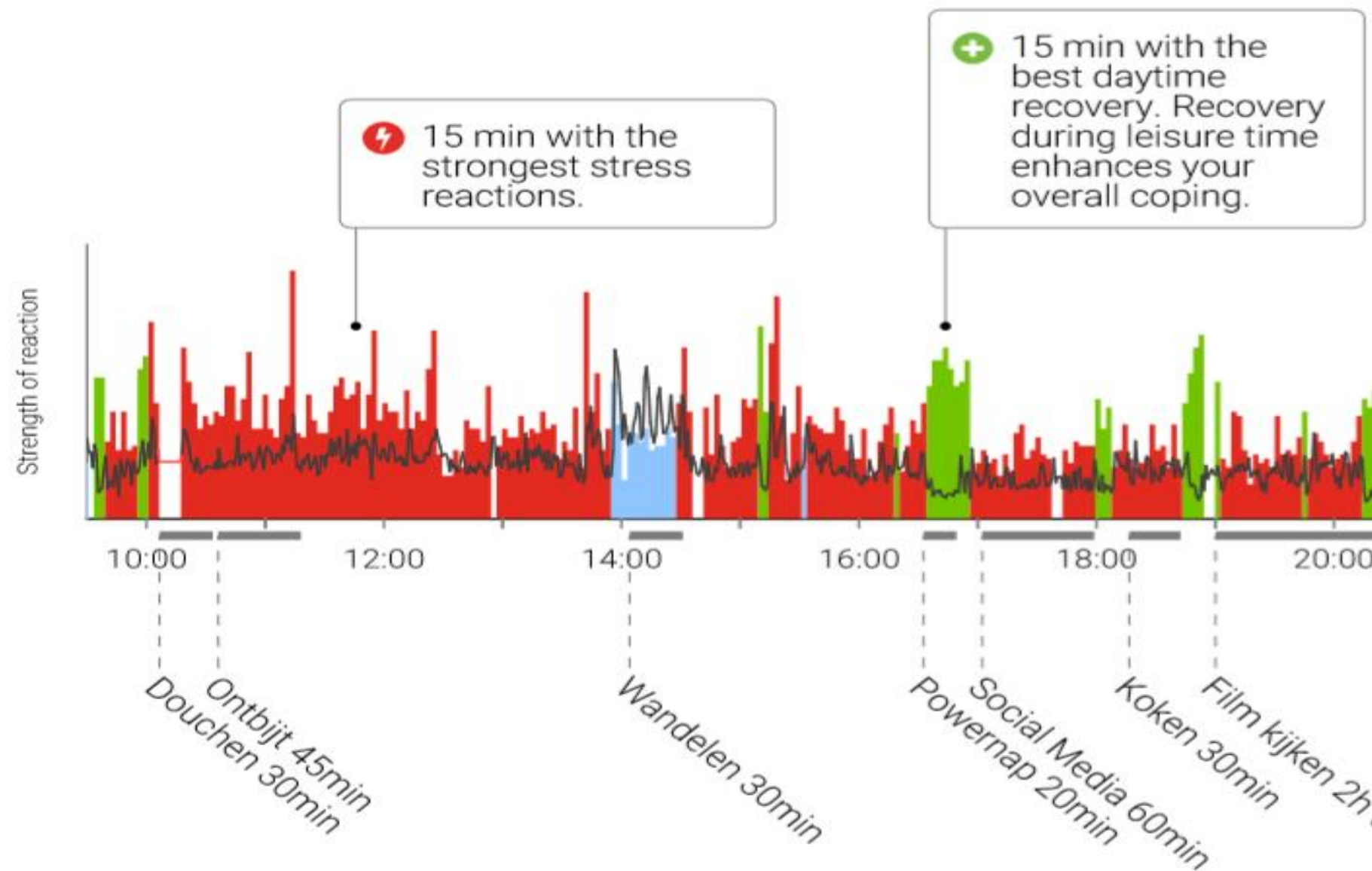
- ▶ Is in fact a sleep extension!
- ▶ Contains deep sleep, growth hormone inducing!
- ▶ Improved readiness for training multiple times a day



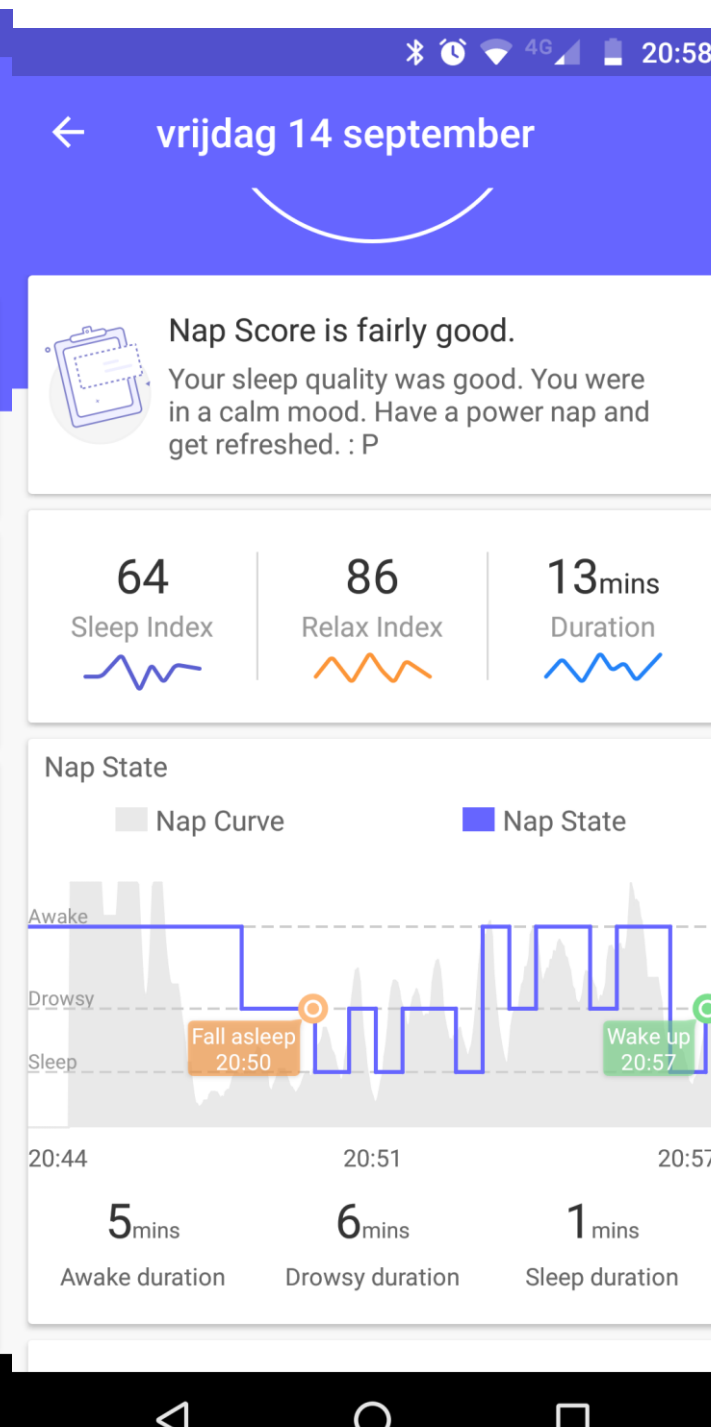
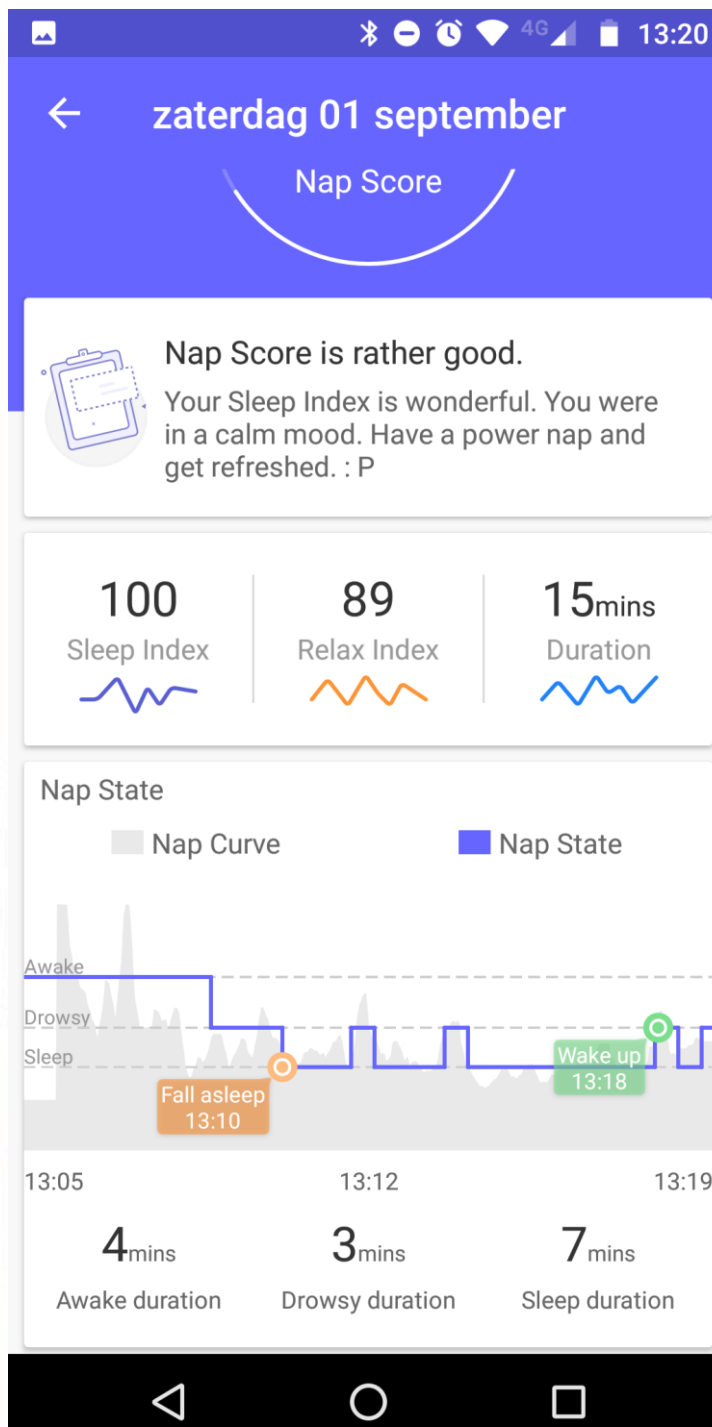
Possibly

- ▶ Improved accuracy
- ▶ Faster sprint times
- ▶ Mood improvements
- ▶ Less illness / injuries!

● Stress ● Recovery ● Vigorous & moderate physical activity ● Light phy



Firstbeat
Lifestyle
Assesment
rapport



**EEG feedback needed
for phase (1,2 or 3) of
sleep?**

**You want to avoid phase
3 sleep**

**--> makes you feel
jetlagged**

**Personalized intervention
with
LUUNA / other EEG
wearable?**

**Optimal power nap
between 10-25min!**

Take to nap in sports & at work

- ▶ **Power nap** (10-25min) increases alertness and decreases fatigue
- ▶ **Oop-I-fell-Asleep** : (30-70min): watch out for **jetlag effect!**
- ▶ **Full-cycle nap** (70-90min) is comparable to 'sleep extension'
 - ▶ Growth hormone, ideal for athletes
- ▶ Design practical sleep interventions (nap monitoring)
- ▶ **Power napping can be learned = just do it!**



V
N
THON 2018



BMW
BERLIN
MARATHON 2018



BMW
BERLIN
MARATHON 2018



BMW
BERLIN
MARATHON

Thank you!

If interested in the practical application?

-> power nap infographic in English

Send me an e-mail:

kasper@napatwork.nl



Nap length...

POWER NAP

A whole cycle lasts about 90 to 110 minutes (and repeats during night-time sleep)

STAGE 1:

*Falling asleep & light sleep
Can get awoken easily
May drift in and out of sleep*

STAGE 2, 3 AND 4:

*Deeper, slow-wave sleep
Difficult to be woken up
May feel grogginess if woken up*

REM:

*Rapid eye movement
Dreaming stage
Brain is active, muscles are relaxed*

15 to 20 minutes cat nap is short enough not to fall into deep sleep and waking up groggy

60 minutes nap allows the brain to go into slow-wave sleep and delivers a boost in performance and memory

90 minutes nap. Completing a full sleep cycle will leave you feeling alert and refreshed



Fresh powernap evidence?

Int J Sports Physiol Perform. 2018 Mar 15;15:1-20. doi: 10.1123/ijsp.2017-0793. [Epub ahead of print]

The Influence of Match-Day Napping in Elite Female Netball Athletes.

O'Donnell S^{1,2}, Beaven CM¹, Driller M^{1,3}.

⊕ Author information

Abstract

Netball (NZ)

- 'As is' monitoring, napping habits were recorded, no intervention

Outcomes:

- Energy levels, counter movement jumps, subjective performance

Results: after short (<20m)-naps vs long naps

- higher jump velocity (3.23 ± 0.26 and 3.07 ± 0.36 m.s⁻¹, resp, $p < 0.05$)
- higher subjective performance (7.2 ± 0.8 and 6.4 ± 0.9 , resp, scale 0-10)

CONCLUSION: The findings from the study would suggest that a short nap (<20 min) on the day of competition can enhance jump velocity and improve subjective performance in elite netball players, as assessed by coaching staff.

KEYWORDS: Team-sports; competition; gender; perceptual indices; performance indices

Napping is trainable!

The

Mitsuo

Department of Behavior

1-

The aim of the present study was to examine the effects of a short daytime nap on sleepiness and fatigue. Seven young adults (21-24 yrs) participated in the study. They were randomly assigned to the Nap and the No-nap condition. All subjects were awakened at 13:00. During the study, subjective sleepiness and fatigue were measured at 13:00 and 16:30. A visual detection task was performed every five days. Sleep inertia was measured by the time taken to fall asleep after waking up at 13:00. Sleep inertia became similar to the No-nap condition after five consecutive days of napping, but also taking it continuously would cause sleep inertia, however, it would have positive effects upon mid-afternoon sleepiness. Furthermore, the effects of

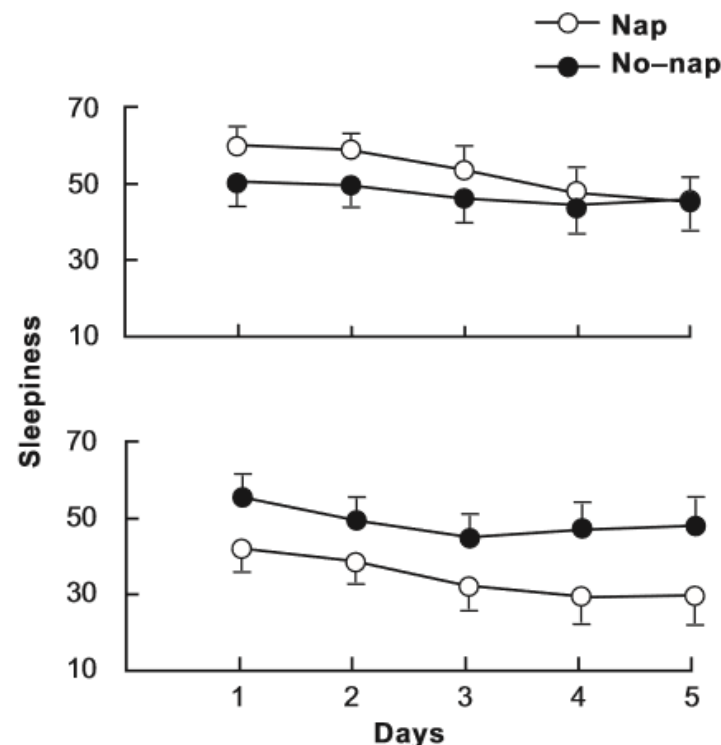


Figure 3. Sleepiness (\pm SEs) immediately after napping or resting at 13:00 (top) and at 14:40 (bottom) for five consecutive days.

Naps

VS

adao Hori

es, Hiroshima University,
apan.

at noon for five consecutive days. The napping participants in both the Nap and the No-nap conditions went to bed at 12:40 and slept in a semi-reclining chair during that time. The Nap condition took a nap for approximately 12 min. Sleepiness was reduced as a function of days and was suppressed by not only taking a nap but also by taking a short nap of less than 20 min. Furthermore, the effects of

CURRENT CLAIM: A short daytime nap of less than 20 min is more effective when taking it for more than three consecutive days.