



# Well..... Let's Talk about SLEEP: Sleep & Wellbeing in College Students

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# Background

## Overview of College Students' Sleep Pattern

- College students are found to have a distinctive pattern of sleep behaviors from non-college aged peers
  - Sleep deprivation
  - Poor sleep quality
  - Eveningness chronotype
  - Excessive daytime sleepiness
- Common biological factors (e.g. pubertal development)
- Different psychosocial factors
  - Academic-related activities (e.g. Early morning lectures)
  - Social life (e.g. On-campus residence, use of computers)

# Sleep in college: Phenomenon

- Decreasing sleep hours in college

*Perceptual and Motor Skills*, 2001, 93, 648. © Perceptual and Motor Skills 2001

## THE CHANGING SLEEP HABITS OF UNIVERSITY STUDENTS: AN UPDATE<sup>1</sup>

ROBERT A. HICKS, COSETTE FERNANDEZ, AND ROBERT J. PELLEGRINI

*San José State University*

Year of Sample	Sleep Duration Interval, hr.						<i>n</i>	<i>Mdn</i> Hours
	<5.5	5.5–6.0	6.5–7.0	7.5–8.0	8.5–9.0	9.5+		
1969	49	355	1291	2059	527	143	4424	7.75
1979	71	419	682	477	154	34	1837	7.13
1989	108	594	596	332	55	12	1697	6.75
2001	104	417	615	350	81	18	1585	6.65

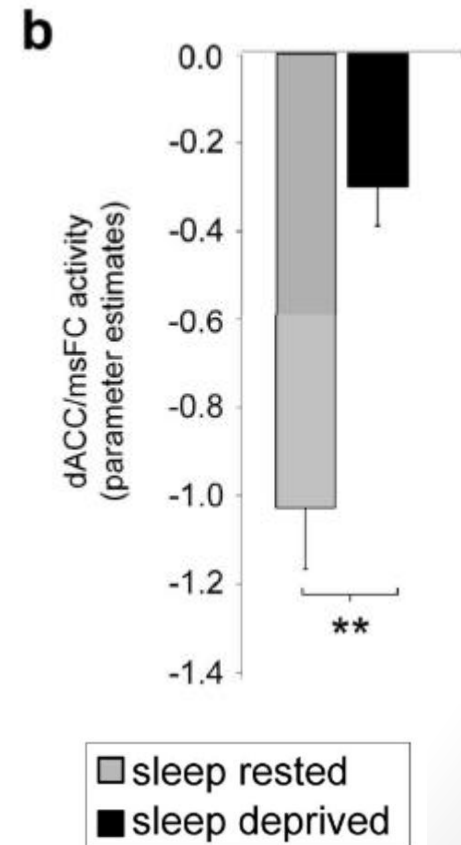
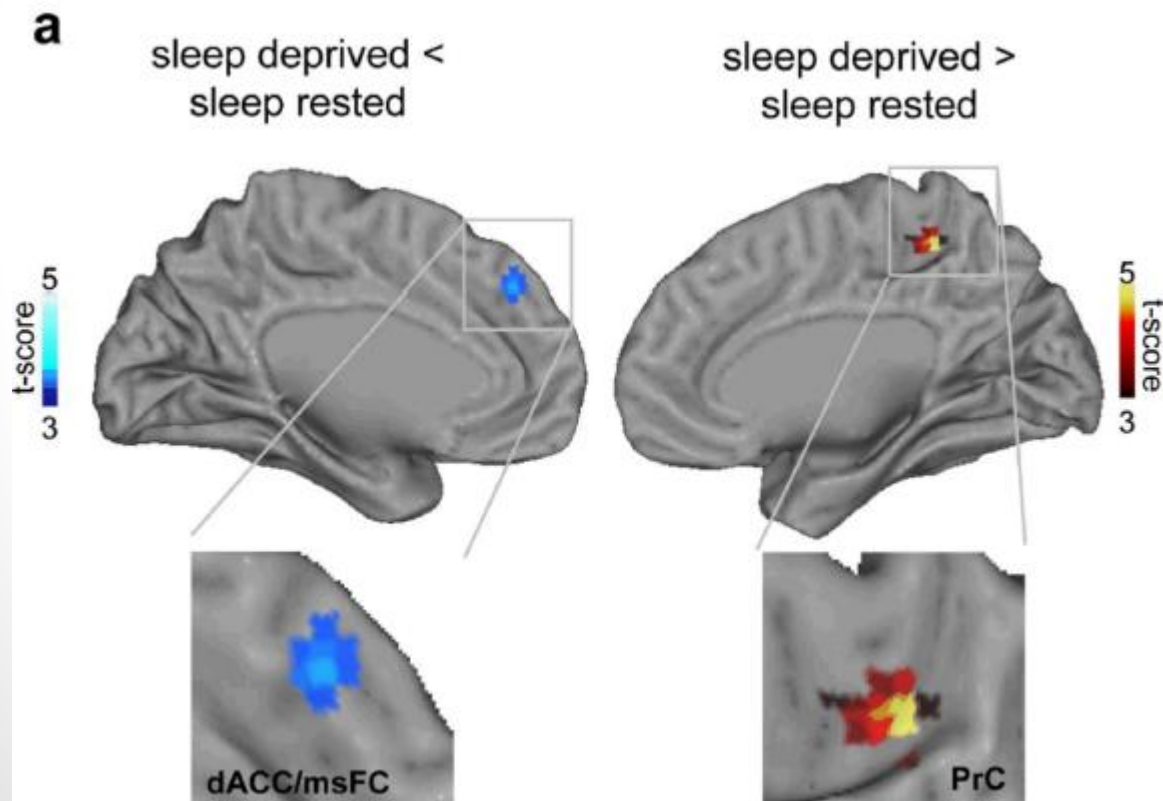
$\chi_{15}^2 = 1513.76, p < .001, \phi^2 = .16$

# Sleep and the (resting) brain

*J Cogn Neurosci.* 2010 August ; 22(8): 1637–1648. doi:10.1162/jocn.2009.21331.

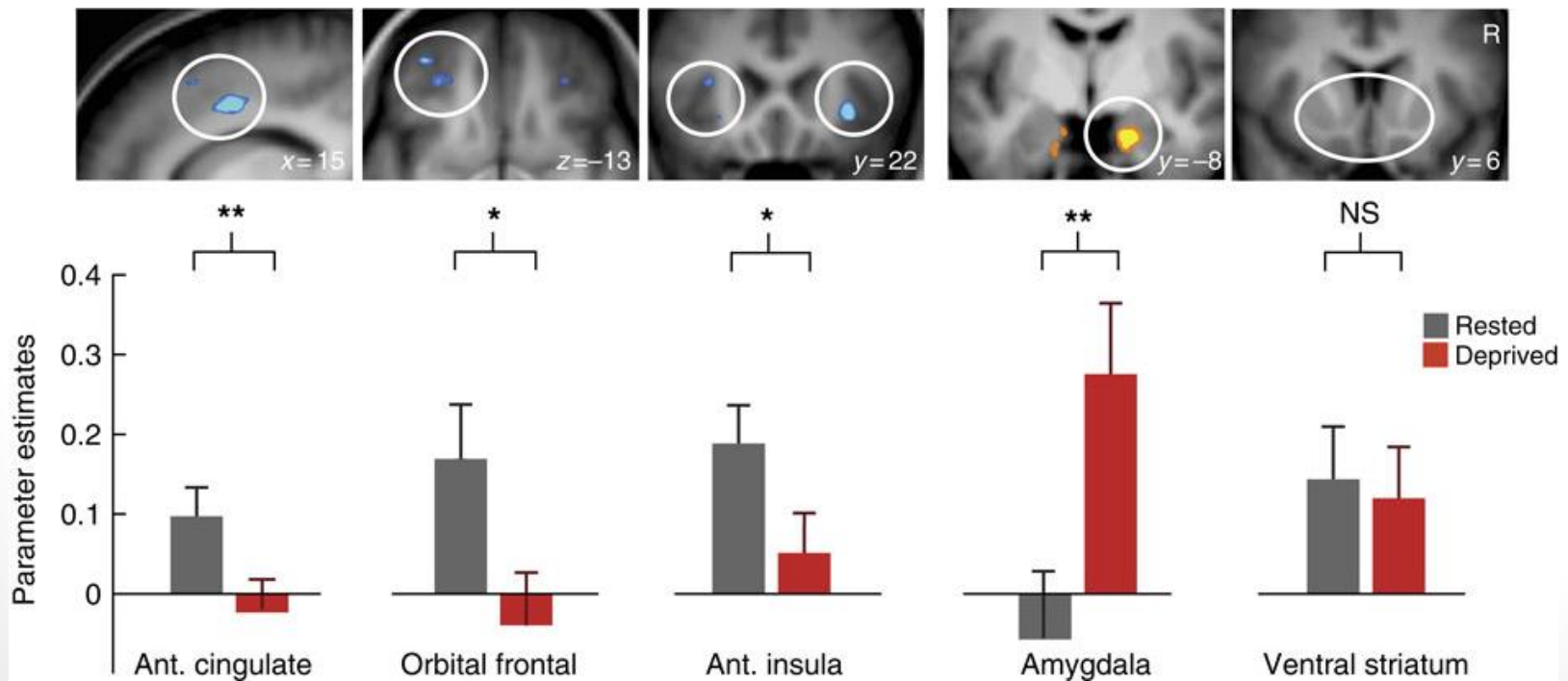
## The un-rested resting brain: Sleep-deprivation alters activity within the default-mode network

Ninad Gujar<sup>1</sup>, Seung-Schik Yoo<sup>2</sup>, Peter Hu<sup>1</sup>, and Matthew P. Walker<sup>1,\*</sup>



# Sleep and emotional functions

- Altered activation of the prefrontal cortex and limbic system (compared to the well-rested)
- Lack of frontal regulation of emotional response from the limbic cortex



# A Local Study

- To explore if students' wellbeing and academic functioning is predicted by their sleep characteristics longitudinally

# Sleep in local college students

- HK and Macau college students (n=972)
- 3 academic semesters for directional relationship
- Sleep behaviors, mood, quality of life and academic performance
- A structural equation modeling with boot-strapping to estimate directional relationship

Journal of Psychosomatic Research 74 (2013) 271–277



Contents lists available at [SciVerse ScienceDirect](#)

Journal of Psychosomatic Research



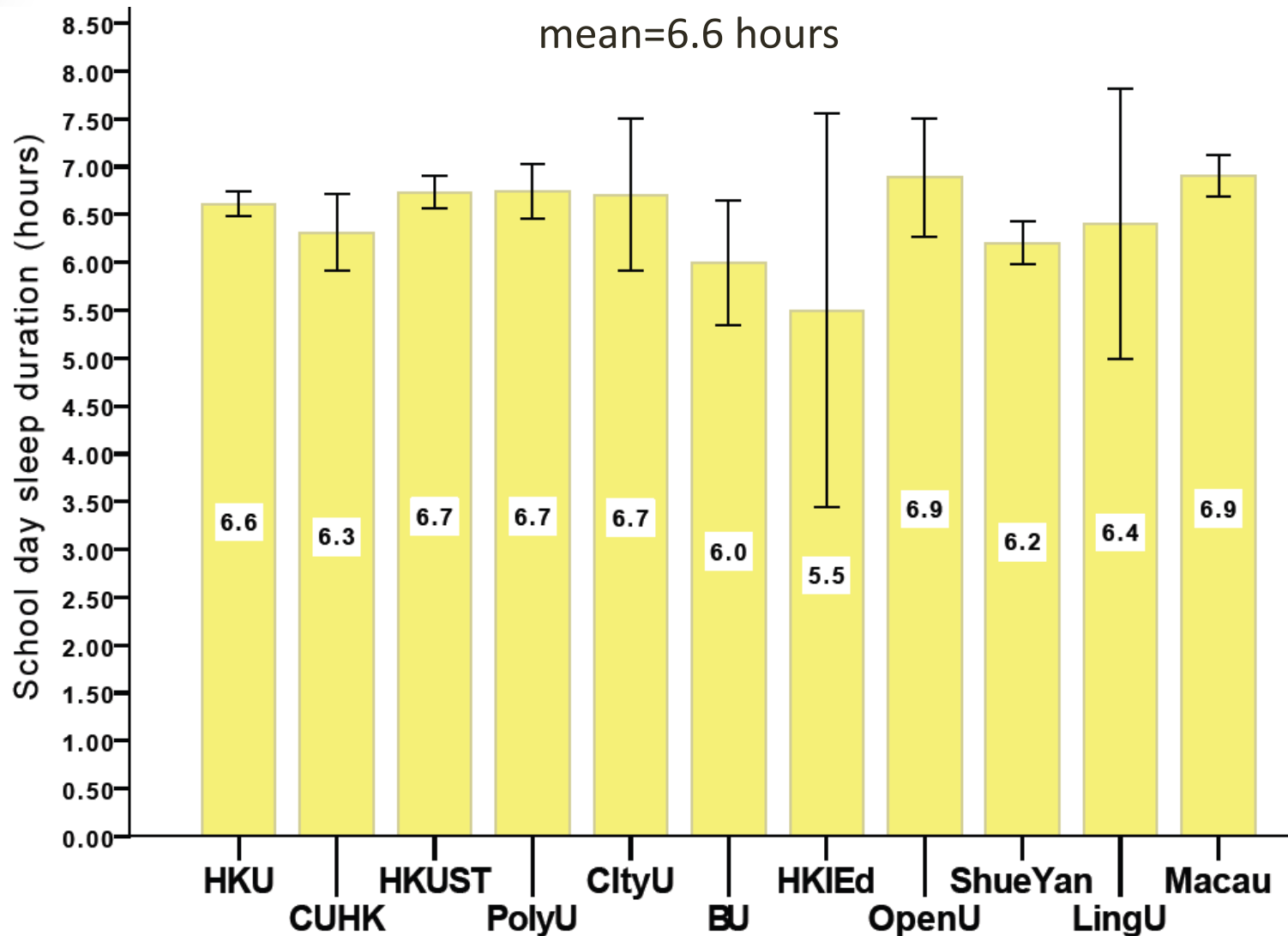
The interplay between sleep and mood in predicting academic functioning, physical health and psychological health: A longitudinal study

Mark Lawrence Wong <sup>a,1</sup>, Esther Yuet Ying Lau <sup>a,\*,1</sup>, Jacky Ho Yin Wan <sup>a</sup>, Shu Fai Cheung <sup>b</sup>,  
C. Harry Hui <sup>a</sup>, Doris Shui Ying MOK <sup>b</sup>

<sup>a</sup> Department of Psychology, University of Hong Kong, Hong Kong, China

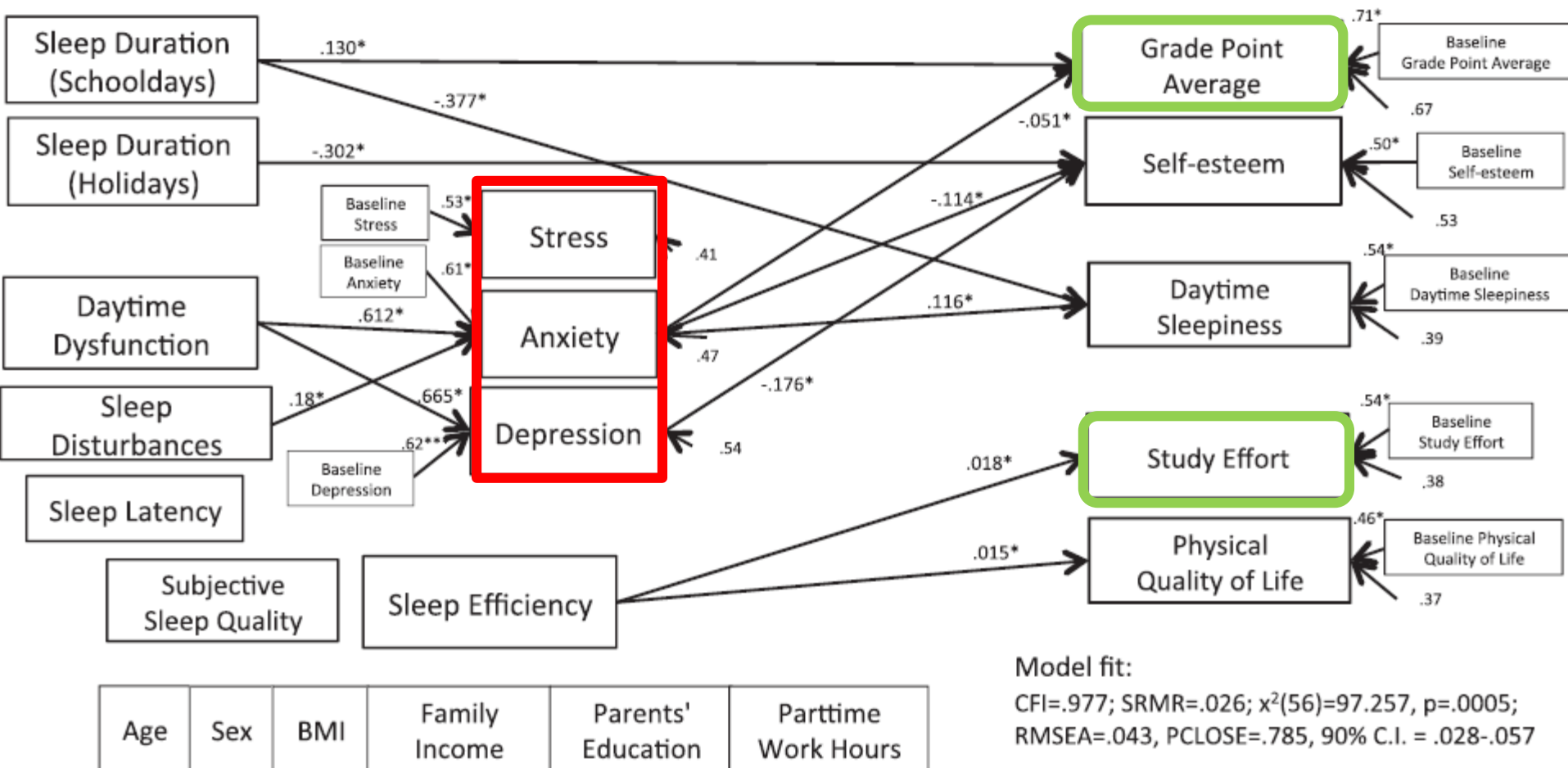
<sup>b</sup> Department of Psychology, University of Macau, China

# Sleep in local college students





# Consequence of poor sleep



- Poor sleep behaviors affect negative affect, GPA and health even after controlling for the corresponding baseline level and demographic factors

# Consequence of poor sleep

*Chronobiology International*, 2013; 30(7): 910–918

## “Social Jetlag” in Morning-Type College Students Living On Campus: Implications for Physical and Psychological Well-being

Esther Yuet Ying Lau<sup>1,2</sup>, Mark Lawrence Wong<sup>1,2</sup>, Eddie Chi Wai Ng<sup>2</sup>, Chi-chiu Harry Hui<sup>2</sup>, Shu Fai Cheung<sup>3</sup> and Doris Shui Ying Mok<sup>3</sup>

<sup>1</sup>Sleep Laboratory and <sup>2</sup>Department of Psychology, The University of Hong Kong, Hong Kong, and <sup>3</sup>Department of Psychology, University of Macau, Macau, China

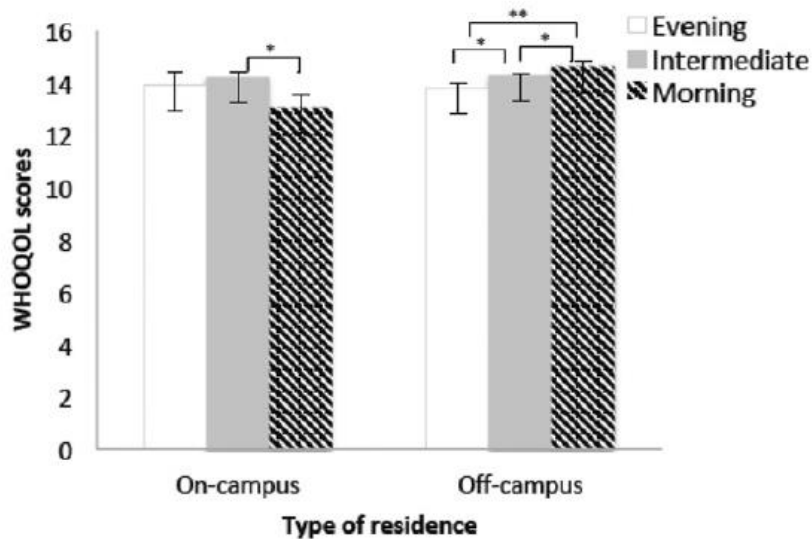


FIGURE 5. Effects of residence type and chronotype on physical quality of life. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .

### Factors Predicting Dropping Out From Campus Residence

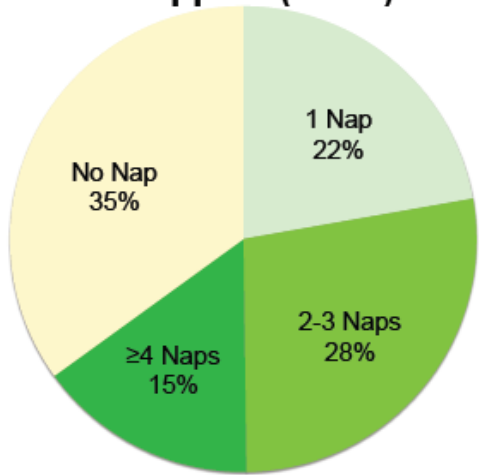
Out of the 331 campus residents participated in T1, 299 (90.3%) continued to live on campus in T2. All campus residents in T1 are included in this analysis. The final model with sleep behaviors (sleep quality dimensions and sleep duration in schooldays and holidays) and chronotype significantly predicted the probability of dropping out among the sample,  $\chi^2(13) = 23.514$ ,  $p < 0.05$ . Dropping out was significantly predicted by higher family income (unstandardized coefficient  $[\beta] = 0.425$ ,  $SE = 0.154$ ; odds ratio  $[OR] = 1.530$ , 95% confidence intervals  $[CI] = 1.132-2.068$ ;  $p < 0.01$ ), greater parents' education ( $\beta = -0.436$ ,  $SE = 0.190$ ;  $OR = 0.647$ ,  $CI = 0.446-.938$ ;  $p < 0.05$ ), and morning-type ( $\beta = 1.520$ ,  $SE = 0.637$ ;  $OR = 4.574$ ,  $CI = 1.312-15.947$ ;  $p < 0.05$ ). Other sleep behaviors

# What to do with poor sleep?

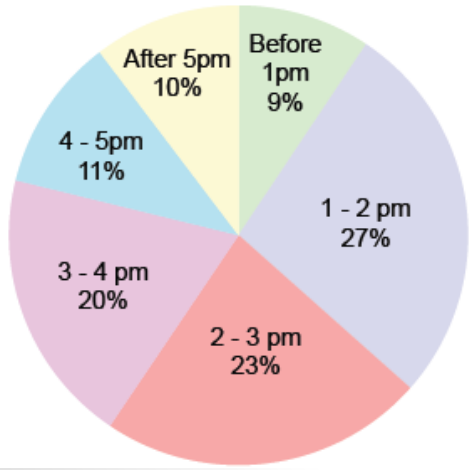
- Sleep opportunity (nighttime)
  - Sleeping earlier at night?
- Sleep opportunity (daytime)
  - Choosing afternoon class?
  - Daytime napping?

# Daytime napping in HK college students

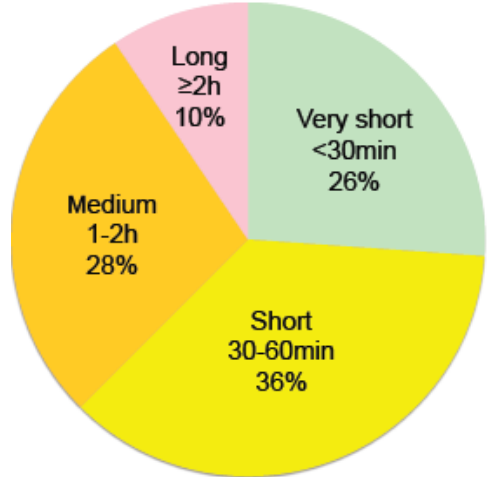
**Percentage of Habitual Nappers (n=972)**



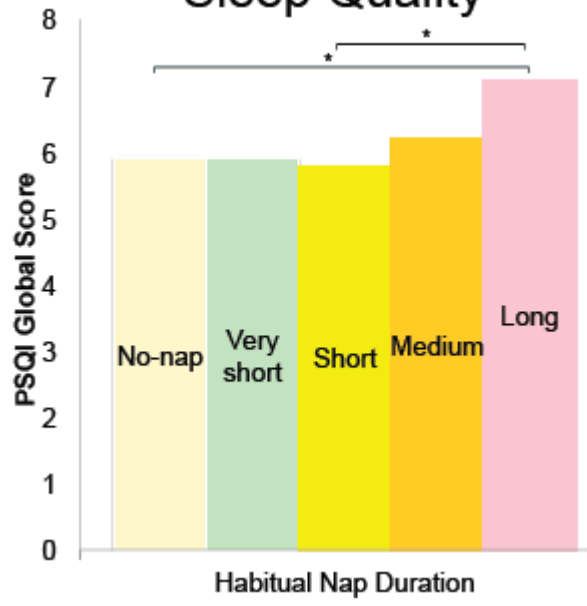
**Habitual Nap Timing (n=632)**



**Habitual Nap Duration (n=632)**



**Sleep Quality**



Wong, M. L., Lau, E. Y. Y, Hui, C. H., Cheung, S. F., & Mok, D. S. Y. (2012). How long may I nap without disrupting my nighttime sleep? *Journal of Sleep Research*, 21, 148

# Napping and Performance

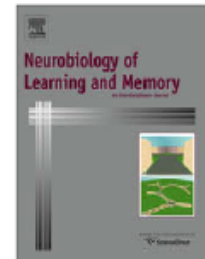
Neurobiology of Learning and Memory 93 (2010) 554–560



Contents lists available at ScienceDirect

Neurobiology of Learning and Memory

journal homepage: [www.elsevier.com/locate/ynlme](http://www.elsevier.com/locate/ynlme)



Daytime napping: Effects on human direct associative and relational memory

*Sleep and Biological Rhythms* 2007; 5: 117–125

doi:10.1111/j.1479-8425.2007.00261.x

## ORIGINAL ARTICLE

Napping and nightshift work: Effects of a short nap on psychomotor vigilance and subjective sleepiness in health workers

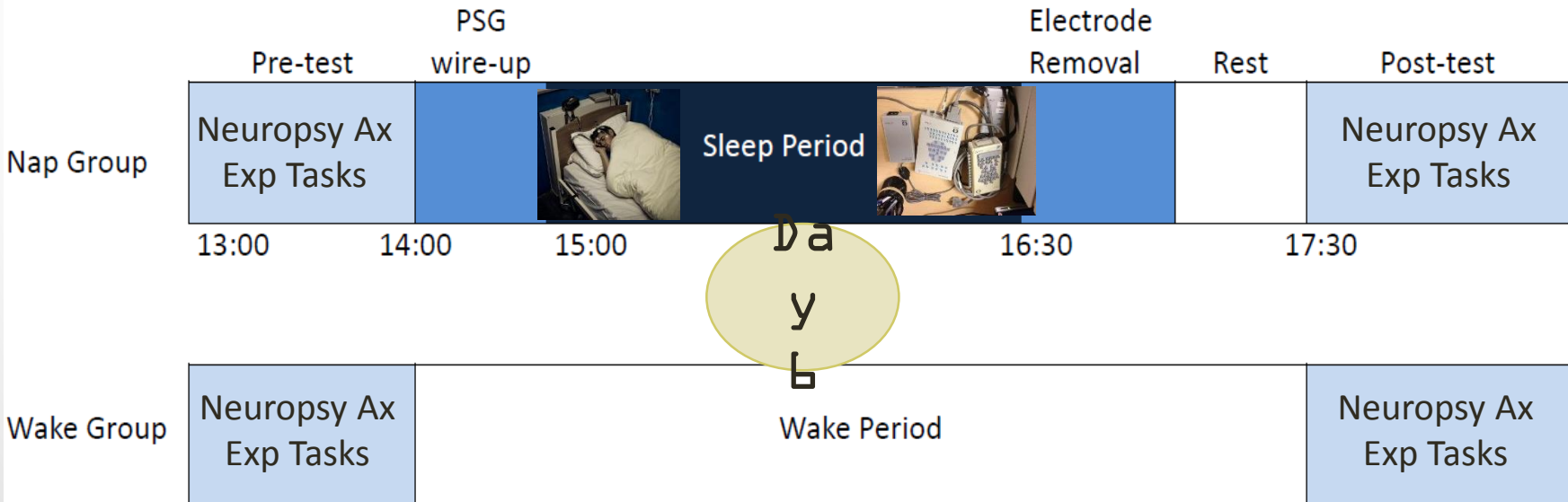
# A Local Study

- To assess if daytime napping affects college students' **cognitive** and **emotional functioning**

# Design and Procedures



Actigraph-watch, sleep diary, questionnaire





# Sleep Laboratory

The University of Hong Kong





# Rapid-Eye-Movement-Sleep (REM) Associated Enhancement of Working Memory Performance after a Daytime Nap

Esther Yuet Ying Lau<sup>1,2,3</sup>\*, Mark Lawrence Wong<sup>1,2</sup>, Kristy Nga Ting Lau<sup>1,2</sup>, Florence Wai Ying Hui<sup>1</sup>, Chia-huei Tseng<sup>2</sup> PLOS ONE | DOI:10.1371/journal.pone.0125752 May 13, 2015

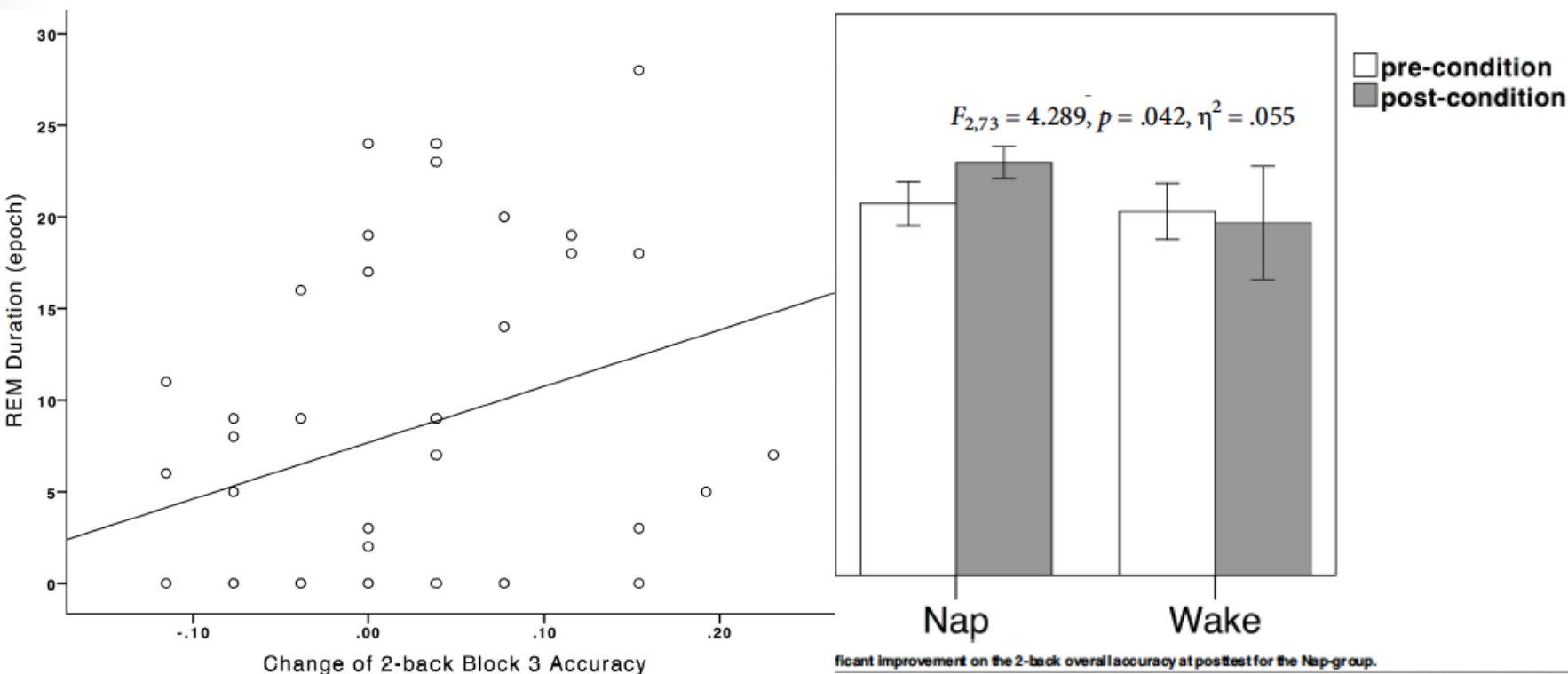
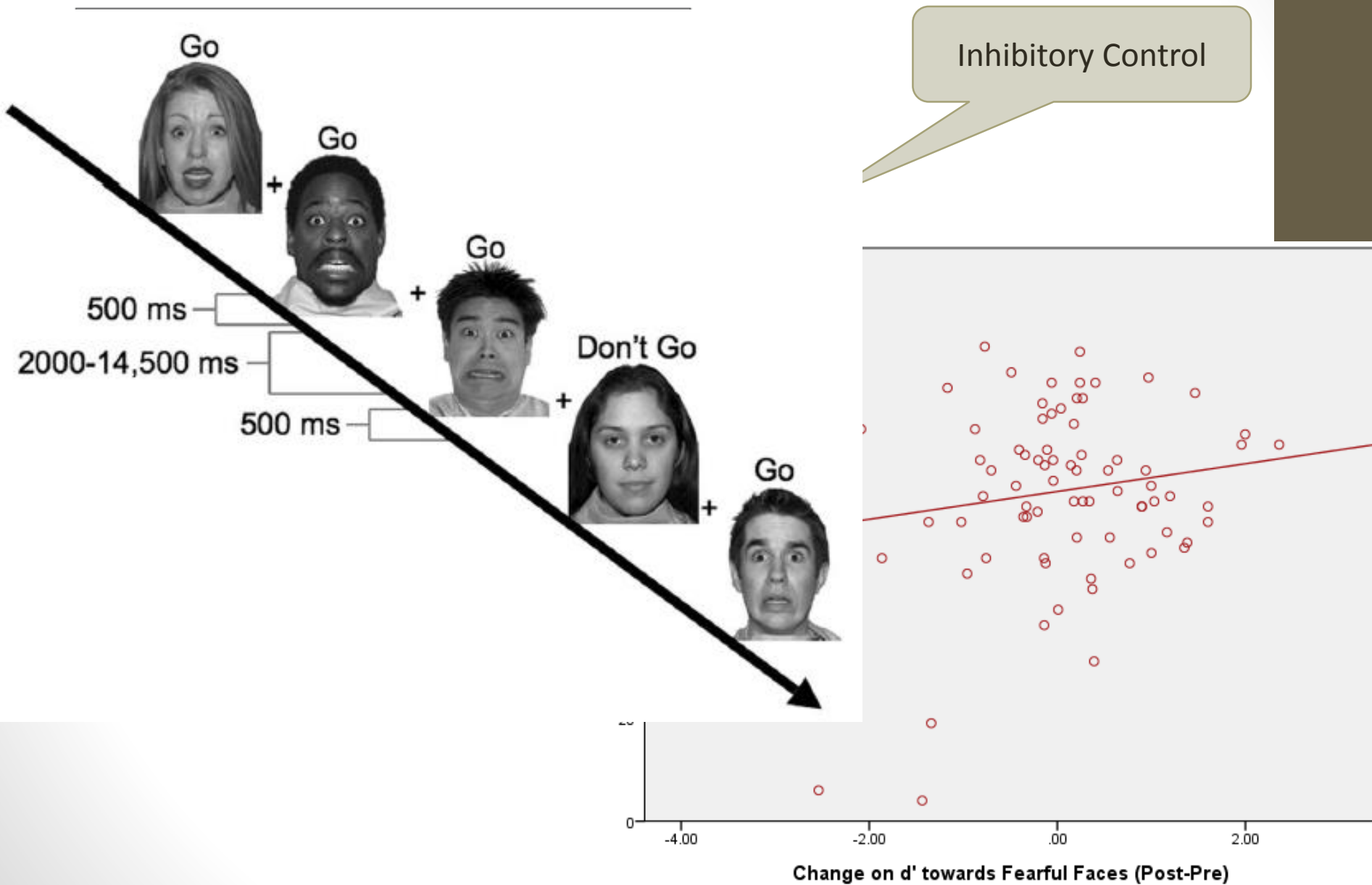
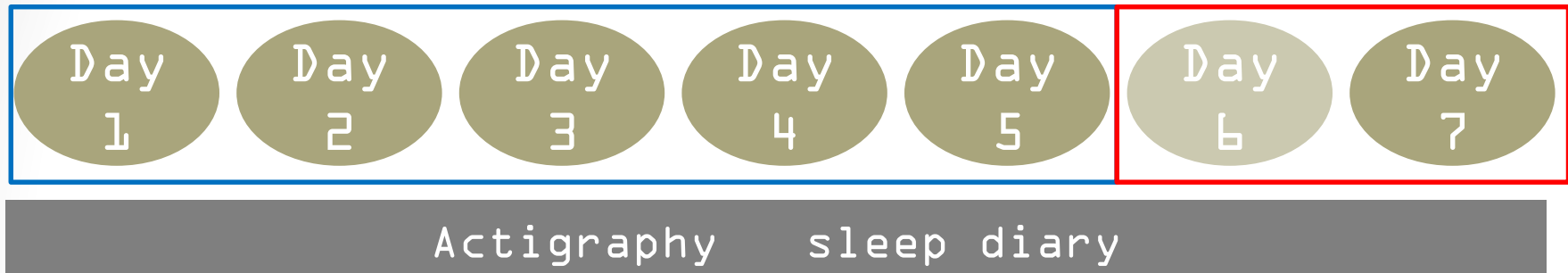


Figure 2i. Difference on the change of  $d'$  towards fearful faces in the Affective Go/No-Go Task between the Nap-group and Wake-group



# Daytime nap and nighttime sleep



- Nap and Wake group **did not differ** on the self-reported and objectively-measured sleep duration and quality significantly before (day 1-5) and after (day 6-7) the intervention day ( $ps > .05$ )

# Take home message

- Local college students had restricted **sleep** and poor sleep quality which **predicted poor academic performance, physical and psychological health**;
- Daytime napping is common among college students
- **Napping for <90 minutes** before 5pm was not only unrelated to nighttime sleep behaviors, but **benefited cognitive and affective functions** which had been shown to be affected by restricted sleep or poor sleep quality

# Medical students: a special population in sleep research?

- Academic demand? Stress from demanding medical training?
- Prevalence of poor sleep quality is higher

 REVIEW ARTICLES

JCSM  
Journal of Clinical  
Sleep Medicine

pii: jc-00118-14

<http://dx.doi.org/10.5664/jcsm.4370>

## Sleep Disturbances among Medical Students: A Global Perspective

Muhammad Chanchal Azad, MBBS, MSc<sup>1</sup>; Kristin Fraser, MD<sup>2</sup>; Nahid Rumana, MS, MD, PhD<sup>3</sup>; Ahmad Faris Abdullah, MD, MMed<sup>1</sup>; Nahid Shahana, MMed, Mphil<sup>4</sup>; Patrick J. Hanly, MD<sup>2,3</sup>; Tanvir Chowdhury Turin, MD, PhD<sup>5,6</sup>

<sup>1</sup>Department of Community and Family Medicine, Faculty of Medicine and Health Sciences, Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia; <sup>2</sup>Department of Medicine, University of Calgary, Calgary, Alberta, Canada; <sup>3</sup>Sleep Center, Foothills Medical Center, University of Calgary, Alberta, Canada; <sup>4</sup>Department of Medical Education, Bangladesh Medical College and Hospital, Dhaka, Bangladesh; <sup>5</sup>Department of Family Medicine, University of Calgary, Calgary, Alberta, Canada; <sup>6</sup>Department of Community Health Sciences, University of Calgary, Calgary, Alberta, Canada

# Sleep & Asian medical students

MedGenMed. 2004; 6(4): 5.  
Published online 2004 Oct 12.

PMCID: PMC1480572

## **Study of the Knowledge, Beliefs, and Practice of Sleep Among Medical Undergraduates of Tamilnadu, India**

[G Sivagnanam](#), MD, [P Thirumalaikolundusubramanian](#), MD, [K Namasivayam](#), MD, and [B Gitanjali](#), MD

G Sivagnanam, Professor of Pharmacology, Chengalpattu Medical College, Chengalpattu, India;

## **Daytime Sleepiness and Sleep Quality Among Malaysian Medical Students**

**A H Zailinawati, MFamMed\*, C L Teng, MMed\*, Y C Chung\*\*, T L Teow\*\*, P N Lee\*\*, K S Jagmohni, FRACGP\***

\*International Medical University, Jalan Rasah, 70300 Seremban, Negeri Sembilan, Malaysia, \*\*Final year medical students in International Medical University, Malaysia

Zhonghua Liu Xing Bing Xue Za Zhi. 2005 May;26(5):328-31.

**[Study on the status and quality of sleep-related influencing factors in medical college students].**

[Article in Chinese]

[Feng GS](#)<sup>1</sup>, [Chen JW](#), [Yang XZ](#).

# Sleep & local medical students

*Sleep and Biological Rhythms* 2007; 5: 226–230

doi:10.1111/j.1479-8425.2007.00278.x

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## COMMENTS AND OPINIONS

### Do medical students in Hong Kong have enough sleep?

Lok-Lam E HUEN, Tze-Wai G CHAN, Wai-Man M YU and Yun-Kwok WING

*Department of Psychiatry, Prince of Wales and Shatin Hospital; Chinese University of Hong Kong, Hong Kong SAR*

#### **Abstract**

This was a cross-sectional study of sleep patterns among Hong Kong medical students. A representative number of 419 medical students with a mean age of 21.2 (SD = 2.1, range 17–32) reported a mean nocturnal sleep of 6.6 h (SD = 1.2 h). About 70% reported having sleep deprivation without significant gender and age differences. Self-perceived stress and long hours of study were found to be the major risk factors for sleep deprivation whereas longer nocturnal sleep duration was its protective factor. Sleep deprivation was common among medical students in this cosmopolitan Asian city. Effective stress management and sleep education should be included in the training of medical doctors.

# Sleep & academic performance

- Positive correlation between usual bedtimes and usual rise times and written examination result
- Positive correlation between subjective sleep quality and clinical skills assessment result

*Biological Rhythm Research*

Vol. 39, No. 4, August 2008, 369–377



Taylor & Francis  
Taylor & Francis Group

## **Sleep–wake habits, excessive daytime sleepiness and academic performance among medical students in Hong Kong**

Wing-Fai Yeung, Ka-Fai Chung\* and Tommy Cy Chan

*Department of Psychiatry, University of Hong Kong, Hong Kong SAR, China*



# Take home message

- Medical students had **poorer sleep quality**, which was associated with **stress** and **academic performance**
- Improving their sleep is important, as their future job continues to be cognitively and emotionally demanding
- While academic demand remains...
  - Education on stress management?
  - Promotion of healthier life style?



# CAMPUS FACILITIEZZZ



# Acknowledgements

## Collaborators

Dr. SF CHEUNG

Dr. KF CHUNG

Dr. CH HUI

Prof. TMC LEE

Dr. DSY MOK

Dr. CH TSENG

Prof. YK WING

## HKU Sleepers!

Jacky, Lawrence, Kristy, Cecilia, Gervais, Phoebe, Edith, Florence, Shirley, Winglan, Jacklyn, Jacqueline, Tiffany, Martin, Lucy, Karen, Lawrence



華人信念發展研究  
Formation and Transformation of Beliefs in Chinese



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UNIVERSIDADE DE MACAU  
UNIVERSITY OF MACAU

# QUESTION COMMENT FEEDBACK

THANKZZZ...

