SINGAPORE SLEEP REVIEW

SINGAPORE SLEEP SOCIETY NEWSLETTER

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SLEEP PROBLEMS IN OLDER ADULTS

In a rapidly aging society across Asia and the world, healthcare costs related to sleep problems can be expected to rise substantially. With physiological and social changes during aging, sleep duration, sleep continuity, and sleep quality may decline, presenting a risk factor for downstream health issues. Sleep problems could include insomnia, obstructive sleep apnea, excessive daytime sleepiness, and circadian sleep-wake disorders.

A recent review paper reported that the world-wide prevalence of sleep problems in older adults could be as high as 46%.

The paper reviewed the literature from the past 35 years and included data from almost 1000,000 elderly participants in 252 original studies from 36 countries across the world, including 2 studies from Singapore.

Reference: Canever, et al. 2024 Worldwide prevalence of sleep problems in community-dwelling older adults: A systematic review and meta-analysis. *Sleep Medicine*. https://doi.org/10.1016/j.sleep.2024.03.040

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SSS NEWS

With the first issue of this new year, we want to wish all our readers a happy year of the snake. In this issue we will share several recent research studies from Singapore and across the world. We are also happy to support the upcoming World Sleep Day Public Health Education Session organized by the Ng Teng Fong General Hospital. Lastly, the World Sleep Congress happening in Singapore (Sept 5-10, 2025) is now open for registration.

Singapore Sleep Society
Sleep Apnea Support Group

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Singapore Sleep Society

ACADEMY OF MEDICINE SINGAPORE
Chapter of Sleep Medicine Physicians

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The review specifically looked at studies in community-dwelling older adults (i.e. adults ≥60 years of age, living at home or in residences without nursing care or rehabilitation) and excluded studies on populations with a specific health condition (e.g. stroke, hip fracture, cardiovascular disease, anxiety, depression, cognitive impairment).

Prevalence data were extracted and quantified in several categories: poor sleep quality, insomnia, excessive daytime sleepiness, obstructive sleep apnea, and other sleep problems (napping, nightmares, insufficient sleep time, and/or any other sleep problem). Prevalence was in most cases measured through validated or non-validated questionnaires (k=246), and in some studies by polysomnography (k=8) or actigraphy (k=16).

Poor sleep quality was mostly assessed by questionnaire. From 113 studies, a pooled prevalence of 40% was estimated. Insomnia was assessed in 49 studies and had a pooled prevalence of 29%. Twenty-one studies included estimates of excessive daytime sleepiness, with a pooled prevalence of 19%. OSA was measured in 17 studies and had a pooled prevalence of 46%. A rest-category of 'other sleep problems' was recorded from 75 studies with a pooled prevalence of 37%.

Studies comparing sleep problems between males and females found that insomnia was more prevalent in females (32%) than in males (25%), while poor sleep quality and OSA were more prevalent in males (34% and 67%) than females (19% and 57%). Study-quality assessment demonstrated that most included studies had adequate sampling methods and sample sizes, good response rates, and used validated tools. However, standardization of evaluation methods was lacking.

From the two studies from Singapore, one had assessed poor sleep quality with a prevalence of 59%[1], higher than the world-wide pooled prevalence. Both studies had a measure of of 'other sleep problems' with 59%[1] and 35%[2] prevalence respectively. No study from Singapore had assessments of insomnia or OSA or excessive daytime sleepiness included.

References: [1] Cheng, Grand H-L., Angelique Chan, and June C. Lo. "Factors of nocturnal sleep and daytime nap durations in community-dwelling elderly: a longitudinal population-based study." *International Psychogeriatrics* 29.8 (2017): 1335-1344. https://doi.org/10.1017/S104161021700062X

[2] Sagayadevan, Vathsala, et al. "Prevalence and correlates of sleep problems among elderly Singaporeans." *Psychogeriatrics*17.1 (2017): 43-51. https://doi.org/10.1111/psyg.12190

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WORLD SLEEP SOCIETY
Advancing Sleep Health Worldwide

Utility of Overnight Oximetry in OSA Detection in Children

Reference: Koh YQ, Sultana R, Pugalenthi A, Tan YH, Teoh OH, Cheng ZR, Cheng DT, Chay OM, Allen JC, Tan SG, Lim M, Tan J, Thomas B. Utility of overnight oximetry indices in the evaluation of children with snoring and suspected obstructive sleep apnea. J Clin Sleep Med. 2025 Jan 1;21(1):109-121. http://doi.org/10.5664/jcsm.11344

Pediatric obstructive sleep apnea can affect 1-5% of children, with its highest incidence between 2-8 years old. While prevalence in pediatric populations is lower than in adult or aging populations, pediatric OSA can have a direct impact on a child's cardiovascular, metabolic, neurocognitive and socio-emotional development. Timely detection and management are therefore centrally important.

Gold standard diagnosis of OSA is established through Polysomnographic assessment. However, accessibility issues due to low availability and high costs of in-lab sleep studies can present a substantial obstacle to seeking diagnosis and finding treatment. Pulse oximetry, used to determine the blood oxygen saturation levels, is part of an in-lab level 1 PSG assessment, but can be deployed separately in level 2 or 3 sleep studies (in-lab or at home).

Determining the right oximetry indices and optimal cut-off values for the population at play, is critically important for differentiating OSA from Primary Snoring (PS, i.e. snoring without significant disruption to breathing or oxygen levels), and for differentiating the severity level of OSA. To this end, a research team from KK Women's and Children's Hospital, the NTU Lee Kong Chiang School of Medicine, and the National University of Singapore performed a retrospective analysis of oximetry indices in children who had undergone a level 1 PSG sleep study in the KKH sleep clinic between 2014 and 2017.

Earlier studies from other countries had provided mixed results, but these studies were based on relatively smaller numbers of patients. From the KKH records, 1,203 patient records were retrieved. This did not include patients with craniofacial anomalies, Down syndrome, neuromuscular disease, and patients with high central apnea index (CAI > 5, as central apnea (as opposed to OSA) is more likely in these cases.

To evaluate the discriminatory value, four oximetry indices were extracted (Oxygen Desaturation Index [ODI_3: number of ≥3% desaturation episodes/hour], SpO_2 nadir [lowest value of SpO_2 during sleep], proportion of sleep time spent with SpO_2 85-94% or <85%) and compared to gold standard PSG Obstructive Apnea-Hypopnea Index (OAHI).

Results showed that ODI_3 achieved the best discrimination between PS and OSA, with an ODI_3 cut-off = 2.4 (sensitivity: 78.8%; specificity: 80.5%) for children ≤12 years of age. For children >12 years, ODI_3, SpO_2 nadir, and TST with SpO2 85-94% showed similar performance, with optimal ODI_3 cut-off = 3.6 (Sensitivity: 71.1%; specificity: 91.1%). ODI_3 also had good discriminatory power for distinguishing OSA severity in both age groups.

These findings indicate that oximetry can provide metrics that can aid in the detection of pediatric OSA. However, as oximetry was taken from the same sessions as PSG diagnosis, the authors caution that correlations might be lower when oximetry is applied in home sleep studies. This also depends on the data quality due to application, scoring, and variability of sensors used in home studies. Furthermore, future studies should test the generalizability to more complex patient populations, and populations with different ethnic make-up or larger representation of younger children (<2 years).

Ng Teng Fong General Hospital

Public Health Education Series by NTFGH

Sleep Well, Sleep Healthy

睡得好，睡得健康

Are you tired of feeling tired?

In our fast-paced lifestyle, the importance of sleep is often overlooked, but it's time to wake up to its incredible benefits. In conjunction with World Sleep Day, join us to discover the relationship between quality sleep and good health!

Our speakers will share insights on how proper sleep can boost your immune system, sharpen your mind, and even help you maintain a healthy weight. Unlock the secrets to restorative sleep and learn practical tips to rejuvenating nights and energised days!

Date & Time

8 Mar 2025 (Saturday)
9am to 12pm
Registration starts at 8.40am

是否厌倦了总是感到疲惫?

在快节奏的生活中，睡眠往往被忽视。然而，正所谓“吃人参，不如睡五更”，充足的睡眠才是健康的基石。配合世界睡眠日，让我们一起探讨优质睡眠与健康活力之间的重要关联!

我们将深入讲解适当的睡眠如何增强免疫力、提升思维敏锐度，并帮助您维持健康体重。讲座将探索恢复性睡眠的奥秘，掌握实用技巧，从此焕新您的每个夜晚，并充实每个白天。

Venue

Ng Teng Fong General Hospital
Tower A, Level 1, Auditorium
Light Refreshments will be provided

9.00AM - 9.40AM - 中文讲座

阻塞性睡眠呼吸暂停症
蔡爱苹医生
呼吸系统科高级顾问医生

9.40AM - 10.40AM - Booth Activities / 活动区

10.40AM - 12.00PM - English Talk

Good Sleep Practices & Sleep Hygiene
Dr Adeline Tan
Senior Consultant
Division of Respiratory Medicine

Obstructive Sleep Apnea
Adj Asst Prof Sridhar Venkateswaran
Senior Consultant
Division of Respiratory Medicine

Registration is required

Please scan for more info and to register

Registration will close on 2 Mar 2025 at 12pm or once the seating capacity is reached.

需提前注册
请扫码获取更多信息并报名。
报名截止日期为2025年3月2日中午12点。

https://for.sg/wsd-ntfgh

Event supported by

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Singapore Sleep Society

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Mandibular advancement device in OSA

Reference: Tan, W., Lye, K., Saffari, S.E. *et al.* Mandibular advancement devices, irrespective of amount of movement, are effective in treating young patients with obstructive sleep apnea. *Sleep Science Practice* **9**, 5 (2025). https://doi.org/10.1186/s41606-024-00123-6

Mandibular advancement devices (MAD) are an oral appliance for the treatment of OSA that work through stabilizing the lower jaw in a forward position during sleep. This prevents the tongue and soft palate to obstruct the upper airway. MAD's are a common alternative treatment for patients who do not tolerate CPAP.

The efficacy of MAD treatment may depend on factors such as sex, BMI, and neck circumference. Efficacy may also depend on the degree of advancement established by the MAD. To test this hypothesis, a team from the National Dental Centre Singapore performed a retrospective of patients receiving MAD treatment at eth NDCS between 2011 and 2017.

Forty-nine patients were included in the analysis (42 males, mean age: 47.4 years). Patients were grouped based on the final amount of advancement (≤ 8 mm or > 8 mm). Treatment response was better in younger patients (<50 years) than older patients. However, no differences in treatment response were found based on advancement group. In both groups, 61% of patients achieved a significant reduction in OSA symptoms (complete or partial response), while 39% had no to minor improvements in symptoms. This suggests that the amount of advancement alone is not predictive of treatment success.

AI detection of cranofacial features for OSA diagnosis

Reference: Gao EY, Tan BKJ, Tan NKW, Ng ACW, Leong ZH, Phua CQ, Loh SRH, Uataya M, Goh LC, Ong TH, Leow LC, Huang GB, Toh ST. Artificial intelligence facial recognition of obstructive sleep apnea: a Bayesian meta-analysis. Sleep Breath. 2025 29(1):36. http://doi.org/10.1007/s11325-024-03173-3

Recent advancements in AI research have opened up a wide range of opportunities to develop applications to support healthcare. Various AI applications could enhance diagnostic workflow, for instance through pattern-recognition in medical imaging and patient records.

One way in which AI could aid the diagnosis of OSA is through the detection of craniofacial features from patient photographs. Several studies have developed models to this purpose. A recent review paper has evaluated the diagnostic accuracy of these models. Six studies, published between 2009 and 2022 were reviewed, assessing a total of 10 models.

Results showed that AI models trained on craniofacial photographs achieve a high level of diagnostic (pooled sensitivity 84.9%, specificity 71.2%). Furthermore, Deep learning models, which excel at image processing, performed the best. Results were independent of AHI cutoffs, OSA prevalence, feature engineering, input data the type of camera used (consumer digital camera/mobile phone camera). Caution should be exercised as training datasets may not contain divers patient samples in terms of sex, ethnicity, and base prevalence of OSA.

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CALENDAR

8 MAR

Sleep Well, Sleep Healthy

NTFGH Public Health Education Series
Ng Teng Fong General Hospital, https://for.sg/wsd-ntfgh

10-12 APR

Sleep and Breathing 2025

The 8th conference organised by the ERS and ESRS
Antwerp, Belgium, https://esrs.eu/sleep-and-breathing-conference/

16-18 MAY

2025 AADSM Annual Meeting

Annual Meeting of the American Association of Dental Sleep Medicine
Las Vegas, NV, USA, https://www.aadsm.org/aadsm_annual_meeting.php

8-11 JUN

Sleep 2025

The 39th annual meeting of the Associated Professional Sleep Societies, LLC (APSS)
Seattle, WA, USA, https://www.sleepmeeting.org

SAVE THE DATE

Singapore 2025 WORLD SLEEP September 5-10

Singapore Sleep Society

Membership Application and Fees

Ordinary members
$30/year – sleep professionals with a medical degree, PhD or equivalent.

Associate members:
$10/year – any person involved in the field of sleep disorders without the above qualification.

Supporting members:
Corporations and individuals supporting the society financially.

Complete the application form and email to:
singaporesleepsociety.sg@gmail.com

Singapore Sleep Society

http://singaporesleepsociety.org

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