

# Screens and Young People's Sleep- Does It Matter?

Oliver Mowforth- Medical Student

Dr Alasdair Parker- Paediatric Neurologist

# Adults .....

- How much sleep does a 14 year old need ?
- Does anyone sleep with a phone (on or off) in their bedroom?
- Does anyone sleep with an ipad or computer in their room ?



# Clinical vignette

- Tom, a 14 year old boy, is referred from his GP following 6 months of poor concentration, irritability and daytime sleepiness.
- His mother is worried that he always appears tired during the day, yet seems to be going to sleep later than he used to
- After an unremarkable history and examination, you discover that Tom was bought a new smart phone for his 14<sup>th</sup> birthday, roughly 6 months ago.
- Could Tom's smart phone be responsible for his change in sleep?

# Clinical Question

What is the evidence to limit screen access in children before and during sleep?



502 Canadian children 9-11 years old

- Children with at least 2 screens in their bedrooms had significantly reduced sleep efficiency.
- No difference between having one screen and no screens
- Sleep duration was not affected.

2048 American students.

9-10 year-old and 12-13 year old

- Children who slept near a small screen reported an average of 21 fewer minutes of sleep and had a higher prevalence of perceived insufficient sleep or rest.
- Children who slept in a room with a TV reported an average of 18 fewer minutes sleep compared to children who did not.

9846 adolescents aged 16-19 in Norway.

- Both daytime and bedtime electronic device screen use increased risk of short sleep duration, longer sleep latency and increased sleep deficiency.

1926 Belgian school children, mean age 16.9 years old. Investigating the effect of media use in the hour before bedtime on sleep and daytime functioning

- Media use, except television, was associated with later bedtimes and taking longer to get to sleep.
- Mobile and computer use was negatively associated with daytime functioning.

6247 4<sup>th</sup> – 8<sup>th</sup> grade Chinese school children.

- They found that with each hour of mobile phone use after school the odds of daytime tiredness increased by 30%.

# Recent analysis- 17 studies

- Bedtime media device use was associated with inadequate sleep quantity, poor sleep quality and excessive daytime sleepiness
- Importantly, same relationships for children who had access to but did not use media devices at bedtime
- Strengths: 17 studies included
- Weakness: non-randomised; heterogeneity between studies e.g. 1 study reported increased sleep quality with bedtime media use.

# Possible mechanisms

- Simple distraction
- Physiological / Social arousal
- Light stimulation – melatonin?

## **What about when turned off?**

- Feeling of always being tuned in and connected
- Waking spontaneously in night to check news feeds

## **University students – only one room**

- Change in culture – disable devices before bed

# Summary Message

- Screen usage prior to bed and sleeping with a screen in the bedroom reduces quality and quantity of sleep in young people
- This is associated with deteriorating function in daytime with sleepiness, and consequent impairments

# Our recommendations

- Screens and devices removed from children's bedrooms
- Limit screen use at and before bedtime
- Reduced sleep quality and quantity even if switched off!

Should parents sleep with screens?  
(Even when turned off)

Any Questions?



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## Screens and my child's sleep

- Good sleep is vitally important for your child's health and development
- Experts have long worried about the effects of devices, like computers, tablets and mobile phones on children's sleep

### Recent research tells us that:

- Children who use devices at bedtime are more likely to have poor sleep quantity, poor sleep quality and excessive daytime sleepiness.
- Children who sleep with devices in their bedrooms, **even if they do not use them**, are more likely to have poor sleep quantity, poor sleep quality and excessive daytime sleepiness

### Our recommendations to you:

- Screens and devices should be removed from your child's bedroom before they sleep, even if they are not using them
- Your child's use of screens and devices at bedtime should be as minimal as possible
- Please ask your child's doctor if you have any questions or require more information

## Screens and my child's sleep: key evidence

**Carter et al., 2016** conducted a systematic review and meta-analysis assessing the association between portable media devices and sleep. 17 studies were included. Bedtime media device use was associated with inadequate sleep quantity, poor sleep quality and excessive daytime sleepiness. Importantly, the same relationships exist for children who had access to but did not use media devices at bedtime. Strengths: 17 studies included. Weakness: non-randomised; heterogeneity between studies e.g. 1 study reported increased sleep quality with bedtime media use.

Carter, B., Rees, P., Hale, L., Bhattacharjee, D., and Paradkar, M.S. (2016). Association Between Portable Screen-Based Media Device Access or Use and Sleep Outcomes: A Systematic Review and Meta-analysis. *JAMA Pediatr.* 170, 1202–1208.

**Chaput et al., 2014** conducted a cross-sectional questionnaire-based study of 502 Canadian children of 9-11 years old, investigating the association between the number of screens in children's bedrooms and sleep. Children with at least 2 screens in their bedrooms had significantly reduced sleep efficiency. There was no difference between having one screen and no screens. Sleep duration was not affected. Sleep duration and efficacy were assessed using a waist-worn accelerometer. Strength: large number of participants, validated sleep accelerometer. Weakness: non-randomised, unexpected results: 1 screen and sleep duration.

Chaput, J.-P., Leduc, G., Boyer, C., Bélanger, P., LeBlanc, A.G., Borghese, M.M., and Tremblay, M.S. (2014). Electronic screens in children's bedrooms and adiposity, physical activity and sleep: Do the number and type of electronic devices matter? *Can. J. Public Health Rev. Can. Sante Publique* 105, e273–e279.

**Falbe et al., 2015** were interested in the association between small screen use and sleep. They conducted a cross-sectional questionnaire-based study of 2048 fourth (9-10 year-old) and seventh grade (12-13 year-old) American students. Children who slept near a small screen reported an average of 21 fewer minutes of sleep and had a higher prevalence of perceived insufficient sleep or rest. Children who slept in a room with a TV reported an average of 18 fewer minutes sleep compared to children who did not.

Falbe, J., Davison, K.K., Franckle, R.L., Ganter, C., Gortmaker, S.L., Smith, L., Land, T., and Taveras, E.M. (2015). Sleep Duration, Restfulness, and Screens in the Sleep Environment. *Pediatrics* 135, e367–e375.

**Arora et al., 2014** conducted a cross-sectional questionnaire-based study of 738 adolescents (11-13 years) in the UK, looking at the relationship between bedtime technology use and sleep. They found that all technology use was adversely associated with sleep duration. Frequent bedtime video gamers had significantly prolonged sleep onset. Technology use, especially television, was associated with frequent early waking. Difficulty falling asleep was significantly associated with frequent bedtime mobile phone, video game and music use and also bedtime social networking. Strength: multiple screen-based technologies, large sample size.

Arora, T., Broglio, E., Thomas, G.N., and Taheri, S. (2014). Associations between specific technologies and adolescent sleep quantity, sleep quality, and parasomnias. *Sleep Med.* 15, 240–247.

**Jiang et al., 2015** conducted a cross-sectional study of 6247 4<sup>th</sup> – 8<sup>th</sup> grade Chinese school children. They found that with each hour of mobile phone use after school the odds of daytime tiredness increased by 30%.

Jiang, X., Hardy, L.L., Baur, L.A., Ding, D., Wang, L., and Shi, H. (2015). Sleep Duration, Schedule and Quality among Urban Chinese Children and Adolescents: Associations with Routine After-School Activities. *PLoS ONE* 10.

**Pieters et al., 2014** conducted a cross-sectional questionnaire-based study investigating the effect of media use in the hour before bedtime on sleep and daytime functioning of 1926 Belgian school children, mean age 16.9 years old. Media use, except television, was associated with later bedtimes and taking longer to get to sleep. Mobile and computer use was negatively associated with daytime functioning.

Pieters, D., DeValck, E., Vandekerckhove, M., Pirrera, S., Wuyts, J., Exadaktylos, V., Haex, B., Michiels, N., Verbraecken, J., and Cluydts, R. (2014). Effects of pre-sleep media use on sleep/wake patterns and daytime functioning among adolescents: the moderating role of parental control. *Behav. Sleep. Med.* 12, 427–443.

**Chahal et al., 2013** conducted a cross-sectional questionnaire-based study of 3398 5<sup>th</sup> grade Canadian school children and found that access to night time use of electronic entertainment and communication devices was associated with significantly shorter sleep duration

Chahal, H., Fung, C., Kuhle, S., and Veugelers, P.J. (2013). Availability and night-time use of electronic entertainment and communication devices are associated with short sleep duration and obesity among Canadian children. *Pediatr. Obes.* 8, 42–51.

**Gamble et al., 2014** conducted a cross-sectional study of 1184 adolescents (11-17 years old) and found a dose-dependent effect of increasing bedtime media device use and later onset of sleep and later waking.

Chahal, H., Fung, C., Kuhle, S., and Veugelers, P.J. (2013). Availability and night-time use of electronic entertainment and communication devices are associated with short sleep duration and obesity among Canadian children. *Pediatr. Obes.* 8, 42–51.

**Hysing et al., 2015** conducted a cross-sectional study of 9846 adolescents aged 16-19 in Norway. They found that both daytime and bedtime electronic device screen use increased risk of short sleep duration, longer sleep latency and increased sleep deficiency.

Hysing, M., Pallesen, S., Stormark, K.M., Jakobsen, R., Lundervold, A.J., and Sivertsen, B. (2015). Sleep and use of electronic devices in adolescence: results from a large population-based study. *BMI Open* 5, 2006748.

**Kubiszewski et al., 2014** showed, in a cross-sectional study of 332 school children of mean age 13, that evening screen time of one hour or more is associated with higher risk of sleep problems: going to bed late, difficulty waking up.

Kubiszewski, V., Fontaine, R., Rusch, E., and Hazouard, E. (2014). Association between electronic media use and sleep habits: an eight-day follow-up study. *Int. J. Adolesc. Youth* 19, 395–407.