

COMMENTARY

## Bedtime screen use in middle-aged and older adults growing during pandemic

Commentary on Gradisar M, Wolfson AR, Harvey AG, Hale L, Rosenberg R, Czeisler CA. The sleep and technology use of Americans: findings from the National Sleep Foundation's 2011 Sleep in America poll. *J Clin Sleep Med*. 2013;9(12):1291–1299. doi:10.5664/jcsm.3272

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In 2013, the *Journal of Clinical Sleep Medicine* published “The Sleep and Technology Use of Americans: Findings from the National Sleep Foundation’s 2011 Sleep in America Poll.”<sup>1</sup> Seven years later, this landmark article is one of the articles from this journal that is most often read and cited. Gradisar et al<sup>1</sup> found that 90% of 1,508 Americans ages 13–64 years reported using electronic devices in the hour before bed. So-called passive television watching was then most popular (60%), but the preferred bedtime technology for those under age 30 was a smartphone. In 2011, 72% of US adolescents, 67% of young adults, 36% of middle-aged adults, and 16% of older adults reported smartphone use before bed. Use of “stimulating interactive bedtime technology” (phones, computers, laptops, videogaming) was significantly associated with self-reported insufficient/poor-quality sleep, difficulty staying asleep, and/or excessive daytime sleepiness; of note, passive television watching or music listening was not. The more interactive devices bedside, the more likely reporting unrefreshing sleep. Worse yet, 22% fell asleep with their phone ringer on and 10% of all Americans were awakened by their phones ringing at least a few nights a week (and associated with difficulty maintaining sleep). The authors thought passive pleasures (television, music) were permissible to fill the void waiting to fall asleep but stimulating interactive media were not “acceptable.”

Since this seminal study, much of the literature published has focused on media use before bed in children, adolescents, and young adults.<sup>2–6</sup> A 2016 meta-analysis (20 studies including 125,198 US children; mean age, 14.5 ± 2.2 years) found digital delights pre-bedtime increased the risk for self-reported inadequate sleep quantity by 2.2-fold and excessive daytime sleepiness by 2.7-fold.<sup>6</sup> Just having a device bedside (not touching it) increased the risk for inadequate sleep quality by 1.8-fold and excessive daytime sleepiness by 2.3-fold.

Bedtime use of screens before bed for leisure, diversion, distraction, and communication was, and is, global, especially among adolescents. In 2015, more than 90% of 9,846 Norwegian adolescents used “screens” before bed.<sup>5</sup> Guidelines recommend recreational screen time be less than 2 hours per day.<sup>7</sup> Teens reporting screen times of more than 4 hours per day had a

3.6-fold increased risk for getting less than 5 hours of sleep. Having multiple devices bedside increased the likelihood for sleeping less than 5 hours from 2.2- to 2.8-fold depending on the number and 4 or more devices bedside increased the risk for a sleep latency longer than 1 hour by 1.3-fold.

A 2020 study of 4,811 adolescents from New Zealand found that 86% used their smartphones in bed most nights, 88% of use was social media, and 77% was texting/instant messaging. Seventy percent “agreed” they spent too much time on screens, knew it was detrimental to sleep, but found not being able to communicate with friends untenable.<sup>2</sup> A 2020 study of 11,361 13- to 15-year-olds from the United Kingdom found that heavy use of screen media was associated with shorter sleep duration, longer sleep latency, and more midsleep awakenings, especially when used for social media or surfing the internet.<sup>3</sup>

How to curb bedtime screen use in adolescents? School-based educational sleep interventions have not been successful in lessening bedtime screen use in adolescents.<sup>2,8,9</sup> Interventional studies have been few. A 2019 study recruited 63 adolescents (mean age, 16 years) who agreed to stop using their phone 1 hour before bed for only 1 week.<sup>10</sup> Doing so, they turned off lights 17 minutes earlier and got 21 minutes more sleep. However, researchers were only able to recruit 26% of those asked because “many adolescents lack motivation to negotiate changes to their evening phone use.” The American Academy of Pediatrics recommends parents develop a family media plan with consistent limits on screen time, but parent enforcement of screen time for older teens is largely nonexistent.<sup>11</sup> Teens when asked suggest apps that reduce screen brightness in a tolerable way to curb their bedtime screen use, but a 2019 laboratory study found that blue light filters in young adults improved sleep quality when watching media but not Facebook.<sup>12</sup> Turning on “do not disturb” at a certain time of night might be effective, but for adolescents, especially girls, the need to stay connected is so strong that groups of friends need to agree to it so none feel left out.<sup>2</sup>

Jumping ahead to today, middle-aged and older adults have embraced digital technology and increasing numbers use media bedside. A 2019 survey found that 90% of

Gen Xers (born 1965–1980) and 68% of Baby Boomers own a smartphone.<sup>13</sup> A 2016 study of 844 Flemish adults found that half owned a smartphone, and 60% of them took their phone to bed.<sup>14</sup> They found that texting and/or phone calls after lights out significantly predicted longer sleep latency, worse sleep efficiency, more sleep disturbance, later rise times, and more daytime dysfunction and fatigue, especially for those younger than 41 years.

An interesting survey of 1,984 Australians aged 18–90 years in 2019 found that 5% reported waking to use technology all/most nights in 7 days, 14% reported 2–3 nights, and 13% reported 1 night.<sup>15</sup> Phone use for 2–3 nights or more per week was significantly associated with daytime sleepiness, fatigue, and impaired mood, motivation, and attention; this was more evident among those who did not report they had a sleep problem. Technology use was independently associated with a 6.4-fold increased risk for 1 or more drowsy-driving motor accident or near miss per month, a 4.8-fold risk of missing work, and a 2.2-fold risk of making errors at work in the last 3 months due to sleepiness/sleep problem. These associations were not significantly modified by age.

A 2020 interventional study randomized 38 adults to either avoid using their phones 30 minutes before bed for 4 weeks (interventional group) or to “do as you like” (controls) found that sleep latency was 12 minutes shorter, and sleep duration 18 minutes longer, in the intervention group.<sup>16</sup> The phone-off group (intervention group) showed improved sleep quality, reduced presleep arousal, and improved positive affect and working memory.

Use of media has become even more pervasive during social isolation of the coronavirus disease 2019 (COVID-19) pandemic.<sup>17</sup> Use of social media such as WhatsApp and Facebook has increased 40–50% during COVID-19, unfettered by regular rise, school, and work times. Locked-down teens report staying up all night on Snapchat and video calls with friends with variable postdawn bedtimes.<sup>18</sup> Digital technology is so woven into the lives of adolescents (and increasingly the rest of us) for communication, entertainment, social connection, play, and education.<sup>11,19</sup> How best to curb this? Probably only 1 patient at a time, tailoring behavioral interventions for that patient, providing education, helping the patient perceive the effect of use on their sleep and daytime functioning, and work with the patient to develop acceptable turn-them-off strategies.

## CITATION

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## DISCLOSURE STATEMENT

The authors report no conflicts of interest.