Real life trumps laboratory in matters of public health

The recent article by Chang et al. (1) adds to the growing literature that exposure to even seemingly dim light at night can have a negative impact on sleep. There have been several articles published in recent years indicating that the seemingly innocuous light emitted from consumer electronics devices has the capacity to increase alertness at night, thereby making it more difficult to initiate sleep (2). One of the problems that we have in judging the light emitted from these devices is that our conscious perception of light is mediated by a circuitry that both overlaps and yet is distinct from the circuitry underlying the mediation of light-induced alertness. This latter system, which also regulates the impact of light on other non–image-forming functions, such as circadian timing, is more sensitive to the shorter wavelength light that is abundant in most consumer electronic goods. Notably, the article by Chang et al. highlights the capacity of the non–image-forming system to respond to light. This article does not, however, answer the important public health question as to whether use of these devices at night is bad for your sleep.

We and others, including Cheng et al., have demonstrated that the non–image-forming system compares light exposure patterns such that the impact of the light one receives at night is moderated by the amount of light one receives during the daytime (3, 4). In the current study, subjects were exposed to ∼90 lx for 12 h before a 4-h session in which they were exposed to the light from a light-emitting eReader. The 12 h of 90 lx (equivalent to spending the entire day in dim room lighting that is well below workplace standards for adequate lighting) would be quite abnormal for most people. Although institutionalized older individuals could be exposed to this lighting schedule, most individuals, even those of us bound to indoor jobs, are normally exposed to greater illuminance throughout the day, especially during the morning and lunch hour (in the tens of thousands of lux range). In fact, one of the authors of the current study reported that both older and young adults spend 37.7% and 27%, respectively, of their waking day in light exceeding 100 lx and 14.7% and 9% of their waking day in light exceeding 1,000 lx (5). Real-life light exposure desensitizes the non–image-forming system to the intensity of evening light exposure that was examined in this study. That is, the light emitted from the eReaders would have had a much smaller effect in alerting the brain than they would have had the participants been exposed to a normal pattern of everyday light exposure before using the eReaders before bedtime. Thus, the question still remains as to whether the light being emitted from an eReader, or any other type of electronic device, would actually impact nocturnal alertness and sleep in normally behaving individuals.

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