The Interface

CELL PHONES:
The Psychosocial Risks

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This ongoing column is dedicated to the challenging clinical interface between psychiatry and primary care—two fields that are inexorably linked.

ABSTRACT

Cell phones are a relatively novel and evolving technology. While the potential benefits of this technology continue to emerge, so do the potential psychosocial risks. For example, one psychosocial risk is user stress, which appears to be related to feeling compelled to promptly respond to cell-phone activity in order to maintain spontaneity and access with others. Other potential psychosocial risks include disruptions in sleep; the user's risk of exposure to cyberbullying, particularly the unwanted exposure of photographs and/or videos of the victim; and overuse, particularly among adolescents. With regard to the latter phenomenon, the boundaries among overuse, misuse, dependence, and addiction are not scientifically clear. Therefore, while cell phones are a convenient and expedient technology, they are not without their potential psychosocial hazards.

KEY WORDS

Addiction, cell phones, cyberbullying, mobile phones, sleep, stress

INTRODUCTION

According to a 2007 to 2008 community survey conducted by Harris Interactive, of the 9,132 adults surveyed, 89 percent of the participants reported owning a cell phone, whereas only 79 percent reported having a traditional telephone landline.[1] Among the participants with cell phones, 14 percent *exclusively* used a cell phone. In addition to the patent popularity of cell phones with the public, this technology is gaining popularity in the healthcare field as a medium for clinical assessment and intervention. For example, cell phone technology has been used to manage commuter stress; reduce examination anxiety; counter battlefield stress; enhance emotional self-awareness; promote socially supportive behavior; assess alcohol use, mood status, stress, and coping behaviors; monitor mood states; and coordinate the activities of surgical wards.[2–9] Cell phones have also been advocated in the healthcare environment to facilitate patient reminders about appointments, enable disease monitoring and management, and provide patient education.[10] Again, the preceding findings affirm that cell phones are quite popular with the public and have significant potential for therapeutic use in the healthcare field. However, in this edition of *The Interface*, we examine the potential psychosocial risks associated with this type of novel technology.

CELL PHONES AND PERSONAL STRESS

According to limited data, cell phones may momentarily increase personal stress. As an empirical example, in a study of more than 100 individuals in the United Kingdom, Balding et al[11] reported that cell phone technology was associated with increased personal stress. The emergence of stress was attributed to participants getting caught up in compulsively checking for new messages, alerts, and updates. In contrast, the investigators did not find linkages between cell phone use and personal stress related to work endeavors.

In a study of 1,367 participants in upstate New York communities, Chesley[12] undertook hour-long telephone interviews that focused on the use of technology, including cell phones, and the potential boundary effects between work and home. She found that persistent communication by cell phone was associated with increased personal distress, decreased family satisfaction, and negative spillover between work and family environments.

Using a self-report questionnaire methodology, Imamura et al[13] examined cell phone use among 10,709 Japanese students in grades 7 through 9. In this 2009 study, 49.9 percent of the students possessed a cell phone and 5.5 percent reported three or more stressful incidents in the past week related to cell phone usage. The authors concluded that, "…e-mail-related stress [is] associated with poor mental health status."

Finally, Angster et al[14] examined 128 undergraduate students in the United States regarding their cell-phone experiences. Participants indicated that a high frequency of texting with others was associated with finding those relationships less fulfilling.

The previous findings indicate that cell-phone use may do the following: 1) potentially increase personal stress levels through the need to monitor and respond to text messages and alerts; 2) blur the boundaries between work and home in a unsatisfactory manner; (3) precipitate stress in adolescents; and (4) at high levels, be associated with less emotionally satisfying relationships with others.

CELL PHONES AND SLEEP DISTURBANCE

Do cell phones contribute to sleep disturbance? Van den Bulck[15] has suggested that cell phones may lead to overexcitement and interfere with or shorten sleep time. In support of this impression, a number of studies using self-report methodologies indicate that cell phone usage in adolescents may impair sleep. For example, in a Japanese study of 220 high school students, Ogata et al[16] concluded that e-mailing by cell phone was possibly associated with sleep loss at night. Kamibeppu and Sugiura[17] examined 578 Japanese eighth-grade students and found that nearly half owned a cell phone; as a group, they stayed up at night engaging in e-mail exchanges. In a Swedish study of 4,156 young adults between the ages of 20 and 24 years, Thomee et al[18] found that compared to low cell phone use, high cell phone use by participants was associated with sleep disturbances. In a study of 1,656 Belgium school children, Van den Bulck[19] reported that participants who used a cell phone more than once a week were 5.1 times more likely to be tired; overall, being tired (35% of participants) was attributable to such use, and cell-phone use after lights out increased the odds of being very tired by 2.2 (95% confidence interval=2.5–10.4).

In an Egyptian study, Salama et al[20] studied 300 individuals and found that 29.5 percent reported sleep disturbance, which correlated with longer total use per day of cell phones. In a study population of 437 Saudi adults, Al-Khlaiwi and Meo[21] reported that four percent of participants experienced sleep disturbances that were presumably related to the use of cell phones. In a Finnish study, Punamaki et al[22] found that intense cell phone usage among 7,292 adolescents was associated with negative sleep effects and increased daytime fatigue. Finally, in a Japanese study of 94,777 adolescents, Munezawa et al[23] found that calling and/or text-messaging after lights out was associated with shorter sleep duration, poorer subjective sleep quality, insomnia, and excessive daytime sleepiness. On a side note, a study by Santini et al[24] suggested that there may be gender differences in the sleep disturbances associated with cell phones, with women reporting more symptoms than men.

Note that the preceding studies all entail self-report methodologies, which have potentially inherent limitations. Are there any objective findings that cell-phone use impairs sleep in humans? While Danker-Hopfe et al[25] found no evidence that two cell-phone frequencies disturbed the macrostructure of sleep as assessed in a laboratory setting, other such studies have reported more concerning findings. For example, in a study from the United Kingdom, Hung et al[26] examined electroencephalograms (EEG) in 10 young healthy adults and reported possible cell-phone effects on sleep onset. Loughran et al[27] examined 50 Australian participants and found that cell-phone exposure prior to sleep could promote rapid eye movement sleep and modify the sleep EEG. Huber et al[28] reported that pulse-modulated electromagnetic fields, such as those from cell phones, affected regional cerebral blood flow during a waking state and caused

changes in the EEG architecture during presleep (enhanced alpha frequency waves) and during Stage 2 of sleep (increased spindle frequency).

Overall, the preceding findings indicate that both subjective and objective disturbances in sleep can develop with cell phone use. As a caveat, subjective findings are limited by the lack of objective corroboration as well as the possibility of multiple confounds. Likewise, the objective data are difficult to fully interpret (i.e., abnormal findings are present, but do they fully account for meaningful sleep disturbances reported by participants?).

CELL PHONES AND CYBERBULLYING

While cell phones are not attributable causes of cyberbullying, they certainly function as a contemporary and expeditious means of victimizing others. According to the available literature, the prevalence of cyberbullying among adolescents who possess cell phones ranges from 5.9 to 24.6 percent.[29–31] According to two other groups, the use of pictures and/or videos of the victim is the most negative form of cyberbullying.[32,33] While less frequent than traditional bullying, students who engage in traditional bullying are oftentimes the perpetrators of cyberbullying, with few gender differences observed.[32–34]

CELL PHONES AND DEPENDENCY/ ADDICTION

Is there such a phenomenon as technological addiction? According to Takao et al,[35] problematic cell phone use can be considered addiction-like. In keeping with this proposal, Walsh et al[36] held focus groups with 32 Australians, ages 16 to 24 years, and found that some participants were extremely attached to their cell phones and reported symptoms suggestive of addictive behavior. In a Korean sample, Lee et al[37] reported that 16 percent of middle school students were "addicted" to their cell phones. In an Italian study of 1,011 students ages 9 to 18 years, Dimonte and Ricchuito[38] indicated that most participants suffered from a sort of addiction to the cell phone. In a Tunisian population, Halayem et al[39] reported that 26 percent of participants suffered from excessive cell-phone use, which they described as "addiction."

According to Choliz,[40] addictive cell phone use may meet several criteria for dependence, including excessive use, problems with parents associated with excessive use, interference with school and other personal activities, gradual increase in use to obtain the same previous level of gratification, and the need to avoid emotional alterations when cell phone use is impeded. In a Taiwanese study, Yen et al[41] examined 10,191 adolescents and their cell phone use, and reported that 30 percent evidenced tolerance, 36 percent withdrawal, 27 percent heavier use than intended, 18 percent unsuccessful attempts to reduce use, and 10 percent functional impairment in terms of secondary poor relationships with friends or classmates.[41] From an opposing perspective, Sanchez-Carbonell et al[42] argue that the maladaptive use of cell phones is best characterized as "abuse," but not genuine addiction, due to the lack of rapid emotional changes that would be expected during use versus nonuse.

As for the psychological characteristics of heavy cell phone users, Thomee et al[43] found that such levels of cell phone use were associated with personal dependency, demands for achievement, and persistent needs for connections with others. Ha et al[44] found that excessive users of cell phones were more depressed, exhibited more anxiety, and had lower self-esteem.

On a side note, there are several available scales for cell phone overuse. These include the Mobile Phone Problem Use Scale by Bianchi and Phillips, the Cell Phone Addiction Scale by Koo (in Korean), and the Cellular Phone Dependence Questionnaire by Toda et al (in Japanese).[45–47]

In summary, most authorities acknowledge that there is a risk of overuse of cell phones. Whether this phenomenon is misuse, dependency, or addiction remains scientifically unclear and will likely be open to debate over the years to come.

CONCLUSION

Cell phones offer historically unique opportunities for maintaining unrestricted and spontaneous contact with others. However, like any other phenomenon, there appear to be some potential psychosocial risks with cell phones. These risks include the personal stress of responding to and maintaining unrestricted and immediate contact with others; possible sleep disturbances related to the anticipation of use after lights out, feeling keyed up after cell-phone conversations, and/or biologically mediated changes in sleep structure related to the electromagnetic fields generated by cell phones; the facilitation of cyberbullying; and overuse/misuse. Understanding the potential psychosocial benefits and limitations of this novel technology and their relationships to overall physical and mental health is important in both psychiatric and primary care settings.

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