Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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Editorial

Using Technology to Improve the Health and Well-Being of Adolescents and Young Adults

With this issue of the *Journal of Adolescent Health*, we bring you a supplement entitled "Innovative Digital Technologies to Improve Adolescent and Young Adult Health" [1–8]. When we began work on this supplement in 2019, little did we know that it would be released at a time when digital technologies have been called upon to rapidly transform the way that we provide clinical care, deliver public health messages, and educate the next generation of health professionals. The COVID-19 pandemic has challenged all of us to adapt to new approaches to maintaining the health care delivery and public health systems and supporting the research and educational programs associated with systems of care. This supplement tackles the newest approaches to using digital technologies to enhance our work, improving the health and well-being of adolescents and young adults.

In her editorial, Dr. Sanci reminds us that adolescent and young adults are early adopters of technology, highlighting the critical importance of a supplement that focuses exclusively on the utility of technological advances for providing care to young people [1]. The supplement brings together six articles, each demonstrating the unique contributions of transdisciplinary collaborations that explore how technology can push the boundaries of developmental science, youth engagement, delivery of clinical preventive services, behavior change within health care systems, and the development of personalized adolescent preventive care with artificial intelligence (AI) [2–7].

The supplement begins with a provocative commentary by Thadaney Israni et al., which frames our discussion about equity and inclusivity for young people [8]. Often adolescents and young adults will embrace technology without understanding where personal profile information is stored and how it may be used without their knowledge. We need to make certain that the health care system in using AI as a "game-changing technology" is thoughtfully integrated to avoid societal harm [8]. Young people need to be encouraged to find out where their data are going and with whom they are being shared. This questioning will enable them to be thoughtful consumers of the new digital health care world [7]. And, more importantly, those of us who use these new technologies need to be mindful of our job of educating young people about the strengths and limitations of technology.

The first review article in the supplement, by Giovanelli et al., brings the field of developmental science into the world of technology. The authors observe that early adolescence—with the onset of puberty and shifts in brain development—is occurring within the context of most adolescents using digital platforms [2]. This developmental period, which is characterized by exploration, sensation seeking, social motivation to engage peers, and greater sensitivity to negative and positive social feedback, makes the use of digital technology captivating. Rather than focusing on the negativity of too much technology use, the thesis of this work is that the field of adolescent health needs to leverage this period of developmental plasticity. This is an opportune time for clinicians to adapt their messages to resonate with social and identity learning, which will serve adolescents well throughout life.

The second article, by Gibbs et al., places youth as active participants in research on adolescence rather than as observers [3]. The authors argue for engaging adolescents as co-investigators in all aspects of investigative work. They acknowledge that although there are challenges to be inclusive, technology provides new opportunities for the development of collaborative relationships with young people. Collaborative investigators will know which digital platforms are valued by adolescents and young adults and how they are used in their lives.

The third article, by Wong et al., uses a scoping review to identify digital health technologies that can enhance adolescent and young adult clinical preventive services [4]. The article describes how digital health technology affordances align with the goals for adolescent and young adult clinical preventive services. The authors also identify challenges to applying technology to this domain, such as ensuring connectedness of digital health to clinical care, advancing adolescent and young adult privacy and security—also called out by Thadaney Israni et al. [8]—and the need to identify high-quality digital health products.

In the fourth article, Ozer et al. build on the work of Wong et al. and Gibbs et al. by emphasizing not just the value of technology but the importance of youth engagement [3–5]. Using a strong theoretical framework for behavior change through youth engagement throughout the development of this intervention targeting risky behaviors, this article embarks on a new course by bringing technological advances with narrative-centered learning environments to a digital intervention called *Inspire* [5]. This game-centered intervention embeds alcohol reduction strategies into interactive story scenarios within a three-dimensional commercial game environment. The scenarios allow the adolescent to observe the consequences of different choices and practice strategies for reducing risky behaviors. The development of this intervention included more

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than 200 adolescents from the initial stages of development until fruition.

Bickmore et al., in the fifth article of this supplement, focus on preconception health care [6]. In a randomized control study, they evaluated the efficacy of an animated Web-based health counselor intervention called *Gabby* to screen young women on preconception risks over the course of the year. There were no differences between young women who worked with *Gabby* compared with usual care. The intervention was well received, and the women overwhelmingly followed the recommendations of *Gabby*, although the participants stated that they would still prefer to speak with a "real" health provider. Once again, we see digital technology as a possible option for this population of young women.

The sixth article in this supplement, by Rowe and Lester, provides a computer science overview of opportunities for personalized preventive interventions using AI [7]. These applications can be used to model adolescent learning and engagement and deliver personalized support in adaptive technologies. The article shares a number of options with new technologies using intelligent learning environments, interactive narrative generation, stealth assessment, affective modeling, goal recognition, and adaptive coaching. The authors identify a number of the same challenges that were outlined by Thadaney Israni et al., including privacy, ethics, encoded bias, and integration into both clinical care workflows and the lives of adolescents and young adults [7,8].

All the articles in this supplement further challenge our thinking in this new world of digital technology where adolescents and young adults live much of their daily lives. These articles provide us with a new framework to further enhance our work in all sectors of health promotion and delivery to improve the health and well-being of adolescents and young adults. The COVID-19 pandemic of 2020 has demonstrated how quickly health professionals throughout the world have moved to embrace technological platforms as a way to reach young people. This supplement enhances our efforts to continue to move forward with digital technology.

Charles E. Irwin, Jr., M.D.
Supplements Editor
San Francisco, California

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