Chapter 8
Digital Behavior Change Interventions

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ABSTRACT

The internet holds considerable potential to improve the world's health. Noncommunicable, or so-called lifestyle, diseases are responsible for more than three-fifths of all deaths worldwide. With over half of the world's population now online, public health officials and entrepreneurs have developed a growing array of digitally mediated interventions to encourage healthy lifestyle choices. In this chapter, the authors discuss online and digitally mediated interventions, provide examples of their use, and summarize recommendations for future research and development. Particular attention is paid to online education, social media support groups, adaptive and gamified interventions, and emerging technologies such as ambient and wearable sensors and artificial intelligence.

INTRODUCTION

The internet holds considerable potential to improve the world's health. Noncommunicable, or so-called lifestyle, diseases are responsible for more than three-fifths of all deaths worldwide (World Health Organization, 2017). These diseases lower quality of life, reinforce inequality in wealth, and incur an enormous economic

burden (Kaiser Family Foundation, 2017). Thankfully, many can be prevented or ameliorated through behavior change. While the benefits of such changes, involving adjustments to exercise, diet, smoking and alcohol use among other activities, are widely-known, many people decline to make them (Hardcastle et al., 2015). Far-reaching, sustainable, and low-cost interventions that encourage healthy behavior are needed. The internet offers an important tool to achieve this end.

Since 2000, internet use has increased nearly tenfold, with over half of the world's population now online (Internet World Statistics, 2018). Public health officials and entrepreneurs have taken notice and developed a growing array of digitally-mediated interventions to encourage healthy lifestyle choices. In the following pages we will discuss these interventions, provide examples of their use, and summarize recommendations for future research and development.

Asynchronous Educational Modules

The term "asynchronous" refers to users' ability to access information at any time, without needing to "synchronize" their learning with an instructional source (e.g. a teacher). Most early online interventions were asynchronous, consisting of instructive text, pictures, and video presented on a webpage, essentially emulating book learning. Initially, these interventions provided an important source of information for users who lacked access to print reference materials. Today, much of the material on the internet still takes this form and is used ubiquitously to help people learn, make decisions, and change behavior. The central benefit of asynchronous interventions is the freedom to learn at one's own pace and to study, in depth, areas of interest. The drawback of such a simple presentational format is its passivity—users are required to actively seek out the intervention and return in the absence of an incentive, though newer interventions employ interactive and gamification elements to increase use, as discussed below. Thus, while well-constructed asynchronous interventions can be effective for motivated users, attrition is high for those with less motivation. The example "Effects of Internet Training in Mindfulness Meditation on Variables Related to Cancer Recovery," presented below, provides a good example of the differential effectiveness inherent in these interventions.

Synchronous Interventions

With improved video-conferencing technology, digitally-mediated interventions replicating person-to-person therapeutic interactions have become possible. Online coaching, psychotherapy, and medical encounters have been explored and real-time classroom environments developed (Tuckson, Edmunds, & Hodgkins, 2017). Unlike their asynchronous brethren, real-time interventions provide a sense of community

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