Chapter 19
Digital Heath Interventions in Mental Health

Aleksandra Stanimirovic
University of Toronto, Canada

ABSTRACT

Technological renaissance of the last century stimulated the application of digital interventions in the healthcare domain. Digital healthcare interventions (DHIs) could be implemented through smartphone applications (apps), remote monitoring and tracking devices, and wearable computers. Technology is positioned to transform how mental healthcare is delivered and accessed. In fact, remote active and passive monitoring of parameters, such as mood, activity, and sleep, could be integrated with therapeutic interventions. However, the transformation entails combined conscription of science, regulation, and design. Implementation, adoption, and evaluation of DHI present special challenges. This chapter presents brief history of DHIs in mental health and frameworks an evaluation strategy in terms of the appropriate methods required for appraisal of DHIs.

INTRODUCTION

Defining Digital Health Interventions [DHIs]

Twenty years ago digital health interventions [DHIs] were nothing but a distant impossibility. The revolution of information technology [IT] in the last century means that technology can be utilized to confront pressing healthcare needs. The range and scope of DHIs and digitally delivered healthcare services have evolved rapidly since Eysenbach's (2001) initial description of Internet-enabled or computer-enabled interventions. (Hollis et al., 2017) Early DHIs in the mental health field were based on static content with limited interactivity and were 'fixed' in terms of access (e.g. via a PC or laptop, requiring a wired Internet connection), whereas users were required to be in a specific location to access the intervention. Examples of these DHIs include computerised cognitive behavioural therapy typically mimicking, face to face (FtF) delivered CBT sessions by providing a series of discrete modules that users complete (Hollis et al., 2017)

DOI: 10.4018/978-1-7998-8544-3.ch019

Initial approaches are often referred to as 'tele-health', 'tele-medicine' or 'tele-psychiatry' and fall within the broad description of 'eHealth. (Hollis et al., 2017) Over the last decade, the increased popularity and availability of mobile digital technologies, such as smartphones and wearable technologies, has led to the development and evaluation of mobile DHIs, also known as 'mHealth' (see Table 1 below). (Hollis et al., 2017) mHealth DHIs include devices such as smartphone applications ('apps'), remote monitoring and tracking devices, and wearable computers (e.g. smartwatches, virtual reality headsets). Remote active and passive monitoring of parameters, such as mood, activity and sleep, are now being integrated with therapeutic interventions. Hence, the distinction between mHealth digital monitoring and interventions is likely to become increasingly blurred. (Hollis et al., 2017) (Murray et al., 2016) Mental health DHIs target a range of psychological disorders and differ in design and functionality. (Chandrashekar, 2018) National institute of mental health (NIMH) categorizes mental health DHIs into six categories based on: 1) functionality: 2) self-management; 3) cognition improvement; 4) skills-training; 4) social support; 5) symptom tracking; and 6) passive data collection. (Chandrashekar, 2018) Evidence indicates that technology present a tremendous opportunity for delivery of high-efficacy mental health interventions in domains of anxiety, depression; and schizophrenia. Considering scarcity of accessible mental health care professionals. and lack of mental health care access in rural and urban areas, DHIs have emerged as a practical tools that may bridge the mental health treatment gap. (Chandrashekar, 2018) Technology is well-poised to transform how mental health care is delivered and accessed, however the transformation requires the combined conscription of science, regulation, and design. (Chandrashekar, 2018)

Table 1. Glossary of common terms and abbreviations used in the field of digital healthcare

Term	Definition
Digital health intervention (DHI)	Interventions that provide information, support and therapy (emotional, decisional, behavioural and neurocognitive) for physical and/or mental health problems via a technological or digital platform (e.g. website, computer, mobile phone application (app), SMS, email, videoconferencing, wearable device)
eHealth (Electronic Health)	Internet-based healthcare delivery/anything health-related that uses information and communications technology (Blackwell et al.), incorporating computers or Internet in its delivery
Internet, online/web-based interventions	Computerised program or service delivered through the Internet (e.g. a website), designed to create a positive change in behaviour or health status with different levels of support (e.g. completely unguided, human-supported)
Computer-based/computer-delivered interventions	Similar to Internet-based interventions, but usually refers to a program delivered via a computer: the intervention may be via the Internet or an offline computerised program (e.g. CD-ROM, or installed software). Includes psychoeducation and psychotherapy packages, 'serious' games and neurocognitive 'brain training' interventions
Computer, Internet-based or mobile-based CBT	Delivery of Cognitive Behavioural Therapy (CBT) via computer (cCBT), Internet (iCBT) or mobile devices or applications (mCBT). Collectively may be referred to as electronically delivered CBT (eCBT)
mHealth (Mobile-delivered Health)	Subdivision of eHealth focusing on delivering healthcare-related information, interventions and monitoring through portable electronic/mobile devices and technologies, such as smartphones, tablets and wearable devices. Examples of mHealth for mental health include smartphone applications ('apps'), text/SMS-delivered interventions and patient monitoring devices
Telehealth, telepsychiatry and telemedicine	Delivery of health services and treatment via telecommunications technology (e.g. videoconferencing/SMS/email), including: online counselling and therapy that may be synchronous (e.g. real-time videoconferencing) or asynchronous (e.g. email /SMS).

*Note: Adapted from: (Hollis et al., 2017)