



Digital Health Psychosocial Interventions for Chronic Pain

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Digital health psychosocial interventions are coming of age as a viable option to support pain management in the clinic and in the community.

Digital health interventions can address barriers to accessing psychosocial services for chronic pain.

The supply of practitioners trained in the delivery of evidence-based psychosocial interventions for patients with chronic pain is substantially lower than the demand for these services. Other barriers to care for patients with chronic pain include work and/or childcare demands, functional disability, financial costs, and geographical distance. The COVID-19 pandemic fortified the barriers in all of these domains^[14], leading the healthcare community to find novel ways to provide care^[6]. Self-administered digital therapeutics are optimized to address this need, offering the ability to provide additional services outside of the clinical setting, at asynchronous times, and often at lower cost than traditional healthcare services^[5]. As of 2021, the percentage of people in the world using the internet on a regular basis is

65.6%, with the highest rates in North America (93.9%) and Europe (88.2%)^[12], which means a digital intervention can be implemented at scale across a majority of society. Even more advanced technology that is not in every home such as virtual reality headsets are now portable enough to be mailed to the patient's home and can be self-administered by the patient^[8].

Clinical trial evidence supports the efficacy and acceptability of digital health psychosocial interventions for children, youth and adults with chronic pain.

A majority of published trials have been on computers using Internet based programs in pediatric^[7] and adult populations^[4] and have demonstrated small to medium effect sizes on pain outcomes. More recent studies of smartphone-enabled interventions similarly demonstrate efficacy, consistent with a small to medium effect size^[20, 22]. Of the literature on digital psychosocial interventions, those based on cognitive and behavioral principles with online learning modules that have a structure and timeline

demonstrate the most consistent evidence in support of efficacy. Most of these digital treatments include some level of initial screening followed by a self-guided curriculum. Therapists (or coaches) are sometimes incorporated as a support alongside the digital program. When included, therapist support (either asynchronous or synchronous) has shown the most consistent positive impact on treatment engagement and outcomes [2, 18]. Implementation strategies need to be further studied to ensure sustainability of digital treatments for individuals with chronic pain as most interventions developed in research studies are not made available to end users [11], for an example of an implementation study to support sustainability see [21].

Digital health interventions rely on patient motivation and engagement.

Though digital health interventions alleviate many barriers to psychosocial treatment, they introduce other barriers, such as a reliance on patient motivation and self-direction, which varies across patients with chronic pain [17]. It is important to consider ways to maximize reach, engagement and enhance treatment response (i.e., therapist support, gamification, persuasive design, contingency management, social support, etc.). Integration of technology into daily life (e.g., personalized smartphone alerts) may optimize engagement and adherence. Without addressing methods to maintain engagement, drop-out will be a considerable issue with some studies showing loss of attention within a few days. Thus, there is a need for research exploring the interaction of program features (e.g., length, content, support) and patient factors (e.g., clinical needs, motivation, symptom and condition profile) to understand how to maximize engagement and outcomes, e.g., [3].

The vast majority of commercially available apps are of low or no scientific quality, have not been developed with patient or provider feedback, and have not been rigorously tested.

Most commercially available apps have undergone little or no evaluation and have been developed without substantial input from patients or providers [23, 25]; therefore, there is no data by which to understand possible benefit. Patients who find these apps independent of clinical recommendations may be unaware of the lack of empirical support behind

them [16]. The pain research community needs to create app evaluation methods [23] to help patients understand which apps have evidence and what to look for in an app. It will be important for researchers to provide the psychosocial framework used in the development of the digital intervention to allow for categorization of the intervention. Such frameworks have been used to assess for the scientific merits of apps addressing psychiatric illnesses [15] and may overlap with the needs of the pain research community to this end.

Virtual reality is being offered in the clinic and home settings for chronic pain.

Some virtual reality (VR) programs contain content to distract from daily peaks in pain severity [13] while others may be used to help individuals with their rehabilitation [10]. There are also VR interventions that include a series of daily modules much like their smartphone counterparts [9]. Evidence is emerging showing promise of VR programs to contribute to positive outcomes in chronic pain, but more research is needed, especially large-scale randomized controlled trials. Given the importance of active participation of the individual with pain, researchers have advocated for a set of guidelines for how to use this technology as well as how to ensure patient and provider feedback is incorporated into the development.

Providing peer support using the Internet is a new way to make self-management education and support available to youth and adults with chronic pain.

Peer support delivered via the Internet (e.g., using video communication platforms, forums, alongside interventions) can complement and support patients' efforts at self-management [19]. Preliminary data show that peer support increases confidence in self-management of pain, but research is lacking to characterize the benefits in terms of pain and function or guide the optimal use of peer support in pain management. Nevertheless, there is a clear desire among people living with pain for access to such support and programs [1, 24]. More rapid development of online programs enabling peer support is needed, and research into the associated outcomes will be necessary to optimally design and employ such programs.

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