E-health: an overview of the uses of the Internet, social media, apps, and websites for mood disorders

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Purpose of review
The current article defines and surveys E-health: Internet and technology-guided interventions and tools useful for mood disorders.

Recent findings
E-health encompasses many categories, including computerized self-help strategies, online psychotherapy, websites that provide information, social media approaches including Facebook, Internet forums for health discussions, personal blogs, and videogames. Multiple tools exist to assess and document symptoms, particularly mood charts. Although all of these approaches are popular, only online psychotherapy and videogames have actually been evaluated in studies to evaluate both validity and efficacy. The face validity of social communication strategies including social media and blogs is strong, with clear implications for stigma reduction and peer support. Informational websites continue to be primary sources of psychoeducation on mental disorders. Social media sites have widespread use by the public and a profusion of health discussions and tools, but without published research evaluation of efficacy.

Summary
E-health strategies, particularly online psychotherapy and tools to document symptoms, are useful and likely effective. Social communication strategies show enormous popularity, but urgently require research evaluation for impact.

Keywords
bipolar disorder, cognitive behavioural therapy (CBT), depression, E-health, Internet, technology

INTRODUCTION

In an era dominated by the rise of Internet, smart phones, and social media, it is only natural that healthcare has been engulfed by technological approaches, often termed E-health (usually defined as Internet-related healthcare delivery). In psychiatry, E-health provides technology-based interventions that facilitate public education about mental health, screening for disorders, provision of self-help strategies and machine-delivered psychotherapy, specific disorder information, and stigma reduction. Although health professionals can often find and evaluate specific Internet-based resources, such as helpful websites, the sheer profusion of technologies, tools, and approaches is overwhelming. This overview provides an orientation to E-health for mood disorders, specifically by identifying and defining each type of E-health strategy and providing illustrative examples. Finally, this review identifies key aspects of the limited evidence base for E-health in mood, with a focus on validated online psychotherapies, and resources including social media and videogames. E-health approaches based on smart phones, primarily through the use of 'apps', are excluded from detailed review, both for space considerations and because there is virtually no evidence base for the effectiveness of any apps for mood.

METHOD

We comprehensively explored two databases, *Medline* (OVID) and *PsychINFO*, for relevant studies and systematic reviews on Internet tools, Internet resources, and video gaming possibilities for mental health from 2010 to 2014. Our primary focus was on

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KEY POINTS

- E-health includes more than just websites: there are many distinct categories for the treatment of mood disorders, with especially strong evidence for the use of online psychotherapies.

- Mental health resources that utilize the Internet expand the scope of healthcare delivery to difficult-to-serve populations and provide resources 24/7 at a low cost, serving a vital public health need.

- E-health provides alternative resources such as symptom (mood) trackers and online CBT resources which can be used alone or in conjunction with face-to-face therapy or pharmacotherapy, with such combined use resulting in better remission rates.

- Social media such as Facebook and Twitter are emerging as a resource for mood disorders, providing social support, stigma reduction, and health information.

- Videogames are being developed as innovative approaches to treatment, particularly by engaging young individuals to engage in tasks which promote health and diminish maladaptive thinking.

tools that were suited toward individuals with mood disorders. Additionally, we employed google.ca to find and then explore Internet tools and psychotherapy sites. First-hand information was obtained by registering on each site when possible, to get direct experience of the website in terms of esthetics, ease of functioning, and face validity.

RESULTS OF E-HEALTH SEARCH

We first identified distinct categories within E-Health for mood: websites, which included both static information resources, and active programmes on websites that assisted in assessing or monitoring symptoms; dedicated psychotherapy self-help websites; social media interventions, including primarily Facebook activities; Internet forums, wherein individuals share experiences and comment on issues; blogs, wherein a specific individual maintains an online diary or series of ongoing short articles; and specific videogames designed to provide treatment via participation. We subsequently searched for both specific research articles to evaluate any of these interventions, and particularly for any meta-analyses; we found a significant number of research articles evaluating the psychotherapy self-help sites including several meta-analyses, but only sporadic research reports on all other types of E-health for mood.

ONLINE RESOURCES

Internet-delivered self-help psychotherapies – very closely resembling familiar self-help books like the Feeling Good Handbook by David Burns [1] – were the most impressive online resources in mood disorders followed by self-help websites, assessment, educational and informative tools, and management tools. Some of the key cognitive behavioural therapy (CBT)/interpersonal therapy (IPT) websites for mood disorders are The Mood GYM – https://moodgym.anu.edu.au/welcome; This Way Up – https://thiswayup.org.au/; Blues Be Gone – http://www.bluesbegone.co.uk/; Mental Health Online – https://www.mentalhealth online.org.au/; Beating the Blues – http://www. beatingtheblues.co.uk/; eCouch – https://ecouch.a-nu.edu.au/welcome; Mindstreet – http://www. mindstreet.com/; and Living Life to the Full – http://www.llttf.ca/. Such psychotherapy sites incorporated both diagnostic and symptom monitoring functions, often along with tools that aided the user to track one's moods, medications, and thoughts. CBT, IPT, and Mindfulness were found to be the only three psychotherapies available online for mood disorders, with CBT having the most efficacy and validity studies with IPT second [2▪]. Mindfulness was prominently incorporated into online therapies and all featured at least some aspects of CBT; no website was devoted exclusively to the IPT model. Eight key CBT for depression websites were found (as mentioned above), of which two appeared to have the most users, face validity, and free access: the MoodGYM and Living Life to the Full. Two were found to incorporate elements of IPT in conjunction with CBT (eCouch and The MoodGYM). All CBT and IPT internet-delivered therapies incorporated psychoeducation via strategy learning, management, and education as key components. Recent meta-analyses of these sites suggest that online CBT for depression clearly is helpful and can be as helpful as face-to-face CBT [3▪▪], particularly if there is a clinician to provide encouragement and reminders to individuals to 'complete the programme' or to provide brief additional CBT advice [4▪].

Psychoeducation with its emphasis on illness information and teaching of self-monitoring and coping skills were the main form of intervention for bipolar disorder, which only had two comprehensive websites: Beating Bipolar and MoodSwings (as mentioned above). However, research evaluation of these sites is only preliminary.

Mindfulness was a frequent component of online therapies, including ones involving a newer one called Acceptance and Commitment Therapy (ACT). Mindfulness is a technique that blends

aspects of CBT with Eastern traditions of meditation and philosophy, to develop an intentional nonjudgmental awareness of one's own emotions in an attempt to understand and alter thought processes. Mindfulness has well established efficacy in stress reduction and particularly in prevention of relapse in depression, and is being explored for use in bipolar disorder [5]; such an approach is not a treatment for a mood episode, in contrast to CBT. Given the popularity of Mindfulness, many websites incorporate some tools from Mindfulness; few sites provide comprehensive approaches. Unfortunately, research evaluation of Mindfulness sites is entirely absent.

A final category of website interventions would include tools that provide primarily assessment and/or symptom tracking, such as a mood diary. Two examples include Check Up from the Neck Up and tool WhatsMyM3, both of which provide a series of questions about symptoms of mood and anxiety disorders. Both have an excellent face validity and WhatsMyM3 has additional validity studies [6] that indicate that individuals may use these sites to obtain an initial idea of whether they have a mood or anxiety disorder.

ONLINE RESOURCES: SOCIAL MEDIA

Social media encompasses platforms that foster interaction on the web, such as Facebook, Twitter, discussion forums like Reddit, blogs, and online games. Because of the general popularity of such approaches, many attempts are being made to develop social media E-health tools as well as apps for speech analysis of phone calls, particularly for manic episodes [7]. Despite an explosion of such applications like apps and blogs, and widespread uptake by the public, almost no research has been published establishing the validity or utility of such tools. Below, we summarize key aspects of social media use in healthcare. Social media approaches can augment traditional treatments whereby individuals can connect with their psychiatrist via the web or be a stand-alone resource for mood disorder information, or foster connections among members of public, allowing for knowledge transfer, peer support, and stigma reduction. Privacy concerns and the general lack of supervision or monitoring of discussion forums provide important caveats.

FACEBOOK

Facebook is an online social networking site wherein users create personal profiles or pages in order to connect with individuals around the globe. Users can connect via common interest groups or social circles by discussion or photo sharing and using applications. Facebook applications are add-on applications for the website and are easily added at the click of a button. Uses of these apps include tracking usage and posting and have major implications for the treatment of mood disorders. Facebook apps have been shown to be able to distinguish depressed individuals from nondepressed by tracking Facebook activities. Park et al. [8■] developed a Facebook application to examine the predictive power of Facebook usage and found that a user's views of webpages on tips and facts related to depression had a positive correlation to depressed users, whereas the number of friends and location tags had a negative correlation. Current prospective studies are examining the possibility of detecting manic episodes in bipolar disorder using changes in Facebook use.

With respect to evidence of efficacy, only three applications have been tested: a medication reminder and mood tracker called Bipolar Tree and two assessment tools. A few useful website links for mood disorders are https://www.beacon.anu.edu.au; http://moodgym.anu.edu.au/welcome; http://whatsmym3.com/; http://www.bluepages.anu.edu.au/; http://rl.powerthinkingcorp.com/RO_info.htm; https://www.moodchart.org/; http://www.ecouch.anu.edu.au/; http://www.llttf.ca/; http://bluepages.anu.edu.au/; http://www.crestbd.ca/; and http://www.ementalhealth.ca/. Pereira [9■] found that having a psychiatrist as a friend on the popular social media site, Facebook, enhanced pharmacotherapy effects in patients receiving medication for depression. This also led to higher remission and response rates than the control [9■]. Further steps should include studies examining the efficacy, feasibility, and validity of applications. Relatively new as well are discussion groups or pages that allow users to join (or like) in order to post or comment on page messages; however, despite their popularity, evaluation of impact has not been published.

FORUMS: THE EXAMPLE OF REDDIT

Similar to Facebook, internet forums are online discussion sites that are a repository of messages posted by various users who respond to earlier messages. In order to post a message, a user usually needs to sign up and create a user name. Moderators look over messages and remove harmful or unnecessary posts, but such moderation varies by site and cannot be relied upon. One of these sites, Reddit, is particularly popular and is composed of many different forums called 'subreddits'. Because of the novelty of this forum, no studies have been published examining its efficacy. The following is the list of the relevant

Reddit forums as well as other prominent sites: http://www.reddit.com/r/anxiety; http://www.reddit.com/r/depression; http://www.reddit.com/r/bipolar; http://www.reddit.com/r/BipolarReddit/; Depression/Bipolar Support Forum – http://www.moodgarden.org/; Anxiety Forum – http://www.socialanxietysupport.com/forum/; Bipolar Support Forum – http://www.mooddisorderscanada.ca/forum; Mood Disorder Support Forum as well as other topics – http://www.beyondblue.org.au/connect-with-others/online-forums; Depression Forum – http://www.depressionforums.org/.

BLOGS

Blogs are personal, fully customizable web pages that can be used by individuals to post opinions, information, images, and links. A few examples and hosting sites of popular blogs are http://natashatracy.com/topic/bipolar-blog/; http://depressionmarathon.blogspot.ca/; http://purplepersuasion.wordpress.com/; http://www.blog.com; www.blog.com; www.tumblr.com; www.blogger.com; and www.wordpress.com. These are essentially public personal diaries although some may be set to private. Sign up is usually required but most are free and these tools can be used as a reflection resource in conjunction with therapy. No efficacy or validity studies were found for specific blog sites, with the single exception of a study by Farrand et al. [10], which demonstrated that the required use of a blog in a self-reflection approach to CBT training enhanced CBT technique practice and established a learning community with improved course supervision. Blogs indicate a novel method of self-reflection as well as a place to vent for individuals in therapy. Similar to blogging is a web resource called Daily Challenge, which incorporates all social media aspects listed above. By sending users daily challenges to their e-mail and allowing them to post completed challenges on Facebook, their personal history blog, and chat with their peers, Daily Challenge utilizes social ties to promote engagement. Poirier and Cobb [11] found that social ties were significant predictors of adherence and site visits for Daily Challenge users. Such social support likely may influence adherence to treatment as well as decrease stigma by awareness, but needs to be studied.

VIDEO GAMES

A particularly exciting, if small, area involves the development of online videogames designed to influence healthcare, in a fashion analogous to the online psychotherapy self-help sites. Particularly compelling, and relatively well studied, are the only two CBT-inspired video games available as therapy, designed for adolescents with mood disorders.

SPARX, a computerized CBT videogame, aims to help adolescents manage symptoms of depression, anxiety, and stress by using fantasy roleplaying to teach tips and strategies on resolving problems. Each level or 'province' has its own series of tasks in the form of puzzles or mini games and are examples of real-life scenarios. Merry et al. [12▪▪] found that SPARX was effective in reducing depressive symptoms and consequently had higher remission rates than usual treatment with improvements maintained at a 3-month follow-up. SPARX is currently only available to New Zealand residents but is hoping to expand its availability.

Like SPARX, gNats Island is a computerized video game incorporating CBT into game play for depression and anxiety symptom treatment in adolescents. Players encounter and answer mental health questions mimicking real-life scenarios while exploring the island using strategies learned from game play. gNats Island is available to individuals in Ireland, the USA, the United Kingdom, and Iceland; however, access differs by area. In a systematic review of three studies by Coyle et al. [13], it was concluded that there was enough evidence to support the acceptability and usefulness of gNats Island by adolescents and a broad range of mental health professionals. Although only preliminary evidence exists, the novel and engaging formats of videogames offers real promise.

CONCLUSION

E-health interventions for mood disorders are broad, encompassing online psychotherapy sites, information resources, video games, social media, and communication vehicles including forums and blogs. Strong evidence exists for a variety of online psychotherapy sites, with potential application both as an alternative to traditional healthcare delivery and as an augmentation of face-to-face treatment. Although the humanistic impact of social media and communication sites cannot be ignored, and the attractiveness of apps cannot be denied, there is insufficient evidence of efficacy or even validity; it would be useful for clinicians to consider social media and communication sites as essentially possibly helpful, but not worth recommending yet to patients. Instead, clinicians should recommend websites and online psychotherapy sites with some evidence of efficacy as reviewed above. Overall, the power of the Internet with its ability to provide resources 24/7, and ability to reach difficult-to-serve populations, and finally its

relatively low cost, provide compelling reasons for further enhancing research and development of E-health strategies for mood disorders. Additional helpful web resources are noted above.

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Conflicts of interest

None.

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