

STAYING RELEVANT IN THE TECHNICAL ERA? There's an App for That!

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A recent Pew Research Center survey found that nearly 80% of teenagers own cell phones, and more than half have smartphones.¹ These advanced computing devices go beyond the basics of phone calls and texting, now allowing teens to quickly communicate with one another via social media sites and instantaneously access information on the Internet. The rapid proliferation of smartphones has not only brought these devices into the mainstream but has led to the development of thousands of apps marketed as productivity, gaming, and most recently therapeutic tools. While some physicians have embraced these technological advancements in their personal lives and practices, others have been left questioning, *"There's a what for that?"*

This article will provide a brief history of apps, explore their emergence into the medical mainstream, discuss their relevance to the field of psychiatry, and review research on the utility of apps in psychiatric practice. We will follow with detailed instructions on how providers can become proficient at downloading apps for themselves and their patients, and how to safely use them as adjuncts to standard treatment modalities. The article set will conclude with an overview of one of the most popular Android mood tracking apps, "eMoods." It is imperative that physicians, especially those who work closely with young adults and teens, familiarize themselves with this technology and learn how apps can enhance their practice and help build better therapeutic alliances with their patients.

A BRIEF HISTORY OF APPS AND THEIR ENTRY INTO THE MEDICAL FIELD

Applications, or "apps," were initially popularized in 2008 with the release of the Apple App Store. The ubiquitous catchphrase "There's an app for that," which first appeared in a 2009 iPhone commercial, heralded the entry of apps into mainstream culture. In general, apps are self-contained tablet and smartphone programs that allow users to increase their productivity by providing calendars and management options, to be entertained through myriad games, and to foster connections via ease of access to social media and networking websites. Most recently, the

medical community has begun to embrace apps in the workplace for information gathering as well as in practice with patients.

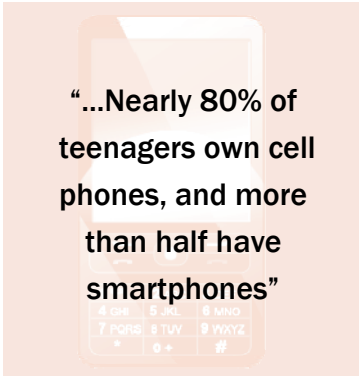
Although there are countless apps for physicians today, the movement gained momentum in 1998 with the mobile platform of Epocrates Rx. Epocrates developed technology that allowed physicians to use personal digital assistants (PDAs) to quickly access medication names, dosing guidelines, drug-drug interactions, and side effects. The platform expanded from Palm operating systems to apps for smartphones, tablets, and personal computers. Epocrates includes additional features, including Pill ID, allowing physicians to identify patients' medications by appearance, and various tables, calculators, and even guidelines for monitoring patients on antipsychotics and other medications. Additionally, Epocrates allows various healthcare professionals to obtain continuing medical education credits on topics through several accreditation systems, including the American Medical Association.⁴ Over 1.4 million healthcare profes-

sionals currently use the app, including a reported 50% of US physicians.³

While Epocrates has maintained its stronghold as primarily a drug reference app, informational apps such as Medscape⁴ and QuantiaMD⁵ are also emerging as useful tools for physicians in the workplace. QuantiaMD, founded in 2006 and reportedly utilized by one in three US physicians, not only allows for social collaboration and exploration of hundreds of lectures and cases submitted by other physicians, but also offers physicians certifications and monetary rewards for completing teaching modules. Modules are submitted by physicians from all over the country, and range from "The 2 AM Suicidal Phone Call" to "25 YO With Headache, Nausea, & AMS." All are accessible via the smartphone and/or tablet app, as well as on the QuantiaMD website.

APPS FOR CHILD MENTAL HEALTH CLINICIANS

In addition to the above-mentioned medical apps, clinicians who work in child and adolescent mental health now have access to apps created specifically to stay abreast of advancements in the field. A recent JAACAP



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article reviewed and listed several apps, such as Evernote and Dropbox, which allow clinicians to quickly share articles and information with their colleagues.⁶ Improving communication and collaboration with colleagues in the rapidly advancing field of child and adolescent psychiatry is key, and the 2012 AACAP Annual Meeting emphasized that point with the inauguration of an Annual Meeting app. The app, downloaded by over 50% of the 4,400 attendees at the annual meeting, not only allowed users to create unique schedules, but fashioned a forum where attendees could send one another messages and connect beyond the walls of the convention center.

While the AACAP Annual Meeting app is helpful with events and collaboration at the meeting site, JAACAP recently released an [iPad app](#) that allows users to read the latest articles in the *Journal* from the convenience of their iPad device.⁷ The app allows for reading articles and abstracts and permits users to bookmark articles, share them with colleagues, and even watch in-article videos. For clinicians interested in quickly finding diagnostic criteria, American Psychiatric Publishing has released an iPhone and Android app that puts the *DSM-5* into a succinct, searchable database.⁸ The app, which retails for \$69, is the latest in expanding clinicians' access to information. Massachusetts General Hospital and Unbound Medicine, Inc. offer a paid app for *MGH Handbook of General Hospital Psychiatry* that includes diagnostic criteria as well as evidence-based treatment approaches. Given the rapidly advancing field of mental health and the pressure for instantaneous information, it is important that clinicians not only familiarize themselves with these new technologies and apps, but begin to incorporate apps to improve their practice and stay abreast of the latest research and practice guidelines.

PATIENT-CENTERED APPS: LATEST RESEARCH

App utility is not limited to enhancing efficiency in child and adolescent mental health practice; it can also contribute to improving treatments for children and adolescents. In addition to the educational apps mentioned above, there are over 15,000 health and fitness apps available in the iTunes App Store and 10,000 in the Android Google Play store, and this number is increasing. While several of these apps, ranging from aiding weight loss to mood tracking, claim to improve health and entice users to

maintain exercise regimens, few have been systematically reviewed; nevertheless, there is evidence to suggest that they can be effectively used to help patients in meeting their health and wellness goals. The next section will review research on patient-centered apps and their relevance to the practice of child and adolescent mental health care.

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WEIGHT MANAGEMENT APPS

Over 17% of US children are obese.⁹ Several studies report that the rate of obesity in children with autism spectrum disorder (ASD) may be high, if not even higher than in the general population due to genetics, food selectivity, and motor problems.¹⁰ Unfortunately, iatrogenic obesity secondary to the use of atypical antipsychotic medications puts this population at even greater risk of developing obesity and associated metabolic complications. Some of the best-reviewed apps have targeted the growing burden of obesity and whether the issue can be mitigated

through smartphone-enhanced behavioral changes. Hebdon et al.¹¹ examined a 12-week program combining text messages, a web-based portal, and a smartphone application to help in decreasing body weight in 51 college students. Although the students lost weight, there was no difference between the intervention and control group, and the researchers postulated the results were due to poor engagement with the protocol.

Studies have also examined the evidence base behind mobile weight loss applications. One group looked at weight loss apps available in the iTunes App Store as of September 2009 and found that none of the 204 apps surveyed adhered to government agency standards of evidence-informed weight loss strategies.¹² A more recent article investigated the top 100 free and paid apps for the iPhone and Android operating systems available as of January 2012.¹³ The researchers included only apps with the ability to track weight, food intake, and activity, and measured them against the evidence-based weight loss strategies proposed in the Diabetes Prevention Program, which has been shown to reduce weight and risk for cardiovascular disease and diabetes. Although none of the apps met all of the Diabetes Prevention Program criteria, some apps, including MyNetDiary (www.mynetdiary.com), were more comprehensive than others. Similar studies of guideline-based apps in psychiatric practice are lacking.

APPS FOR IMPROVING COMMUNICATION IN CHILDREN WITH ASD

Computers have been used for over 10 years to improve communication skills and emotional recognition in people with ASD.¹⁴ A recent study went beyond the desktop and utilized a software application called PixTalk that runs on any Windows Mobile smartphone to help children communicate via exchange of visual symbols.¹⁵ The study was limited by small sample size, but it suggested that PixTalk could help improve the communication skills of children with ASD, and that children preferred this modality to standard pen-and-paper. Although research on the use of touch-screen devices in individuals with developmental disability has been largely promising,¹⁶ more data are needed to show that this technology significantly improves upon existing treatments. There are currently numerous apps in development to further investigate this treatment modality (including additional PixTalk studies) for use with ASD.¹⁵

“POCKET THERAPY” APPS

Mobile apps have also emerged as aids in psychotherapeutic interventions. A “DBT Coach” app (DBT standing for dialectical behavior therapy) that specifically targeted emotional response, intensity, and substance use among patients with borderline personality disorder was helpful in reducing symptoms of depression and decreasing substance use.¹⁷

Additionally, while internet-based cognitive behavioral therapy (CBT) interventions for depression have been strongly correlated with positive outcomes,¹⁸ a recent study found evidence that use of a CBT-oriented mobile app could yield similar improvements in depressive symptoms,¹⁹ and another study is currently underway to test the efficacy of mobile apps when used in conjunction with behavioral activation strategies.²⁰ To date, none of the mobile therapy apps have been tested with children or adolescents.

SELECTING THE RIGHT APP

Since there are currently no guidelines for the use of mobile apps in child psychiatry, clinicians must utilize clinical judgment in screen-

ing for appropriate apps to incorporate into practice. As mentioned above, both the Apple and Android app stores feature lists of their top-downloaded or top-selling apps, so this is a good starting point if searching for a non-specific health app. For something more relevant to weight loss, depression, etc., the app stores offer search options and user reviews for their apps. A quick internet search of mental health apps, or mobile apps for autism, can also be a helpful starting point; however, be advised that most apps are not vetted by research, do not guarantee treatment results, and could be harmful. Detailed steps for how to find and download apps for iPhone and Android markets are listed at the end of this article.

IMPLEMENTING APPS INTO PRACTICE

When carefully and conscientiously used, apps may have some utility in practice. However, given the lack of data on apps, clinicians should first download and explore any apps they plan to recommend to patients, before recommending them as adjuncts to treatment. This will allow clinicians to determine the app’s medical soundness, user-friendliness, and make sure there are no concerning features, such as links to harmful websites or treatment recommendations. In general, it is most prudent to use apps that provide a forum for data collection rather than therapeutic intervention.

Once clinicians have reviewed the app themselves, and before recommending the app to patients, they should have a thorough discussion about why the app would be helpful, how app outcomes may be used to guide treatment, and the risks and benefits of utilizing the app. Ideally, clinicians should download the app with teens and/or parents in the office and explore its functionality together, either on a mobile device or via the website. It is important to obtain parental consent and explain the process and potential data fees. Clinicians should also urge patients not to forgo current treatments in favor of the app, and patients should be informed that they may cease using the app at any time. These precautions will help minimize any potential hazards of using the app, and the collaborative effort of downloading the app together and using it in conjunction with patients will help teens feel supported by their providers, and ultimately strengthen the treatment alliance.

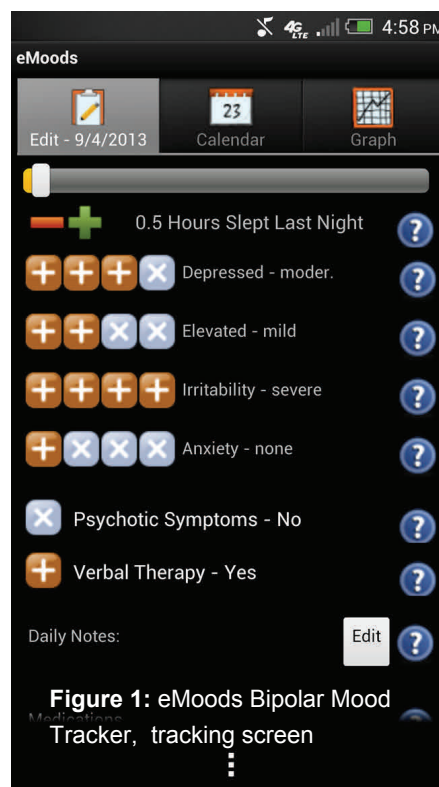


Figure 1: eMoods Bipolar Mood Tracker, tracking screen

APPS IN PRACTICE: A BIPOLAR MOOD TRACKER

In order for clinicians to make informed decisions about using mobile health apps, they must first have a working knowledge of app terminology and how to download and install apps. The following is a brief overview of one app used in practice by the author, the eMoods Bipolar Mood Tracker. We then follow with a skill-building step-by-step guide to downloading apps onto smartphones, mobile devices, and computers in the next article.

The eMoods app is free to download and was developed to help people track mood symptoms such as depression, anxiety, and irritability. While the app includes “bipolar” in the title, it caters to a broad array of individuals interested in assessing their daily and weekly mood symptoms. The app allows for graphing capabilities to view mood symptoms over a month-long period, as well as an e-mail function that allows for sharing of graphical data with healthcare providers or caregivers via e-mail. The app does not claim to provide any medical advice or treatment, and developers specifically note on their website that the app “should only be used under the supervision of a licensed professional.”

In general the eMoods app would likely be most beneficial for clinicians and patients wishing to get a more accurate assessment of mood symptoms over a period of time, whether they be anxiety, depression, elevated mood, or irritability. Patients could also use the app to record particularly difficult or positive events, with the note-taking feature allowing for a more detailed assessment of triggers and symptoms. Additionally, the app may be helpful for patients who forget to take their medications because patients can set a daily reminder that will alert them to track for that day.

Mood Tracking

Once the app is loaded, the home screen immediately brings users to a tracking page (Figure 1). This allows users to select their amount of sleep for the day (sliding bar at the top of the screen), and rate their depression, elevated mood, irritability, and anxiety with a series of “+” signs. The app allows

users to select “Yes” or “No” for psychotic symptoms, as well as if users participated in verbal therapy. Users can also add daily notes and input the medications and doses they took that day (latter not pictured on screen). Figure 2 depicts an eMoods Bipolar Mood Tracker sample graphical report of depressed mood (yellow bars), anxiety (red line), elevated mood (light blue line), irritability (green line), and sleep (dark orange circles). The chart also depicts medication use (pictured here in purple Xs on the bottom).

Graphing and Export

eMoods allows users to see graphical representations of their mood on a monthly basis and share that information via graph and/or Excel sheet with providers. Graphs are color-coded and users can scroll by month. The graphing feature can be accessed by selecting the “Graph” tab on the top right corner of the app (see Figure 1 or 2), and an immediate image is created based on a user’s tracking history.

Daily Reminder Function

Integrated into the app is a daily reminder function that allows users to set a reminder to enter data for the day. The option is found in the app Settings/Export tab and al-

lows users to set one daily reminder. The reminder, which presents as a pop-up on Apple devices and as an alert on Android devices, tells users to “Click here to enter data for today.” However, clinicians could direct patients to use the reminder for any purpose, such as a prompt to take their medications.

The app can be found in the Google Play store under the search terms “mood tracking,” or simply by searching for the app name. It can be downloaded using the instructions above either directly onto an Android device or through a computer and then transferred to a device. The app is free, although developers do allow for user donations via a separate app available in the Google Play Store. While the app is currently only available for Android users, the developers are working on an iPhone app that is slated for introduction in the Fall of 2014.

Conclusions

Despite the paucity of mobile app effi-

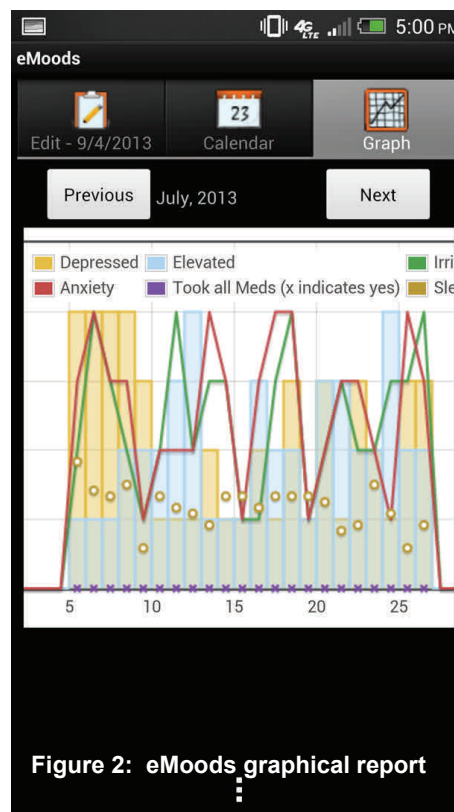


Figure 2: eMoods graphical report

cacy studies, emerging research suggests that this technology, when used wisely and prudently, can be an effective adjunct to psychiatric treatment and intervention. Although it is unrealistic for clinicians to acquaint themselves with the thousands of mobile health apps currently available, clinicians should become familiar with the growing evidence base and be willing and able to discuss app use with their technologically savvy patients. Some apps are strictly mobile-based, but many have companion websites. Either modality could be used to explore apps with patients during office visits.

Until more evidence becomes available, it is important to note apps are not part of standard of care. For example, mood tracking apps could potentially be helpful in delineating between anxiety, depression, and irritability, but clinicians should warn patients that they have not been researched and could pose unclear but genuine risks such as negatively affecting mood. Apps for parents of children with autism may claim to improve symptoms, but without

further research, these claims cannot be substantiated. Although there is currently a debate about whether the FDA should get involved in regulating medical apps,²¹ medical apps are not currently regulated. As such, anyone with programming capabilities can post an app in the app stores and claim it is a medical app. As with all emerging treatment options, clinicians must develop proficiency in the treatment modality and be aware of the risks, benefits, and alternatives.

Take-Home Summary:

Apps are now available for weight management, improving communication in children with ASD, and as adjuncts to office-based psychotherapy. With over 50% of teenagers using smartphones, providers need to familiarize themselves with this growing technology for accessibility and alliance building in mental health treatment.

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