



# Smart Steps for Psychiatric Education: Approaching Smartphone Apps for Learning and Care

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The rapid rise of smartphone apps for physical health and mental health has outpaced psychiatric educators' ability to formulate best practices and standards [1]. The most recent industry data suggest there are over 300,000 health apps available on their commercial marketplaces [2] and over 10,000 of these are relevant to mental health [3]. While many of these apps are patient facing, there are also many apps of interest to medical students and psychiatry residents. These apps can be considered as (a) tools that directly support clinical care, e.g., patient apps and associated provider dashboards, versus (b) indirect supports, such as tools for provider use/reference [4]. Examples of apps that directly support clinical care include those from electronic health record vendors, such as Epic and Cerner, that allow access to patient information from a smartphone. There are also numerous apps to facilitate secure text messaging and scheduling with staff and colleagues regarding clinical care issues. Examples of indirect support apps are numerous. For example, even the American Psychiatric Association's (APA) *Diagnostic and Statistical Manual (DSM) 5* is available on an app that offers the advantage of automatic and free updates for any approved revisions. Many well-used psychopharmacology reference books also have app versions, which may be more convenient to access compared to carrying a book around the clinic. There are also apps that psychiatrists can use to remotely monitor symptoms like mood, track medication adherence, promote healthy lifestyle interventions, facilitate homework completion for cognitive therapies, message patients, and more.

Providing up-to-date, accurate, and relevant education and supervision for trainee use of this plethora of new digital tools remains an evolving challenge for psychiatry educators. With many medical students and residents already using smartphones in various roles in their medical education and in clinical care roles, it is important that psychiatric educators are familiar with the potential—as well as limitations—of these tools and offer guidance in the context of didactics, supervision, and clinical feedback. However, educators themselves may experience difficulty in “keeping up” with technology, identifying the evolving role of mobile health tools for clinical care and offering guidance for use of these tools in busy clinical settings. Therefore, this article explores the landscape of smartphones for psychiatric education and offers an easy-to-apply framework to help educators evaluate these digital resources. The objective of this paper is to inform the reader about the current knowledge base of smartphones in psychiatry education, current resources to help educators themselves learn more, and current methods to evaluate smartphone apps.

## Background

The average US adult today spends nearly 3 h per day on their smartphones according to industry market research [5]. Thus, it is not surprising that psychiatric residents and medical students are already actively using smartphone apps as part of their training. A recent study of psychiatry residents at two geographically distinct residency programs found that up to 80% of residents use their phones to access patient information, 40% to look up psychopharmacology information when prescribing, and 10% to access psychotherapy treatment plans [6]. Medical students rotating on psychiatry are interested in educational apps [7] and also using digital resources in their education. However, a single-site study found that over 70% surveyed medical students felt their psychiatry clerkship did not provide them with sufficient guidance on which electronic

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resources were most reliable [8]. Yet another survey study of psychiatry residents found they are also seeking instruction in regard to how to best evaluate and utilize online and digital resources, and feel that psychiatric educators are not yet providing adequate guidance [9].

The need for this guidance makes sense in that the vast majority of apps relevant to psychiatry are not made or endorsed by clinicians, medical societies, or regulatory bodies [10], but rather individuals or small technology startups that may have limited experience with psychiatry. Processes that help ensure quality papers that are published in medical literature, such as peer review, do not exist on the commercial app stores, meaning there is no guarantee for app quality or content [11]. The result, as discussed later in this paper, is that many smartphone apps marketed directly to patients have shown at best inconsistent quality [12] and several could actually cause harm [13].

From the perspective of psychiatric educators, there is also an urgent need to offer guidance around trainees' use of smartphone apps. While issues such as online presence and not “friending” patients on social media websites like Facebook are now part of medical student and resident education, technologies like apps create new issues [14]. How do psychiatric educators help residents decide if it is appropriate to recommend an app into the treatment plan, consider the impact of technology use on the therapeutic relationship, formulate response plans to unexpected data generated by apps, and weigh any potential legal liability generated through app use?

## Current Guidance

Presently, there is no clear guidance or authoritative source for psychiatric educators to turn to. In the USA, even the Food and Drug Administration (FDA) is still defining its own approach to regulating Software as a Medical Device (SAMD), a term encompassing the designation for clinical psychiatric apps and other medical software [15]. At the time of this writing, the FDA has approved a single smartphone app for use on certain substance use disorders [16].

In the Twenty-First Century Cures Act, the FDA [17] notes that while some “apps that may meet the definition of medical device ... [the] FDA intends to exercise enforcement discretion.” The FDA provides the following example of apps that technically could be regulated as medical devices, but which it does not currently plan to regulate: “Mobile apps that help patients with diagnosed psychiatric conditions (e.g., post-traumatic stress disorder (PTSD), depression, anxiety, obsessive compulsive disorder) maintain their behavioral coping skills by providing a ‘Skill of the Day’ behavioral technique or audio messages that the user can access when experiencing increased anxiety.” The FDA lists other examples, although

the point for psychiatry educators is that there is still no clear guidance from the federal government or even state medical boards regarding these apps. Towards the end of 2017, the Center of Medicare and Medicaid Services (CMS) issued a memo noting that text messaging of patient information and orders is prohibited. CMS later backtracked, stating that text messaging of patient information between providers is permitted if using a secure messaging smartphone application [18]. In such an evolving landscape, psychiatry educators cannot yet rely on guidance from regulatory bodies.

But even outside of regulatory bodies, defining local or internal standards and guidance is a challenge, as smartphone apps are rapidly evolving in terms of their function and role. Some apps may update and change on a weekly basis and are not static targets for curriculum development like psychopharmacology or psychological therapies. It may even be counterproductive to build a model curriculum on today's smartphone apps and online resources, as the digital landscape may have shifted rapidly by the time that curriculum is released. While other articles in this special edition offer fresh ideas on digital technology curricula for psychiatry, formal recommendations from bodies such as the American Association of Directors of Psychiatric Residency Training (AADPRT), the American Medical Informatics Association (AMIA), or the *Association of American Medical Colleges (AAMC)* do not yet exist. This represents an opportunity for groups like AADPRT to convene all relevant stakeholders and create new recommendations and guidelines.

## A Framework for Informed Decision-making

In this context, we introduce a framework for smartphone app evaluation, developed by the American Psychiatric Association (APA) [19], as a tool to help psychiatric educators guide informed decision-making around smartphone apps for use by medical students and residents.

The APA evaluation framework offers a scaffold to guide informed decision-making around apps in a step-by-step process. While it does not produce a binary yes-or-no answer about whether to recommend or use any app, it brings attention to salient and teachable points. The framework is a four-level

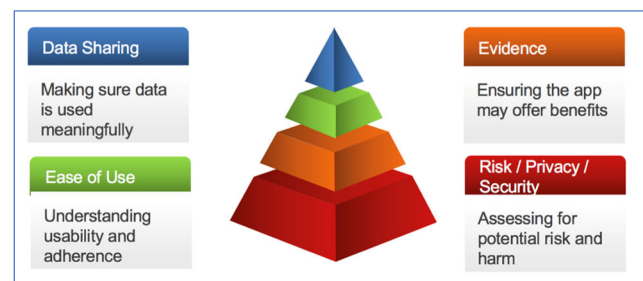


Fig. 1 APA app evaluation framework

stage-and-gate model, presented below in Fig. 1, which first considers privacy and safety, followed by evidence, then engagement, and finally, clinical data sharing. While each stage is outlined in further detail on the APA website [19], a brief description as relevant to psychiatric educators is outlined below.

A first stage when evaluating any digital tool like an app is to ensure it will not cause harm. As discussed above in the FDA section, many psychiatric apps may fall outside of federal privacy laws like HIPAA, and so do not guarantee patients' psychiatric information will be kept private [20]. Checking for the presence of a privacy policy, understanding the privacy policy, and understanding any declared use of patient data are critical. A recent review of apps for use in dementia patients found that the majority of apps offered no safeguards for patient data, and the vast majority sell and market any collected patient data [21]. Psychiatry educators also must be aware that patients may also not be aware of the privacy risks of apps [22, 23] and trainees should balance respect for patient autonomy with beneficence when discussing apps that may have questionable privacy practices. Both educators and trainees can serve as advocates for regulations to increase patient protections [24]. Thus, guiding trainees to consider the implication of privacy policies is always a useful recommendation. While difficult to validate, also checking that the app at least claims to keep patient data secure with protections like passwords, encryption, and secure storage is important. If an app does not explicitly claim to offer security features for patient data, it is likely that the data is not fully secure.

The potential harm from apps is more numerous than may be immediately apparent. Categorizing harm in physical, psychosocial, financial, and privacy/legal domains offers a practical means to consider potential risks. Like any new tools, there can be unintended consequences with smartphone apps used for psychiatric care. For example, one study investigated how an alcohol tracking app could help college student reduce risky drinking, but found that male students actually used the app as a game to see who could drink more [25]. While there have been no malpractice cases to date regarding incorrect recommendations from a psychiatric app, the lack of best practices in many apps advertised for suicide prevention is concerning, especially given the high stakes involved in providing appropriate care to suicidal patients [26].

Understanding harms from apps remains an evolving topic. Potential psychosocial harms from apps are a largely unexplored area, although research evidence shows that some participants drop out of studies as they may find app use stressful or annoying. Just as poorly conducted in-person therapies can cause harm to vulnerable or traumatized patients, untested and unvalidated app based interventions also pose risk. Financial risks associated with app use may include inadvertent disclosure of mental health information that could legally be used by

insurance companies or even employers. Finally, privacy risks may include malicious disclosure of mental health information, resulting from hacks or data breaches. Considering that apps can record not only medications and self-reported symptoms, but also geolocation data on where patients live and go during the day, who they call and text, and log information of personal contacts, social medial profiles, and internet browsing histories, the consequences of such a privacy breach are enormous. These consequences are only compounded for patients experiencing domestic violence, stalking, and abuse. While apps may not have known biological risks of medications—such as gastrointestinal side effects—they present unique psychological and social risks that are important to be aware of and raise with trainees.

If an app appears to respect privacy and be safe, it is next worth considering what the evidence supporting use is. Many apps may not present psychiatric knowledge or facts appropriately [26, 27] and some may present exaggerated claims regarding their use. Psychiatry trainees, given their evolving knowledge base, may not always be able to separate which claims are evidence based. Beyond false claims, some apps may also offer harmful recommendations: one app, purportedly designed for those in a bipolar manic episode, instructed users to drink alcohol [27]. Thus, discussing with trainees the evidence supporting app use and checking that the content appears at least of reasonable value are important teaching moments. Often, a simple PubMed search can be very revealing about whether an app is backed by clinical evidence.

If an app appears to have some evidence to justify use, it is useful to next consider engagement. Just as psychiatric educators help trainees learn to formulate treatment plans that patients will stick with, it is no different with digital technologies like apps. Evidence suggests that most who download a mental health app may not stick with that app for more than two or three uses, and many patients may struggle to navigate how to actually use apps in daily life [28]. Thus, considering engagement and a plan to ensure app use is matched to a patient's interest and technology skillset are critical. A final stage to consider is how the data or results of app use will be shared with the clinical team, impact the therapeutic relationship, and be utilized as part of the treatment plan.

While the EHR vendor Epic recently announced the release of its own marketplace for smartphone apps that can send data directly into Epic EHR's, many apps can make patient data difficult—and sometimes even impossible—to access and share. Many apps send collected clinical data to their own proprietary portal, making it inconvenient to access and risking fragmenting the patient's psychiatric information. Integrating patient-generated health data into existing clinical workflows requires thoughtful aggregation of raw data into clinically meaningful and actionable information, and feeding this back to providers through effective tools for data visualization and manipulation [29]. Changes to clinical workflows

may be necessary to incorporate mobile health data into practice, and this may require training for providers and staff as well as support for practice redesign. This represents a final stage in this four-stage framework, as discussion of these points only makes sense in the context of an app that should potentially be used in care: one that is safe, supported by evidence, and usable by the patient.

The above framework offers a flexible tool to engage trainees in discussions whether or not to use a specific app or technology, although it is not intended to produce definitive answers regarding app or technology use. Rather, by offering a structure for a conversation, important teaching points will be raised that will help guide informed decision-making. These conversations may be raised during individual supervision, offered during didactics, or occur in the clinic. It is not necessary for educators to have all the answers about any particular app, but instead, simply to recognize that if information about an app is unclear or missing, then that is a factor itself to consider in determining a recommendation. More well-known issues regarding boundaries with electronic communication with patients (for example, on social media sites) are also relevant as the same device a resident is now using to put in orders, page a colleague, and pull up clinical note may also be used to browse Facebook.

## Next Steps

As a first step, it may be useful for training directors to conduct a simple need assessment through surveying trainees regarding how they are currently using technology and smartphones and where they are seeking guidance. Similarly, surveying faculty and staff can also provide valuable information about a program's current ability to provide instruction and supervision. Volunteer faculty who often conduct resident supervision should also be surveyed as they may differ in their familiarity with new technologies that residents are using. They also may serve as a useful resource for offering a new pair of eyes to help consider and evaluate the risks and benefits of technology use.

While education resources on smartphone apps for psychiatry continue to evolve with the technology, the American Psychiatric Association offers a section of its website devoted to smartphone apps and offers CME lectures on the topic at <https://www.psychiatry.org/psychiatrists/practice/mental-health-apps>. *Academic Psychiatry* continues to offer up-to-date articles on the topic [30], and technology-focused journals such as the *Journal of Technology in Behavioral Science* and *Journal of Medical Internet Research (JMIR) Mental Health* also publish relevant articles. The FDA recently created an entire webpage devoted to smartphone apps: <https://www.fda.gov/MedicalDevices/DigitalHealth/MobileMedicalApplications/default.htm>. Being cognizant

that trainees are using smartphone apps and engaging in informed decision-making regarding their own use and use with patients is an important and feasible first step that all programs can begin today.

## Conclusion

Just as psychiatrists may be unaware that their patients are using mental health apps unless they explicitly ask, psychiatric educators may be surprised to learn how many of their trainees are also using apps. Through simply inquiring about technology use and then guiding trainees through the four-stage framework presented above, psychiatric educators can offer practical guidance that respects the dynamic nature of apps, while still allowing for educational opportunities to guide the informed, ethical, safe, and effective use. These efforts can also help close the “digital divide” in ensuring that psychiatric patients are offered safe and effective digital tools that have the potential to reduce mental health disparities. Effective teaching about these new technologies from psychiatric educators will ensure trainees are able to offer new types of psychoeducation that will increase patients' awareness of digital health resources and make more informed choices for improved health.

## Compliance with Ethical Standards

**Adherence with Ethical Standards** No human subjects' research or personal data was used as part of this paper.

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