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PSYCHIATRY IN THE DIGITAL AGE (J SHORE, SECTION EDITOR)

Managing Psychiatrist-Patient Relationships in the Digital Age: a Summary Review of the Impact of Technology-enabled Care on Clinical Processes and Rapport

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Abstract
Purpose of Review Participatory medicine and the availability of commercial technologies have given patients more options to view and track their health information and to communicate with their providers. This shift in the clinical process may be of particular importance in mental healthcare where rapport plays a significant role in the therapeutic process.
Recent Findings In this review, we examined literature related to the impact of technology on the clinical workflow and patient-provider rapport in the mental health field between January 2014 and June 2017. Thirty three relevant articles, of 226 identified articles, were summarized. The use of technology clinically has evolved from making care more accessible and efficient to leveraging technology to improve care, communication, and patient-provider rapport.
Summary Evidence exists demonstrating that information and communication technologies may improve care by better connecting patients and providers and by improving patient-provider rapport, although further research is needed.

Keywords Patient-provider rapport · Information and communication technologies · Technology-enabled care · Clinical process · Participatory medicine · Psychiatric services · mHealth · eHealth · Telepsychiatry · Clinical informatics

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Introduction

Participatory medicine and the increased availability of health information through commercial technologies have given patients more access, options, and tools to view their health information, communicate with their provider, and track their health information electronically. Smartphone and mobile applications offer patients new ways to self-assess, monitor, and track symptoms [1, 2]. Email, direct messaging, text, and virtual care are becoming increasingly prevalent in healthcare as common methods of communication between patients and providers [3, 4]. The demand for care that is both participatory and technology-enabled is growing, as consumers interact with technology in almost all aspects of their daily lives and expect more rapid access to providers and healthcare services [5]. In the consumer-driven model, patients and their providers are increasingly partners in managing the patients' care, and the relationship of healthcare practitioner and patients is collaborative [6].

The uptake in technology-enabled care dovetails with the consumer-focused shift in healthcare, which is both a function

of meeting consumer demand and federal mandates. The incentivization of health information technology through the HITECH Act (2009) has led to almost complete integration of electronic health records (EHR) into general medical practices in the USA [7]. As of 2015, 87% of office-based physicians had adopted an EHR [8], and almost half of Americans used a form of information technology to interact with their provider or track their health information digitally [9]. The widespread EHR use alone has impacted patient perceptions of their healthcare [10] and their relationship with their healthcare providers [11]. The increasing use of technology in healthcare, by both patients and providers, has led to new challenges that must be taken into consideration as the clinical workflow and patient-provider relationships shift to keep pace with the evolving technological environment.

The field of mental health, where approximately two thirds of patients report interest in utilizing technology to monitor mental health or to monitor symptoms [12] is no stranger to this phenomenon. Broader use of technology-enabled care and the impact this may have on patient-provider rapport may be of particular importance in the mental health field as the patient-provider relationship plays a significant role in the therapeutic process [6]. In this summary review, we have examined recent literature related to the impact of technology on the clinical workflow and patient-provider rapport specifically in psychiatry. A search was conducted of Medline, PsycINFO, and the Cochrane Library from January 2014 to June 2017. The key words "technology" and "patient" and "provider" and ("rapport" or "relationship" or "communication") in the three databases yielded 226 articles for review. We scanned all abstracts and reviewed the most relevant articles, a total of 33, evaluating the impact of technology on the provider-patient relationship and the clinical workflow. Conference abstracts, editorials, book chapters, and non-English publications were excluded.

Technology and the Changing Clinical Landscape

Text messaging, telehealth, mobile health (mHealth), and remote monitoring are becoming part of the emerging hybrid technology-enabled care model. This model combines the benefits of in-person and technology-enhanced care for psychiatric services [13]. The integration of video and other electronic technologies into care influences the way providers communicate with patients. More interactions can be performed electronically, frequently asynchronously, and often as a complement to in-person visits. Psychiatric clinics have adopted various forms of asynchronous communication, where persons do not have to be present at the same time to communicate with each other [14].

Telemedicine via live or synchronous video is a well-researched clinical modality in the field of psychiatry [15, 16], and can be considered equivalent to a typical in-person psychiatric encounter [17]. Telepsychiatry not only facilitates and expands care [18, 19], and reduces costs [20], but may be a superior modality of care compared to a traditional in-person model for some patient populations and conditions [21, 22••, 23]. A 2014 study compared cognitive behavioral therapy (CBT) administered via telemedicine versus traditional face-to-face therapy in a rural military population with posttraumatic stress disorder (PTSD). Although the study sample was small (n = 18), 69% of subjects experienced a clinically significant improvement, and greater treatment satisfaction with telemedicine compared to traditional in-person treatment [21]. Telepsychiatry may ultimately be a more effective treatment for patients with conditions that warrant exposure and response prevention such as PTSD or obsessive-compulsive disorder (OCD) [22••, 23]. Such treatments may be better administered via telemedicine as in-person visits are anxiety-provoking for patients, and this anxiety may be minimized with proper use of telemedicine [22••, 23]. Further, asynchronous online therapy has been found to improve outcomes for adolescent patients undergoing cognitive behavioral therapy for OCD in comparison to a waitlist control [23].

One form of asynchronous communication that is being more broadly adopted is secure messaging between patients and providers through patient-facing EHR web portals. The adoption of patient portals and secure messaging is rapidly expanding in psychiatry. As providers adopt EHR systems and other clinical technologies, patient-provider communication outside of the clinic will evolve beyond voicemail and phone calls. A retrospective cohort study at Vanderbilt University Medical Center found that growth in likelihood for messaging was greater in psychiatry than medicine, growing from 1.6% of outpatient interactions in 2008 to 20.4% in 2010 [24]. While EHR web portals and secure messaging have been heralded as a tool to improve patient-provider communication, research is emerging regarding how such asynchronous technologies may impact patient-provider rapport, and early evidence is mixed [25, 26].

Benefits to the use of EHR patient web portals in the EHR have been examined largely with patients with chronic diseases [27]. Patient portals have led to improved disease management by enhancing patient-provider relationships and offering new channels for communication and self-monitoring [26]. A 2017 review found that secure messaging between adult diabetic patients and their clinician was associated with improved glycemic control [25]. Despite these benefits, portal adoption remains low in some specialties and some patients do not take advantage of portal features, such as secure messaging. Limitations to provider adoption include unreliable reporting and increased workload. Potential barriers to patient use include lack of access to the internet, poor literacy, and health literacy [25, 26].

In mental health populations, preliminary research suggests patient web portals may offer potential benefit. A 2016 study conducted a benefits analysis on the use of

patient portals in patients with mental illness. All registered inpatients and outpatients receiving usual care at a tertiary level mental health care facility were offered the opportunity to utilize a patient portal. The portal provided online access where patients could view portions of their EHR, make appointments, and communicate with their healthcare provider. Patients who opted to use the portal completed online surveys at baseline and at follow-up. Users and non-users were compared on missing appointments and requesting information from health information management in the year before (2014) and the year after (2015) portal implementation. Approximately 44% of patients opted to register for the portal. The majority of uses in the portal (95%) were to view medical records. The overall MHRM score (an online survey used as a proxy for patient activation) increased from 70.4 (SD 23.6) at baseline to 81.7 (SD 25.1) at follow-up ($p = 0.01$). The odds of a portal user attending an appointment were 67% (CI 56–79%) greater than that of non-users over the follow-up period. Compared with pre-portal implementation, there was an 86% decrease in requests for information in users compared to non-users. The authors also noted that patients who utilized the portal reported an increased sense of autonomy and were satisfied with the portal. Overall benefits included patient activation, improvements in recovery scores, and improvements in organizational efficiencies [28]. Interestingly, while the patients in this study reported satisfaction with the portal, the vast majority of patients utilized the portal to view their records and only 4% used it to communicate with their provider via e-visits [28]. The authors did not report whether or not this was a preference of the patients or a function of the system or portal design.

There is also evidence to suggest that patient adoption of technologies in their healthcare may be tied to their existing relationship and interactions with their provider. Use of secure asynchronous communication, such as electronic messaging, may be in part provider driven or even dependent upon provider utilization and responsiveness to patients via technology. A 2017 study examining 25 million observations of provider and patient messaging among US Army soldiers and clinicians found that prior provider messaging levels were associated with new patient messaging. When providers were highly responsive to patient initiated messages, a 334% increase in secure messages was seen compared to providers who did not personally respond ($p < 0.01$) [29].

Considering these results, and the inevitability that patient demand for technology to support mental health treatment will increase in the coming years [30], it is important to understand how technology-enabled care influences patient-provider rapport and communication. This may in turn shape patients perception, satisfaction, and outcomes in treatment.

Technology and Provider-Patient Rapport

The provider-patient relationship changes over time and is impacted by technological, social, and environmental factors [13]. In mental health, where telemental health services have been used extensively to expand access to care [31, 32], the patient-provider relationship or alliance is considered to be at the center of clinical care [33–36]. Studies examining the relationship between therapeutic alliance and psychotherapy outcomes have found that therapeutic alliance accounted for nearly 30% of the variance in treatment outcome ($r = 0.275$, $p < 0.0001$) independent of moderating factors [33]. The increase of technologically supported care may have an effect on the patient-provider relationship and may, in turn, influence patient engagement and outcomes.

The amount of time a physician spends making eye contact with their patient during an in-person office visit, instead of charting in the EHR, has been associated with greater patient satisfaction with their care [37, 38]. However, recent evidence in studies related to EHR use in the clinical setting is mixed. A 2016 review found that studies examining patient satisfaction and communication found no change as a result of EHR use by physicians during the office visit [39]. Of the 53 studies examined, studies examining overall patient perceptions of satisfaction, communication, or the patient-doctor relationship ($n = 22$) reported no change with EHR use ($n = 16$), a positive impact ($n = 5$), or showed mixed results ($n = 1$) [39]. Similar mixed results appear in psychiatric encounters. Rosen et al. [39] evaluated the working alliance in face-to-face intake interview sessions videotaped and assessed by independent reliable coders, using the Working Alliance Inventory, Observer Form-bond scale. Therapist computer use in in-person office visits was significantly negatively associated with the quality of the observer-rated therapeutic alliance, and client's continuance in care. Rosen and colleagues (2016) caution about the use of computers during mental health visits. Interestingly, surveys of outpatient satisfaction showed no changes in satisfaction scores (based on communication, perceived interpersonal manner, and time spent with the physician) in offices that used paper charts during encounters versus electronic charting [40]. It is possible that technology in the exam room has become a fixture in the medical field, and may not in future greatly impact on patient's perceptions of their care. There is a need for further studies evaluating factors beyond the use of technology in the face-to-face clinical setting [41]. The use of computers to connect with patients virtually, such as through online therapy, on the other hand, has not been found to negatively impact the therapeutic alliance [22••, 42, 43].

Emerging mobile technologies may provide a virtual platform to increase communication and build patient-provider rapport between appointments. One mHealth technology, text messaging, has been studied extensively

when it provides between-clinic visit support. Text messages between providers and patients for coping support and medication management have been found to be an important component of illness management for people with psychotic disorders and substance abuse [44]. Supportive text messages delivered daily to subscribers of a counseling program in Alberta, Canada, were evaluated through a questionnaire to determine the value of the program. Overall, 894 participants responded (21% response rate), and most respondents felt the text messages made them more hopeful about managing issues in their lives (81%, n = 588), felt in control of managing depression and anxiety (76%, n = 552), and felt connected to a support system (75%, n = 542). The majority of respondents felt that the daily supportive text messaging program improved their overall mental well-being (83%, n = 598) [45••]. Mobile phone applications (apps), like text messaging, have the potential to not only increase access to evidence-based care but better inform and engage patients, increase the use of evidence-based practices, and sustain treatment gains post treatment [46]. A pilot study (n = 16) utilized wearable and mHealth apps to provide objective data of real-time physiological stress for armed forces veterans undergoing CBT for stress and anger management. Researchers used cardiovascular and electrodermal inputs from a wearable device, to detect physiological stress. Patients who used the mHealth app were less likely to discontinue therapy and significantly improved on measures of stress, anxiety, and anger, compared to controls undergoing CBT alone [4].

As technology-enabled care evolves, technology in the clinical setting may even be used to provide clinicians with real-time feedback, giving providers valuable data on the quality of their rapport with their patient. A study utilizing automatic speech recognition in a text-based predictive model of empathy found high accuracy of machine learning technology in detecting provider empathy during psychotherapy. The accuracy of computationally derived empathy ratings were evaluated against human ratings for each provider in 200 audio recorded interviews. According to Xiao et al. (2015), computationally derived empathy scores and classifications (high versus low) were highly correlated with human-based codes and classifications. The authors concluded that it is possible to generate accurate predictions of provider performance in psychotherapy from audio recordings alone using speech and language processing methods [47••].

In considering these results, it is important to parse out the impact of technology in the clinical setting and the use of technology to connect with patients and enable care. When examined separately, a theme emerges: when technology is utilized to connect and engage with patients, rather than simply used as an adjunct to care, patient-provider communication is enhanced and opportunities to improve care and patient-provider rapport emerge.

Discussion

Technology-enabled care is reshaping the clinical landscape. Recent health services research has analyzed how technologies improve clinical practice by making care more efficient and accessible. These technologies can also connect patients and providers, and bolster patient-provider rapport. Increasingly, even more recent technological developments in the clinical realm have evolved beyond improving efficiency and accessibility, towards leveraging technology for building rapport.

What makes technology-enabled care unique is the ability to harness technologies for communication and the transmission of information, which can then be leveraged to improve care. Technology in healthcare, in itself, is not new. Throughout the history of healthcare, providers (including nurses, occupational therapists, physicians, social workers) have used technologies to care for patients. Physicians, for instance, used the scalpel to make incisions and the stethoscope to listen to hearts and lungs. Nurses used and operated dialysis machines for patients with renal disorders, and physical therapists used machines to rehabilitate muscles. All of these tools can now be connected and share information with each other through information technology, creating a new connected therapeutic environment in which the patient can share. mHealth, eHealth, digital health, information technologies all are different names for the same idea: that information can be communicated, transmitted, aggregated, analyzed and applied to improving care. It is evident that information technology is becoming the equivalent of the physician's new scalpel and stethoscope.

The online relationship may overcome weaknesses in the in-person relationship, such as access and the power differential [13]. While the physical separation of patient and provider has been presumed to be a downfall of technology-enabled care in mental health, the "virtual space" may be a valuable resource in some cases to provide better care and new opportunities to improve patient-provider rapport [13]. Within psychiatric care, a specialty heavy on communication, the opportunity now lies to use information technology to shape our communication and relationships with patients. How can healthcare providers best listen to the patient, use technology to understand their words, and provide effective and efficient therapy? We understand that many of these technologies are feasible, acceptable, and even desired by both patients and providers alike. The more challenging questions are how to best use these tools. For example, should text messages be

Table 1 Pragmatic advice for mental health clinicians in use of technology

1. Consult about available HIPAA compliant clinical technologies	Consult with your institution, malpractice provider, or information technology officer about what clinical technologies are acceptable to use for patient care
2. Stay up-to-date on emerging literature in the area	Technology advances faster than practice guidelines can be developed. Thus, it is imperative for providers to stay up-to-date on the most recent literature and with their malpractice carrier regarding use of technology in the clinical setting to determine appropriate practices
3. Give informed consent discussing security risks, privacy issues, drawbacks, and benefits of digital therapies	Consider providing this informed consent—as you do with medication side effects—before recommending mobile devices, smartphone apps, smartwatch apps, and web apps. Follow the American Psychiatric Association guidelines for evaluating mobile apps
4. Develop, document, and discuss communication boundaries	Consider having an electronic communication policy in your practice to delineate therapeutic boundaries online. Document the policy in your consent form and discuss with patients early and often
5. Discuss the use of a variety of technologies that you can use with your patients	Consider describing the types of technologies that are available to you in your practice and routinely ask patients to indicate which ones they feel comfortable with using. Develop some "use cases" of how you can use technologies with patients
6. Develop best practices for charting	Consider whether and how to chart or take notes during sessions, and how this may impact the relationship with your patient. Consider your style preferences and encourage an open dialog with your patients on how they feel charting impacts the therapeutic process
7. Use technology to attract customers, streamline your practice, and automate menial tasks	Employ a reliable, reputable EHR vendor that fulfills government requirements (such as Meaningful Use), features computer provider order entry, e-prescriptions, and patient record requests. Streamline your practice and strengthen your web presence by offering online patient portal features including patient-reported outcome measure surveys, messaging, appointment scheduling, and bill pay
8. Include reference, e-book, social service web directories, and app recommendations as part of your treatment	Point out which self-help education references, videos, and online sites are appropriate. Discuss and visit patient advocacy group websites together. Providers curate psychotherapy techniques, medication recommendations, and social service referrals, and digital therapeutics are part of this arsenal

written with specific vocabularies or grammars? Should computer monitors be positioned at a particular angle between the patient and the psychotherapist? Are there any contraindications regarding the use of telephony or e-books? Can technologies be utilized regularly to evaluate the quality of care such as communication, the therapeutic process or other factors such as treatment compliance and medication adherence?

Before these questions can be fully addressed and the spread of technologically enabled care can take hold, comprehensive guidelines for the use of mobile technology and apps are needed [48••], and curricula within residency training programs must be defined [49]. Research on these topics is scarce and thus, guidelines can only currently be developed through expert consensus. As no specific guidelines are available to date, we offer some basic advice for the use of technology in the clinical space, detailed in Table 1 Generally, we recommend that clinicians keep abreast of HIPAA compliance, institutional requirements and current literature; to talk about technology use and potential options with patients and to document policies in the consent process.

Conclusions

Technology and technology-enabled care is rapidly reshaping the clinical landscape in psychiatry. Evidence exist demonstrating that information technologies may improve clinical practice by making care more efficient and accessible, connecting patients and providers outside clinic encounters, and bolstering patient-provider rapport. The impact of technology on provider workflow and rapport are important areas to be evaluated in the digital age of healthcare. More clinical trial and comparative effectiveness studies are required on the patient-provider-technology triad, so that evidence-based guidelines can be developed and implemented. Future studies should not only evaluate the patient-provider dyad but also the use of communication technologies between patient-family, patient-spouse, patient-environment, and patient-society. The majority of a patient's health is influenced, and life is lived, outside of the clinic and health systems.

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