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Introduction to Evidence-Based Digital Interventions and Informatics Approaches to Service Delivery for Behavioral Health Populations

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Abstract

Technology use is ubiquitous in the digital age, and to ensure quality care, patients, more research, and evaluation are needed of digital interventions and informatics approaches for behavioral health disorders—particularly those that have population-level impact. Clinicians, teams, organizations, and countries have to prioritize and implement systems to organize clinical care and set the stage for evidence-based interventions. Much of this is through electronic health records (EHRs), patient portals, artificial intelligence (AI), and data analytic approaches for workflow (e.g., clinical decision support). The Special Edition is geared to help clinicians/faculty, trainees, and healthcare leaders improve clinical care, by showcasing new systems, technologies, research, and evidence- and consensus-based best practices. One overarching goal is to apply the most recent health technology and evidence to promote behavioral health and to predict, assess, triage, and treat behavioral health disorders. Another goal is to describe how to shift from in-person/video care visits to longitudinal, in time care with patient and clinician decision support facilitated by artificial intelligence and other technologies. The issue focuses on effectiveness and implementation science approaches for patients across populations and settings. Evaluation of intended and unintended consequences of new technologies could facilitate or impede workflow and outcomes.

Keywords Behavioral health · Evidence · Informatics · Interventions · Population

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Introduction

This special issue, “Evidence-based digital interventions and informatics approaches to service delivery for behavioral health populations,” is geared to help providers, faculty, trainees, team and service leaders, healthcare administrators, and other community partners to improve access, quality, and sustainable clinical care. The Call for Papers emphasized the following:

- patient care assessment, workflow, teamwork, outcome, and practice management;
- platform, EHR, portal, and other artificial intelligence (AI) approaches (e.g., clinical decision support, algorithms, digital phenotyping);
- patient- and user-side design to facilitate engagement and adherence
- pros/cons of in-person vs. technology-based interactions for communication, clinical care, and teamwork;
- policies, guidelines, and strategies for data collection, analysis, and management—for both resource rich and low- or middle-income communities;

- ways to integrate technologies into existing healthcare infrastructure, funding/reimbursement, and government policy.

The resulting papers fell into two sections. Section 1 covers research on the application of technology to clinical practice. Section 2 covers informatic and decision support frameworks helpful to systems of care. Section 3 has guidelines, training, and organizational leadership approaches.

Section 1

One key theme from this section is the outreach to populations in need, defined as those who may not seek care or who have a hard time accessing it. Volpe et al. focus on.

psychoeducation and psychosocial rehabilitation in-person versus the digital video modality in the management of psychosis. Rego et al. review mHealth interventions for marginalized and underserved populations—with regard to efficacy, challenges, and adaptations—in the USA. Ahuja et al. apply many of the same approaches for digital psychosocial interventions in low- and middle-income countries. In those settings, the foundations of clinical services and technology infrastructure do not promote in-person and video care, but the popular use of mobile phones lends itself to mobile applications and for the future, perhaps even wearable sensors. Low- and middle-income countries have begun to formulate mental health performance indicators for domains such as needs, utilization, quality, and financial risk protection (Jordans et al., 2019), hoping that new and simpler collection of data, monitoring, and documentation will improve outcomes (Ahuja et al., 2019; Jordans et al., 2019).

Iterative development of technology with input—and/or lean processes, user satisfaction, and the fit of goals, methods, and routines may be much higher (Aij et al., 2017; Maijala et al., 2018)—is important for customizing care (Hilty, Torous et al., 2021). It has also helped with prioritization, customization, and coordination for health and governmental systems (Ahuja et al., 2018; Naslund et al., 2017). Similarly, outreach to more patient populations is made possible by implantation studies of group-based video telemental health (Ecker et al.), cognitive stimulation therapy for people with dementia (Fisher et al.), and parents to manage stress (Lee et al.). As suggested by the quadruple aim, which adds a goal of improving the work life of healthcare providers (Bodenheimer & Sinsky, 2014), qualitative studies are also needed to assess impact of technology (Mancini et al.) and how to incorporate digital interventions into mental health clinical practice (Johansen et al.).

Section 2

Informatics approaches have helped develop workflow and integrate technology at a foundational level for clinicians and health systems, which also help to collect and evaluate

data in vivo for process improvement. This may include computational approaches to wearable sensor interventions and suicide prevention (Patriquin et al.). A review of narrative review of digital phenotyping and biomarkers (Jacobson et al.) and specific example of intervention—symptom improvement of the mental health of college students (Torous et al.)—provide context for these new technologies. The role of social media is also increasing related to healthcare—for both adults and younger patients. Children, adolescents, and young adults under 25 years of age (i.e., youth) are raised in an increasingly digitalized society, with technology as an integral part of daily life (Pew Research Center, 2018). One review of evidence since the pandemic suggests that technology is supporting mental health wellness in addition to care interventions (Naslund et al.). Similarly, studies are exploring mobile technology use in middle-aged and older adults to streamline workflow.

Section 3

One article focuses on competencies that are needed for behavioral health professionals to integrate digital health technologies into clinical care (Gleason et al.). Competencies in information technology were suggested as part of healthcare reform in 2003 (National Academies of Sciences, Engineering, and Medicine, 2019). Most of the competency work has been done for video in adults, though it may apply to children and adolescents (Maheu et al., 2019), social media (Zalpuri et al., 2018), mobile health and culture (Hilty, Crawford et al., 2021), wearable sensors (Hilty, Armstrong et al., 2022), and asynchronous (Hilty, Torous et al., 2021; Hilty, Zalpuri et al., 2021) competencies. At the institutional level, a scoping review explores training, faculty development, and administrative approaches for technology (Hilty et al.). This builds on workflow and workplace adjustments for institutional competencies for video (Hilty, Unutzer et al., 2019) and asynchronous technologies (Hilty, Torous et al., 2021). The global marketplace on apps (Torous et al.) and cost economic approaches (Serhal et al.) are also explored.

Conclusion

In reviewing this compilation of papers, it is clear that the evidence base in this area is increasing dramatically, but still has gaps. While clinical studies have provided evidence and research on video-based and mobile healthcare delivery, primarily, informatic approaches provide a foundation for a whole new set of technologies for patient and provider users. The pandemic has furthered the research in a helpful way for

most care participants, as it was necessary to adapt quickly and use mobile health apps and wearable technologies. Internationally, the work in low- and middle-income countries is parallel to this, but for somewhat different reasons, those technologies are more accessible via mobile phones. A significant amount of research still needs to be conducted to create a solid evidence base. Developing frameworks for assessment of technologies, the impact on users, and clinical outcomes is imperative. Likewise, clinician and institutional competencies are needed, as are national or international consensus guidelines across behavioral health professions. We hope that the articles in the special issue will be of interest to a wide range of readers and inspire readers to further consider these important issues, conduct research, and advocate for broader adoption of technologies in healthcare and education.

Data Availability There are no data for this paper for review.

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