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ORIGINAL ARTICLE

Leveraging Implementation Science to Integrate Digital Mental Health Interventions as part of Routine Care in a Practice Research Network

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Abstract

The supply / demand issue in behavioral health care is a well-established fact, and the mental health toll of the COVID-19 pandemic continues to add challenges to an already taxed system. Existing healthcare models are not set up to adequately address the increasing mental health related needs. As such, innovative models are needed to provide patients with access to appropriate, evidence-based behavioral health care within routine clinical care. This paper introduces Precision Behavioral Health (PBH) as an example of such a model. PBH is an innovative, digital first care delivery model that provides an ecosystem of evidence-based digital mental health interventions to patients as a frontline behavioral health treatment within routine care in a large multispecialty group medical center in the United States. This paper describes the implementation of PBH within a practice research network set-up as part of an integrated behavioral health department. We will present how our team leveraged the RE-AIM (Reach, Effectiveness, Adoption, Implementation, Maintenance; "What is RE-AIM?," n.d.) implementation science framework, which emphasizes the design, dissemination, and implementation processes at the individual, staff, and organizational levels, to prioritize key implementation constructs to enhance the successful integration of PBH within routine care. We describe how each of these constructs were operationalized to aid data gathering for rapid evaluation and lessons learned. We discuss the benefits of these types of initiatives across multiple stakeholders including patients, providers, organizations, payers, and digital intervention vendors.

Keywords Practice oriented research · Implementation science · Digital mental health interventions · Rapid evaluation · Practice research network

Introduction

There is a global mental health crisis, with an increasing demand for mental health services without adequate providers to meet this need (Abrams, 2020; Marques et al., 2020). In the United States, 163 million Americans live in a designated mental health provider shortage area and over 8,000 providers are needed to fill this gap (Health Resources and Services Administration, 2023). Even in well-resourced areas, only 41% of referrals to behavioral health care are successfully filled within six months of referral (Nordberg et al., 2023). The mental health provider supply problem is not new, and numerous attempts to increase the supply of providers have proven ineffective (Satiani et al., 2018).

Recently, digital mental health interventions, evidence-based mental health applications that can be accessed on smartphones and other devices (Substance Abuse and Mental Health Services Administration, 2023), have been proposed as an innovation with the power to radically improve access to effective interventions through its scalability, flexibility, accessibility, and potential to reduce the stigma around utilizing mental healthcare (Webb et al., 2010). With the growing rise of technology and ubiquity of cell phones (Pew Research Center, 2019), digital therapeutics can facilitate access to care at the moment that care is needed (Bucci et al., 2018). For example, digital therapeutics typically include self-directed apps for skills building or intervention application in the moment (Fairburn & Patel, 2017). In this way, they provide unique opportunities for patients to seek

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out strategies and use coping mechanisms in the moment, instead of having to wait until their next therapy appointment. Furthermore, they offer an avenue to overcome additional barriers to treatment such as a reluctance to speak to a professional, or simply offering a treatment when there are no available professionals, such as in rural settings (Bucci et al., 2018, Moore et al., 2011). Another area of benefit is that digital therapeutics offer patients more access to their progress and self-monitoring in a way that paper-administered reports in waiting rooms cannot (Bucci et al., 2018). Simple reminders to complete assessments and appealing graphical interfaces enable patients to track their symptom change and learn more about their mental health journey, and these features have been shown to have greater impact on agency and self-awareness (Cohen et al., 2013). Finally, from an organizational perspective, digital therapeutics require fewer resources to maintain compared to a therapeutic practice, and they are not limited by the number of providers or available times (Webb et al., 2010).

Despite their numerous benefits, there are some limitations to digital therapeutics. Presently, these tools are most commonly obtained directly by consumers, without clinical guidance (Espie et al., 2022). This can result in individuals accessing substandard therapeutics and receiving incorrect or even harmful advice (Martinez-Martin and Kreitmair, 2018). An additional hurdle to accessing appropriate care through digital therapeutics is the oversaturation of the market. As of 2020, there were an estimated 350,000 different mental health apps across the various app stores making it challenging for even the most informed users to select a digital therapeutic (IQVIA Institute for Human Data Sciences, 2021). An additional challenge with digital tools is continued engagement. Even if the initial registration hurdle identified above is addressed, the median retention rate of digital therapeutics at 15 days is 3.9% (Baumel et al., 2019), which highlights continued usage problems with this direct to consumer approach.

To address these challenges, we propose a novel model of care called *Precision Behavioral Health* (PBH). PBH is a digital first care model that provides an ecosystem of evidence-based digital mental health interventions to patients as a frontline treatment. The digital mental health interventions included in the ecosystem encompass a wide array, inclusive of wellness, provider programs, and digital therapeutic categories, and will be referenced collectively as digital therapeutics hereon. PBH's digital first care model includes a workflow enabled clinical triage support to match patients to digital therapeutics as part of routine clinical care. In this paper, we will first describe the practice research network setting where we developed and implemented the PBH program, present the PBH program in detail, and present how an implementation science framework was leveraged throughout this process to enhance its successful integration within routine practice and promoted long-term sustainability. We will highlight the key dimensions that were used to evaluate the implementation process, guide change within the organization, and the data that were collected for rapid testing and decision making, all aligned with practice-oriented research (POR)'s goal of evaluating and improving mental health services as they are delivered in routine clinical care (Castonguay et al., 2021).

Innovation Setting: Reliant Practice Research Network

Reliant Medical Group is a large multispecialty group medical practice in central Massachusetts serving 340,000 patients in adult, pediatric, and family practice primary care. Reliant has a primary care integrated behavioral health department, which is staffed with over 80 full-time licensed mental health clinicians including clinical psychologists, master's level clinicians, medical doctors, and nurse practitioner prescribers available for consultation, triage, and intervention delivery. In-house services include short-term goal-oriented, cognitive behavior therapy lasting between eight and ten sessions for adult and pediatric psychotherapy, alcohol and substance use treatment, bariatric clinics, as well as a fully remote virtual dialectic behavior therapy program. Additionally, the behavioral health department has a team of 17 integrated clinicians. These integrated clinicians are the first line of contact for patients referred into behavioral health services from primary care. Integrated clinicians are responsible for conducting warm hand-offs between primary care, triaging patients to appropriate behavioral health services, conducting assessments, and providing crisis consultation. Despite the robust size of the department and the comprehensive services available, the Reliant Behavioral Health department experiences the supply/demand challenges inherent in the behavioral health field. For example, between 2019 and 2021, only 46% of patients referred outside of Reliant ultimately received service within six months. The majority of those patients waited an average of 31 days to receive their first service (Nordberg et al., 2023).

Since 2020, Reliant has utilized a practice research network that strives to improve access to high quality care and clinical outcomes and reduce strain on the healthcare system. Its multidisciplinary team of researchers, data scientists, clinicians, and operational leaders study scalable, evidence-based models of care in real world settings to improve the identification of health concerns and develop innovative models of treatment and prevention.

Innovation: Precision Behavioral Health

The primary aim of the PBH program is to increase access to evidence-based therapeutic skill-building and treatment options by triaging patients experiencing mild-moderate anxiety and depression into a digital first care model developed to provide patients with appropriately matched digital therapeutics. The PBH digital care model's key components include an ecosystem of pre-vetted, evidence-based digital therapeutics (see funding and digital therapeutics for more information) and wrap-around clinical and engagement support systems to enhance treatment outcomes.

Aligned with POR, the PBH program was initiated to address the Reliant behavioral health supply/demand problem described above, and if demonstrated to be effective, will be scaled to other care delivery organizations. The team members comprising PBH reflect Reliant's routine clinical care delivery workstream and include teams of licensed mental health clinicians, project managers, members from the electronic medical record team, operational personnel, and clinical researchers from the practice research network. Additional personnel specific to PBH come from the PBH funding source. These staff assist with project management, program strategy, and lead relationship development and contracting with the digital therapeutic vendors. PBH also includes digital care navigators who were integrated as a key role in enhancing the patient experience.

PBH Patient Experience Journey

Figure 1 depicts the patient's journey through the PBH program. As part of routine care at Reliant, patients who present to primary care with behavioral health concerns are referred to the Behavioral Health department for a triage needs assessment with the integrated clinician. Prior to their meeting with the clinician, patients are asked to complete the Norse Feedback measure, a patient reported multidimensional outcome measure, through the electronic health record system. During the triage needs assessment, the integrated clinicians use the clinical interview information, results from the Norse Feedback measure, and their clinical judgment to refer the patient to several treatment pathways: PBH, in-house treatment services, or outside community resources. If the patient accepts the referral to PBH, the integrated clinician makes a specific digital therapeutic recommendation for the patient, followed by instructions on how to register for the digital therapeutic, a scheduled appointment with the digital care navigator, and an appointment 6 weeks following the needs assessment with the integrated clinician. This follow-up appointment is used to evaluate the need for any clinical alterations to the patient's care, such as changing digital therapeutics or referring to one of the other treatment pathways.

The digital care navigator is a non-clinical staff member whose role is to conduct a "warm handoff" between the integrated clinician and the digital therapeutic for the patient. Their scheduled call with the patient is aimed at enhancing the patient's experience and can include technical support with registration and enrollment to the digital therapeutic, answering any questions patients may have, and providing another check-in point for the patient. Patients then follow the therapeutic programming inherent to each digital therapeutic. In addition, they are asked to complete the Norse Feedback measure at 2-, 4-, 6-, 9-, and 12-weeks post triage

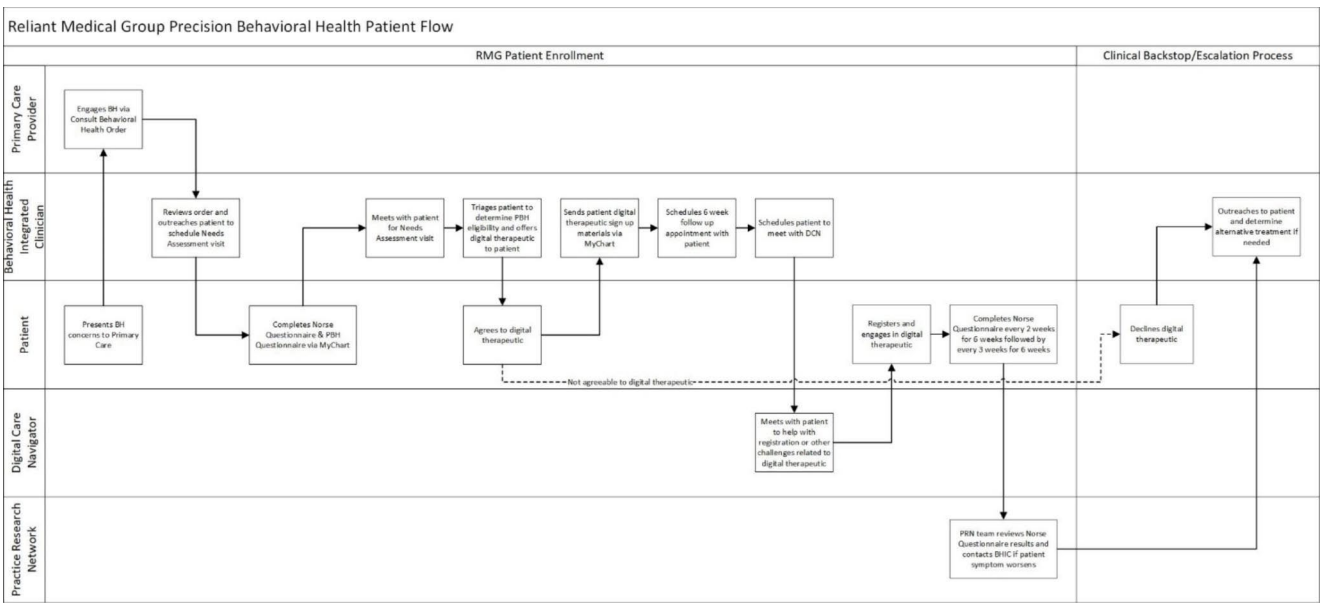

Fig. 1 *Patient Journey through Precision Behavioral Health at Reliant Medical Group*

needs assessment with the integrated clinician through Reliant's electronic medical record system for continued monitoring of behavioral symptom change. If the patient's behavioral health is deemed to be clinically worsening, the integrated clinician outreaches the patient to check-in and determines the best course of clinical action.

PBH: Funding and Digital Therapeutics

The PBH program was funded by United Health Group's Strategy & Innovation Office. Funding for PBH was possible due to Reliant having been acquired by United Health Group's Optum Care in 2018. This type of internal funding source offered PBH a number of advantages that would not have been available if the program had been funded by external grants, including (1) rapid implementation of PBH within Reliant, (2) development and deployment of a robust and systematic progress assessment, (3) flexible adjustments and increases in funding if justified modifications were needed in the course of the program deployment, and (4) unprecedented rapid scaling to other settings within Optum Care.

Funding for the program was used primarily to support staffing and resource costs, including contracts with the digital therapeutic vendors. Together with leaders from United Health Group's Strategy & Innovation Office, the PBH clinical and research leadership members conduct the vetting process to evaluate potential digital therapeutic vendors on key metrics to decide whether to onboard the digital therapeutic into the PBH ecosystem of available options. These metrics include: (1) whether the digital therapeutic's target problem(s) align with the clinical needs of the PBH patient population, (2) presence of robust theoretical mechanism of change embedded in the clinical program content of the digital therapeutic (such as behavioral activation, cognitive restructuring, exposure, meditation, etc.), (3) effectiveness evidence of the digital therapeutic program, as supported through peer-reviewed manuscripts or independent data analysis, (4) additive value of a new digital therapeutic in expanding the currently available repertoire of treatment options, and (5) collection and ability to share engagement data with PBH. Vendors that meet these criteria then sign a pilot services agreement with Reliant to enroll up to 300 patients in their program. This agreement allows for patients that are enrolled into the PBH program to have access to the digital therapeutic at no cost to them. The clinical and evidence-based vetting process enhances the treatment options available for patients through PBH's care model. On one hand, this process includes only robust digital therapeutics into the ecosystem so that patients and providers feel confidence in the referral and consumption of such tools as comparable to alternative treatment options for patients for their behavioral needs, such as psychotherapy. In addition, the process also strengthens the program's flexibility and responsiveness to emerging and changing provider and patient needs. For example, the current ecosystem within the PBH model includes digital therapeutics that as a whole, provide patients with a diversity of mechanisms of change treatment options, such as mindfulness and meditation skills building, and cognitive and behavior-based skills building such as cognitive restructuring, behavioral activation, and diaphragmatic breathing.

PBH Roll-Out

PBH's roll-out within Reliant included several meetings with the Optum Office of Human Research Affairs. Given that PBH was implemented as part of routine clinical care for all behavioral health patients at Reliant and that the digital therapeutic treatments offered had effectiveness evidence, the Office of Human Subjects Research determined PBH did not meet the definition of human subjects research and it was deemed permissible to conduct its operations without direct institutional review board oversight. Since launch, PBH and the Office of Human Subjects Research continuously communicate throughout the program's implementation to ensure all changes are compliant with the exemption status.

Initial implementation focus was on onboarding the integrated clinicians to PBH. Integrated clinicians attended a series of trainings for each digital therapeutic. Trainings were led by the vendors and champion Reliant clinical leads with a focus on providing education about the mechanism of change behind the digital therapeutic, the digital therapeutic programming, and to discuss clinical applications. Integrated clinicians were also provided demo accounts to the digital therapeutics so they could have first-hand experience. The demo accounts allowed the integrated clinicians to use the therapeutics as if they were a patient, with access to all content and information, without saving their usage as part of the patient data files. PBH funding also included protected time each week for the integrated clinicians to attend these trainings, try out the digital therapeutics, and attend ongoing weekly feedback sessions in addition to office hours with the clinical leads. The goals of these trainings and experiential learning opportunities were to increase integrated clinicians' knowledge and self-efficacy with the digital therapeutics as they serve as key implementation change drivers (Zhang et al., 2017).

The inclusion of the Norse Feedback measure as part of the PBH patient experience was a critical component of the PBH implementation process. The Norse Feedback measure is a multidimensional routine outcome measure designed to dynamically adapt questions and areas monitored based on

a patient's answers to a set of trigger questions (McAleavey et al., 2021). The Norse Feedback measure allows detailed quantification of a patient's symptom profile using multifaceted subscales, compared to traditional measures that focus on a singular outcome domain. Subscales on the Norse Feedback measure 3.0 include: sad affect, physical anxiety, restrictive eating, substance use, intrusive memories, anger, hopelessness, worry, self-compassion, social avoidance, internal avoidance, self-contempt, pain (the experience of and interference it creates), social support, general functioning, cognitive problems, urges, quality of life, social determinants of health, readiness for change, and five single items that address concerns such as sleep, physical health, and sex-life.

As part of routine clinical care at Reliant, all patients complete the Norse Feedback measure prior to attending their triage needs assessment. The integrated clinicians are then able to review the patient's clinically relevant concerns as identified by the Norse feedback measure during their needs assessment, which is used to aid their referral recommendations, including whether they refer a patient to PBH or not. If a patient accepts the referral to PBH, they are subsequently sent the Norse feedback measure at 2-, 4-, 6-, 9-, and 12-weeks post needs assessment date via the patient facing portal of the electronic health record system. These subsequent Norse evaluations are administered both to inform the effectiveness evaluation as well as for critical clinical care provision, exemplifying POR. Patients' Norse Feedback responses post baseline are actively monitored for any indication of clinical worsening. For example, clinical backstops include a patient's integrated clinician as well as the PBH clinical leads receiving messages through the electronic health record system with indications of all the Norse Feedback measure subscales that show clinical worsening scores as compared to the patient's baseline scores. The integrated clinician then outreaches the patient and clinically intervenes as needed. Additionally, the integrated clinicians use the Norse Feedback measure responses during the 6-week follow up check-in visit with the patient to inform any treatment changes to their care.

PBH related data tracking was also prioritized as part of implementation. All PBH data that was collected as part of routine clinical care was captured within the existing electronic health record system at Reliant. The integrated clinicians' routine documentation was edited to capture documentation that simultaneously addressed both the clinical needs as well as the evaluation metrics for PBH as operationalized below. As part of the contracting terms, the digital therapeutic vendors were asked to send weekly engagement and programming data to the PBH team. PBH clinical researchers were allocated specifically to support ongoing data management and analysis to inform evaluation of PBH implementation, develop strategies to address challenges, and conduct PBH effectiveness and cost analyses.

Evaluation of PBH Implementation Within Reliant Practice Research Network: RE-AIM Framework

To guide the evaluation of our implementation of PBH within routine care, the Reach Effectiveness Adoption Implementation and Maintenance (RE-AIM) framework was used (Glasgow et al., 1999). This framework is widely used and places an emphasis on translating protocols to real-life settings. Additional focus is drawn to the design, dissemination, and implementation processes that facilitate or act as barriers in achieving the impact of innovations. Further, this framework underscores public health impact which aligns with PBH's goal to reduce the mental health burden by providing more individuals with access to quality mental health care. As such, the RE-AIM framework was applied to conduct rapid testing across its outcomes at the individual, staff, and organizational levels to enhance the seamless integration of PBH into all levels of care. Here we share how RE-AIM was conceptualized to aid PBH implementation and evaluation and examples of how the data were applied post rapid testing to include changes.

Operationalization of RE-AIM Constructs for PBH

Reach

Reach is defined as the "absolute number, proportion, and representativeness of individuals who are willing to participate in a given initiative, intervention, or program" ("What is RE-AIM?," n.d.). For PBH, reach was operationalized as the proportion of patients that accepted the referral to PBH out of the number of patients that were deemed to be eligible and referred to PBH based on the triage needs assessment meeting with the integrated clinician. We also tracked the proportion of patients that were deemed an appropriate fit by their clinician but declined participation in PBH. This allowed us to capture the representativeness of the patients served by PBH compared to those that were deemed eligible within the overall Reliant patient population.

Reflective of POR, our initial operationalization of reach expanded to account for emerging clinical and implementation needs. For instance, for the patients that were referred to and accepted the PBH referral, we tracked whether they registered with the digital therapeutic, whether they engaged with the program and how many times, and whether they completed or dropped out of the program. These additional metrics allowed the team to identify the timepoints where patients were lost in their journey within PBH and developed and deployed additional implementation strategies as

needed. Clinically, the team shared this information with the integrated clinicians to increase their confidence in the program as a whole and the specific digital therapeutics which further solidified the integration of PBH within routine care as a valid, evidence-based referral source for patients.

To further characterize the reach population, we captured the reasons for declining the referral to PBH that patients shared with the integrated clinicians. The results of these data informed implementation related changes to increase the reach of patients served by PBH, such as expanding the option of PBH to patients that were also receiving psychotropic medications. The patients' feedback was also used to advise the selection of new digital therapeutics that were considered for onboarding into the PBH ecosystem. For example, one of the reasons for declination included patients' preference for having more human interactions as part of their digital therapeutic journey (compared to some of the options that included a sole technologically driven delivery system of the interventions).

Effectiveness

Effectiveness or efficacy refers to the evaluation of the impact of an intervention on important patient-level outcomes ("What is RE-AIM?," n.d.). We focused on effectiveness which was operationalized to encompass both the real-world clinical and economic impact of PBH. Clinical improvement was evaluated at the patient level using change in symptomatology assessed by the Norse Feedback measure (McAleavey et al., 2021). Clinical effectiveness of PBH was evaluated by estimating the proportion of patients that were categorized as having clinically improved, clinically deteriorated, or as not having shown any change in their clinical outcome scores when compared to their baseline scores. Effectiveness of the PBH program was also measured by comparing latency to receiving care and likelihood of receiving care after a referral with benchmarks identified in the literature. Preliminary results showed that patients in the PBH program receive treatment services faster than patients seeking services in the community (Nordberg et al., 2023).

Key treatment moderators that may have impacted effectiveness evaluation were also actively tracked. The pilot agreements signed with vendors included monitoring and sharing patient engagement data captured by the digital therapeutic with PBH. In addition to impacting effectiveness assessment, we used engagement data to navigate implementation-related decision points. Using a data-driven approach, we assessed patients' engagement patterns across the various digital therapeutic programs, likelihood of completion rate, as well as dropout patterns. Based on these results, we partnered with the digital therapeutic vendors to enhance support systems for patients to increase engagement. For example, for digital therapeutic options where patients had to wait to receive a physical device from the vendor, we found that they had a higher likelihood of not engaging after referral compared to patients who had access to their therapeutic right away. Thus, we worked with the device-based vendors so that the patients had a scheduled call with a member of the vendor team shortly after receipt of the device to help with the set-up process. We observed that this additional support increased likelihood of engagement.

The health economics effectiveness evaluation of PBH assessed the organizational cost-savings associated with the introduction of PBH into Reliant's routine care. The assessment focused on the pre-post PBH implementation differences on two metrics: (1) patients' healthcare utilization (e.g., number of in person visits, video visits, duration of video/in-person visits, telephone calls and MyChart messages); and (2) the number of referrals placed to community resources. Organizationally, it is hypothesized that the rate of patients referred to external resources would reduce as they would be serviced by PBH instead.

Adoption

Adoption refers to "the absolute number, proportion, and representativeness of settings and intervention agents (people who deliver the program) who are willing to initiate a program" ("What is RE-AIM?," n.d.). Since PBH was integrated as part of routine clinical care at Reliant, all integrated clinicians adopted PBH.

Implementation

Implementation is defined as the "intervention agents' fidelity to the various elements of an intervention's key functions or components" ("What is RE-AIM?," n.d.). Implementation for PBH was initially operationalized as the integrated clinicians' fidelity in both identifying eligible patients and referring them to PBH by recording the absolute number of patient referrals to PBH per integrated clinician. To be responsive to the feedback we received regarding this operationalization from the integrated clinicians and clinical leads, we updated our evaluation of implementation to better account for the natural ebbs and flows in the number of needs assessments completed in a given week and the complexity of patients seen by the integrated clinicians.

Thus, PBH's evaluation of implementation consisted of two definitions at the integrated clinician level: first, the absolute number and proportion of patients that were referred to PBH from all those that completed a needs

assessment visit; and second, the proportion of patients with mild/moderate anxiety and depression symptoms that were referred to PBH vs. not referred. To inform implementation efforts, we also explored characteristics that differentiated integrated clinicians' referral numbers. For example, given that increased sense of self-efficacy has been shown to be related to adoption (Zhang et al., 2017), we assessed the frequency by which providers used their demo accounts for each of the digital therapeutics. The results showed that increased use of the demo was related to increased referral to that particular digital therapeutic by the integrated clinician. The qualitative feedback that we gathered during weekly meetings with the integrated clinicians further strengthened this relationship, as the integrated clinicians reported experiencing enhanced familiarity and comfort of a given digital therapeutic from their demo use. We hypothesized that the demo-usage may have impacted their sense of self-efficacy, and thus, have built purposeful integrated clinician demo-use and debriefing time as part of the onboarding schedule of a new digital therapeutic into the PBH ecosystem.

We also gathered qualitative data to evaluate implementation as part of note taking during feedback sessions with the integrated clinicians. Notes focused on discussions related to the integrated clinicians' clinical judgement in determining which patients were appropriate for PBH, what criteria they used to refer patients to certain digital therapeutics compared to others, or their decision-making process in not referring patients to PBH and instead referring them to routine clinical care options, such as outside referrals for traditional psychotherapy. Discussions also focused on communication strategies that were used by the integrated clinicians to introduce PBH to patients and for each digital therapeutic specifically, and notes were taken during these meetings to assess for adaptations used, such as identifying convergence and differences in the referral strategies used.

Maintenance

Maintenance is defined at the setting level as the extent to which a program becomes a part of routine organizational practice, and at the individual level it refers to the long-term effects of the program after its conclusion ("What is RE-AIM?," n.d.). Given that PBH was implemented at Reliant a year ago, we have not conducted formal assessment of this construct. We are planning to evaluate it both at the patient- and organizational-levels. At the patient-level, we will evaluate whether the PBH program has an impact on patients per member per month total cost of care, including cost of medical, behavioral, and pharmacy costs of care 6 months- and 24 months- post PBH enrollment. At the organizational-level, we plan to monitor the previously mentioned patient-level maintenance related measurements after the initial funding from United Health Group's Strategy & Innovation Office concludes, and a business model on coverage for PBH is determined.

Discussion

The goal of this paper is to illustrate how to leverage implementation science to enhance POR. We describe the integration of PBH within routine clinical care to promote adoption and long-term sustainability. Our hope is that our methods and learnings can serve as a blueprint for others who are conducting POR to achieve these aims. The RE-AIM framework guided the evaluation process for critical PBH implementation dimensions that impact patients, providers, and organizations. It also provided a comprehensive structure that allowed for a thorough and rapid evaluation process to address questions raised by researchers, clinicians, and funders. Utilizing the RE-AIM framework therefore allowed for real-time multi-level evaluation on the successful implementation of a program, rapid iterations to be responsive to clinical care, and enhance the impact of PBH and POR at large, at the patient-, provider- and organization- levels. PBH was developed and implemented with each of these multilevel challenges in mind.

By creating a digital first care model with an ecosystem of diverse evidence-based digital therapeutics, and a data-driven and theoretically-anchored process that supports its implementation, PBH aims to address multisystemic problems that occur when trying to respond to the mental health demand, beyond responding only to the provider shortage. For example, consistent with the core principles of POR, PBH provides multifaceted benefits to patients. First, patients are not burdened with finding treatment resources and options, and instead, can trust that they are receiving access to a digital therapeutic that has been vetted by a clinical and research team. Additionally, patients are referred to specific tools based on their clinical presentation, with the goal to not only provide care to patients, but care that is *most relevant* to each unique patient and their presenting concerns. Through continuous monitoring of the Norse Feedback measure responses, patients feel supported throughout the journey knowing that their clinical team is tracking their progress and ready to intervene if indicated. Furthermore, the flexibility of the digital therapeutics, such as being able to use them at home, during a break at work, during their commute, etc., enables patients to receive care without the burden of rearranging their schedules or traveling to an office. Finally, PBH allows patients to receive care almost immediately after referral. It has been shown that the shorter the time between when a patient seeks mental health treatment and receives a service, the more likely they are

to engage with that service (Hill & Joonas, 2005). The use of the PBH digital first care model shows that patients are waiting no more than 1 week to receive devices, if needed, and they can begin their mental health treatment as soon as possible while their motivation is still high.

PBH has also been found to be beneficial to providers. By creating a digital first care model with a digital therapeutic ecosystem, we have centralized clinical workflows and information flow regarding the availability of the various digital therapeutics that providers can readily utilize. In an already over-taxed mental health system, providers do not always have the time to test out new digital therapeutics that they may want to refer patients to use. With PBH and the research team, providers can trust that all digital therapeutics in the ecosystem have been thoroughly vetted and have an evidence base. This availability allows providers to feel confident in referring patients to the PBH ecosystem tools, and also frees up time that they would have spent having to evaluate these therapeutics themselves. Furthermore, PBH was purposefully designed to be thoroughly integrated into clinical workflows and the pre-existing electronic medical records system. This embodies POR as it allows providers to use an already familiar health record system to provide care, monitor patient progress, document interactions, and capture information that the research team can use to evaluate the critical implementation outcomes.

From an organizational perspective, the PBH care model has the potential to impact relevant outcomes for the organization at large. For example, having an additional treatment option that is effective in addressing patients' mental health needs that is not dependent on hiring and onboarding additional staff is beneficial. Furthermore, as mentioned above, we hypothesize to see healthcare costs savings associated with patient's use of the PBH ecosystem digital therapeutics.

Conclusion

POR and implementation science share the goals of integrating research and practice, increasing adoption and implementation of research that is informed by clinical practice, and impacting the multiple levels that comprise our healthcare system (Youn et al., this issue). In this paper we exemplify how to apply these two complementary research practices by describing how we used POR and an implementation science framework to enhance the integration of PBH, a digital first care model inclusive of an ecosystem of evidence-based digital therapeutics to patients as a frontline treatment. By focusing on the multi-level needs, we were able to rapidly evaluate implementation outcomes and monitor the successful integration of PBH into an existing clinical care process.

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Authors' Contributions Soo Jeong Youn and Brittany Jaso were responsible for the initial conceptualization and broad outline of the article. All authors contributed subsections, feedback, and assisted with References. Soo Jeong Youn, Brittany Jaso, and Mara Eyllon organized the drafted sections, managed the revision process, and completed the final paper in accordance with the journal's formatting guidelines. All authors reviewed the final paper and approved the manuscript.

Declarations This is a conceptual paper that is submitted as part of a special issue, and does not follow an existing reporting guideline framework. The paper is part of the special issue on: "Practice-Oriented Research".
Optum Office of Human Subjects Research deemed that the Precision Behavioral Health project did not meet the definition of human subjects research and it was deemed permissible to conduct its operations without direct oversight.

Conflict of Interest Samuel S. Nordberg has a financial relationship with Mental Health Informatics, which owns the Norse Feedback measure, a measurement-based care tool that has been integrated within routine care at Reliant Medical Group as part of the Precision Behavioral Health initiative described in this paper. Samuel S. Nordberg declares a potential conflict of interest. Dr. Nordberg has a plan in place with OptumCare and Reliant Medical Group to monitor that the potential conflict of interest does not impact methods, results, and publications related to the Norse Feedback measure or Precision Behavioral Health. No other authors have a conflict of interest to disclose.

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