

Toward user-centered design of game-based digital mental health interventions

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EXTENDED ABSTRACT

The global mental health crisis needs novel approaches

“Mental health conditions are widespread, undertreated and under-resourced,” describes a recent global report (World Health Organization 2022). Scalable digital mental health interventions (DMHI) are actively researched to help alleviate the mental health crisis. Many interventions have been found effective and acceptable (Andrews et al. 2018), but user engagement with them varies (Borghouts et al. 2021), diminishing their effectiveness.

Game-based interventions—both gamified solutions and serious games—are suggested to expand treatment reach, encourage user commitment to the demanding behavior change process, and offer novel avenues for symptom alleviation (Fleming et al. 2017). Yet, while preliminary evidence accumulates (Dewhurst, Laugharne, and Shankar 2022), game-based interventions have not yet found wide market traction, indicating challenges in their development, implementation, and go-to-market.

How can novel game-based interventions contribute to the alleviation of the global mental health crisis? We approached the question through triangulation. Our first three studies are unified by a user-centric ethos (Mohr et al. 2017): to design and develop interventions that the clients find attractive, engaging, and effective; and that fit the real-world clinical context.

Study 1: Alleviating the entertainment-vs-healthcare tension

Game-based interventions use elements from entertainment games to achieve health benefits. However, combining the two paradigms is challenged by their disparate institutional contexts (Scott 2014). The highly regulated and risk-averse domain of healthcare seeks to treat disorders and minimize user interaction with health services. Meanwhile, the substantially less regulated domain of entertainment aims to captivate the audience and maximize their playtime by offering a broad range of genres to choose from. The two domains are driven by disparate aims: health and subjective enjoyment.

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In the first study (submitted), we conduct a theoretical synthesis of the two domains and describe the interventions in a continuum between healthcare and entertainment. To negotiate the tension between the paradigms, we focus attention on four unifying themes in development: Target audience, user Engagement, Mechanisms of action, and intervention Effectiveness (TEME). The framework illuminates how game-based intervention development requires practices from both paradigms. Healthcare provides the goal for the intervention, the theoretical rationale for reaching it, ways to measure success, and describes the implementation context. Entertainment offers design elements to reach the goal and iterative processes that allow honing player experience. The study facilitates interdisciplinary game-based digital mental health intervention development through conceptual clarification.

Study 2: Understanding mental health professionals' digital tool usage

In addition to the end-users, mental health professionals (MHP) are the second key user group for digital interventions. MHPs have considerable influence on which digital tools they suggest to their clients (Davies et al. 2020), and they act as gatekeepers to the interventions. Thus, understanding their perspective is essential to implement digital tools in healthcare successfully. To examine how MHPs use and do not use digital tools in their practice, we interviewed Finnish MHPs ($N = 19$) and analyzed the data inductively.

In the second study (submitted), we distinguished three essential functions in MHP work: communication with the client, their evaluation, and supporting therapeutic change. Across these functions, analogue solutions were being augmented and replaced with digitized and digital solutions. Three themes characterized MHP digital tool usage. The usage was highly adaptive to the client's needs and preferences. However, the considerable MHP autonomy led to significant variance in the tools used; in their digital toolboxes. Many MHPs found benefits with digitized and digital solutions, but most were concerned that the digital interventions would be insufficient for their clients. The key concern was that the digital tools lacked the very aspect their work was founded on: interpersonal therapeutic interaction. From this perspective, achieving the scalability benefits expected from digital solutions is challenging. The research facilitates the game-based intervention design, development, and implementation by providing a rich, qualitative description of the therapeutic environment.

Study 3: The characteristics of first adopters of game-based interventions

All innovative solutions—including game-based—that challenge existing practices and expectations and may attract a self-selected group (Rogers 2003). Understanding the early adopters is crucial to facilitate the user-centered development of new solutions. The third study (submitted) described *who* were attracted to game-based digital interventions. Using a sequential mixed methods research design, we studied adults who had indicated their interest in using a game-based intervention by signing up for a randomized controlled clinical trial (RCT) investigating the effect of a serious game intervention on depression. First, adults with confirmed major depressive disorder (MDD) were interviewed ($N = 22$), the interview data were inductively analyzed, and then the results were quantified with a larger questionnaire dataset ($N = 445$).

The analysis found that the participants exhibited substantial variance in their psychiatric symptomatology, presenting possibilities for transdiagnostic approaches. Their symptoms were often long-term, and they had already received numerous treatments, which invited considering the role of game-based interventions in

augmenting rather than replacing other therapies. The participants were active video game players, and many found that playing allowed self-managing psychiatric symptoms. We took this self-help usage of entertainment games to exhibit the need for purposefully designed game-based interventions. Overall, the results depicted that the users were indeed self-selected, which has implications for the intervention design.

Conclusion: Toward real-world impact

Alleviating mental disorders requires interventions that the users find favorable, lead to meaningful behavioral and symptom changes, and fit the complex healthcare ecosystem. The first three research efforts described here aim for real-world impact by facilitating user-centered intervention development. Ultimately, the research seeks to find ways to alleviate the strain mental health challenges cause society, but most importantly, the individuals and their loved ones.

Keywords

development processes; game development; healthcare; mental health; psychology; psychiatry; user-centered design; serious games

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