A Scoping Review on Digital Mental Health Implementation Frameworks and Lessons Learned for the Minder Mental Health App

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Introduction

- Implementation science is the study of identifying and addressing factors contributing to successful integration of evidence-based practices to real-life scenarios (1).
- *Minder* is a digital mental health intervention (DMHI) mobile app designed to support university students with their mental well-being and substance use consisting 4 components:
  1. An interactive chatbot that delivers evidence-based content regarding sadness, anxiety, relationships etc.,
  2. A services component that matches users with on- and off-campus services based on a short survey
  3. A community component that allow users to filter on-campus clubs by interest
  4. A peer coaching component that matches users with peer coaches trained in psychosocial support
     - *Minder* was shown to be effective in improving symptoms of depression and anxiety as well as overall mental well-being in a randomized control trial (n= 1489) (2)
- Better understanding of implementation frameworks applicable to DMHI may help interventions, such as *Minder*, address common problems surrounding user engagement and retention as they move from research to implementation(2,3). Frameworks highlight areas that influence resource inefficiency, equity, scalability, and user engagement during the implementation process by identifying common failure points (1).

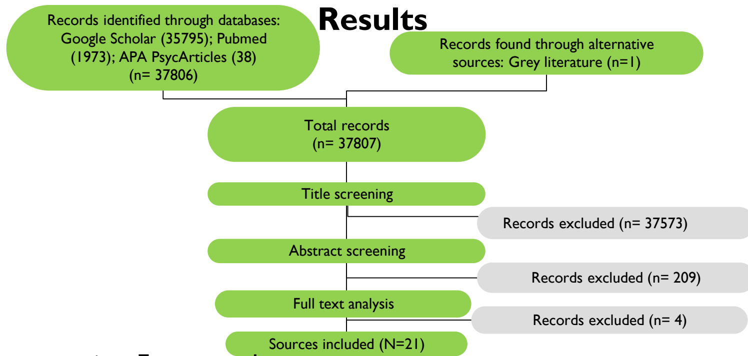
Objective

- Conduct a scoping review on implementation strategies of digital mental health interventions to better understand the key areas and improvements for consideration when implementing *Minder* and other DMHI

Methods

- Medline, Google Scholar, APA PsycArticles were the databases used to search for studies published between 1999 and 2024 in addition to grey literature.
- Keywords used in the search were related to implementation frameworks, digital mental health interventions, and healthcare.
- Studies included addressed the implementation of digital interventions or the application of implementation frameworks in healthcare settings. There were no specific exclusion criteria.
- Screening was conducted in 3 steps: title, abstract, and full text, with articles charted based on authors, year, framework, and major themes emerging from the framework.
- The review was concluded when thematic saturation was reached. Saturation was defined as the point at which new articles do not provide any new insights or themes (ex., multiple studies analyzed consecutively producing no new insights).

Results



Implementation Frameworks

RE-AIM (Reach Effectiveness Adoption Implementation Maintenance)
- Popular framework used frequently in many implementation contexts including healthcare

CFIR (Consolidated Framework for Implementation Science)
- Used primarily in research context to evaluate implementations

i-PARIHS (Promoting Action on Research Implementation in Health Services)
- Used in healthcare context to adapt research into practice

Key Themes

Efficiency
- Cost effectiveness
- Resource efficiency
- Reducing the time between research and clinical use

User Experience
- Improving user perceptions and feelings toward intervention or program

Adoption
- How many users start the program
- Allow intervention to treat a greater number of people

Retention
- How many users continue to use the program
- Increase use of more features e.g., coaching

Key Areas of Potential Improvement

Key Area	*Key Theme Addressed*	Examples of implementation for DMHI
Specialized technical staff	• Efficiency	• Hiring programmers experienced in digital healthcare interventions • Contracting when needed • Adequate and continuous training • References: 4, 7 (i-PARIHS), 8, 9 (CFIR), 13, 14, 16, 17, 18
Improving ease of use	• User experience • Retention • Adoption	• Intuitive app user interface • App customizability/*flexibility* • Eg. Allowing more flexible coaching times, offline features, dictation options • References: 6, 7, 8 , 11, 15, 16, 19, 22
Increased digital accessibility and equity	• User experience • Retention	• App available on more devices and on browsers • Easy to understand user interface (UI) • Streamlined onboarding • More language support • References: 5, 6, 7 (i-PARIHS), 8, 10 (RE-AIM), 13, 15, 16, 21, 22
Marketing	• Adoption	• Posters, billboards and partnerships with organizations for targeted user population • Increased social media presence • Hiring marketing professionals • References: 7 (i-PARIHS), 20,22
Clear user confidentiality guidelines	• User experience • Adoption	• Clear and accessible data disclosure information • In-app anonymity • References: 7 (i-PARIHS), 11, 12, 15, 18, 21, 22
Collecting stakeholder feedback	• Retention • User experience	• Streamline and adding more in-depth feedback forms in app • Surveying key stakeholders (ex., end-users, investors) to collect data on user experience and popular suggestions • References: 4, 5, 9 (CFIR), 10 (RE-AIM), 11, 15, 17, 19, 22, 23

Discussion

- Consideration of the key areas of improvement identified has potential to improve *Minder's* efficiency, scalability, sustainability during an implementation.
- Specific improvements to consider for *Minder* in these key areas include:
  - Utilizing marketing professionals experienced in healthcare and/or social media to create a consistent brand and marketing strategy
  - Adding dedicated feedback areas that encompass both app feature feedback and app bug reporting
  - Supports for other languages
  - Streamlined onboarding including seamless user creation and walkthrough of app components
  - Clear and accessible data disclosure forms during the onboarding process
- Limitations
  - This scoping review was conducted to identify key areas and features of a successful digital mental health intervention.
  - Only focused on frameworks and implementations in healthcare. Analyzing frameworks and implementations in other digital settings may provide more insight.
  - No methodological quality screening was conducted.
  - No duplicate screening was conducted for Google Scholar results but manual screening of the final studies selected was conducted.
  - Google Scholar was used for maximum comprehensiveness.
- Additional research required to evaluate the efficacy of different implementation frameworks in DMHIs.

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