

Navigating the Digital Landscape: A Scoping Review of Mental Health App Integration into Clinical Practice

Nikki S. Rickard, Perin Kurt, Tanya Meade

Submitted to: JMIR Mental Health
on: April 08, 2025

Disclaimer: © The authors. All rights reserved. This is a privileged document currently under peer-review/community review. Authors have provided JMIR Publications with an exclusive license to publish this preprint on its website for review purposes only. While the final peer-reviewed paper may be licensed under a CC BY license on publication, at this stage authors and publisher expressly prohibit redistribution of this draft paper other than for review purposes.

Table of Contents

Original Manuscript.....	5
---------------------------------	----------

Preprint
JMIR Publications

Navigating the Digital Landscape: A Scoping Review of Mental Health App Integration into Clinical Practice

Nikki S. Rickard¹ PhD; Perin Kurt²; Tanya Meade²

¹ The University of Melbourne Carlton AU

² Western Sydney University Sydney AU

Corresponding Author:

Nikki S. Rickard PhD

The University of Melbourne
100 Leicester St
Carlton
AU

Abstract

Background: The global demand for mental health services has significantly increased over the past decade, exacerbated by the COVID-19 pandemic. Digital resources, particularly smartphone apps, offer a flexible and scalable means of addressing the research-to-practice gap in mental health care. Clinicians play a crucial role in integrating these apps into mental health care, although practitioner guided digital interventions have traditionally been considered more effective than stand-alone apps.

Objective: This scoping review explores mental health practitioners' perspectives on integrating smartphone apps into clinical practice. We ask, "What is known about how mental health practitioners view the integration of smartphone apps into their practice?" Further, this scoping review explored the factors that might influence integration of smartphone apps into practice such as practitioner and client characteristics, app design and functionality and practitioner views.

Methods: A systematic search of three databases yielded 38 studies published between 2018-2025, involving 1,894 practitioners across various mental health disciplines, most predominantly psychologists and psychiatrists. Data were collected on practitioner and client characteristics, app functionality, and factors deemed important or influencing practitioners' opinions about app integration.

Results: The included studies were most likely to explore use of apps outside the clinical session, and focussed on self-management apps for mental health monitoring and tracking, and for collecting data from the patient. Fewer studies explored use of apps within session, or practitioner-guided apps. Practitioners prioritized app features aligned with the American Psychological Association's evaluation criteria, with practitioners prioritising engagement and interoperability, but also noted the importance of training and resourcing to support integration.

Conclusions: While practitioners recognise the potential of apps in mental health care, integration into clinical practice remains limited. The review highlights the need for further research on practical implementation, clinical effectiveness, and practitioner training to facilitate the transition from potential to actual use of apps in mental health care settings. Recommendations include evaluating effectiveness of app integration through experimental studies and developing training modules to develop practitioners' digital competencies and confidence in app utilization.

(JMIR Preprints 08/04/2025:75640)

DOI: <https://doi.org/10.2196/preprints.75640>

Preprint Settings

1) Would you like to publish your submitted manuscript as preprint?

✓ **Please make my preprint PDF available to anyone at any time (recommended).**

Please make my preprint PDF available only to logged-in users; I understand that my title and abstract will remain visible to all users.
Only make the preprint title and abstract visible.

No, I do not wish to publish my submitted manuscript as a preprint.

2) If accepted for publication in a JMIR journal, would you like the PDF to be visible to the public?

✓ **Yes, please make my accepted manuscript PDF available to anyone at any time (Recommended).**

Yes, but please make my accepted manuscript PDF available only to logged-in users; I understand that the title and abstract will remain visible to the public.

Yes, but only make the title and abstract visible (see Important note, above). I understand that if I later pay to participate in <http://www.jmir.org/preprint/75640>, I will be able to make my accepted manuscript PDF available to anyone.

No. Please do not make my accepted manuscript PDF available to anyone.



Original Manuscript

Article Type: Review:

"Navigating the Digital Landscape: A Scoping Review of Mental Health App Integration into Clinical Practice"

Abstract

Background: The global demand for mental health services has significantly increased over the past decade, exacerbated by the COVID-19 pandemic. Digital resources, particularly smartphone apps, offer a flexible and scalable means of addressing the research-to-practice gap in mental health care. Clinicians play a crucial role in integrating these apps into mental health care, although practitioner guided digital interventions have traditionally been considered more effective than stand-alone apps.

Objectives: This scoping review explores mental health practitioners' perspectives on integrating smartphone apps into clinical practice. We ask, "What is known about how mental health practitioners view the integration of smartphone apps into their practice?" Further, this scoping review explored the factors that might influence integration of smartphone apps into practice such as practitioner and client characteristics, app design and functionality and practitioner views.

Methods: A systematic search of three databases yielded 38 studies published between 2018-2025, involving 1,894 practitioners across various mental health disciplines, most predominantly psychologists and psychiatrists. Data were collected on practitioner and client characteristics, app functionality, and factors deemed important or influencing practitioners' opinions about app integration.

Results: The included studies were most likely to explore use of apps outside the clinical session, and focussed on self-management apps for mental health monitoring and tracking, and for collecting data from the patient. Fewer studies explored use of apps within session, or practitioner-guided apps. Practitioners prioritized app features aligned with the American Psychological Association's evaluation criteria, with practitioners prioritising engagement and interoperability, but also noted the importance of training and resourcing to support integration.

Conclusions: While practitioners recognise the potential of apps in mental health care, integration into clinical practice remains limited. The review highlights the need for further research on practical implementation, clinical effectiveness, and practitioner training to facilitate the transition from potential to actual use of apps in mental health care settings. Recommendations include evaluating effectiveness of app integration through experimental studies and developing training modules to develop practitioners' digital competencies and confidence in app utilization.

Introduction

Background

The global demand for mental health services has increased significantly over the past decade, with the World Health Organisation reporting a 13% increase in the period from 2007-2017 (World Health Organisation, 2022). The COVID-19 pandemic has placed an additional burden on the mental health system, with the prevalence of depression and anxiety disorders alone increasing by 25% (Santomauro et al., 2021). Mental health professionals are struggling to meet this increased service demand, and there is a need for sustainable approaches to support professional care (Holmes et al., 2018; Kazdin and Blase, 2011; Wainberg et al., 2017).

Digital resources offer a flexible, data rich and economical means of addressing the research-to-practice gap (Australian Government Department of Health, 2020; East & Havard, 2015; McGorry et al., 2022; Torous et al., 2020) and can be used to support the full spectrum of mental health care services (Cornish, 2020; Australian Government Department of Health, 2016; Pedrelli et al., 2023; Rickwood, 2012). Among the most rapidly increasing digital resources available in the mental health sphere are smartphone apps. With over 30,000 mental health smartphone apps (MHapps) available to the public, and smartphone ownership penetrating most sectors of the population, MHapps have the potential to be an accessible and scalable adjunct to professional mental health care (De Witte et al., 2021; LeComte et al., 2020; Wies et al., 2021; Moshe et al., 2021; Wasil et al., 2019; Firth et al., 2017a; 2017b). Smartphone apps can also offer quite sophisticated personalization for each user and are reported to be less stigmatizing for many than seeking professional care (Beard et al, 2019; Widnall et al, 2020 2017a; 2017b).

Clinicians are in a unique position to guide the integration of smartphone apps into mental health care. The breadth of their influence is diverse and can include recommending reputable apps to clients to use independently, or using apps in- or out-of-session with ongoing support (Lipschitz et al., 2019; Gindidis et al., 2019). Digital interventions that are guided by a therapist or with in-person feedback are generally regarded to be more effective than self-management or 'stand-alone' apps (Baumeister et al., 2014; Duarte-Diaz et al., 2023; Garrido et al., 2019; Linarden 2019; Moshe et al., 2021; Weisel et al., 2019). This is consistent with the widely accepted notion of a therapeutic alliance being a key mechanism underlying mental health treatment outcomes (Martin et al, 2000). There is, however, some indication that a major benefit of guided digital interventions may be encouraging adherence to the intervention (Baumeister et al., 2014; Mohr et al., 2011), and that the role of

clinician could be reduced to key touchpoints such as onboarding at the end of every other module or on-demand (Baumeister et al., 2014). While high quality hybrid models such as the Digital Clinic (Calvert et al, 2025; Macrynika et al, 2023) and Precision Behavioral Health (Youn et al, 2025) offer mobile app functionality (monitoring and interventions) fully integrated with strategically placed practitioner support (e.g., via telehealth or in-person followups), there is also a need to better understand how practitioners feel about integrating stand-alone apps into mental health care.

The capacity for smartphone app integration into mental health care also depends on the functionality of the app and the level of support it targets across the mental health spectrum. For example, app functions can include informing, recording, sharing data, reminding, communicating and displaying (IMS, 2013; Myers et al, 2021). Levels of support can range from lower (e.g., wellbeing promotion, mood tracking, assessment and psychoeducation) to higher (interventions and relapse prevention) intensity (Gindidis et al., 2019; Rickard et al., 2022). Digital mental health services are most confidently advocated as a low intensity treatment within the stepped-care model, providing health promotion, prevention and early intervention support for sub-clinical populations (Australian Government Department of Health, 2016; Firth et al, 2017a). Digital apps are also generally claimed to be more effective for prevention and mild symptomatology (Morello et al, 2023; Firth et al, 2017a) although some studies have observed stronger effects for individuals with more severe symptoms (Bakker et al, 2019; Seegan et al, 2023). It would be of interest to better understand where mental health practitioners themselves consider app usage to be most acceptable.

Integration of smartphone apps into mental health care must therefore also consider what factors are important to the practitioner. In a survey of general healthcare providers, regulatory body support and an evidence base were ranked as the most important factors affecting practitioners' decisions to incorporate digital tools into their practice (Leigh & Ashall-Payne, 2019). Previous research has also suggested that remote monitoring tools are of particular interest to mental health providers (Schueller et al., 2016). Several evaluation frameworks describe key criteria identified as important to professional regulatory bodies like the American Psychological Association (APA). The APA's criteria for evaluating MHapps include accessibility, privacy and security, evidence base, engagement and interoperability (Henson et al., 2019; Torous et al., 2018). While models such as the APA evaluation framework are critical for shaping regulation of digital tools like smartphone apps, the prioritisation of standards may not necessarily align with what is important for individual practitioners. For example, while accessibility is the fundamental standard for smartphone MHapps,

if practitioners are supplying devices or paying for the cost of the app, then this criterion may become less critical. In a recent evaluation of 100 of the most popular MHapps at the time (Rickard et al., 2022), only one of those apps were found to meet all the five standards expected by the APA evaluation model. The majority lacked basic accessibility, privacy and security features, and only one met the final criterion of interoperability, which is important for integrating apps into broader mental health care.

Rationale & objectives

The use of smartphone apps among physicians and rehabilitation clinicians has previously been explored in other scoping reviews (Lee et al., 2023; Dicianno et al., 2024); however, to date, no scoping reviews have been conducted on mental health practitioners' integration of smartphone apps into clinical care. The affordances of smartphone apps may vary between different groups of professionals and in different clinical settings (Lee et al., 2023). Accordingly, research from the past six years was examined to answer the broad research question, "What is known about how mental health practitioners view the integration of smartphone apps into their practice?" Further, this scoping review explored the factors that might influence integration of smartphone apps into practice such as practitioner and client characteristics, app design and functionality and practitioner views.

Methods

A scoping review methodology was selected to identify and map key characteristics related to the uptake of smartphone apps by mental health practitioners (Mun et al., 2018). This review was guided by the Preferred Reporting Items for Systematic reviews and Meta-analysis extension for Scoping Reviews (PRISMA-ScR) (Tricco et al., 2018). The protocol was registered via the Open Science Framework (Registration doi: <https://doi.org/10.17605/OSF.IO/VNY7J>)

Search strategy

A search was finalised in March 2025 using three electronic databases (PsycINFO, Web of Science and IEEE Xplore). The search strategy was adapted for each database (see Appendix A). Searches were conducted with a combination of terms related to mental health practitioners and smartphone MHapps. These terms were selected following a preliminary review of the literature. Searches were run against the title and abstract, and where possible, subject headings were combined with keywords. The search was restricted to peer-reviewed journal articles written in English and published between 2018 and March 2025.

Eligibility criteria

Selection of articles was based on the SPIDER (Sample, Phenomenon of Interest, Design, Evaluation, Research type) framework (Cooke et al., 2012), as shown in Table 1. This framework was chosen to capture qualitative, quantitative and mixed methods studies.

Table 1

Eligibility criteria

	Inclusion	Exclusion
Sample	Mental health practitioners if more than 25% of the sample were psychologists, psychotherapists, psychiatrists, or other counsellors/social workers predominantly working in mental health.	- General practitioners, nurses, or other health workers not specific to mental health. - Studies which included both practitioners and other end users (e.g., clients) but did not differentiate results by participant type were excluded.
Phenomenon of Interest	Integration of mental health smartphone apps into practice. Studies exploring the use, consideration, design, or trial of apps were all included.	- Studies focusing on web based MHapps, as opposed to smartphone MHapps. - Studies focusing on only users', rather than practitioners' attitudes, behaviours or experiences towards apps.
Design	- Interviews - Surveys - Observations - Behaviour measures	No original data collected.
Evaluation	Attitudes, behaviours or experiences of mental health practitioners in consideration of, or use of, smartphone app integration into their practice.	- Studies focusing on web based MHapps, as opposed to smartphone MHapps. - Studies focusing on only users', rather than practitioners', attitudes, behaviours or experiences towards apps.
Research Type	- Qualitative - Quantitative - Mixed methods	- Reviews and meta-analyses - Commentaries - Opinion pieces - Study Protocols

Selection

Searches were managed using EndNote X9 and Microsoft Excel. Duplicates were removed using the EndNote deduplication tool. One reviewer (PK) screened titles and abstracts to exclude obviously irrelevant articles and those identified as reviews, commentaries or opinion pieces. The remaining titles and abstracts were then screened by two independent reviewers (NR and PK). Disagreements were resolved by discussion and where doubt existed, an independent assessment was conducted by a third reviewer (TM). Full texts were independently reviewed by all three authors. PK reviewed 100% of the articles, with NR and TM each reviewing approximately 50% of the articles each. Disagreements between each pair of reviewers were resolved by discussion to achieve consensus.

Data extraction and analysis

An Excel spreadsheet was created to compile relevant data. Data items were sorted into five categories:

1. Article information: including author, year of publication, country, aim and design.
2. Practitioner characteristics: including sample size, type of practitioner (e.g., psychologist), age and gender.
3. Client characteristics: including age, mental health condition (e.g., depression), population (e.g., clinical).
4. Characteristics of app use: including app name, app purpose (prevention/wellbeing promotion; psychoeducation; monitoring/tracking; assessment/case identification; treatment/intervention; continuing care/relapse prevention; other), app functionality (inform, instruct, record (collects, shares, evaluates, intervenes), remind/alert, communicate, display, guide), patterns of use, in and/or out-of-session and practitioner guided and/or self-managed.
5. Characteristics considered important and/or useful based on APA's criteria: including accessibility, privacy and security, evidence base, engagement, interoperability, and other.

The data charting form was completed by one reviewer (PK) and a random subset (20%) of articles was independently verified for accuracy by NR and TM. Studies were not critically appraised during this review.

Data Synthesis

Study designs and methodologies were diverse, so data were synthesised in a descriptive format. Frequencies were determined where possible within variables, and trends were identified where

appropriate in a narrative format.

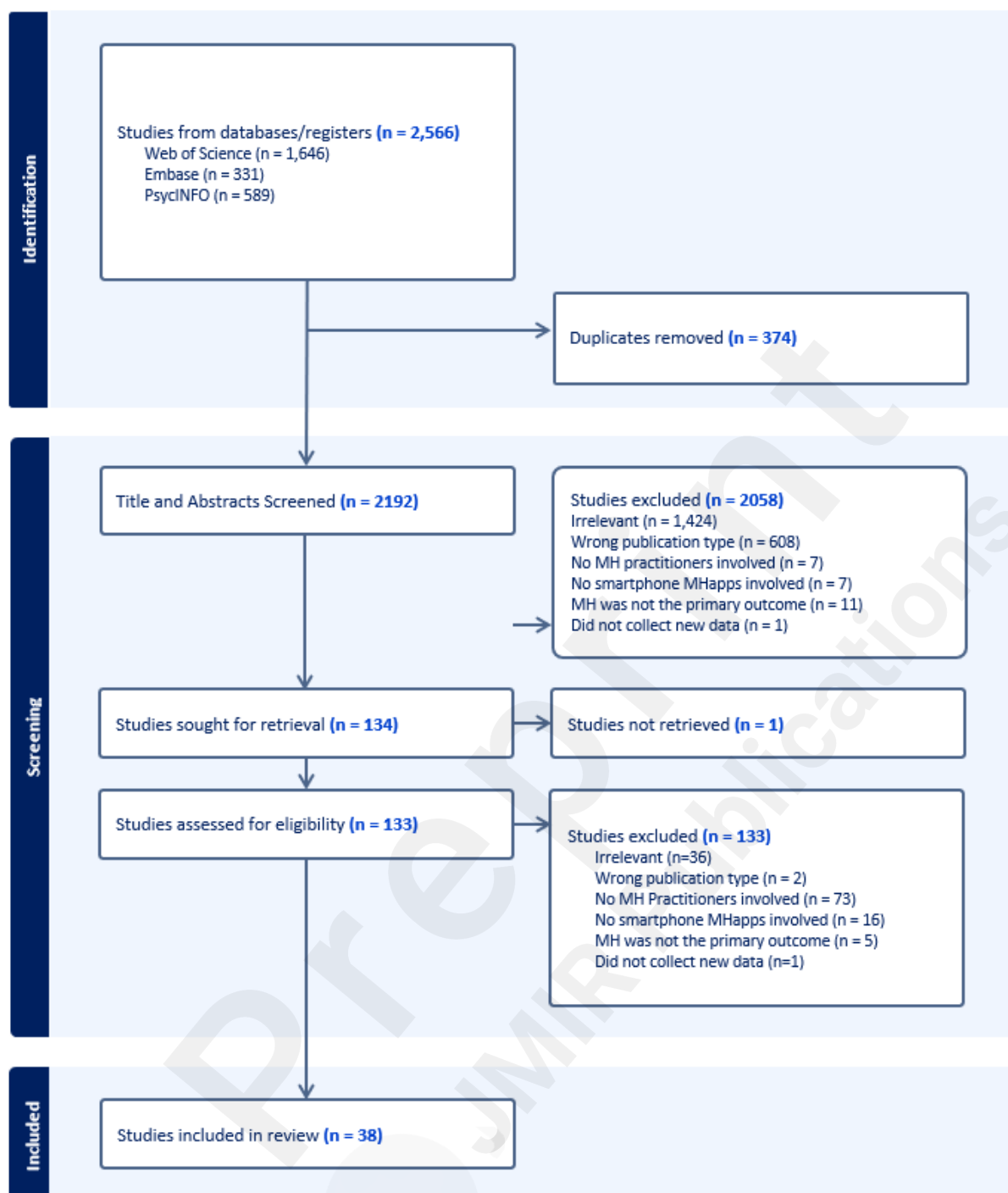
Results

Selection of sources of evidence

The initial search yielded 2,566 records. After removing 374 duplicates, 2,192 titles and abstracts were screened, and 133 full text publications were reviewed. Following full text review, 38 publications were submitted to data extraction (see Figure 1).

Figure 1

PRISMA 2020 Flow Diagram Documenting Literature Search and Outcome of Screening Process



Results of individual sources of evidence & synthesis of results

The full characteristics of the included studies are outlined in Tables 2 to 5.

Table 2*Study Information of Retrieved Studies.*

Author only)	(1 st Year	Country	Aim	Primary Methodology and Design
Adams	2021	US	To develop and perform initial usability pilot-testing of a mobile app designed to augment outpatient behavioural health treatment for adolescents with substance use disorders and co-occurring mental health concerns	• Mixed methods (Pilot) • Semi structured interviews • Questionnaires
Almadani	2025	Saudi Arabia	To investigate MH-App use among Saudi Arabian healthcare workers (HCWs) and assess their interest in and willingness to integrate these apps into their practices, as well as their cognitive flexibility and its relationship with their attitudes and app use	• Quantitative • Questionnaires/Survey • Cross-sectional
Anastasiadou	2019	Spain	To test the acceptability and feasibility of a mHealth tool for patients with an eating disorder among patients and specialists	• Qualitative • Focus groups
Armstrong	2021	US	To explore youth and mental health provider perspectives on using apps to enhance evidence-based clinical care, with an emphasis on behaviour-tracking apps	• Qualitative • Semi structured interviews
Bucci	2019	UK	To explore frontline staff views regarding the utility and appropriateness of using digital tools in the healthcare pathway for people accessing specialist secondary care mental health services	• Qualitative • Focus groups
Chang	2023	US	To conduct interviews with both patients and clinicians about their experience with visualisations being integrated into their care	• Qualitative • Semi-structured interviews
Cheung	2023	Canada	To identify the perceived facilitators and barriers to technology-enhanced measurement based care from both patient and provider perspectives	• Quantitative (cross-sectional) • Survey
Deady	2023	Australia	To systematically detail the development process used to build a smartphone app that supports face-to-face clinical treatment for PTSD	• Mixed Methods • Semi-structured interviews • Questionnaires/Survey
Dobson	2022	New Zealand	To explore the digital competence of psychologists and their use of digital tools in the practice	• Mixed methods • Survey
Dominiak	2024	Poland	To assess the attitudes, expectations, and concerns of mental health professionals towards mHealth, in particular mobile health self-management tools and telepsychiatry	• Mixed Methods • Questionnaires/Survey
Etingen	2024	US	To examine VHA mental health provider perspectives on the MHC app, including impacts that using the app has on mental health care delivery and outcomes.	• Mixed Methods • Semi-structured interviews • Questionnaires/Survey
Dubad	2021	UK	To explore the clinical impacts of mobile mood-monitoring in youth with mental health problems	• Mixed methods • Semi structured interviews
Francesse	2023	Italy	To assess (i) the acceptability of an app that	• Quantitative

			monitors mood by images, speech and questionnaire answers for use in clinics and (ii) the patient user experience.	• Questionnaire	
Green	2023	US	To understand the methods to implement and support technology in routine coordinated specialty care (CSC) and offered insights from a quality improvement study assessing the implementation outcomes of digital mental health interventions (DMHIs) in CSC.	• Mixed Methods • Questionnaires/Survey	
Gonzalez-Perez	2024	Spain	A geolocation-based smartphone software component was designed and developed to instrumentalise patient guidance in in-vivo ET and its psychological validity was assessed	• Mixed Methods • Questionnaires/Survey	
Heydarian	2023	Iran	To identify the features of designing a mobile application for BP-affected patients	• Mixed Methods • Semi-structured interviews • Questionnaires/Survey	
Hildebrand	2024	Germany	To explore psychotherapists' perspectives on the barriers and facilitating conditions to internet- and mobile-based interventions.	• Qualitative • Questionnaires/Survey • Cross-sectional	
Hoffman	2019	US	To test the feasibility of using mental health applications to augment integrated primary care services; solicit feedback from patients and providers to guide implementation, and develop a mental health apps toolkit for system-wide dissemination	• Mixed methods (longitudinal pilot) • Survey	
Kerst	2020	Germany	To explore the attitudes of health care professionals towards their use of apps for depression in practice	• Survey	Quantitative
Khan	2023	Canada	To understand stakeholders' opinions and experiences on how to choose a Mhealth App.	• Qualitative • Semi-structured interviews	
Lukka	2023	Finland	To create a contextual understanding of how MHPs use different digital tools in clinical client practice and what characterises the use across tools	• Qualitative • Semi-structured interviews	
Li	2022	Australia	To design a new CBT smartphone app that targets depressive and anxiety symptoms in adolescents	• Quantitative • Survey	Quantitative
McGee-Vincent	2023	US	To develop, disseminate, and evaluate a training for multidisciplinary staff as part of a national quality improvement project to increase the reach of mobile mental health apps as a resource for veterans	• Quantitative • Questionnaires/Survey	
Medich	2023	US	To analyse the acceptability and usability of passive mobile monitoring and self-tracking among patients with serious mental illness and their mental health clinicians	• Qualitative • Semi-structured interviews • Focus groups	
Miller	2019	US	To evaluate the use and perceptions of apps among Primary Care Mental Health Integration (PCMHI) providers	• Mixed • Survey	methods
Morton	2021	Multiple	To explore clinicians' attitudes towards, and use of apps when working with people with bipolar disorder (BD)	• Mixed • Survey	methods
Naccache	2021	France	To explore early acceptability and user experience of a companion app prototype for adolescents with anorexia nervosa (AN) using user-centred design methods	• Mixed • Semi structured focus group interviews • Questionnaires	methods

Nogueira-Leite	2023	Portugal	To understand the attitudes and expectations of psychiatrists and psychologists toward digital mental health apps (DMHAs) in the Portuguese context, as well as perceived benefits, barriers, and actions to support their adoption	• Mixed Methods • Semi-structured interviews • Questionnaires/Survey • Cross-sectional
Orengo-Aguayo	2018	US	Assess providers' views of the use of technology in the delivery of an empirically supported mental health treatment for adolescents (Trauma-Focused Cognitive Behavioral Therapy; TF-CBT)	• Mixed methods • Semi structured focus group interviews • Survey
Patoz	2021	France	To identify, through a user-centred design approach, patient and physician expectations of a hypothetical app dedicated to depression	• Qualitative • Semi-structured interviews
Puhy	2021	US	To investigate whether the mHealth software platform, NeuroFlow, was usable and acceptable for students receiving mental health services and for their treatment providers	• Mixed methods • Focus groups • Questionnaire
Richards	2018	Australia	To investigate therapist views on their experiences using a technological adjunct (goACT) to traditional, face-to-face psychotherapy	• Qualitative • Focus groups
Rodriguez-Villa	2021	Multiple	To engage clinicians, and people living with schizophrenia spectrum disorders and their family members in developing new features and co-designing the mindLAMP app and assess its effectiveness in predicting and preventing relapse	• Qualitative • Focus groups
Rothmann	2022	Denmark	To develop and pilot test a telepsychology module for inclusion in the app My Hospital to provide remote psychological counselling to vulnerable adults with either rheumatic diseases or diabetes	• Qualitative • Semi-structured interviews
Stefancic	2022	US	To describe the systematic process of soliciting inputs from clinician stakeholders to develop First Episode Digital Monitoring (FREEDoM), an app-based mHealth intervention	• Qualitative • Semi-structured interviews
Strodl	2020	Australia	To explore the perceptions of PTSD Coach Australia by clinicians with experience in assisting Defence members with mental health problems	• Mixed methods • Focus groups • Semi-structured interviews • Questionnaire
Weermeijer	2023	Belgium	To evaluate the usability of an experience sampling method (ESM) protocol for using the ESM in a specialised mental health care setting	• Mixed Methods • Semi-structured interviews • Questionnaires/Survey • Pilot
Wu	2020	US	To understand clinicians' perspectives on patient-generated health data (PGHD) and current mental health apps	• Mixed methods • Semi structured interviews

1. Studies' characteristics

Publications were distributed evenly across the 8 year period of inclusion (2018-2025) with a peak in

2023 during which 32% of included studies were published (see Table 2). The largest representation of studies was from the US (32%), then Australia (11%), with only one or two studies across each of remaining 14 countries. The total number of practitioners sampled within the retrieved studies was 1,894, with sample sizes ranged from three (Rothman et al., 2022) to 271 (McGee et al, 2023), and 11 being the median sample size.

The studies' aims covered a wide range of topics related to the use of mobile apps in mental health care, with about half the studies retrieved reporting on clinicians' attitudes, experiences, and their views on acceptability and feasibility of using digital tools in mental health care. Usability studies involved developing and testing mobile mental health apps for a variety of conditions, with depression the most common, and then general mental health and multiple disorders. Less commonly, studies focussed on evaluating specific features of mental health apps, such as mood monitoring components, or on developing training programs for healthcare professionals and assessing their digital competence. The studies employed a diverse range of methodological approaches, with the majority utilizing qualitative or mixed methodologies to explore the perspectives, experiences, and needs of stakeholders regarding the use of mobile apps in mental health care. More than half the studies (20 studies; 53% of total) were mixed methods designs, while 12 studies (32% of total) were qualitative designs (involving for example, focus groups, semi-structured interviews). Only six studies (16%) had an entirely quantitative design (involving cross-sectional and longitudinal surveys or questionnaires). Several studies focussed in designing new apps included co-design or user-centred design approaches, which emphasized the involvement of end-users (practitioners, clients, or both) in the development and refinement of mobile apps.

Table 3*Characteristics of Practitioners and Clients in Retrieved Studies*

Characteristics of Practitioners					Characteristics of Clients		
Author	Sample size meeting criteria (of total)	Sample Type	Age ¹ Mean (SD) where available	Gender (%)	Age Mean (SD)	Mental Health Condition	Population
Adams	11 (55% of N=20)	(Clinicians with active adolescent SUD treatment caseload) 2 PsyD trained 6 licences clinical social workers 3 licensed medical health counsellors	• Alpha: 43.3 (7.5) • Beta 2: 37.8 (12.1)	Female (100%)	• Alpha: 15.3 (1) • Beta: 15.9 (1)	Substance use disorders	Clinical
Almadani	135 (35% of N=386)	62 Psychiatrists 73 Psychologists	<30 (61.1%) 30-40 (30.1%) 41-50 (06.0%) >50 (02.8%)	53.40%	Not reported	Not reported but likely multiple conditions	Not Reported but likely Clinical
Anastasiadou	7 (88% of N=8)	2 Psychiatrists 5 Psychologist	34.63 (7.21)	Female (75%)	15 (0.5)	Eating disorders	Clinical
Armstrong	6 (50% of N=12)	6 Psychologists	38.42 (5.78)	Female (67%)	18.9 (3.73)	Not reported (General mental health)	Clinical
Bucci	17 (35% of N=48)	(Working in Early Intervention for psychosis services) 8 Clinical psychologists 5 Mental health practitioners 4 Psychiatrists	36.2 (SD not reported)	Female (56%)	Not reported	Psychosis	Not reported (but is likely clinical)
Chang	5 (100% of N=5)	(Clinicians working at the clinic where study was done) 3 M.S. Counselling Psychology 1 PhD Health Psych/ Clinical Sci Counselling 1 DPpsychology	Not reported	Not reported	37 (10.7)	Depression Anxiety	Clinical

¹ Mean age and gender typically reported for all practitioners, and sometimes all of sample.

candidate							
Cheung	98 (91% of N=108)	(Healthcare providers currently providing services) 97 Psychiatrists 1 Psychologist	Mode: 60+ (34.3%)	Female (40.7%)	• 18-29 (20.5%) • 30-39 (24.4%) • 40-49 (20.6%) • 50-59 (22.9%) • 60+ (13%)	Depression	Clinical
Deady	3 (100% of N=3)	3 Clinical Psychologists	Not reported	100%	50 (range 42-56)	PTSD Anxiety Depression	Clinical
Dobson	178 (91% of N=195)	78 Psychologists 75 Clinical Psychologists 25 Interns	Mode: 24-35 (37%)	Female (88%)	Not reported	Not reported	Not reported
Dominiak	62 (42% of N=148)	62 Psychologist/ Psychotherapist	25-39 (27%) 40-55 (56%) 55-64 (15%)	67%	Not reported	Not reported	Not Reported
Dubad	3 (50% of N=6)	2 consultant psychiatrists 1 assistant mental health practitioner	Not reported	Not reported	20.71 (2.56)	• Psychotic disorders • Mood, panic, eating, and/or anxiety disorders	Clinical
Etingen	230 (81% of N=284)	197 Psychologists 25 Psychiatrists 8 Counsellors	Under 35 (19.2%) 36-45 (50.5%) 46-55 (19.2%) 56-65 (9.3%) 66-75 (1.6%)	80.70%	Not reported	PTSD Depression Anxiety Military sexual trauma Adjustment disorders/ stress reactions Substance use disorder Bipolar disorder Psychotic disorders Other diagnoses	Clinical
Francese	8 (100% of N=8)	4 Psychiatrist 4 Psychologist	43 (6.18)	Not reported	36.24 (14.02)	Depression	Clinical
Gonzalez-Perez	9 (100% of N=9)	9 Psychology experts (5PhD,	35 (SD not	66.60%	Not reported	Anxiety disorders	Not Reported

		4MD)	reported)				but likely Clinical
Green	7 (78% of N=9)	6 Psychiatrist 1 Psychologist	Not reported	Not reported	19.6 (2.05)	Psychosis	Clinical
Heydarian	7 (54% of N=13)	7 Psychiatrists	Not reported	Not reported	Not reported	Bipolar disorder	Clinical
Hildebrand	269 (77% of N=350)	269 Licensed Psychotherapists (incl CBT, psychodynamic therapy, analytical psychotherapy, and systemic psychotherapy)	42.83 (12.16)	76.90%	Not reported	Anxiety Depressi on Stress- related Substanc e abuse Pain	Clinical
Hoffman	15 (63% of N=24)	12 Psychotherapists 3 Consult Psychiatrists	Not reported	Not reported	36.5	• Anxiety • Stress • Depressi on • Alcohol and tobacco use	Clinical
Kerst	33 (58% of N=57)	33 Medical Practitioner/ Psychologist/ Psychotherapist	43 (12.3)	Female (64.9%)	Not reported	Depressi on	Not reported
Khan	2 (33% of N=6)	2 Psychiatrists	Range: 32-48	Not reported	Range: 32-48	Not reported but general mental health, and at least one affective disorder	Not Reported but likely Clinical
Lukka	11 (61% of N=19)	7 Psychologist- Psychotherapists 4 Psychologists	18-29 (5%) 30-39 (16%) 40-49 (32%) 50-59 (37%) 60-69 (11%)	68%	Not reported	Not reported	Clinical
Li	10 (31% of N=32)	10 Psychologists (Psychiatrists were included in "other" - so actual number unknown)	38.7 (10.4)	Female (81.3%)	14.94 (1.3)	• Depressi on • Anxiety	• Clinical • Non- clinical
McGee- Vincent	271 (25% of	232 Psychologists 39 Psychiatrists	MHSL staff	MHSL staff (71.8%)	Not reported	Not reported	Clinical

	N=1107)		(44.2, 10.2) AOSL staff (46.0, 10.9)	AOSL staff (79.1%)				
Medich	10 (63% of N=16)	7 Psychiatrists 3 Psychologists	Not reported	Not reported	Median: 45, Range: 21-66 years	Serious mental illness	Clinical	
Miller	103 (47% of N=220)	(PCMHI providers) 103 Psychologists	45.5 (11.1)	Female (78.6%)	Not reported	Apps were used primarily for insomnia or sleep disturbances (76.4%), stress (75.8%), PTSD (65.9%), depression (65.9%), and/or anxiety (64.3%).	Not reported	
Morton	57 (71% of N=80)	31 Psychiatrists 18 Psychologists 8 Registered Counsellors	44.7 (13.1)	Female (53.8%)	Not reported	Bipolar disorder	Not reported	
Naccache	3 (43% of N=7)	3 Psychiatrists	36.7 (7.38)	Female (57.1%)	15.5 (1.07)	Anorexia nervosa	Clinical	
Nogueira-Leite	152 (95% of N=160)	127 Psychologists 25 Psychiatrists	<26 (2.5%) 26-35 (35%) 36-45 (36.9%) 46-55 (19.4%) 56-65 (3.8%) >65 (2.5%)	83.80%	Not reported	Not reported	Clinical	
Orengo-Aguayo	Phase 1: 7 (78% of N=9) Phase 2: 35 (63% of N=56)	(TF-CBT Providers) P1: 7 Clinical or Counselling Psychologists P2: 35 Clinical or Counselling Psychologists	• Phase 1: 41.88 (10.25) • Phase 2: 39.73 (10.26)	Not reported	Not reported (although we know that the clinicians treated children and adolescents)	Trauma-related conditions	Not reported (but is likely clinical)	
Patoz	16 (62% of N=26)	Psychiatrists and physicians - 10 general	45.5 (12.2)	Female (50%)	51.5 (15.5)	Depression	Clinical	

		practitioners remainder must be psychiatrists (n=16)						
Puhy	3 (100% of N=3)	1 Licensed Psychologist 2 Counsellors (Masters level)	Not reported	Not reported	16.1 (1.2)	Most common disorder was depressio n (44.4%, n = 4)	Clinica (5+ sessions)	
Richards	6 (100% of N=6)	6 Intern Psychologists (but all had provisional or full registration with AHPRA)	Not reported	Not reported	Not reported (although we know that the patients were 18 years and older)	Not reported	Not reported (but is likely clinical)	
Rodriguez- Villa	35 (67% of N=52)	21 Psychiatrists 7 Psychologists 7 possibly Psychiatry Residents?	• BIDMC: 41 (SD not reported) • AIIMS: 35 (SD not reported) • NIMHAN S: 41 (SD not reported)	Not reported	• BIDMC: 32 (SD not reported) • AIIMS: 33 (SD not reported) • NIMHANS: 35 (SD not reported)	Schizoph renia	Clinical	
Rothmann	3 (100% of N=3)	3 Psychologists (master level counsellors)	Not reported	Not reported	Only reported range = 25-59 years	Not reported	Referred to clinic due to psycholo gical challenge s related to living with chronic rheumati c disease or diabetes	
Stefancic	8 (73% of N=11)	Psychiatric team specialising in First Episode Psychosis 5 Psychiatrist and nurse practitioner 3 Primary therapists (clinical social workers)	Not reported	Not reported	Not reported (although we know the clinics provide treatment to adolescents and young adults aged 16-30 years)	Psychosis	Assume Clinical	

Strodl	38 (60% of N=63)	36 Psychologists 2 Counsellors	• Focus group: 47 (10.5) • Telephone sample: 45.7 (10.5)	• Focus group: Female (73%) • Telephone sample: Female (80%)	Not reported	PTSD/ Trauma	Not reported	
Weermeijer	9 (75% of N=12)	6 Clinical Psychologists (but 1 dropout) 3 Psychiatrists (all 3 dropped out)	Users: 45.57 (6.11) Dropouts or nonusers: 43.50 (17.50)	Users: 88% Dropouts or nonusers: 25%	Users: (11.27) Dropouts or nonusers: (13.47)	34.93 or 36.67	Not reported (likely multiple including substance abuse, OCD, stress)	Clinical
Wu	12 (100% of N=12)	7 Psychiatrists 5 Clinical Psychologists	Not reported	Female (41.6%)	Not reported	Not reported	Not reported	

2. Practitioner and Client information

A range of mental health practitioners were represented in the included studies (see Table 3), with psychologists the most common (in 32 studies) and psychiatrists the next most common (in 21 studies). Practitioner age varied significantly across studies, with modal age ranging from under 30 to over 60 years, and there were more female (40.7% to 100% range) than male or non-binary practitioners represented.

Clients' age ranged from 15 to 52 years, with the most common age range (when reported) being adolescents and young adults (eight studies). The majority of studies (29 of 38 studies) appearing to include clinical samples, although reporting was at times ambiguous. The most commonly reported mental health conditions in the clients sample were mood disorders (depression, anxiety, bipolar disorder) following by general mental health conditions and multiple disorders.

Table 4

Characteristics of App Use in Retrieved Studies

Author	App Name	App	Purpose	App Function	In and/or	Practitioner	Patterns of Use
--------	----------	-----	---------	--------------	-----------	--------------	-----------------

				Out of Session	Guided and/or Self-Managed	
Adams	Bright Path	• Prevention/ Promotion • Assessment/ Case Identification)	• Inform - Collect • Instruct	Both	Both	Not reported
Almadani	Recommended a variety of apps including Qariboon (31.1%), Calm (19.8%), Alseha Alnasfsia (19.8%), Headspace (14.2%)	Psychoeducation Monitoring/ Tracking Treatment/ Intervention	• Inform • Instruct • Record - Collect • Communicate	Not Reported	Not Reported	27.5% of HCWs recommended mental health apps to their patients, 71.2% intended to use the apps in the future for patient-related purposes.
Anastasiadou	TCApp	• Monitoring/ Tracking • Continuing Care/ Relapse Prevention	• Record - Collect, Share • Remind/Alert • Communicate	Out-of-session	Practitioner guided	Not reported
Armstrong	N/A	• Monitoring/ Tracking	• Record - Collect	Out-of-session	Not reported	Not reported
Bucci	N/A	• Monitoring/ Tracking • Treatment/ Intervention	• Record - Collect, Share, Evaluate, Intervene	Out-of-session	Self-managed	Not reported
Chang	mindLAMP	Monitoring/ Tracking	• Record - Collect • Remind/Alert • Display	Out-of-session	Not Reported	2 clinicians did not often utilise the app visuals in clinical settings. 1 clinician found that the reports rarely, if ever, augmented patient care.
Cheung	N/A	• Assessment/ Case Identification • Monitoring/ Tracking	• Record - Collect, Share, Evaluate	Not reported	Not reported	Not reported
Deady	Support Base	Psychoeducation Treatment/ Intervention	• Inform - Collect, Share • Remind/Alert • Communicate	Out-of-session	Practitioner guided	Two clinicians stated they would be 'somewhat likely' to incorporate an app as a treatment support tool, while the other

							was likely unlikely'.	'neither nor
Dobson	N/A	Not reported	Not reported	Not reported	Not reported	Not reported	Not reported	
Dominiak	N/A	Prevention/ promotion Monitoring/ Tracking Continuing care/ Relapse prevention	Wellbeing Tracking care/	• Record - Collect	Not Reported	Not Reported	Between 2020 and 2023, 71.43% to 74.19% of participants would recommend apps to patients.	
Dubad	Catch It	• Monitoring/ Tracking		• Record - Collect	Not reported	Not reported	Not reported	
Etingen	Mental Health Checkup (MHC)	Monitoring/ Assessment/ identification	Tracking Case	• Record - Collect, Share • Remind/Alert • Display	Out-of-session	Practitioner guided	Most assigned assessments through MHC to veterans, and had reviewed these assessments.	had
Francese	EDApp	• Assessment/ Identification • Monitoring/ Tracking	Case	• Record - Collect, Share, Evaluate • Display	In-session	Practitioner guided	Not reported	
Gonzalez-Perez	SyMptOMS-ET	Psychoeducation Monitoring/ Tracking Assessment/ identification Treatment/ Intervention	Case	• Inform • Record - Collect • Remind/Alert • Guide	Out-of-session	Self-managed	Not reported	
Green	mindLAMP	Psychoeducation Monitoring/ Tracking Treatment/ Intervention		• Inform • Instruct • Record - Collect, Share • Remind/Alert	Out-of-session	Practitioner guided	Not reported?	
Heydarian 223	N/A	Psychoeducation Monitoring/ Tracking		• Inform • Record - Collect, Share • Remind/Alert • Display	Not Reported	Self-managed	Not reported	
Hildebrand	N/A	Psychoeducation Treatment/ Intervention		• Inform • Record - Collect • Communicate	Out-of-session	Not Reported	26.29% reported already prescribing IMIs.	
Hoffman	Variety from Cambridge Health Alliance's mobile app toolkit including Breahe2Relax, Mindfulness	• Treatment/ Intervention • Psychoeducation • Monitoring/ Tracking		• Record - Collect, Intervene • Inform • Guide	Out-of-session	Self-managed	The majority (82.6%) incorporated apps into their clinical work	

	Coach, Self-Help for Anxiety Management, CBT-iCoach, MoodTools, T2 MoodTracker, QuitforLife						
Kerst	N/A	• Treatment/ Intervention		Not reported	Not reported	21.1% indicated that they used apps in clinical practice before	
Khan	N/A	Psychoeducation Monitoring/ Tracking Treatment/ Intervention	• Inform • Record - Collect • Remind/Alert	Not Reported	Not Reported	One clinician mentioned that they had not recommended any apps, while the other clinician noted that some patients successfully integrated apps into their daily routines and reported back as part of continued follow-up care.	
Li	ClearlyMe	• Treatment/ Intervention (CBT) • Psychoeducation (activities for depression)	• Inform • Record - Collect Share	Out-of-session	Self-managed	Not reported	
Lukka	N/A	Psychoeducation Treatment/ Intervention	• Inform (although unclear if used for other purposes also)	Not Reported	Both	The MHPs rarely used or recommended mobile apps to their clients.	
McGee-Vincent	N/A	Not Reported	Not Reported	Not Reported	Not Reported	61.7% reported that they would definitely recommend the VA MH apps to veterans at baseline, increasing to 84.5% following training	
Medich	Mobile Sensing	Monitoring/ Tracking	• Record - Collect, Share • Remind/Alert • Display	Out-of-session	Self-managed	Most had no experience using mobile apps for mental	

							health in their clinical practice, but said they would recommend the Mobile Sensing app to their patients.
Miller	The most commonly used VA-created apps were Mindfulness Coach (67.6%), CBT-i Coach (56%), PTSD Coach (50.5)	• Monitoring/ Tracking	• Inform • Record - Collect • Remind/Alert • Guide	Out-of-session	Self-managed	Majority (82.7%) recommended or used apps with their patients	
Morton	N/A	• Monitoring/ Tracking • Treatment/ Intervention	• Record - Collect • Inform	Not reported	Self-managed	Approximately half (48.8%) discussed or recommend health apps with patients	
Naccache	Not reported	• Prevention/ Promotion • Monitoring/ Tracking • Treatment/ Intervention	• Inform • Guide • Record - Collect, Evaluate • Remind	Not reported	Self-managed	Not reported	
Nogueira-Leite	N/A	Monitoring/ Tracking	• Record - Collect	Not Reported	Not Reported	42.5% declared to have an increased likelihood to prescribe DMHAs in the coming 12 months, although almost none had prescribed digital MHapps to their clients to date.	
Orengo-Aguayo	N/A	• Prevention/ Promotion • Monitoring/ Tracking • Assessment/ Case Identification	• Remind/Alert • Record - Collect • Communicate • Inform	Both	Practitioner guided	Not reported	
Patoz	N/A	• Prevention/ Promotion • Monitoring/ Tracking • Assessment/ Case Identification	• Record - Collect, Share, Evaluate, Intervene • Display • Communicate • Inform • Guide • Remind/Alert	Out-of-session	Self-managed	Not reported	

			• Instruct			
Puhy	NeuroFlow	• Prevention/ Promotion • Monitoring/ Tracking	• Remind/Alert • Record - Collect, Share, Evaluate, Intervene • Inform • Guide • Communicate • Display	Both	Both	Not reported
Richards	goACT	• Tracking/ Monitoring • Assessment/ Case Identification	• Communicate • Remind/Alert • Record - Collect, Share	Out-of- session	Both	Not reported
Rodriguez- Villa	mindLAMP	• Continuing Care/ Relapse Prevention	• Record - Collect, Evaluate • Display • Guide • Remind/Alert • Inform • Instruct • Communicate	Both	Self- managed	Most providers had suggested mindfulness apps to patients, and some recommended apps focused on clinical outcomes such as DBT diary card or CBT apps.
Rothmann	My Hospital	• Prevention/ Promotion • Treatment /Intervention	• Inform	Both	Practition er guided	Not reported
Stefancic	First Episode Digital Monitoring (FREEDoM)	• Assessment/ Case Identification	• Record - Collect, Share, Evaluate • Inform • Communicate • Instruct • Display	Out-of- session	Self- managed	Not reported
Strodl	PTSD Coach	• Prevention/ Promotion • Tracking/ Monitoring • Assessment/ Case Identification	• Inform • Record - Collect, Share • Guide • Remind/Alert	Out-of- session	Both	Not reported
Weermeijer	IMPROVE	Monitoring/ Tracking	• Record – Collect, Share • Remind/Alert • Display	In- session	Not Reported	Not reported
Wu	31 sleep and mood tracking apps	• Monitoring/ Tracking	• Record - Collect, Share, Evaluate • Display	Out-of- session	Practition er guided	Not reported

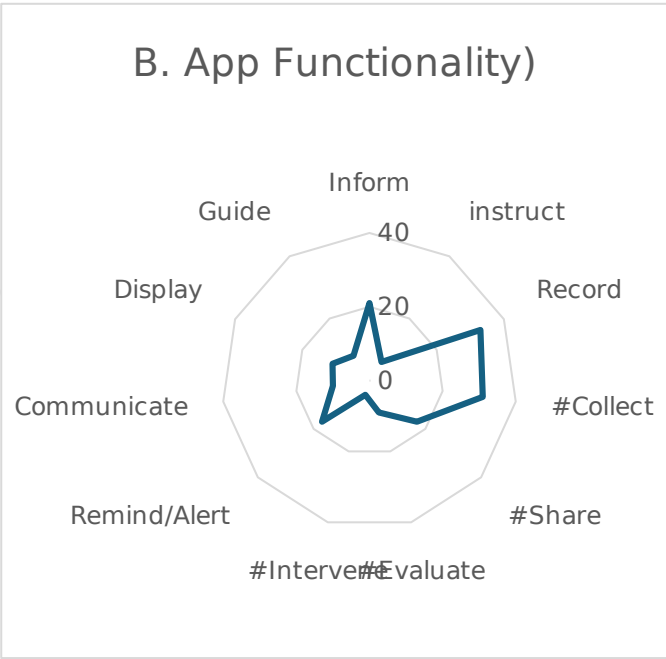
3. App Characteristics

Almost half the studies (18 of the total of 38; 47%) explored the use of a specific app, with four studies (11%) examining a toolkit of apps (see Table 4). The remaining studies explored practitioners attitudes or use of mental health apps more generally.

The majority of apps discussed across studies were Monitoring or Tracking apps, followed by Treatment/Intervention apps, Psychoeducation and Assessment/Case identification apps (Figure 2A). With regard to app functionality (Figure 2B), most apps (66%) had three or less of the seven IMS app functions. The majority of apps (87%) included a Recording function, with nearly all Collecting data from users (82%). The next most common function was Informing (55% of apps), followed by Reminding/Alerting (45%) and Recording for purpose of Sharing data (45%). The least common functions were Instructing (evidence in only 16% of apps) and Intervening (11% of apps).

Figure 2

Radar plots of (A) Purpose of apps, and (B) App Functionality. #Relates to 4 sub-functions of Recording function



Apps were used primarily out-of-session (18 of 38 studies; 47%), with five studies (13%) citing app use both in and out of session. Only two studies (Francese & Attanasio, 2023; Weermeijer et al, 2023) focused on an app used specifically in clinical sessions. The most common management approach reported was self-management (12 studies; 32%), with five studies (13%) reporting both practitioner-guided and self-management, and eight studies (21%) were practitioner-guided

only. The remainder of studies did not report the management approach.

Sixteen of the 38 retrieved studies (42%) indicated practitioners’ current patterns of using apps with their clients. In the majority of these studies (82%), practitioners had incorporated apps into their practice by either using them or recommending them to clients. Patterns of use included providing a list of apps to patients to explore, or recommending a specific app with varying levels of instructions or follow up. Where described, the practitioner’s intentions tend to be for patients to self-manage their health (e.g., Hoffman et al., 2019; Miller et al., 2019; Morton et al, 2021; Rodriguez-Villa et al, 2022), with follow up or review rarely reported. In other studies, practitioners intended to use apps in the future for their patients (e.g. Almanadi et al, 2025; Nogueira-Leite et al, 2023). In one study, the likelihood of prescribing apps increased following practitioner training designed to increase the reach of mobile mental health apps for veterans (McGee-Vincent et al, 2023).

Table 5
APA App Quality Features Prioritised by Practitioners in Retrieved Studies

Author	Accessibility	Security Privacy	& Evidence Base	Engagement	Interoperabilit y
Adams	Yes	Yes	Yes	Yes	Yes
Almadani	Yes	Yes	Yes	Not reported	Not reported

Anastasiadou	Yes	Yes	Yes	Yes	Yes
Armstrong	Yes	Yes	Yes	Yes	Yes
Bucci	Yes	Yes	Not reported	Yes	Yes
Chang	Yes	Yes	Yes (e.g., applicability to certain disorders/therapies)	Yes	Yes
Cheung	Yes	Yes	Not reported	Not reported	Not reported
Deady	Yes	Not reported	Yes	Yes	Yes
Dobson	Not reported	Yes	Not reported	Not reported	Not reported
Dominiak	Yes	Not reported	Yes	Yes	Yes
Dubad	Not reported	Not reported	Not reported	Not reported	Yes
Etingen	Not reported	Not reported	Not reported	Yes	Yes
Gonzalez-Perez	Not reported	Not reported	Not reported	Not reported	Not reported
Green	Yes	Not reported	Yes	Yes	Yes
Francese	Not reported	Not reported	Not reported	Yes	Yes
Heydarian	Not reported	Yes	Yes	Not reported	Yes
Hildebrand	Yes	Not reported	Yes	Yes	Not reported
Hoffman	Yes	Yes	Yes	Yes	Yes
Kerst	Yes	Yes	Not reported	Not reported	Yes
Khan	Not reported	Yes	Not reported	Yes	Yes
Li	Yes	Yes	Yes	Yes	Yes
Lukka	Not reported	Yes	Yes	Yes	Not reported
McGee-Vincent	Yes	Yes	Yes	Yes	Not reported
Medich	Not reported	Not reported	Yes	Yes	Not reported

Miller	Yes	Yes	Yes	Yes	Yes
Morton	Yes	Yes	Yes	Yes	Yes
Naccache	Yes	Yes	Yes	Yes	Yes
Nogueira-Leite	Yes	Not reported	Yes	Yes	Yes
Orengo-Aguayo	Yes	Yes	Yes	Yes	Yes
Patoz	Yes	Yes	Yes	Yes	Yes
Puhy	Not reported	Yes	Yes	Yes	Yes
Richards	Yes	Not reported	Not reported	Yes	Yes
Rodriguez-Villa	Yes	Yes	Yes	Not reported	Yes
Rothmann	Yes	Not reported	Not reported	Yes	Not reported
Stefancic	Yes	Yes	Yes	Yes	Yes
Strodl	Yes	Yes	Yes	Yes	Yes
Weermeijer	Yes	Not reported	Yes	Yes	Not reported
Wu	Not reported	Not reported	Yes	Yes	Yes

4. Practitioners' prioritisation of app features mapped onto APA app quality criteria

All five APA criteria were recognised as important across the majority of studies (see Table 5). The criterion most commonly raised was Engagement, cited by practitioners in 79% of the retrieved studies. Factors of importance to practitioners included ease of use and user-friendliness, attractive and intuitive design, ability to personalize and customize features, inclusion of reminders and notifications, gamification and interactive elements and provision of feedback and progress tracking. For example, Li et al (2022) emphasized the importance of incorporating interaction patterns and functionalities used in popular social media apps, such as swipe interactions and short videos, to enhance engagement for a youth-focused app.

Similar in importance to practitioners was Interoperability, cited in 76% of the studies, with key factors including the ability to share data with clinicians or caregivers, integration with electronic health records, supporting in-session and between-session use and compatibility with clinician workflows and systems. For example, Wu et al (2020) highlighted the importance of apps that

seamlessly integrate data into electronic health records and support collaborative care, suggesting the value of interoperability for practitioners.

Accessibility and evidence base were also commonly cited criteria by practitioners (cited in 68% and 71% of studies respectively). Accessibility included factors associated with smartphone ownership (due to technical resources such as WiFi or cost), availability on multiple platforms, language requirements, ability to use offline or on-demand, and data storage requirements. Regarding the importance of an Evidence-base, practitioners noted the importance of including credible, reliable, and up-to-date content, the use of validated scales and questionnaires, alignment with clinical practice guidelines, provision of psychoeducation, information being appropriate for specific mental health conditions and information about the underlying science and research. For example, Miller et al (2019) noted that the intention to use apps in the future was influenced by professional training, followed by scientific evidence, suggesting the importance of an evidence base for practitioners. Security and Privacy concerns were the least frequently cited issue by practitioners although still cited in 63% studies (24 of the 38 studies). Concerns including data privacy and confidentiality, security protocols (e.g., passwords, encryption), regulations and liability governing data access and use, and ensuring user privacy when sharing information with clinicians or caregivers. For example, Anastasiadou et al (2019) highlighted concerns about a restrictive healthcare system in Spain that limited the sharing of patient information online, emphasizing the importance of addressing privacy and security concerns. Given all five APA criteria were raised as important across most studies, it was not possible to discern any patterns or associations between APA criteria raised and client or practitioner characteristics.

Other issues identified as important by practitioners beyond the formal APA app quality evaluation model included a range of implementation factors such as the importance of clinician training in using the technology to enhance familiarity and confidence in using and recommending apps, and organisational investment in resources and support for integrating digital mental health into practice. Client factors were also noted, including the potential impact of apps on therapeutic alliance and treatment outcomes, and moderation of app utility by client characteristics including digital literacy, age and motivation.

Discussion

The aim of this scoping review was to explore what is known about the mental health practitioners' view on integration of smartphone apps into their practice; the factors that may influence such integration including practitioners and clients' characteristics, apps functionality and design and reported use of those apps in practice.

Main findings

Across the 38 included studies, 1,894 mental health professionals participated with the sample size ranging from three to 350. The participants predominantly included psychologists and psychiatrists, as well as a number of other mental health practitioners, with participants being predominantly females and mid-career based on their age range (30s and 40s). Practitioners worked across a range of services from specialised clinics (such as eating disorders, psychosis early intervention) to school/tertiary-based counselling units, demonstrating a diverse and representative sample of mental health practitioners and services. Notably, however, more than half (24 of the 38) of the studies had sample sizes less than 50, and some demographic features such as age or gender were not reported by all studies which limits the degree of generalisability of views to a broader mental health practitioners' population.

From the demographic information included, the participants appear to be predominantly experienced and qualified practitioners actively involved in mental health services. Practitioners' clients across the included studies ranged from children to adolescents and adults, predominantly from clinical settings and presenting with a range of mental health issues most commonly mood and anxiety disorders. This is consistent with the prevalence of those mental health conditions in both clinical and community populations which have further increased post COVID-19 (Santomauro et al 2021). The increased prevalence of those common conditions continues to challenge limited health services, access and continuity of care and practitioners' ability to meet the needs of growing number of clients. The consistency in the mental health conditions in the population, and those identified in this review of practitioners who are exploring smartphone apps in their practice, is therefore promising for alignment of support demand and practitioner readiness for integration of digital tools into their practice. Therefore, smartphone apps offer a viable potential add-on resource and a self-directed mental health support.

However, much of the current literature on the potential use of smartphone apps in mental health care

is predominantly focussed on the *development* of such apps and exploration of perspectives of both practitioners and clients on their *usability* rather than on *actual* usage patterns or clinical *effectiveness*. Across the 38 studies, about half reported app use out-of-sessions, or in- and out-of-session, with only 2 out of 38 reporting in-session use only. It therefore appears that while the use of apps is recognised by practitioners as potentially helpful to their clients, the practice of use remains consistent with stepped care models of mental health care, in which digital technologies are regarded as potentially well suited for self-managed, low intensity support (Pedrelli et al, 2023; Department of Health, 2021) rather than as part of an integrated in-session care plan. This is understandable, given that the primary focus of the apps included across those studies was on wellbeing promotion, tracking/monitoring, psychoeducation, early intervention and assessment monitoring, as well as their capacity to collect, record and inform. In contrast, about a third of studies reported using apps within the Higher Intensity range of treatment/intervention or continued care/relapse prevention functions, with few apps offering ‘instructing’ or ‘intervening’ functions. Interesting, however, the proportion of apps offering these higher intensity support options appears to be increasing – with the proportion doubling from 17 to 34% in the final year covered by this review. Most apps remain limited in the scope of their functionality offering 3 or fewer functions. Apps that offer a greater multi-functionality in their design are more likely to be useful to client-practitioner sessions (Myers et al 2021), suggesting a need for broader spectrum, ‘all-in-one’ apps.

Despite previous literature suggesting practitioner-guided apps are more effective than self-managed or ‘stand-alone’ apps (Baumeister et al., 2014; Moshe et al, 2021), the studies identified in this review focussed more on self-management apps. The majority of studies (45%) included self-management apps, with 32% entirely stand-alone. While there is currently still limited evidence of effectiveness for stand-alone apps (Moshe et al, 2021), this delivery mode may be of greater interest to practitioners given the persistent high demand for their services (APA, 2022). Self-management apps also align with models of healthcare that aim to empower patients to participate more in the management of their own health (Flores et al, 2013). This is despite some reports that involvement of practitioners in the client use of mental health apps aids effectiveness of those apps in comparison to self-managed or stand-alone app use (Garrido et al, 2019, Duarte-Diaz et al, 2023). There is, however, a need for research to capture what that involvement looks like and to what degree it facilitates the effectiveness of the app and its contribution to the clinical sessions. Practitioners are more likely to recommend apps (whether used in- or out-of-session) if there is clear evidence of how their involvement and the client’s use of the app contributes to the clinical care outcomes.

Given that the majority of mental health apps do not meet all five standards outlined by the APA evaluation model (Rickard et al, 2022), it is understandable that their use by mental health practitioners is still at a potential rather than actual and evidence-based stage. Notably, across the 38 studies reviewed, practitioners raised the importance of app features consistent with those five APA standards, indicating an informed position in their considerations of suitability of apps for integration into mental health care. It is notable that engagement and interoperability were most commonly identified by practitioners as important. Practitioners' awareness of the need for an engaging user experience is promising given its critical role in compliance and sustainability of use (Baumel et al, 2019; Ng et al, 2020; Torous et al, 2018). Similarly, the importance of data sharing is consistent with digital tools being used as an adjunct rather than alternative to professional care, and providing practitioners with information that may contribute to their in-session interactions with the client (Luxton et al, 2011; Torous & Hsin, 2018). Integration of assessment and monitoring data into electronic records may also provide new insights which may not be possible with more manual recording of less regular data points. It is also promising that an evidence or clinical base for apps was reported in 71% studies. This reflects an awareness that mental health apps need to be credible and developed by trusted sources, and for the function and outcomes of the app to be aligned via systematic evaluation. In this context, it is of concern that the majority of mental health apps available publicly lack sufficient evidence or clinical support for their effectiveness (LeCompte et al, 2019; Wang et al, 2018).

Security and privacy and accessibility were each also reported across the majority of studies. The importance placed on security and privacy demonstrates practitioners' awareness of the importance of ethical management of digital patient records (Entzeridou et al, 2018). The equally high importance of accessibility reflects practitioners' awareness that mental health apps must be designed and distributed in a way that does not exclude any sociodemographic, and encourages uptake and sustained use for all. Among the other criteria raised by practitioners beyond the APA model, the need for organisational support in training and technical resource support was a commonly reported concern. Implementation of training modules has been effectively demonstrated to enhance knowledge and confidence of mental health practitioners about using apps (McGee et al, 2023). These are important practical considerations in facilitating progression from potential to actual use of apps in clinical settings, and should be considered for all mental health staff working within clinical settings.

To progress the potential integration of mental health apps into clinical sessions, it may be informative to understand the context of clinical sessions that include assessment, formulation, treatment plan, monitor of progress and self-directed tasks between sessions. In addition, it would be helpful to include information on which APA standards a mental health app meets in app stores, or some other mental health register, to assist selection for a particular client with a particular mental health condition. Without a closer alignment between what may aid sessions and a client's in and out of session support, self-development and psychoeducation, there may be too many apps for practitioners to choose from without a clear sense of how useful those apps may be or how to measure their add-on effectiveness.

Overall, the 38 studies included in this review provide an informative understanding of what practitioners consider important in the design and function of mental health apps if they were to use or integrate their use in their clinical sessions. Further research is required to capture what that use may look like in practice and if using particular apps provides additional benefit to the clinical session and the therapeutic output, or provide support in between sessions that may otherwise be lacking. Given the constraints of limited mental health services, anything that may be added to the sessions' content (i.e., review of app collected data) or between sessions (i.e. client and practitioner's engagement with the app) has to have a clear add-on clinical value.

Limitations

This scoping review is not without limitations. This review focussed on mental health professionals only – a similar review could be undertaken with other health professionals who work with mental health issues in a different therapeutic context (such as general practitioners, nurses, other allied health practitioners) and may have different potential usability of available apps. The quality of included studies was also not assessed as this was a scoping not a systematic review and therefore relied on descriptive rather than evaluative presentation of those studies.

Notwithstanding these limitations, the 23 studies offer an overview of a number of potentially useful mental health apps that could be integrated into clinical practice ranging from between-session monitoring/tracking data to interactive relapse prevention apps that may provide a useful between-session engagement and within-session progress-informing data. This scoping review has identified that practitioners are interested in use of low intensity support apps outside of sessions, which is

aligned with the stepped care model and two key points: addressing the support gaps between sessions, critical to retention and relapse prevention; and empowering clients to self-manage some aspects of their health. As a way forward, it is recommended that the potential use of some apps be explored in a clinical setting using well-structured experimental designs to assess suitability, usability and effectiveness of those apps beyond their potential and *ad hoc* use. A good starting point may be integrating the use of apps outside of sessions but with a review of their use, clients' perception of usefulness and, where relevant, review of data during sessions similar to the common practice of giving clients homework (for example, new skills to practice, daily mood-monitor sheets or behaviour tracking).

For practitioners who would like to utilise mental health apps, it is recommended that they base their selection of apps on the APA's standards as a starting point, focusing on apps that align with particular aspects of client's care plan (such as relaxation for anxiety, or daily pleasant activities for mood) and then determine how they may like to integrate them in their clinic sessions (for example, for psychoeducation or monitoring symptoms). Some practitioners may find reviewing apps against the APA's standards relatively straightforward especially if they are comfortable users of digital technology. Others, however, may require some support given there is a large variation in digital competencies with many having a low awareness and knowledge (Dobson et al, 2022; Kerst et al, 2020; Hoffman et al, 2019) and confidence in suggesting apps to their clients (Morton et al, 2021). It is therefore recommended that educational training modules or workshops are developed to inform use of mental health apps in practice starting with low intensity apps selection for use between session to high intensity apps for within sessions for more advanced digital technology-user practitioners. Such training needs to address commonly raised concerns by both practitioners and clients, including accessibility, safety, and potential side-effects (Patoz et al, 2021) and build practitioners' self-efficacy in use of apps with their clients (Morton et al, 2021).

Conclusion

This scoping review has provided valuable insights into mental health practitioners' perspectives on integrating smartphone apps into their practice. The findings reveal that practitioners are interested in the potential of these digital tools, particularly for self-management and out-of-session support, aligning with stepped care models of mental health care. The use of mental health apps is an untapped resource that can support both practitioners and clients in improving engagement and implementation of care plan strategies (Strodl et al 2020) and a reciprocal responsibility for mental

health management (Richards et al, 2016). This may be particularly relevant for practitioners who are regular users of digital technologies who can be at the forefront of apps integration into practice, and practitioners whose clients are highly engaged with technology as a health self-management resource. However, the actual integration of apps into clinical practice remains limited, with practitioners emphasizing the importance of app features such as interoperability, security, privacy, engagement, and accessibility. This review highlights a gap between the potential and actual use of mental health apps in clinical settings, suggesting a need for further research to explore the practical implementation and effectiveness of these tools in therapeutic contexts. To facilitate the adoption of mental health apps in clinical practice, it is recommended that:

1. Practitioners base their app selection on established standards, such as those outlined by the APA.
2. Educational training modules or workshops be developed to enhance practitioners' digital competencies and confidence in using apps with clients.
3. Well-structured experimental designs be employed to assess the suitability, usability, and effectiveness of apps in clinical settings.
4. App developers and researchers work towards aligning app functionalities more fully with a range of therapeutic needs and contexts.

As the field of digital mental health continues to evolve, ongoing collaboration between practitioners, researchers, and app developers will be crucial in realizing the full potential of smartphone apps as valuable adjuncts to traditional mental health care.

References (*Indicates study includes in Review)

- *Adams, Z., Grant, M., Hupp, S., Scott, T., Feagans, A., Phillips, M. L., Bixler, K., Nallam, P. T., & La Putt, D. (2021). Acceptability of an mHealth app for youth with substance use and mental health needs: Iterative, mixed methods design. *Jmir Formative Research*, 5(12), Article e30268. <https://doi.org/10.2196/30268>
- *Almadani, A. H., Aldawood, B. D., Alahmari, F. M., Abudujain, N. M., & Otayf, M. M. (2025). Use and perceptions of mobile mental health applications among healthcare workers in Saudi Arabia. *Journal of Nervous and Mental Disease*, 213(1), 7-21. <https://doi.org/10.1097/NMD.0000000000001812>
- *Anastasiadou, D., Folkvord, F., Serrano-Troncoso, E., & Lupianez-Villanueva, F. (2019). Mobile health adoption in mental health: User experience of a mobile health app for patients with an eating disorder. *Jmir Mhealth and Uhealth*, 7(6), Article e12920. <https://doi.org/10.2196/12920>
- APA (American Psychological Association) (2022). *Psychologists Struggle to Meet Demand Amid Mental Health Crisis*. <https://www.apa.org/pubs/reports/practitioner/2022-covid-psychologist-workload.pdf>
- *Armstrong, C. C., Odukoya, E. J., Sundaramurthy, K., & Darrow, S. M. (2021). Youth and provider perspectives on behavior-tracking mobile apps: Qualitative analysis. *Jmir Mental Health*, 8(4), Article e24482. <https://doi.org/10.2196/24482>
- Aromataris E, Munn Z (Editors). (2020). *JBIM manual for evidence synthesis*. Joanna Briggs Institute. <https://doi.org/10.46658/JBIMES-20-01>
- Australian Government Department of Health (2020). Scoping and development of a National Digital Mental health Framework: Current State Assessment Report. PWC. https://www.pwc.com.au/health/National-Digital-Mental-Health-Framework_Current-State-Assessment-Report.pdf
- Australian Government Department of Health (2016). *PHN Mental Health Flexible Funding Pool Programme Guidance: Stepped Care*, Canberra: Australian Government Department of Health.
- Australian Government Department of Health and Ageing (2012) *eMental Health Strategy for Australia*. Australian Government.

- Bakker, D., & Rickard, N. (2019). Engagement with a cognitive behavioural therapy mobile phone app predicts changes in mental health and wellbeing: MoodMission. *Australian Psychologist*, 54(4), 245-260. <https://doi.org/10.1111/ap.12383>
- Baumeister, H., Reichler, L., Munzinger, M., & Lin, J. . (2014). The impact of guidance on Internet-based mental health interventions — A systematic review. *Internet Interventions*, 1(4), 205-215. <https://doi.org/10.1016/j.invent.2014.08.003>
- Baumel, A., Muench, F., Edan, S. & Kane, J. (2019). Objective user engagement with mental health apps: Systematic search and panel-based usage analysis. *J Med Internet Res* , 21(9):e14567. <https://DOI: 10.2196/14567>
- Beard, C., Silverman, A. L., Forgeard, M., Wilmer, M. T., Torous, J., & Björgvinsson, T. (2019). Smartphone, social media, and mental health app use in an acute transdiagnostic psychiatric sample. *JMIR Mhealth Uhealth*, 7(6), e13364. <https://doi.org/10.2196/13364>
- Bramer, W.M., de Jonge, G.B., Rethlefsen, M.L., Mast, F., & Kleijnen, J. (2018). A systematic approach to searching: an efficient and complete method to develop literature searches. *J Med Libr Assoc.*, 106(4):531-541. doi: 10.5195/jmla.2018.283.
- *Bucci, S., Berry, N., Morris, R., Berry, K., Haddock, G., Lewis, S., & Edge, D. (2019). 'They are not hard-to-reach clients We have just got hard-to-reach services' staff views of digital health tools in specialist mental health services. *Frontiers in Psychiatry*, 10. <https://doi.org/10.3389/fpsyt.2019.00344>
- Calvert, E., Cipriani, M., Chen, K., Dhima, A., Burns, J., & Torous, J. (2025). Evaluating clinical outcomes for anxiety and depression: A real-world comparison of the digital clinic and primary care. *Journal of Affective Disorders*, 377, 275-283, <https://doi.org/10.1016/j.jad.2025.02.051>.
- *Chang, S., Gray, L., Alon, N., & Torous, J. (2023). Patient and clinician experiences with sharing data visualizations integrated into mental health treatment. *Social Sciences*, 12(12), 648. <https://doi.org/10.3390/socsci12120648>
- *Cheung, B. S. W., Murphy, J. K., Michalak, E. E., Liu, J., Yang, X., Wang, X., Chen, J., & Lam, R. W. (2023). Barriers and facilitators to technology-enhanced measurement based care for depression among Canadian clinicians and patients: Results of an online survey. *Journal of Affective Disorders*, 320, 1-6. <https://doi.org/10.1016/j.jad.2022.09.055>
- Cooke, A., Smith, D., & Booth, A. (2012). Beyond PICO: The SPIDER tool for qualitative evidence

synthesis. *Qualitative Health Research*, 22(10), 1435-1444

Cornish, P (2020). *Stepped Care 2.0: A Paradigm Shift in Mental Health*. Springer Cham. Doi: <https://doi.org/10.1007/978-3-030-48055-4>

Cross, S.P.M, & Hickie, I. (2017). Transdiagnostic stepped care in mental health. *Public Health: Research & Practice*, 27(2), e2721712. <http://dx.doi.org/10.17061/phrp2721712>

*Deady, M., Collins, D., Gayed, A., Harvey, S. B., & Bryant, R. (2023). The development of a smartphone app to enhance post-traumatic stress disorder treatment in high-risk workers. *Digital Health*, 9. <https://doi.org/10.1177/20552076231155680>

Department of Health. (2021). *National digital mental health framework*. https://www.health.gov.au/sites/default/files/documents/2022/03/national-digital-mental-health-framework_0.pdf

De Witte, N. A. J., Joris, S., Van Assche, E., & Van Daele, T. (2021). Technological and digital interventions for mental health and wellbeing: An overview of systematic reviews [Review]. *Frontiers in Digital Health*, 3. <https://doi.org/10.3389/fdgth.2021.754337>

Dicianno, B. E., Salh, A., Morris, L., Xiang, Y., & Ding, D. (2024). Rehabilitation clinicians' use of mainstream wireless technologies in practice: a scoping review. *Disability and Rehabilitation. Assistive Technology*, 19(8), 2742-2760. <https://doi.org/10.1080/17483107.2024.2316891>

*Dobson, R., Variava, R., Douglas, M., & Reynolds, L. M. (2022). Digital competency of Psychologists in Aotearoa New Zealand: A cross-sectional survey. *Frontiers in Digital Health*, 4, Article 951366. <https://doi.org/10.3389/fdgth.2022.951366>

*Dominiak, M., Gedek, A., Antosik, A. Z., & Mierzejewski, P. (2024). Mobile health for mental health support: a survey of attitudes and concerns among mental health professionals in Poland over the period 2020-2023. *Frontiers in Psychiatry*, 15. <https://doi.org/10.3389/fpsy.2024.1303878>

Duarte-Díaz, A., Perestelo-Pérez, L., Gelabert, E., Robles, N., Pérez-Navarro, A., Vidal-Alaball, J., Solà-Morales, O., Masnou, A. S., & Carrion, C. (2023). Efficacy, safety, and evaluation criteria of mHealth interventions for depression: Systematic review. *Jmir Mental Health*, 10, Article e46877. <https://doi.org/10.2196/46877>

*Dubad, M., Elahi, F., & Marwaha, S. (2021). The clinical impacts of mobile mood-monitoring in young people with mental health problems: The MeMO study. *Frontiers in Psychiatry*, 12,

Article 687270. <https://doi.org/10.3389/fpsy.2021.687270>

- East, M. L., & Havard, B. C. (2015). Mental health mobile apps: From infusion to diffusion in the mental health social system. *Journal of Medical Internet Research*, 2, Article e10. <https://doi.org/10.2196/mental.3954>
- Entzeridou, E., Markopoulou, E., & Mollaki, V. (2018). Public and physician's expectations and ethical concerns about electronic health record: Benefits outweigh risks except for information security. *International Journal of Medical Informatics*, 110, 98–107. <https://doi.org/10.1016/j.ijmedinf.2017.12.004>
- * Etingen, B., Zocchi, M. S., Higashi, R. T., Palmer, J. A., Richardson, E., Bixler, F. R., Patrianakos, J., McMahon, N., Smith, B. M., Kale, I., Fortney, J. C., Turvey, C., Lipschitz, J. M., Evans, J. A., Frisbee, K. L., & Hogan, T. P.(2024). Mental health provider perspectives on a mobile health application to support remote measurement-based care: Challenges and impacts. *Psychological Services*. Advance online publication. <https://dx.doi.org/10.1037/ser000088>
- Firth, J., Torous, J., Nicholas, J., Carney, R., Pratap, A., Rosenbaum, S., & Sarris, J. (2017a). The efficacy of smartphone-based mental health interventions for depressive symptoms: a meta-analysis of randomized controlled trials. *World Psychiatry*, 16(3), 287-298. <https://doi.org/https://doi.org/10.1002/wps.20472>
- Firth, J., Torous, J., Nicholas, J., Carney, R., Rosenbaum, S., & Sarris, J. (2017b). Can smartphone mental health interventions reduce symptoms of anxiety? A meta-analysis of randomized controlled trials. *J Affect Disord*, 218, 15-22. <https://doi.org/10.1016/j.jad.2017.04.046>
- Flores, M., Glusman, G., Brogaard, K., Price, N.D., & Hood, L. (2013). P4 medicine: how systems medicine will transform the healthcare sector and society. *Per Med*. 2013;10(6):565-576. doi: 10.2217/pme.13.57.
- *Francesse, R., & Attanasio, P. (2023). Emotion detection for supporting depression screening. *Multimedia Tools and Applications*, 82(9), 12771-12795. <https://doi.org/10.1007/s11042-022-14290-0>
- Garrido, S., Millington, C., Cheers, D., Boydell, K., Schubert, E., Meade, T., Nguyen, Q., & Quang, V. (2019). What works and what doesn't work? A systematic review of digital mental health interventions for depression and anxiety in young people. *Frontiers in Psychiatry*, 10, 759. <https://www.frontiersin.org/articles/10.3389/fpsy.2019.00759/full>
- Gindidis, S., Stewart, S., & Roodenburg, J. (2019). A systematic scoping review of adolescent

- mental health treatment using mobile apps. *Advances in Mental Health*, 17(2), 161-177. <https://doi.org/10.1080/18387357.2018.1523680>
- *González-Pérez, A., Diaz-Sanahuja, L., Matey-Sanz, M., Osma, J., Granell, C., Bretón-López, J., & Casteleyn, S. (2024). Towards a self-applied, mobile-based geolocated exposure therapy software for anxiety disorders: SyMptOMS-ET app. *Digital Health*, 10. <https://doi.org/10.1177/20552076241283942>
- *Green, J. B., Rodriguez, J., Keshavan, M., Lizano, P., & Torous, J. (2023). Implementing technologies to enhance coordinated specialty care framework: Implementation outcomes from a development and usability study. *JMIR Formative Research*, 7. <https://doi.org/10.2196/46491>
- Henson, P., David, G., Albright, K., & Torous, J. (2019). Deriving a practical framework for the evaluation of health apps. *The Lancet Digital Health*, 1(2):e52–4. [https://www.thelancet.com/journals/landig/article/PIIS2589-7500\(19\)30013-5/fulltext](https://www.thelancet.com/journals/landig/article/PIIS2589-7500(19)30013-5/fulltext)
- *Heydarian, S., Shakiba, A., & Kalhori, S. R. N. (2023). The minimum feature set for designing mobile apps to support bipolar disorder-affected patients: Proposal of essential functions and requirements. *Journal of Healthcare Informatics Research*, 7(2), 254-276. <https://doi.org/10.1007/s41666-023-00134-5>
- *Hildebrand, A. S., Planert, J., Machulska, A., Margraf, L. M., Roesmann, K., & Klucken, T. (2024). Exploring psychotherapists' attitudes on internet- and mobile-based interventions in Germany: Thematic analysis. *JMIR Formative Research*, 8. <https://doi.org/10.2196/51832>
- *Hoffman, L., Benedetto, E., Huang, H., Grossman, E., Kaluma, D., Mann, Z., & Torous, J. (2019). Augmenting mental health in primary care: A 1-year study of deploying smartphone apps in a multi-site primary care/behavioral health integration program. *Frontiers in Psychiatry*, 10. <https://doi.org/10.3389/fpsy.2019.00094>
- Holmes, E.A., Ghaderi, A., Harmer, C.G., Ramchandani, P., Cuijpers, P.G., Morrison, A.P., et al. (2018). The Lancet Psychiatry Commission on psychological treatments research in tomorrow's science. *Lancet Psychiatry* 2018 Dec;5(3):237-286. [doi: 10.1016/S2215-0366(17)30513-8]
- IMS Institute for Health Informatics. (2013). *Patient apps for improved healthcare: From novelty to mainstream*. https://ignacioriesgo.es/wp-content/uploads/2014/03/iihi_patient_apps_report_editora_39_2_

1.pdf

- Kazdin A, Blase S. (2011). Rebooting psychotherapy research and practice to reduce the burden of mental illness. *Perspect Psychol Sci*, 6(1), 21-37. [doi: 10.1177/1745691610393527]
- *Kerst, A., Zielasek, J., & Gaebel, W. (2020). Smartphone applications for depression: A systematic literature review and a survey of health care professionals' attitudes towards their use in clinical practice. *European Archives of Psychiatry and Clinical Neuroscience*, 270(2), 139-152. <https://doi.org/10.1007/s00406-018-0974-3>
- *Khan, W., Jebanesan, B., Ahmed, S., Trimmer, C., Agic, B., Safa, F., Ashraf, A., Tuck, A., Kavic, K., Wadhawan, S., Abbott, M., Husain, O., Husain, I., Hamid, M. A., McKenzie, K., Quintana, Y., & Naeem, F. (2023). Stakeholders' views and opinions on existing guidelines on "How to Choose Mental Health Apps". *Frontiers in Public Health*, 11: 1251050. <https://doi.org/10.3389/fpubh.2023.1251050>
- Lau, N., O'Daffer, A., Colt, S., Yi-Frazier, J. P., Palermo, T. M., McCauley, E., & Rosenberg, A. R. (2020). Android and iPhone mobile apps for psychosocial wellness and stress management: Systematic search in app stores and literature review. *JMIR Mhealth Uhealth*, 8(5), e17798. <https://doi.org/10.2196/17798>
- Lee, M., Bin Mahmood, A. B. S., Lee, E. S., Smith, H. E., & Tudor Car, L. (2023). Smartphone and mobile app use among physicians in clinical practice: Scoping review. *JMIR mHealth and uHealth*, 11, e44765. <https://doi.org/10.2196/44765>
- LeComte, T., Potvin, S., Corbière, M., Guay, S., Samson, C., Cloutier, B., et al. (2019). Mobile apps for mental health issues: Meta-review of Meta-analyses. *JMIR mHealth and uHealth*;8(5).
- Leigh, S., & Ashall-Payne, L (2019). The role of health-care providers in mHealth adoption. *The Lancet Digital Health*, 1. DOI: [https://doi.org/10.1016/S2589-7500\(19\)30025-1](https://doi.org/10.1016/S2589-7500(19)30025-1)
- *Li, S. H., Achilles, M. R., Spanos, S., Habak, S., Werner-Seidler, A., & O'Dea, B. (2022). A cognitive behavioural therapy smartphone app for adolescent depression and anxiety: Co-design of ClearlyMe. *The Cognitive Behaviour Therapist*, 15. <https://doi.org/10.1017/S1754470X22000095>
- Linardon, J., Cuijpers, P., Carlbring, P., Messer, M., & Fuller-Tyszkiewicz, M. (2019). The efficacy of app-supported smartphone interventions for mental health problems: a meta-analysis of randomized controlled trials. *World Psychiatry*, 18(3), 325-336.

<https://doi.org/10.1002/wps.20673>

- Lipschitz, J., Miller, C.J., Hogan, T.P., Burdick, K.E., Lippin-Foster, R., Simon, S.R., et al. (2019). Adoption of mobile apps for depression and anxiety: cross-sectional survey study on patient interest and barriers to engagement. *JMIR Ment Health*, 6:e11334. doi:<http://dx.doi.org/10.2196/11334>.doi.org/10.2196/ 11334 42.
- *Lukka, L., Karhulahti, V. M., & Palva, J. M. (2023). Factors affecting digital tool use in client interaction according to mental health professionals: Interview study. *JMIR Human Factors*, 10. <https://doi.org/10.2196/44681>
- Luxton, D. D., McCann, R. A., Bush, N. E., Mishkind, M. C., & Reger, G. M. (2011). mHealth for mental health: Integrating smartphone technology in behavioral healthcare. *Professional Psychology: Research and Practice*, 42(6), 505-512. <https://doi.org/10.1037/a0024485>
- Macrynika, N., Nguyen, N., Lane, E., Yen, S., & Torous, J. (2023). The Digital Clinic: An innovative mental health care delivery model utilizing hybrid synchronous and asynchronous treatment. *NEJM Catalyst; Innovations in Care Delivery*, 4(9). DOI: 10.1056/CAT.23.0100
- Marshall, J. M., Dunstan, D. A., & Bartik, W. (2020). Apps with maps—Anxiety and depression mobile apps with evidence-based frameworks: Systematic search of major app stores. *JMIR Ment Health*, 7(6), e16525. <https://doi.org/10.2196/16525>
- Martin, D.J., Garske, J.P., & Davis, M.K. (2000). Relation of the therapeutic alliance with outcome and other variables: a meta-analytic review. *J Consult Clin Psychol*, 68(3):438-450.
- *McGee-Vincent, P., Mackintosh, M. A., Jamison, A. L., Juhasz, K., Becket-Davenport, C., Bosch, J., Avery, T. J., Glamb, L., & Hampole, S. (2023). Training staff across the Veterans Affairs health care system to use mobile mental health apps: A national quality improvement project. *JMIR Mental Health*, 10. <https://doi.org/10.2196/41773>
- McGorry, P. D., Mei, C., Chanen, A., Hodges, C., Alvarez-Jimenez, M., & Killackey, E. (2022). Designing and scaling up integrated youth mental health care. *World Psychiatry*, 21(1), 61-76. <https://doi.org/10.1002/wps.20938>
- *Medich, M., Cannedy, S. L., Hoffmann, L. C., Chinchilla, M. Y., Pila, J. M., Chassman, S. A., Calderon, R. A., & Young, A. S. (2023). Clinician and patient perspectives on the use of passive mobile monitoring and self-tracking for patients with serious mental illness: User-centered approach. *JMIR Human Factors*, 10. <https://doi.org/10.2196/46909>

- *Miller, K. E., Kuhn, E., Yu, J., Owen, J. E., Jaworski, B. K., Taylor, K., Blonigen, D. M., & Possemato, K. (2019). Use and perceptions of mobile apps for patients among VA primary care mental and behavioral health providers. *Professional Psychology: Research and Practice*, 50(3), 204-209. <https://doi.org/10.1037/pro0000229>
- Mohr, D. C., Cuijpers, P., & Lehman, K. (2011). Supportive accountability: A model for providing human support to enhance adherence to eHealth interventions. *J Med Internet Res*, 13(1), e30. <https://doi.org/10.2196/jmir.1602>
- Morello, K., Schäfer, S. K., Kunzler, A. M., Priesterroth, L. S., Tüscher, O., & Kubiak, T. (2023). Cognitive reappraisal in mHealth interventions to foster mental health in adults: a systematic review and meta-analysis. *Frontiers in Digital Health*, 5, 1253390. <https://doi.org/10.3389/fdgth.2023.1253390>
- *Morton, E., Torous, J., Murray, G., & Michalak, E. E. (2021). Using apps for bipolar disorder—An online survey of healthcare provider perspectives and practices. *Journal of Psychiatric Research*, 137, 22-28. <https://doi.org/10.1016/j.jpsychires.2021.02.047>
- Moshe, I., Terhorst, Y., Philippi, P., Domhardt, M., Cuijpers, P., Cristea, I., Pulkki-Råback, L., Baumeister, H., & Sander, L.B. (2021). Digital interventions for the treatment of depression: A meta-analytic review. *Psychol Bull*, 147(8):749-786. doi: 10.1037/bul0000334. PMID: 34898233.
- Munn, Z., Peters, M. D. J., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology*, 18(1), 143. <https://doi.org/10.1186/s12874-018-0611-x>
- Myers, A., Chesebrough, L., Hu, R., Turchioe, M.R., Pathak, J., & Creber, R.M. (2021). Evaluating commercially available mobile apps for depression self-management. *AMIA Annu Symp Proc.*, 906-914. PMCID: PMC8075488.
- *Naccache, B., Mesquida, L., Raynaud, J.-P., & Revet, A. (2021). Smartphone application for adolescents with anorexia nervosa: An initial acceptability and user experience evaluation. *BMC Psychiatry*, 21. <https://doi.org/10.1186/s12888-021-03478-7>
- Ng, M.M., Firth, J., Minen, M., & Torous, J. (2019). User engagement in mental health Apps: A review of measurement, reporting, and validity. *Psychiatr Serv*, 70(7):538-544. doi: 10.1176/appi.ps.201800519.

- *Nogueira-Leite, D., Diniz, J. M., & Cruz-Correia, R. (2023). Mental health professionals' attitudes toward digital mental health apps and implications for adoption in Portugal: Mixed methods study. *JMIR Human Factors*, 10. <https://doi.org/10.2196/45949>
- *Patoz, M.-C., Hidalgo-Mazzei, D., Blanc, O., Verdolini, N., Pacchiarotti, I., Murru, A., Zukerwar, L., Vieta, E., Llorca, P.-M., & Samalin, L. (2021). Patient and physician perspectives of a smartphone application for depression: A qualitative study. *BMC Psychiatry*, 21. <https://doi.org/10.1186/s12888-021-03064-x>
- *Orengo-Aguayo, R. E., Hanson, R. F., Moreland, A. D., Jobe-Shields, L., & Adams, Z. W. (2018). Enhancing the delivery of an empirically-supported trauma-focused treatment for adolescents: Providers' views of the role of technology and web-based resources. *Administration and Policy in Mental Health and Mental Health Services Research*, 45(4), 575-586. <https://doi.org/10.1007/s10488-017-0846-6>
- Pedrelli, P., Bentley, K.H., Pittman, M.A., Meyer, A.K., Fisher, L.B. (2023). Use of technology and stepped care. In: Sprich, S.E., Petersen, T., Wilhelm, S. (Eds) *The Massachusetts General Hospital Handbook of Cognitive Behavioral Therapy. Current Clinical Psychiatry*. Humana, Cham. https://doi.org/10.1007/978-3-031-29368-9_27
- *Puhy, C. E., Litke, S. G., Silverstein, M. J., Kiely, J. R., Pardes, A., McGeoch, E., & Daly, B. P. (2021). Counselor and student perceptions of an mhealth technology platform used in a school counseling setting. *Psychology in the Schools*. <https://doi.org/10.1002/pits.22541>
- *Richards, P., Simpson, S., Bastiampillai, T., Pietrabissa, G., & Castelnuovo, G. (2018). The impact of technology on therapeutic alliance and engagement in psychotherapy: The therapist's perspective. *Clinical Psychologist*, 22(2), 171-181. <https://doi.org/10.1111/cp.12102>
- Rickard, N. S., Kurt, P., & Meade, T. (2022). Systematic assessment of the quality and integrity of popular mental health smartphone apps using the American Psychiatric Association's app evaluation model. *Front Digit Health*, 4, 1003181. <https://doi.org/10.3389/fdgth.2022.1003181>
- Rickwood, D. (2012). Entering the e-spectrum: An examination of new interventions for youth mental health. *Youth Studies Australia*, 31(4), 18-28.
- *Rodriguez-Villa, E., Rozatkar, A. R., Kumar, M., Patel, V., Bondre, A., Naik, S. S., Dutt, S., Mehta, U. M., Nagendra, S., Tugnawat, D., Shrivastava, R., Raghuram, H., Khan, A., Naslund, J. A., Gupta, S., Bhan, A., Thirthall, J., Chand, P. K., Lakhtakia, T., . . . Torous, J. (2021). Cross

cultural and global uses of a digital mental health app: Results of focus groups with clinicians, patients and family members in India and the United States. *Global Mental Health*, 8. <https://doi.org/10.1017/gmh.2021.28>

*Rothmann, M. J., Mouritsen, J. D., Ladefoged, N. S., Jeppesen, M. N., Lillevang, A. S., Laustrop, H., & Ellingsen, T. (2022). The use of telehealth for psychological counselling of vulnerable adult patients with rheumatic diseases or diabetes: Explorative study inspired by participatory design. *Jmir Human Factors*, 9(1), Article e30829. <https://doi.org/10.2196/30829>

Royal Australian College of General Practitioners (RACGP) (2022). *General Practice: Health of the Nation 2022*. <https://www.racgp.org.au/getmedia/80c8bdc9-8886-4055-8a8d-ea793b088e5a/Health-of-the-Nation.pdf.aspx>

Santomauro, D.F., Mantilla Herrera, A.M., Shadid, J., Zheng, P., Ashbaugh, C., Pigott, D.M., et al. (2021). Global prevalence and burden of depressive and anxiety disorders in 204 countries and territories in 2020 due to the COVID-19 pandemic. *Lancet*. 398(10312):1700–1712. doi:10.1016/S0140-6736(21)02143-7

Schueller, S. M., Washburn, J. J., & Price, M. (2016). Exploring mental health providers' interest in using web and mobile-based tools in their practices. *Internet Interventions*, 4, 145-151. <https://doi.org/10.1016/j.invent.2016.06.004>

Seegan, P. L., Miller, M. J., Heliste, J. L., Fathi, L., & McGuire, J. F. (2023). Efficacy of stand-alone digital mental health applications for anxiety and depression: A meta-analysis of randomized controlled trials. *J Psychiatr Res*, 164, 171-183. <https://doi.org/10.1016/j.jpsychires.2023.06.019>

*Stefancic, A., Rogers, R. T., Styke, S., Xu, X. Y., Buchsbaum, R., Nossel, I., Cabassa, L. J., Stroup, T. S., & Kimhy, D. (2022). Development of the First Episode Digital Monitoring mHealth Intervention for People With Early Psychosis: Qualitative Interview Study With Clinicians. *Jmir Mental Health*, 9(11), Article e41482. <https://doi.org/10.2196/41482>

*Strodl, E., Shakespeare-Finch, J., Alichniewicz, K. K., Brown, K., Quinn, C., Hides, L., White, A., Gossage, G., Poerio, L., Batras, D., Jackson, S., Styles, J., & Kavanagh, D. J. (2020). Clinicians' perceptions of PTSD Coach Australia. *Internet Interventions-the Application of Information Technology in Mental and Behavioural Health*, 21, Article 100333. <https://doi.org/10.1016/j.invent.2020.100333>

Taylor, K., & Silver, L. (2019) Smartphone ownership is growing rapidly around the world, but not

always equally. Accessed 19/12/2023;
<https://www.pewresearch.org/global/2019/02/05/smartphone-ownership-is-growing-rapidly-around-the-world-but-not-always-equally/>

- Torous, J., & Hsin, H. (2018). Empowering the digital therapeutic relationship: virtual clinics for digital health interventions. *NPJ Digital Medicine*, 1(1), 1-3. <https://doi.org/10.1038/s41746-018-0028-2>
- Torous, J., Jän Myrick, K., Rauseo-Ricupero, N., & Firth, J. (2020). Digital mental health and COVID-19: Using technology today to accelerate the curve on access and quality tomorrow. *JMIR Ment Health*, 7(3):e18848. doi: 10.2196/18848.
- Torous, J. B., Chan, S. R., Gipson, S. Y.-M. T., Kim, J. W., Nguyen, T.-Q., Luo, J., & Wang, P. (2018). A hierarchical framework for evaluation and informed decision making regarding smartphone apps for clinical care. *Psychiatric Services*, 69(5), 498–500. <https://doi.org/10.1176/appi.ps.201700423>
- Torous, J., Nicholas, J., Larsen, M.E., Firth, J., & Christensen H. (2018). Clinical review of user engagement with mental health smartphone apps: evidence, theory and improvements. *Evid Based Ment Health*, 21(3):116-119. doi: 10.1136/eb-2018-102891.
- Tricco, A.C., Lillie, E., Zarin, W., O'Brien, K.K., Colquhoun, H., Levac, D., Moher, D., Peters, M.D.J., Horsley, T., Weeks, L., Hempel, S., Akl, E.A., Chang, C., McGowan, J., Stewart, L., Hartling, L., Aldcroft, A., Wilson, M.G., Garritty, C., Lewin, S., Godfrey, C.M., ... Straus SE. (2018). PRISMA extension for Scoping Reviews (PRISMA-ScR): Checklist and explanation. *Ann Intern Med*, 169(7), 467-473. doi: 10.7326/M18-0850.
- Wainberg, M. L., Scorza, P., Shultz, J. M., Helpman, L., Mootz, J. J., Johnson, K. A., Neria, Y., Bradford, J. E., Oquendo, M. A., & Arbuckle, M. R. (2017). Challenges and opportunities in global mental health: A research-to-practice perspective. *Curr Psychiatry Rep*, 19(5), 28. <https://doi.org/10.1007/s11920-017-0780-z>
- Wang, K., Varma, D.S., & Prosperi, M. (2018). A systematic review of the effectiveness of mobile apps for monitoring and management of mental health symptoms or disorders. *J Psychiatr Res*, 107:73-78. doi: 10.1016/j.jpsychires.2018.10.006.
- Wasil AR, Gillespie S, Patel R, Petre A, Venturo-Conerly KE, Shingleton RM, et al. (2020). Reassessing evidence-based content in popular smartphone apps for depression and anxiety: Developing and applying user-adjusted analyses. *Journal of Consulting and Clinical Psychology*, 88(11), 983-993. doi: 10.1037/ccp0000604.

- *Weermeijer, J. D. M., Wampers, M., de Thurah, L., Bonnier, R., Piot, M., Kuppens, P., Myin-Germeys, I., & Kiekens, G. (2023). Usability of the Experience Sampling Method in specialized mental health care: Pilot evaluation study. *JMIR FORMATIVE RESEARCH*, 7. <https://doi.org/10.2196/48821>
- Weisel, K.K., Fuhrmann, L.M., Berking, M., Baumeister, H., Cuijpers, P., Ebert, D.D. (2019). Standalone smartphone apps for mental health-a systematic review and meta-analysis. *NPJ Digit Med*, 2(1):118. doi: 10.1038/s41746-019-0188-8.
- Widnall, E., Grant, C. E., Wang, T., Cross, L., Velupillai, S., Roberts, A., Stewart, R., Simonoff, E., & Downs, J. (2020). User perspectives of mood-monitoring apps available to young people: Qualitative content analysis. *Jmir Mhealth and Uhealth*, 8(10), Article e18140. <https://doi.org/10.2196/18140>
- World Health Organization (WHO) (2022). *World mental health report: transforming mental health for all*. Geneva: World Health Organization; 2022. Licence: CC BY-NC-SA 3.0 IGO. <https://iris.who.int/bitstream/handle/10665/356119/9789240049338-eng.pdf?sequence=1>
- *Wu, D. T. Y., Xin, C., Bindhu, S., Xu, C., Sachdeva, J., Brown, J. L., & Jung, H. (2020). Clinician perspectives and design implications in using patient-generated health data to improve mental health practices: Mixed methods study. *Jmir Formative Research*, 4(8), Article e18123. <https://doi.org/10.2196/18123>
- Youn, S.J., Schuler, K., Sah, P. *et al.* (2025). Scaling out a digital-first behavioral health Care model to primary care. *Adm Policy Ment Health* (2025). <https://doi.org/10.1007/s10488-025-01433-2>