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Advancing health equity and the role of digital health technologies: a scoping review protocol

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ABSTRACT

Introduction Healthcare systems around the world exhibit inherent systemic inequities that disproportionately impact marginalised populations. Digital health technologies (DHTs) hold promising potential to address these inequities and to play a pivotal role in advancing health equity. However, there is a notable gap regarding a comprehensive and structured overview of existing frameworks and guidelines on advancing health equity and a clear understanding of the potential of DHTs in their implementation. To this end, our primary objectives are first to identify prevalent frameworks and guidelines that promote health equity and second to pinpoint the contemporary role of DHTs as an avenue for implementing these frameworks and guidelines. This synthesis will guide future DHTs, ensuring equitable accessibility and effectiveness and ultimately contributing to enhancing health equity among marginalised populations.

Methods and analysis This work adheres to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Scoping Reviews. To identify pertinent evidence, we will employ seven electronic databases (PubMed, EMBASE, Cochrane, PsycINFO, Scopus, Web of Science and WISO) encompassing the fields of medicine, healthcare and social sciences. Moreover, selected grey literature will be considered. We will include primary and secondary studies published in English between 2010 and 2023 that focus on (technology and non-technology-based) frameworks and guidelines for health equity improvement. Each article will undergo an independent assessment for eligibility, followed by the extraction of pertinent data from eligible sources. Subsequently, the extracted data will be subjected to qualitative and quantitative analyses, and findings will be presented using narrative and descriptive formats.

Ethics and dissemination Ethical approval is deemed unnecessary for this scoping review, as it involves synthesising existing knowledge. The findings from this study will be disseminated through peer-reviewed publications.

Protocol registration https://osf.io/94pht.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ The application of a rigorous, well-established methodological framework will ensure the production of a high-quality scoping review.
⇒ A comprehensive search in multiple databases will allow an extensive mapping of the current landscape of health equity frameworks and guidelines and the potential of digital health technologies (DHTs) in implementing them.
⇒ Selective inclusion of grey literature further strengthens our review by reducing publication bias and enhancing the comprehensiveness of the findings.
⇒ The synthesis will be limited to articles published in English, which increases the risk of missing relevant insights from local initiatives across the globe.

INTRODUCTION

As of 2017, non-communicable diseases (NCDs) such as cancer, diabetes, cardiovascular diseases and chronic respiratory diseases, including common mental disorders, accounted for a staggering 73% of global mortality,[1] posing a significant health and economic challenge for healthcare systems worldwide.

Yet, the burden of NCDs is not distributed equally. Marginalised populations, such as low socioeconomic status individuals, people of colour, sexual/gender minorities and people with disabilities, are significantly more affected by NCDs than non-marginalised populations.[2–8] This is particularly prevalent in common mental disorders since attitudinal barriers such as stigma hinder adequate treatment in addition to structural barriers.[9] For instance, studies reveal that individuals within the LGBTQ+ community have a greater than twofold increased probability of having a common mental disorder within their lifetime.[10] Similarly, lower-income individuals are twice as likely to experience mental health issues as those with higher income levels.[11] Additionally, there is an inequitable distribution of the global burden of common mental disorders, with low- and middle-income countries (LMICs) experiencing a disproportionate impact. These countries harbour approximately 80% of the world's population affected by the challenges

posed by common mental disorders.[12] This is particularly gruesome, as the continuous rise of NCDs in developing countries results in a double burden. While still fighting infectious diseases and infant mortality, they are also increasingly facing an epidemic of NCDs.[13] In addition to the higher burden of NCDs, marginalised populations often experience limited access to healthcare or inadequate healthcare delivery,[14–17] leading to further disparities in health outcomes and perpetuating existing social inequalities.[18–20] Access and quality of healthcare delivery thereby point towards another important influence on health disparities, so-called social determinants of health (SHD). As per the WHO, social determinants of health refer to non-medical factors influencing health outcomes and describe the 'conditions in which people are born, grow, work, live and age and the wider set of forces and systems shaping the conditions of daily life'. Research indicates that social determinants of health contribute to approximately 30%–55% of health outcomes (WHO), underscoring the critical importance of addressing these factors to enhance overall health and combat enduring health inequities.

Given the rising prevalence of NCDs globally and the simultaneous persistence of health disparities, it is crucial to identify and implement systematic solutions to advance global health equity and improve the health of marginalised populations. Health equity refers to 'the absence of unfair, unavoidable or remediable differences among groups of people, whether those groups are defined socially, economically, demographically, geographically or by other dimensions of inequality. Health equity is achieved when everyone can attain their full potential for health and well-being' (WHO).

Patient-facing digital health technologies (DHTs), such as well-being tools, patient monitoring systems, technology-supported blended care, digital diagnostics or digital therapeutics (Digital Therapeutics Alliance, 2023), present a promising opportunity to advance health equity. By leveraging technology, DHTs promise to overcome many traditional barriers to healthcare access, such as geographical location, lack of transportation and appointment availability, and the high cost of healthcare.[21 22] Moreover, DHTs could help reduce bias and inequality within the healthcare system, as they are not subject to the same implicit social and cultural biases that can influence traditional healthcare delivery. Furthermore, the inherent technological flexibility in modifying and customising digital solutions underscores the immense potential of DHTs to adapt to diverse cultures, languages and contexts,[23] which has been demonstrated to not only enhance treatment effects but also foster sustained engagement across numerous studies.[24 25] Given the recent developments in generative artificial intelligence and large language models,[26–28] such adaptations and even personalisation of treatment are expected to become easier. As such, DHTs could play an active role in advancing health equity on multiple dimensions.

Despite the potential of DHTs to promote health equity, there currently exists only a small body of knowledge on how to systematically leverage DHTs to close the healthcare gap. Previous studies have explored how individual DHTs can be developed, deployed and integrated into existing healthcare systems to ensure equitable access and outcomes for all populations, regardless of socioeconomic status, race, ethnicity or other demographic characteristics.[18 29–31] However, most of the work focusses on individual solutions or adaptions of existing solutions to specific geographical and cultural contexts.[32–34] A commonly adapted intervention is WHO's step-by-step programme.[35] Adaptations of the programme include, but are not limited to, the sociocultural contexts of Lebanese, Syrian and Palestinians in Lebanon[36]; Syrian refugees in Germany, Sweden and Egypt[32]; and Chinese young adults.[34] While the cultural adaption of treatments undoubtedly plays a vital role in advancing health equity, cultural adoption still requires substantial efforts. There remain considerable variations in adaption approaches and the respective reporting methods,[35] hindering adaptions at scale and systematically. To systematically improve health outcomes for marginalised populations, prioritising health equity as a fundamental objective within the field becomes imperative to reframe our approaches to designing, implementing, evaluating and disseminating DHTs.[37–41] This is crucial so we do not accidentally widen the gap in health outcomes as per the *inverse care law*, which highlights the phenomenon where individuals with more resources have better access and awareness of these interventions compared with those with fewer resources but actively contribute to the closure of the healthcare gap.[42]

Thus, there is an urgent need to investigate how DHTs can be leveraged systematically to address traditional healthcare's inherent inequities and advance health equity. To this end, we must first understand the state of the art on advancing health equity to transfer this knowledge to the DHT context. These findings can be leveraged for future work on design principles for DHTs that are informed by health equity standards.

Recent studies have laid important groundwork by lifting prior health disparity research into the digital age, for example, by expanding the health disparity framework by a digital domain[39] or by defining digital determinants of health based on social determinants of health frameworks.[38] These works significantly contribute to understanding the impact mechanisms and the magnitude of the problem of health disparities in the modern age. However, to this day, a structured overview and analysis of existing frameworks and guidelines on advancing health equity is missing.

Thus, the current work aims at closing this gap by conducting a comprehensive scoping review. By identifying, analysing and synthesising overarching and population-specific frameworks and guidelines to advance health equity, this research can inform policies and practices alike. For example, these findings could be

translated to actionable design knowledge to guide healthcare providers and technology developers in designing DHTs that are tailored to the specific needs of diverse populations and are overall more accessible, affordable and effective for all people. Additionally, policies could be informed to include relevant equity-focused criteria in the evaluation and approval process of new DHTs.

METHODS AND ANALYSIS

Protocol design, registration and reporting

Scoping reviews are an established tool to provide an overview of the existing body of knowledge on a given topic, to identify key concepts or characteristics across the literature and to identify knowledge gaps.[43] This protocol is based on the extension of the Preferred Reporting Items for Systematic Reviews and Meta-Analysis for Scoping Reviews (PRISMA-ScR). It will follow the evidence synthesis guidelines provided by the Joanna Briggs Institute.[43–45] The protocol was written before the review activities and registered in the Open Science Framework (https://osf.io/94pht). The planned review start is December 2023, with screening and analysis anticipated to last until May 2024.

Research questions

As outlined in the introduction, there is an urgent need to systematically investigate how DHTs can be leveraged to address traditional healthcare's inherent inequities and actively advance health equity. However, to this day, there has been no structured overview and analysis of the existing frameworks and guidelines on advancing health equity. Thus, our research goal is to close this gap by conducting a comprehensive scoping review of the current body of knowledge on frameworks and guidelines to advance health equity. To do so, we aim to answer the following research questions:

1. Which frameworks and guidelines exist to advance health equity?
2. To what extent are DHTs currently discussed as an opportunity to implement these frameworks and guidelines?

Eligibility criteria

The eligibility criteria follow the JBI guidelines outlining population, concept, context and evidence sources (PCCE) and are summarised below.

Types of participants

In this review, we consider studies focusing on any marginalised population typically affected by health disparities. Examples include, but are not limited to, marginalisation due to race or ethnicity, religion, age, gender, sexual orientation or gender identity, cognitive, sensory or physical disability, and/or financial and socioeconomic status.[46]

Concept

We consider studies that focus on advancing health equity for marginalised populations. We will focus on frameworks and guidelines that aim to advance equity as a primary study outcome. Acknowledging that health equity may not be used explicitly, other terms aligning with health equity will be included, such as health equality or health justice (for a complete list of terms, see the search strategy below). The same applies to the term frameworks and guidelines. Other terms may include principles, approaches, policies, standards, strategies, directives or methodologies to advance health equity. This review will exclude sources not explicitly positioned as frameworks and guidelines to advance health equity as a primary outcome but only touch upon health equity peripherally. To answer the second research question, we will focus on patient-facing DHTs. This includes well-being tools, patient monitoring systems, technology-supported blended care, digital diagnostics and digital therapeutics (Digital Therapeutics Alliance, 2023). If the evidence base is too small for adequate analysis, we will include healthcare professional-facing DHTs as well.

Context

The search will not be limited to specific geographical, cultural or social settings to ensure a diverse perspective. However, only studies published in English will be considered, which might miss valuable global perspectives. This decision is based on the practical constraints of time and resources, as well as the widespread use of English as the primary language of scientific communication. To mitigate potential biases, efforts will be made to include review articles that incorporate findings from non-English sources as well as conduct forward-backward searches with identified studies, ensuring that valuable global perspectives are not entirely omitted.

Evidence

This review will consider qualitative, quantitative and mixed-method studies. Additionally, all types of reviews (eg, systematic, scoping, umbrella and narrative) and selective grey literature (eg, government documents and policy documents) from selective institutions (eg, WHO) will be considered. Studies from 2010 and onwards will be included, as this marks a shift in both language and research emphasis from health disparities (focus on problem identification) to health equity (focus on solutions).[47] In addition, this coincides with the emergence of early digital health solutions and the increasing availability of smartphones and mobile apps, ringing in the second wave of DHTs.[48] Inclusion of relevant literature will not be restricted by regional origin.

Exclusion criteria

The exclusion criteria are as follows: advancement of health equity not as a primary study outcome, full-text not accessible, full-text not available in English and other study types (editorials, opinion papers, grey literature, dissertations, conference papers, comments and letters published without peer review).

Table 1 Search strings based on alternative keywords

ID	Description	Search terms
1	Frameworks and guidelines	framework* OR guide* OR principle* OR approach* OR polic* OR standard* OR strateg* OR directive* OR methodolog* OR protocol* OR practice* OR recommend* OR consider* OR imperative* OR agenda OR synthesis
2	Health equity	'health equit*' OR 'health equalit' OR 'health justice' OR 'health parit*' OR 'health inequit*' OR 'health inequalit*' OR 'health injustice' OR 'health disparit*'

Search strategy

The scoping review's search strategy was developed according to the PRISMA-ScR guidelines.[45] The detailed search strategy has been designed with the help of an expert librarian in the field of medicine at the University of Zurich.

Initial search strategy

The primary author conducts a preliminary limited search across two relevant databases.[44] PubMed and Web of Science were selected to identify key descriptions, synonyms and keywords included in titles and abstracts of publications related to the field of study. Based on the first research question, the selected keywords included frameworks and guidelines and health equity. Furthermore, additional keywords were generated by exploring alternative options within the preliminary studies. The final search strategy is presented in table 1. For the full search strategy per database, please refer to the online supplemental material.

Data sources

Both primary and secondary studies should be considered sources of evidence for a scoping review.[44] Consistent with prior work, the search will be conducted using the following databases: PubMed, EMBASE, Cochrane, PsycINFO, Scopus, Web of Science and WISO.

Test search

A pilot test of the search strategy will be conducted to identify any limitations. To ensure reliability, two authors will apply the developed search strategy across each database and assess the titles and abstracts of the first 25 papers. The research team will then discuss relevant concerns and limitations, modifying the search strategy as required. The comprehensive search strategy will be documented and disclosed in the scoping review.

Selection of sources of evidence

Each database will undergo an electronic search, employing the adjusted search strategy following the PRISMA-ScR guidelines. The search process will involve four sequential steps: identification, screening, eligibility and inclusion. It will be graphically presented in a PRISMA flow chart in the scoping review.[45] The search results will be individually exported to Citavi 6.17 to identify duplicate entries and manually cross-checked. Two authors will independently assess the titles and abstracts of the retrieved studies with *Rayyan* (https://www.rayyan.ai/) based on the predefined eligibility criteria, followed by the exportation of the selected studies, including their full texts. An additional author will independently verify the study selection process. A comprehensive list of all selected and excluded studies and the reasons for exclusion will be reported in the appendix of the final scoping review.

Data extraction

Data will be extracted for the final selection of evidence sources that align with the scoping review's objectives and research questions. We will use a customised Excel workbook, initially testing it on selective studies to iteratively refine and finalise it. Two reviewers will conduct a comprehensive full-text inspection and data extraction process independently for all selected sources to ensure accuracy and minimise errors. The data extraction will encompass generic key information commonly used in scoping reviews, such as the author's name, publication year, country of origin, study type, publication title, population type, research questions and results.[44] Moreover, specific to the topic, data related to health equity frameworks and guidelines to advance health equity and to what extent DHTs are discussed as an opportunity to implement these frameworks and guidelines will be extracted. This includes, but is not limited to, the applied health equity definition, the application domain of the framework (eg, cardiology and oncology) and the level of the initiative proposed (eg, policy level and organisations). The extracted data will be manually coded by two independent reviewers and differences will be discussed to refine and finalise the outcome dimension. Additionally, any review data sources that overlap with primary studies will be evaluated to determine the uniqueness of the evidence.

Analysis and presentation of results

Both quantitative and qualitative analyses will be performed on the identified evidence. Quantitative analysis, for example, the number and types of published studies, publication year and average occurrence of concepts to advance health equity, will be conducted using descriptive statistics in R. Qualitative analysis will be presented in a narrative format following the PRISMA-ScR guidelines.[45] Tables and diagrams will be used to present the evidence synthesis, followed by a comprehensive discussion of relevant literature in line with the overall objective of the scoping review. The will be made available upon reasonable request from the corresponding author.

Patient and public involvement

Neither patients nor the public were or will be involved in the design, reporting, or dissemination of this research project.

ETHICS AND DISSEMINATION PLAN

Since the described scoping review is solely based on previously published peer-reviewed work, separate ethics considerations are unnecessary. The plan is to submit the results of this scoping review for publication in a peer-reviewed academic journal.

Contributors LB and TK conceptualised and designed the study. LB collaborated with the expert librarian for guidance and wrote and critically revised the review protocol. MN and TK provided methodological guidance, critically reviewed the protocol and offered guidance for revision. ECP critically reviewed the protocol. All authors approved the final version of the work to be published and agreed to be accountable for the integrity of the work published, with TK acting as guarantor. The research team used ChatGPT 3.5 sporadically to refine and optimise individual sentences presented in the manuscript to ensure adherence to the highest academic standards of English proficiency. The authors reviewed the generated optimisation suggestions before applying them to the manuscript.

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Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

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