



REVIEW ARTICLE

Digital mental health interventions for the mental health care of refugees and asylum seekers: Integrative literature review

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Email: rhonda.wilson@newcastle.edu.au**Abstract**

This study aimed to provide a critical analysis of the current literature on the use of digital mental health interventions (DMHIs) for the management and treatment of mental health disorders among refugees and asylum seekers. These groups are among the most disadvantaged compared to the general population in terms of health and socio-economic status, due to conflicts and wars. The number of refugees fleeing their home countries is growing exponentially, and refugees experience trauma, torture, persecution and human right abuses, which have a profound effect on their mental health and overall well-being. The researchers conducted an integrative literature review from electronic databases Medline, CINAHL and Google Scholar, selecting articles published in English from 2010 to 2023. The thematic analysis of the 10 articles identified in the review revealed four main themes and two sub-themes: (1) *types of digital health intervention/apps used*; (2) *barriers encountered in digital health intervention*; (3) *user experience of the digital health intervention* and (4) *mapping gaps*. Two sub-themes were identified located in Theme 2: (2.1) *Language and demographic barriers* and (2.2) *Structural barriers*. The study showed that the use of DMHIs was associated with positive experiences among refugees and asylum seekers. Limited mental health care is offered to refugees and asylum seekers due to a range of logistical, political, economic, geographical, language, cultural and social barriers. DMHIs have the potential to overcome and/or moderate these barriers. The study concludes that the scaled implementation of effective DMHIs holds the possibility to improve the wider distribution of mental health care among refugees and asylum seekers. However, further research is needed to confirm the effectiveness of DMHIs and to scale up studies for their utilisation among this group. In summary, this study highlights the potential of DMHIs in improving the mental health care of refugees and asylum seekers. The results of this study have important implications for mental health service providers, policymakers and researchers to address the mental health needs of this vulnerable/priority group.

KEYWORDS

asylum seekers, digital health, displaced person, mental health, migrant, refugee, smartphone technology

INTRODUCTION

In recent years, there has been an increase in the number of people fleeing their home countries associated with war, armed conflicts, persecution and human rights

violation such as discrimination, structural violence and inequality (Freedman, 2019; Wilson et al., 2022). As of mid-2023, there were approximately 110 million forcibly displaced persons worldwide, out of this figure, 62.5 million were internally displaced (IDPs), 36.4 million

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were refugees, 6.1 million were asylum seekers and 5.3 million were individuals requiring international protection [United Nation Higher Commissioner for Refugee (UNHCR), 2023]. This number is expected to increase on the account of the ongoing conflicts and wars in Syria, South Sudan, Ethiopia, Ukraine and recently Palestine (UNHCR, 2023). Reports confirm that wars and conflicts exert negative impact on the mental health of refugees and asylum seekers (Cuijpers et al., 2023). It has been observed that there is a lack of appropriate mental health care, treatment and support for this population, especially during resettlement in hosting countries (Raphiphatthana et al., 2020). Innovative technologies such as digital mental health interventions (DMHIs) have been suggested as way to breach this gap (Smith et al., 2023). DMHI encompass a broad spectrum of technological tools, applications and platforms designed to promote, monitor and enhance mental well-being (Hollis et al., 2018; Smith et al., 2023). These interventions leverage digital technologies such as mobile applications, online platforms, wearables, virtual reality and artificial intelligence to provide various forms of support, therapy and resources to individuals seeking to manage their mental health concerns. DMHI can include but are not limited to cognitive behavioural therapy apps, mood tracking applications, virtual support groups and personalised mental health chatbots. The efficacy and reach of DMHI have garnered significant attention in recent years due to their potential to increase accessibility, affordability and scalability of mental health support (Hollis et al., 2018; Smith et al., 2023). DMHIs have the potential to enhance mental health care for refugees and asylum seekers. These digital interventions have been shown to be cost-effective and overcome the barriers of accessibility in the absence of face-to-face mental health services. This integrative literature review critiques the use of DMHIs and associated claims about improving the mental health of refugees and asylum seekers.

BACKGROUND

In 1951, the United Nations (UN) defined refugee as a 'person who lives outside their country of nationality, owing to the fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion and is unable or unwilling to avail the protection of that country or return to the country for the fear of persecution (UNHCR, 2012). While an asylum seeker is defined as an individual who has formally applied for protection in another country and their request has not yet been approved (Wilson et al., 2022). Moreover, a migrant is defined as a person who has moved from his country of nationality, across an international border or within a state to seek opportunities or safer and better prospects (UNHCR, 2012). Marit et al. (2017) has confirmed

depression, anxiety, post-traumatic stress disorder (PTSD) and related somatic health symptoms as the most common mental health disorders among refugees and asylum seekers. A literature review about refugee health conducted in Australia showed epidemiological estimates of 7.6% for depression and 12.9% for PTSD in war affected populations (Charlson et al., 2016). A recent systematic review and meta-analysis study from Europe revealed high prevalence of mental illnesses such as PTSD, major depressive disorder (MDD), bipolar affective disorder (BPD) and psychotic disorders among refugees and asylum seekers (Patanè et al., 2022).

A further systematic review conducted in Australia in 2005 examined the prevalence of mental illness among 7000 refugees resettled in western countries (Fazel et al., 2005). It found that refugees were 10 times more likely to be diagnosed with PTSD than the general population (Fazel et al., 2005). A cross-sectional study conducted in Melbourne, Australia showed higher prevalence of mental illnesses among refugees and asylum seekers compared to Australian-born counterparts attending the same clinic (Shawyer et al., 2017). PTSD is a debilitating mental illness characterised by flashbacks of traumatic past events, hypervigilance and emotional numbing, which can lead to substance abuse and suicide (Fazel et al., 2005). A recent study by Magwood et al. (2022) has found that approximately 4.4% of the world population suffer from major depression and 3.3% with PTSD. Furthermore, emotional dysregulation, behavioural problems and significant anxiety levels are found to be higher in children of refugees and asylum seekers (Marit et al., 2017). These findings concur with a systematic review conducted in Europe on psychosocial interventions for adult refugees and asylum seekers (Nosè et al., 2017). In that study, they found a higher rate of mental health disorders, specifically PTSD, depression and anxiety among adult refugees and asylum seekers (Nosè et al., 2017). Mental health disorders among refugees and asylum seekers are known to be dependent on factors such as the quality of pre-migration, post-migration resettlement or migration experiences in the host country (Raphiphatthana et al., 2020). It is apparent that early and conveniently accessible mental health care for refugees and asylum seeker populations are ideal to curb the severity of mental health disorders experienced within this priority population.

Increases in mental health disorders among refugees and asylum seekers has been linked with their previous experiences such as harsh conditions experienced in the camps, overcrowding, poor health, poor nutrition, loss of aspirations, worries about families, friends and relatives left behind (Procter et al., 2022). In addition, literature has further acknowledged exposure to violence contributes to the development of poorer mental health conditions for children and adolescent of refugees and asylum seekers background (Procter et al., 2022). It has also been shown that mental health among refugees



and asylums seekers in the resettling nations is exacerbated by factors such as unemployment, language barrier, cultural shock, perceived racism and discrimination, sense marginalisation and limited health literacy (Procter et al., 2022). Notably, factors which enable and facilitate mental health improvements for refugees and asylum seekers have been associated with positive relationships with friends, relatives, peers and families and acculturation success and securing employment (Procter et al., 2022).

Barriers to achieving mental health care for refugees and asylum seekers

Literature demonstrates that refugees and asylum seekers face many challenges in accessing suitable psychological or mental health treatment in both developed and developing nations (Marit et al., 2017). These challenges include language barriers, lack of access to mainstream mental health services, discrimination, detention, denial of the right to work and delayed decisions on asylum applications (Ryan et al., 2009). It is estimated that 80%–90% of the refugees experiencing psychological distress are unable to access mental health services because of the remoteness of their location (Marit et al., 2017).

A mixed methods study conducted in Sweden investigating the development of an Internet-based CBT self-help program for Arabic-speaking immigrants reveals that refugees in Sweden with psychological symptoms failed to seek mental health support due to perceived discrimination, lack of psychotherapy and language barriers (Nygren et al., 2018). These findings were consistent with the earlier studies which identified the underuse of mental health services by refugees compared to the general population (Kirmayer et al., 2011). This was due to structural issues, stigma and lack of trust in services by refugees as they believed that their issues could not be capably understood by the health professionals (Nygren et al., 2018). This was further confirmed by Raphiphatthana et al. (2020) who found refugees, migrants and asylum seekers were hesitant to use mainstream mental health services compared to their counterparts due to barriers such as literacy problems, stigma and limited access. Considering the limitations that refugees and asylum seekers face in accessing medical facilities, DMHI provides an opportunity to navigate through barriers and help in enhancing the mental healthcare opportunities (Liem et al., 2021; Romao et al., 2021).

DMHI for refugees and asylum seekers/migrants

DMHI utilise the convenience of personal digital communication devices (e.g. mobile phones, tablets and computers) and media modalities to manage, treat and

alleviate the symptoms of patients with mental illnesses (Lehtimaki et al., 2021; Liem et al., 2021). Alternative terminologies for digital mental health include e-mental health, e-health, telemedicine and telepsychiatry (Lehtimaki et al., 2021; Raphiphatthana et al., 2020). DMHI uses information and communication technology (ICT) to provide mental health care such as promoting mental health, early interventions, suicide prevention, treatment and recovery (Raphiphatthana et al., 2020). Currently, DMHI for refugee and asylum seeker children and young people with mental health problems are delivered through computer-assisted therapy, smartphone apps and portable technologies (Hollis et al., 2015). These technologies have enormous potential to improve accessibility, clinical effectiveness and personalised mental health interventions (Hollis et al., 2015). These types of innovations have led to improved mental health outcomes in some refugee and asylum seeker settings (Marley & Farooq, 2015). Literature has demonstrated the effectiveness of these interventions with similar effectiveness to traditional mental health care in the general population (Josephine et al., 2017). Online interventions overcome the problems associated with poor accessibility, remoteness and associated stigma issues (Weir, 2021). Moreover, literature has found the existence of a strong evidence-based digital intervention for the treatment of depression and anxiety (Weir, 2021). DMHIs have gained recognition for their inherent flexibility, which includes the option to administer interventions offline in regions where reliable network connectivity is unavailable. As a result, DMHIs are increasingly being acknowledged as a viable mode of treatment for mental health conditions, as they have the capacity to overcome a range of structural barriers and have gained prominence in recent years (WHO, 2019).

A study by Maitland and Xu (2015) on Za'atari refugee camp in Syria showed that 90% of the people had mobile phones and 60% had access to Internet. Dewa et al. (2019) explored the views of young people on the acceptability of technological wearable devices and social media in mental health detection and deterioration. Wearables and mobile apps can detect deterioration of mental health in real-time by detecting changes in sleep patterns, mood and physical activities (Dewa et al., 2019). Wearables and mobile apps are viable technological options in early detection and intervention of mental health in young people (Dewa et al., 2019). However, there are still limitations in access to digital interventions in populations such as migrants, refugees and asylum seekers, and people from low socio-economic status (Goodman et al., 2021). These limitations include cost or affordability, low health literacy and stigma associated with mental health illness and services. Overall, there is evidence to suggest that DMHI are plausible and effective in addressing barriers in mental health care among refugees, migrants and asylum seekers (WHO, 2019; Wirz et al., 2021).



Evidence-based mental health interventions for refugees and asylum seekers

Evidence-based interventions are clinical actions or procedures that have been extensively studied and replicated in multiple studies to ensure their effectiveness (Kilbourne et al., 2007). The use of evidence-based practices is crucial to validate treatments and ensure patient safety. However, the effectiveness of evidence-based interventions may vary among different populations and settings. For instance, Marit et al. (2017) found that evidence-based interventions are more effective among refugee populations in high-income countries than in low-income countries. This suggests that cultural and contextual factors play a significant role in the success of interventions. To ensure the success and effectiveness of evidence-based interventions among refugee populations, it is crucial to consider cultural safety and competence. As Sit et al. (2020) noted, design considerations that accommodate cultural elements such as language, religiosity and social norms can increase the acceptability of DMHIs among refugees. Cultural adaptation, which involves adjusting evidence-based interventions to fit the cultural context and values of the clients, is also essential (Sit et al., 2020).

Several evidence-based interventions, such as cognitive behavioural therapy (CBT), narrative exposure therapy (NET), eye movement desensitisation and reprocessing (EMDR) and individual-based multimodal interventions for PTSD, have been found to be effective in treating refugees and asylum seekers (Marit et al., 2017). A meta-analysis conducted in high-income countries identified 14 randomised control trials (RCTs) that showed NET and CBT to be effective in reducing PTSD and depressive symptoms (Nosè et al., 2017). Similarly, EMDR has been found to be effective against PTSD and depression in Syrian refugees and asylum seekers living in Turkey. It is apparent that evidence-based interventions are essential for the effective treatment of refugees and asylum seekers. However, cultural and contextual factors play a significant role in the success of these interventions. Therefore, it is crucial to consider cultural safety and competence and adapt evidence-based interventions to fit the cultural context and values of the clients to ensure their effectiveness.

Significance

Refugees and asylum seekers face higher psychological distress and mental illness rates due to exposure to trauma and human rights violations (Byrow et al., 2019). Limited mental health support during application phases

emphasises the need for innovative solutions (Slewa-Younan et al., 2015; Smith et al., 2023; Rubeis, 2021). DMHIs emerge as a practical way to address barriers (El-Haj-Mohamad et al., 2022; Hollis, 2015; Smith et al., 2023). This review consolidates DMHI research for refugee mental health, guiding tailored applications and future priorities. It aids international mental health services, governments and refugee agencies, aligning with Sustainable Development Goal 3.4 to reduce non-communicable disease-related deaths through mental health initiatives (Herrman, 2019; Lund et al., 2018; WHO, 2019). The findings support collaborative efforts for humanitarian services, emphasising universal mental healthcare access for this vulnerable populations.

METHODS

Study design

The study utilised an integrated literature review design to allow for the inclusion of various studies and the synthesis of both theoretical and empirical evidence based on extensive data available for the chosen topic, as suggested by Whittemore and Knafle (2005). This design followed a structured five-step process, which included:

1. Problem identification: This step involved identifying the problem or research question that the study aimed to address.
2. Literature search: This step entailed conducting a comprehensive literature search to identify relevant studies and other sources of information.
3. Data evaluation: This step involved evaluating the data obtained from the selected studies and sources to determine their relevance and quality.
4. Data analysis: This step entailed analysing and synthesising the data to identify patterns and relationships among the findings.
5. Presentation. This step involved presenting the results in a clear and concise manner, using appropriate techniques to communicate the findings effectively.

Problem identification

The aim of this literature review is:

1. To critique current available literature on the use of DMHIs in the management of mental health disorders among refugees and asylum seekers.
2. To identify the gaps in the literature and consider future research implications and practice directions.

To achieve these aims, we asked the following research questions to guide the literature search:



1. What is the information available on DMHIs for refugees and asylum seekers?
2. What are the effective mental health interventions available in Australia for refugees and asylum seekers?
3. What are the gaps in the current literature that can inform future research?
4. What, if any, are the barriers for the use of the digital health interventions among refugees and asylum seekers?

After an extensive review of the existing literature, we structured our research questions using the well-established PICOT model, which represents Population, Intervention, Control, Outcome and Type of question. The PICOT model is widely recognised for its effectiveness in formulating clinical and research queries and is acknowledged for its role in guiding literature searches and reviews (Aslam & Emmanuel, 2010). Following this model, we carefully selected keywords and MeSH terms that are prominent within our research domain, including 'migrant', 'refugee', 'asylum seekers', 'displaced persons', 'digital mental health interventions', 'mobile phones', 'smartphone', 'technology', 'e-mental health interventions' and 'mental health disorders/illness'. Subsequently, we executed a highly targeted search across electronic research databases, with a detailed breakdown provided in Tables 1 and 2 for reference. This methodological approach ensures precision and comprehensiveness in our exploration of the subject matter.

Literature search strategy

The literature search focused on studies between 2010 and 2023. The last 10 years has seen a surge in the development of digital technology such as smartphones, apps and other devices, and hence investigating their impact on mental health intervention is warranted. Furthermore, the study focuses on a period where there has been an increase in refugees and asylum seekers. It coincides with a significant change in 2013 for migration policy in Australia, where our study is located. Thus, it is relevant to understand the use of digital technology in mental health interventions between 2010 and

2021 (Silove & Mares, 2018; Witte et al., 2021). More recently, WHO's regional director in Europe in 2020 has recommended the use of Internet and mobile interventions broadly to administer psychological first aid and mental health problem management in the midst of COVID-19 pandemic (van Daele et al., 2020).

Mobile phone usage in the context of mental health care has been well established in the literature over the last decade (Harrison et al., 2011). Moreover, mobile devices have been used in mental health to monitor mood, stress, sleep problems and behavioural coping strategies (Reid et al., 2009). A study by Proudfoot et al. (2010) explored attitudes of the Australian general public regarding the use of mobile phones for monitoring mental health conditions and self-management strategies, and they found high interest in the use of mobile phones for the purposes of receiving mental health interventions. This benefit and interest in using mobile devices for health service consumption, especially in mental health, is situated in the context of a continual increase in mobile device usage rates, for instance, recent global statistic mobile devices use is projected to reach 18 billion (18.22 billion) by 2025 (Laricchia, 2022). Furthermore, an exploratory research study conducted in 2015 in Za'atari refugee camp in Jordan found higher use of mobiles and Internet among refugees (Maitland & Xu, 2015). It was noticed that among 174 young people who had participated in the research, 86% owned a mobile and 83% had active SIM cards. Mobile phones were found to be most popular device for accessing the Internet among this group (Maitland & Xu, 2015). Given the widespread use of Internet-connected mobile devices among refugee and asylum seeker populations, there is an opportunity to leverage digital technology to improve access to mental health care for this group. Accordingly, this study aims to synthesise the literature to understand what can be learnt to improve the future development of DMHI that can serve as effective tools for delivering mental health interventions to this vulnerable and priority population.

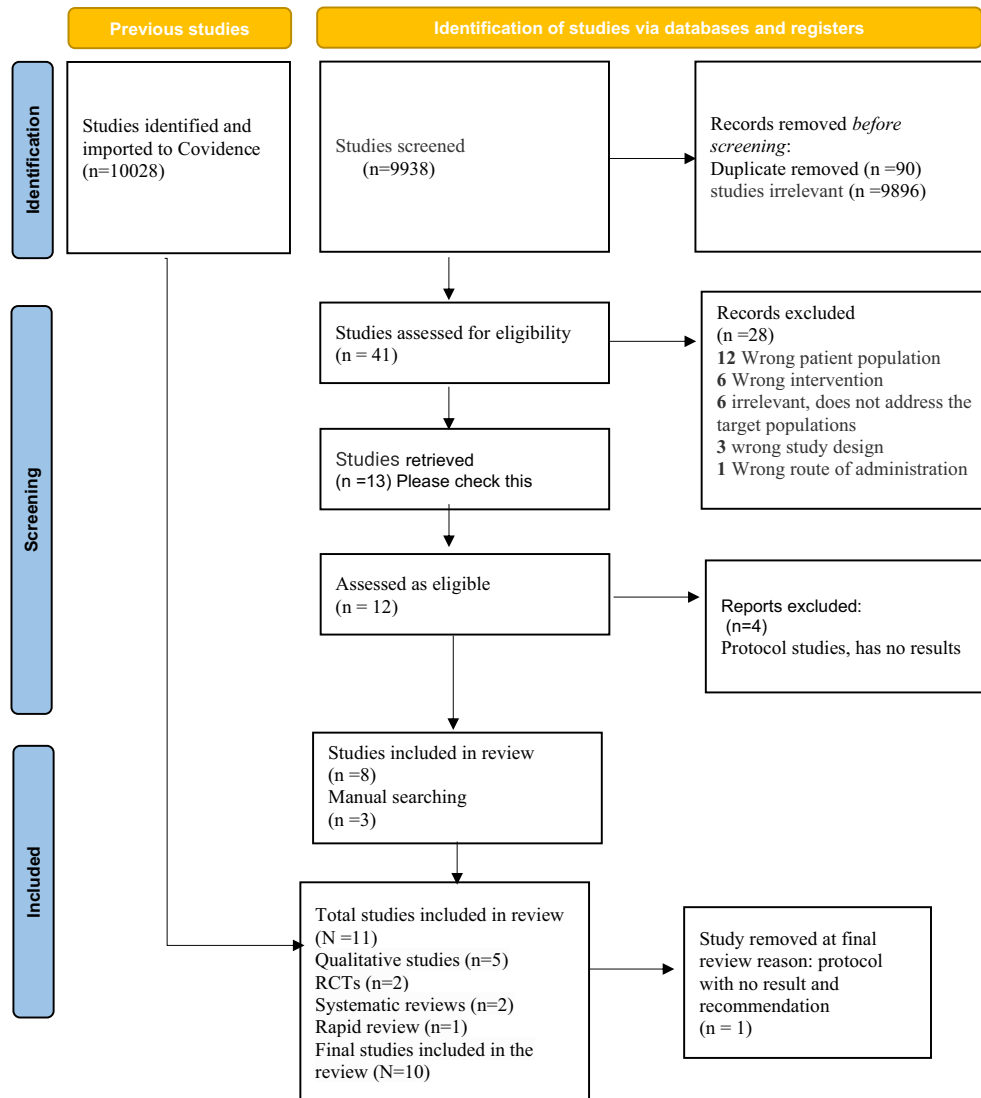
The electronic databases Medline, CINAHL and Google Scholar were used to search globally for literature discussing DMHIs. Our search located 10028 articles which were screened according to selection criteria

TABLE 1 The PICOT model for clinical question.

P	Patient, population or problem	Refugees, asylum seekers and migrants with mental illness
I	Intervention, or exposure	Digital mental health interventions, smartphones, e-mental health technological devices, telepsychiatry, telemedicine
C	Comparison or intervention (if appropriate)	Not applicable
O	Outcome you would like to measure or achieve	Improved mental health outcomes for this population, create ease and accessibility to mental health services
T	What Type of question being asked?	What is known about digital mental health interventions among refugees and asylum seekers worldwide? What are the effective mental health interventions among refugees and asylum seekers?
	Type of Study	Integrated literature review (Whittemore & Knafl, 2005)

**TABLE 2** Keywords and MeSH terms employed in the literature search strategy.

Search engine	Search terms
CINAHL	(Refugees or asylum seekers or displaced or migrants or immigrants or immigration) AND (digital interventions or telehealth or telemedicine) AND (mental health or mental illness or mental disorder or psychiatric illness)
PubMed/Medline	(refugee) OR (asylum seeker) OR (immigrants) OR (displaced person) AND (digital intervention) OR (wearable technology) OR (smartphone) OR (telehealth) OR (telemedicine) OR (e-health) OR (health) AND (mental illness) OR (psychiatric nursing) OR (mental health disorders)
Google Scholar	'Digital health interventions for refugee and asylum seekers with mental illness'
Other search methods	Manual search was conducted from the list of references

**FIGURE 1** PRISMA chart.

for suitability using Covidence software, with duplications removed (see Table 1 and Figure 1). This resulted in the selection of seven suitable articles, with a manual search revealing a further three articles suitable for inclusion. Thus, 10 relevant articles for this study were retrieved and included in the review. The selection criteria

for inclusions or exclusions in the literature review were based on the criteria that are provided in Table 3. Only articles published in English language were screened due to limited time for the project duration. The screening process for data collection of relevant articles is outlined in the PRISMA chart provided in Figure 1.

**TABLE 3** Eligibility criteria.

Inclusion criteria	Exclusion criteria
A Published between 2010 and 2023	• Studies published in languages other than English
B Published in English, peer-reviewed, systematic reviews	• Studies published before 2010, and do not examine digital mental health interventions in this population
C Studies that examine digital mental health interventions for refugees/asylum seekers/migrants across the world	• No full text available
D With full-text available	• Books, conference papers, newspapers, commentaries and study protocols

Data evaluation

During the data evaluation phase, the assessment of study quality was executed with utmost precision, involving the careful evaluation of data extracted from the selected studies and sources to ascertain their relevance and calibre. To ensure a stringent evaluation, all identified articles seamlessly underwent integration into Covidence, a dedicated systematic review management tool, which effectively streamlined the screening process. In accordance with established standards, the methodological rigour of the chosen studies underwent a meticulous appraisal using the Critical Appraisal Skills Program (CASP) framework (Long et al., 2020). This widely respected framework, acclaimed for its comprehensive evaluation criteria, facilitated a thorough analysis of study methodologies, potential biases and overall research rigour. In the event of a divergence of opinions between the two initial reviewers, a third reviewer was engaged to provide the decisive vote, thus resolving any discrepancies and maintaining the integrity of the evaluation process. As a result, this robust and collaborative approach fortified the reliability and robustness of the findings presented in our review (Table 4).

Presentation

This step involved presenting the results in a clear and concise manner, using appropriate techniques to communicate the findings effectively.

RESULTS

Our data for this review included ten studies ($n=10$) and are summarised in a matrix (Table 5). The study designs varied with five qualitative studies ($n=5$), two randomised control trials (RCTs) ($n=2$), two systematic reviews ($n=2$) and one rapid review ($n=1$). The studies were conducted in Europe ($n=6$), Germany ($n=4$), Sweden ($n=1$), Switzerland ($n=1$), USA ($n=2$), Indonesia ($n=1$) and the Middle East ($n=1$). Most participants were refugees from Syria, Middle East and a few from Africa. The studies were fully reviewed and thematically analysed.

Data analysis

Thematic analysis was selected for this study and has been described as a process of identifying and analysing pattern of themes allocated into categories to create meaning and context (Braun & Clarke, 2019). This method was selected because it allowed the researchers to identify emerging patterns of meaning being generated through collective or shared experiences. The analysis of themes across the dataset would lead to the critical understanding of the topic under investigation and hence answers to the research questions would be authentically produced (Braun & Clarke, 2019). The thematic analysis process utilised familiarisation with the data elucidating understanding the various topics, enabling the generation of themes. An iterative process of reviewing themes, defining and refining themes and finally naming the themes took place. Based on the analysis, four main themes and two sub-themes were revealed: (1) *types of digital health intervention/apps used*; (2) *barriers encountered in digital health intervention*; (3) *user experience of the digital health intervention* and (4) *mapping gaps*. Two sub-themes were identified located in Theme 2: (2.1) *language and demographic barriers* and (2.2) *structural barriers*. These themes and sub-themes are aligned to a meaningful response to the research question devised for this study assisted with the developing an understanding of experiences and gaps in knowledge that are relevant to DMHI implementation for improving the mental health of refugee and asylum seeker populations.

Theme 1: Types of digital health interventions and apps

The primary theme of *digital health intervention and apps* arose directly from the data. Due to the barriers faced by refugees and asylum seekers in accessing traditional mental health treatment, digital health interventions were deemed a suitable alternative. A comprehensive list of mental health intervention apps and online websites utilised by this population is presented in Table 6. DMHIs are advantageous for individuals who are hesitant to engage in face-to-face interactions with mental health professionals. DMHIs have been found to be appropriate for individuals experiencing emotions such as shyness, embarrassment, fear and shame (Gan

**TABLE 4** Matrix summary of included articles.

Author (year)	Study aim	Design, setting and sample size	Data collection and analysis
Morina et al. (2017)	This study aimed to assess MAPSS, a new ACASI software for touchscreen devices, for screening purposes in a clinical setting. It evaluated its reliability, feasibility and usability.	Design: (RCT) Cross-over design. Setting: Conducted in Switzerland. Sample size: A total of 30 treatment-seeking refugees. Participant diversity: Included individuals from Tamil, Arabic, Farsi or Turkish backgrounds. Clinical measures: Feasibility questionnaires: User interface rating of MAPSS, paper-pencil clinician-administered interviews.	Data were collected and analysed using IBM, SPSS. Paired sample <i>t</i> tests were conducted to compare HSCL, PDS and EUROHIS-QoL.
Nygren et al. (2018)	Explore the process of developing trans diagnostic Internet-based cognitive behavioural therapy (ICBT) self-help program in Arabic for mild-to-moderate symptoms such as anxiety, depression and insomnia.	Design: Qualitative study. Setting: Conducted in Germany, Sweden and Egypt. Sample size: Total sample size of 128 participants. Participant diversity: Syrian refugees residing in Germany, Sweden and Egypt. Language diversity: Program available in three languages: Swedish, English and Arabic. Team members: Four-member clinician, including research psychologists, a webmaster and a translator administering the program, 105 real-life test users participated in the study.	Data collected through focus group and interview.
Burchert et al. (2019)	Explored the stages of user-centred mobile adaptation process step-by-step (SBS) app, a web-based e-mental health intervention developed by WHO examined use with Syrian refugees.	Qualitative study (<i>n</i> =128) Syrian refugees residing in Germany, Sweden and Egypt who took part in qualitative assessments.	Interview and focus groups. Results were analysed using inductive and deductive thematic analysis.
Hassan and Sharif (2019)	Evaluated existing studies to determine the clinical and cost-effectiveness of telepsychiatry in resource constrained environment.	Systematic review Setting: Utilised electronic databases: PsychINFO, PubMed, Medline, EMBASE. Sample size: Included 1477 studies. Participant selection: Focused on Syrian refugees. Examined diagnoses of depression, panic disorder, PTSD, schizophrenia and bulimia nervosa. Geographic scope: USA, Canada and Spain.	Computerised literature search was conducted on databases as stated in design section. Manual search was also conducted. Two independent reviewers examined studies which met the inclusion criteria (<i>N</i> = 14 RCTs).
Shah et al. (2019)	Explored refugees' perception, impact of communication through ICT on their MH, how to use ICT to communicate with family and logistical issues in using and accessing ICT in USA.	Design: Qualitative study Setting: Conducted in the United States. Sample size: <i>N</i> =290. Participant selection: Adult refugees from multiple countries: Afghanistan, Iraq, Syria and the Great Lakes region of Africa (Burundi, Democratic Republic of Congo and Rwanda). Participants were settled in the United States. Additional information: Participants were part of an RCT involving a community-based mental health intervention. In-depth qualitative interviews were conducted as part of the qualitative study.	Constructivist grounded theory. In-depth interviews. Part of a multimodal study with RCT.



Intervention description	Finding and results	Limitations/strengths	Recommendations
Patients were enrolled in outpatient clinic to test the feasibility of MAPSS. Participants were undergoing treatment for their trauma-related psychosocial problem. Participants were assigned to two groups: MAPSS or paper-pencil interview (PAPI).	MAPSS feasible and efficient for traumatised refugees, better than paper-pencil interview. Cost-effective, flexible and valid alternative to interpreter-based assessment.	Small size affects the generalisation of results. Researcher did not analyse the level of educational influence on the usability.	The Mobile Assessment for the Psychological Support (MAPSS) scale has the potential to be a valuable tool for screening refugees in low-resource settings and refugee camps.
The iterative development process, included feedback from 105 pilot users and the two focus groups.	ICBT is acceptable and was able to increase access to psychological help for high-risk population. Feedback from two focus groups was positive in relation to the content and structure of the program.	Demographics of the test users were not recorded, and this limits generalisation. Limited access to Internet was a barrier as this program can be only run online, thus refugees and immigrants may not have access to the program.	Group recommended improving the quality across three domains: Arabic translation, usability and content material.
SbS e-MHI developed by WHO for depression, online self-help on CBT model, psychoeducation, stress management, increasing social support and prevention of relapse.	Digital technology (DT) highly used by Syrian refugees. Majority of participants agreed potential health benefits of the interventions. App usability, flexibility customisability and learnability were positive attributes among respondents.	Risk of recall bias. No audio recording was used; this may affect the quality of the data. No follow-up post study. Selection bias: Only Syrian refugees included. Strengths: Sample size, genders equally represented.	Mobile mental health apps provided more sessions in shorter time than web-based intervention. Provide easy user interface and clear instructions for less technically literate.
Studies examined telehealth with large sample and include studies with small samples. Studies which failed to analyse intervention outcomes were excluded. Intervention groups received treatment through video conferencing.	The study highlighted that psychotherapeutic treatment by video conferencing as effective as traditional treatment.	Studies were conducted in developed countries with resources and thus findings cannot be generalised to resource constrained environments such among Syrian refugees.	Development and evaluation of research strategies to examine telepsychiatry programs are recommended in resource-constrained settings such as Syria, Jordan, Lebanon and Turkey.
Participants were enrolled in RCT of a community-based mental health intervention. ICTs, e.g. mobile phones, Internet and social media sites, such as Facebook, WhatsApp, Skype and Viber were used in this study.	ICTs were found to have different impacts on the MH of refugees. For example, positive impact on emotional and mental well-being of many refugees, especially separated families. A few participants found communications with families via digital technology to be difficult due to logistical and financial barriers.	Study design focused on the use of ICT among refugees for communication with their separated families.	Study recommends that organisations can use ICTs for mental well-being of refugees in host countries. Host nations should train refugees how to use ICTs and provide digital literacy.



TABLE 4 (Continued)

Author (year)	Study aim	Design, setting and sample size	Data collection and analysis
Spanhel et al. (2019)	Explore cultural adaptation of Internet interventions for refugees. Results from a user experience study in Germany. Participants had pre-existing sleeping problems.	Design: RCT. Setting: Conducted in Germany. Sample size: Intervention group (IG): 33 participants, Control group (CG): 33 participants. Combined total: 66 participants. Participant selection: Age range: 18–49 years, participants came from 14 different nationalities, however, majority of participants were from Syria.	Data were analysed with multiple statistical analysis, SPSS Statistics 27 tool.
Ashfaq et al. (2020)	The study reviewed literature on the use and acceptability of mental health services among Syrian refugees and other vulnerable Arab populations from 2000 to 2019.	Design: Systematic review. Setting: Conducted in the Middle East. Data sources: Electronic databases used for the search: PubMed, PsychINFO, ACM, DOAJ. Search method: PRISMA guidelines were followed for the search and selection of studies. Focus of review: The systematic review aimed to identify and synthesise studies addressing mobile health (mHealth) in the context of refugees.	Search conducted electronic databases, 607 studies identified, 10 (1.6%) met inclusion criteria.
Zehetmair et al. (2020)	Evaluated self-practice of stabilising and guided imagery techniques by digital audio files for traumatised refugees living in a reception and registration centre in Germany.	Study design: Prospective, descriptive qualitative study. Setting: Patrick Henry Village (PHV), Heidelberg-Kirchheim, Germany. Sample size: $N=83$ participants. Recruitment: Refugees with PTSD referred to audio-based therapy from May to December 2018–February 2019. Inclusion criteria: PTSD diagnosis, smartphone access, fluency in specific languages, asylum seekers. Exclusion criteria: Substance addiction, current psychosis, age under 18 years. Clinic collaboration: University Hospital of Heidelberg and private practice physicians operated a walk-in clinic at PHV.	Semi-structured interviews.
Liem et al. (2021)	The study investigated the use of digital health applications in mental health care for immigrants and refugees, considering ethical considerations, outcomes and scaling challenges.	Rapid review design. Literature from 2005 to February 2019 from three databases. Studies which applied digital health technologies included. Focus population was refugees/immigrants/asylum seekers. No age limit. Studies written in English or Indonesian were included. $N=16$ studies were reviewed that applied software, website and videoconferencing technologies.	Data were collected through electronic databases, in which 1217 studies were identified and after critical review and analysis by two independent reviewers only 16 studies were included.
Romao et al. (2021)	Digital platform designed to help refugees arriving in Switzerland, provide information to support their MH and a guide to how-to-live in Switzerland.	Qualitative review. Study was conducted in Switzerland. Participants were refugees living in Switzerland. ($n=5$) Syrian refugees.	Interviews via skype, Microsoft teams due to COVID-19.



Intervention description	Finding and results	Limitations/strengths	Recommendations
<p>Internet-based intervention delivering cognitive behavioural therapy for insomnia. eSano Sleep-e intervention.</p> <p>RCT intervention group (IG) received the eSano sleep-e intervention.</p> <p>Control group: Waitlist control group (CG) was used as the control group in the study.</p> <p>Telehealth, mobile health or electronic health platforms particularly targeted towards mental health provision in Arab population.</p>	<p>Cultural adaptation to facilitate implementation of intervention is crucial to increase acceptance among refugees.</p> <p>Digital sleep intervention eSano Sleep-e was culturally adapted.</p> <p>Limited studies in mMHealth for vulnerable Arab population. Some positive impacts demonstrated, but barriers hinder intervention implementation.</p>	<p>Small sample. Majority of participants were Syrian refugees.</p> <p>Self-report questionnaire used to assess effectiveness and acceptability of the interventions was not evaluated.</p> <p>Only four databases were used, relevant studies would have been found in other databases.</p>	<p>Study recommends redefining cultural adaptation focusing on language, intervention, complexity and engagement strategies. Next step towards bridging the mental health treatment gap for refugees.</p> <p>The authors suggest further research on barriers to mMHealth adoption and strengthening service capacity in the Arab region and refugee diaspora.</p>
<p>Introductory session of audio-based stabilising and guided imagery techniques for patients and made a face-to-face appointment for an introductory session.</p>	<p>Self-practiced audio-based stabilising and guided imagery techniques showed promising results among the highly vulnerable group of newly arrived traumatised refugees.</p>	<p>Relied on self-report open to recall bias. Participants were of different age, education and culture, hence this heterogeneity affects the generalisation of the results.</p> <p>$N=83$ participants recommended for treatment, but only 42 attended, which is 50% dropout.</p> <p>The treatment had logistical barriers.</p>	<p>Study recommends more research on the effectiveness of DMHIs for refugees and asylum seekers.</p> <p>Recommends future studies to consider the ethical implications of using DMHIs on these groups such as issues privacy, confidentiality and informed consent.</p> <p>DMHIs be made available in multiple languages.</p>
<p>Multilingual computer-assisted self-assessment software, Internet-delivered CBT, videoconferencing technologies, telepsychiatry-based culturally sensitive collaborative treatment.</p>	<p>Two findings: (1) Satisfaction with digital mental health care (MHC). (2) Positive attitude and satisfaction with digital MHC as safe, flexible, time-saving and culturally sensitive, with enhanced privacy and facilitated truthfulness. Digital applications reduced caregiver burden and improved mood and behavioural problems.</p>	<p>The review is a first of its kind and used well-known databases. Rapid review followed WHO guidelines with two reviewers. Selection bias included English studies due to limited resources.</p>	<p>For effective implementation of digital health applications in MHC for immigrants, the authors suggested investing in technology and addressing stigma and technology literacy issues.</p>
<p>Progressive web application (PWA) was developed in collaboration with Swiss Red Cross (SRC), based on the requirements and data collected. Mockup was developed.</p> <p>PWA supports offline mode, displays the content and saves user data without Internet.</p>	<p>This study found that refugees were interested in the use of DMHI in supporting their mental health and integration. The study has found adaptability and guided interactive component by avatar increase user experiences and accessibility.</p>	<p>The study acknowledged that the group interviewed was not a target group. This group was stable, had lived in Switzerland longer, were stable and had job/housing. Size was small ($n=5$).</p>	<p>Repetition of this study to address the target group 'new arrived refugees'.</p>



TABLE 5 Methodological quality appraisal of studies using CASP.

Studies appraised	Clear aims and focus of study	Methodological appropriateness	Research design appropriate	Appropriate recruitment strategy	Clear data collection method	Research role considered	Ethics considered	Data sufficiently rigorous	Clear statement of findings
Qualitative studies (<i>n</i> =5)									
Nygren et al. (2018)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Burchert et al. (2019)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Shah et al. (2019)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Zehetmair et al. (2020)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Romao et al. (2021)	✓	✓	✓	✓	✓	✓	✓	✓	✓
RCTs (<i>n</i> =2)									
Morina et al. (2017)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Spanhel et al. (2019)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Systematic reviews (<i>n</i> =2)									
Hassan and Sharif (2019)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ashfaq et al. (2020)	✓	✓	✓	✓	✓	✓	✓	✓	✓
Rapid review (<i>n</i> =1)									
Liem et al. (2021)	✓	✓	✓	✓	✓	✓	✓	✓	✓

**TABLE 6** Apps/web used by refugees and asylum seekers to access digital mental health interventions.

Studies	Apps/online websites	Description	Links/webs
Burchert et al. (2019)	Step-by-step (SBS) self-help app for depressive symptoms	SBS is a digital application for refugees and migrants' mental health, with three components: content, model guidance and delivery system. It uses CBT techniques like stress management, social support enhancement and relapse prevention to support users	https://psychcentral.com/depression/self-help-for-depression
Röhr et al. (2021) and Grochtdreis et al. (2021)	Sanadak apps developed in Germany for Syrian refugees	Sandak is an app available on smartphones that offers self-help based on cognitive behavioural therapy (CBT) in Arabic for Syrian refugees dealing with PTSD or stress	https://www.sanadak.de/
Wirz et al. (2021)	Ilajnafsy Selbsthilfe app. 2017 (available in Arabic and German)	'Ilajnafsy' offers web and smartphone-based therapy for treatment of PTSD and depression among refugees and asylum seekers	https://ilajnafsy.bzfo.de/portal/en/online-therapies/
	Application for Mental Health Aid for Refugees (ALMHAR) online developed in Germany	This app is specifically designed for refugees and asylum seekers, providing them with information and strategies to cope with emotional issues. It addresses five common problems and offers coping strategies to assist them	http://almhar.org/ http://www.healthonthemove.net/knowledgebase/welcome-to-almhar/
	Balsam apps	The Balsam app, developed in Berlin, was created to aid refugees and migrants in comprehending the mechanisms of stress. It is available in four languages—Arabic, English, Farsi and German	https://fadidouaji.com/balsam-app-charite-universitatsmedizin-berlin
	SMILERS online apps (Smartphone Mediated Intervention for Learning Emotional Regulation of Sadness)	SMILERS is an Arabic-only iPhone app that aids users with moderate depression symptoms. It offers 7-week modules consisting of picture storytelling, fictional personal treatment and brief exercises for coping with depression, without requiring a therapist's assistance	https://www.infomigrants.net/fr/post/8582/apps-for-refugees-suffering-psychological-trauma-and-depression
Zehetmair et al. (2020)	Stabilising and guided imagery techniques via digital audio files	This is used for the treatment of PTSD among refugees and their minors, it has three components: (1) mindful breathing, (2) the body scan and (3) the guided imagery technique.	The modules were not available in the public domain and were accessed by registered participants through a private link

et al., 2021). DMHIs offer a private and comfortable solution, mitigating these emotions to some extent and suggesting that for some individuals, online connections or apps are preferable to traditional face-to-face therapy (Gan et al., 2021).

The digital resources for refugees and migrants' mental health have strengths and limitations as discussed in Table 6. Strengths include the provision of information and coping strategies for emotional problems, with apps like SBS, Sandak and Ilajnafsy offering CBT techniques like behavioural activation, stress management and increasing social support (Grochtdreis et al., 2021; Röhr

et al., 2021). Balsam app also helps refugees understand the mechanism behind stress in four languages (Wirz et al., 2021). SMILERS is suitable for iPhone users and assists with moderate symptoms of depression, while the treatment of PTSD is offered through the mindful breathing, body scan and guided imagery techniques (Wirz et al., 2021). However, some limitations include the limited languages offered by certain apps, and some apps are not meant to replace therapy sessions (Zehetmair et al., 2020). Additionally, the effectiveness of these apps may vary based on individual factors and may not be suitable for severe mental health issues (Burchert et al., 2019).



Theme 2: Barriers related to DMHI

The second theme describes the barriers related to DMHI, such as factors that hamper refugees and asylum seeker end-users' accessibility to DMHI and that hinder the implementation by service providers with policies or practices that fail to support DMHI adoption and diffusion. Data reviewed in this study revealed specific barriers which affect the successful implementation of DMHIs among refugees and asylum seekers. Two barriers emerged and these are described as sub-themes:

Sub-theme 2.1: Language and/or demographic barriers

It is evident from the data that majority of the refugees and asylum seekers came from countries where English is not their first language (Morina et al., 2017). When settled in Western Europe, or neighbouring countries, they encounter language barriers such as other languages of host countries, or English as an international language. Poor communication exchange occurs as a result of linguistic variation and this results in misunderstanding, lack of trust, hesitancy to seek support or help as well as poor perception. We noted that most of the participants in the studies included in our literature review were non-English speakers (Asgary & Segar, 2011). In addition, other barriers such as culture, education, age, socio-economic conditions, communication preferences and familiarity with technology were identified in this sub-theme (Nosè et al., 2017). As such, it was recommended that health services and hospitals should utilise interpreters and translators to overcome the language barrier (Nosè et al., 2017).

Sub-theme 2.2: Structural barriers

Structural barriers were described as factors occurring at the institutional level, whereby individual persons may have no control over them. These factors include affordability, cultural competency, resettlement challenges and limited availability of services (Nosè et al., 2017). Furthermore, perceived discrimination by service providers toward refugees and asylum seekers was also noted in this category (Borghouts et al., 2021). Cultural diversities between refugees and service providers privilege service providers in powerful positions and contribute to polarisation whereby patients or help seekers sensitivities and emotional vulnerability are reinforced (Spanhel et al., 2022). Technological barriers are primarily due to limited distribution of resources such as smartphones and WiFi network, thus weakening the strength of administration of digital intervention (Hollis et al., 2015). Unfamiliarity with the host country's mental healthcare system, together with a lack of trust, and

stigma related to mental illnesses impact the veracity of any digital intervention (Spanhel et al., 2022). Relocation and accommodation insecurity together with rigidity in appointment scheduling were identified as some of the major logistical barriers that refugees and asylum seekers encountered (Carreño-Calderón et al., 2020). The literature indicated that there was a need to find solutions to overcome barriers for the facilitation of adequate and effective therapeutic mental healthcare provision in the future (Borghouts et al., 2021).

Theme 3: Users experiences

The third theme describes user satisfaction and user experience of the DMHI and associated devices. Service providers must ensure that their connection with end users through their devices and applications is designed based on the principles of human-computer interaction (HCI). We extracted the HCI and design elements that were described in the literature and these are presented in Table 7. User experience is described as the perception or opinion of an individual or group when they use or interact with a particular digital product, system or service (Mirnig et al., 2015). In assessing user experience, acceptability, usability and learnability are the key factors that are considered. In a recent qualitative study conducted in Europe, Burchert et al. (2019) confirmed that feedback from users following their first encounter with a device is a good indicator of the real-world acceptability of each digital intervention. User experience is typically assessed by subjectively rating the effectiveness and satisfaction of the intervention (Kaveladze et al., 2022). Therefore, it is crucial for service providers to prioritise the user experience of their devices and applications to ensure their overall success and acceptance among users.

In a narrative review by Torous et al. (2018) about the use of mobile phones in a clinical context, participants indicated feelings of empowerment, motivation, relaxation and self-determination when questioned about their personal experiences using mental health apps. Despite the positive experiences, participants were concerned about privacy, confidentiality and anxiety about third party use of personal information, such as the possibility it may be accessed by law authorities which might be used to further disadvantage them (Kaveladze et al., 2022). The participants reported that the cost of devices was a factor that determined their decision making about uptake of digital health interventions. Moreover, additional barriers experienced by refugee and asylum seeker end users including exposure to racism, discrimination and stigmatisation (Romao et al., 2021). In summary, the reviewed literature indicated that assessing and understanding the nature of end-user experience is essential in the evaluation of a device or app designed to support the mental health of refugee and asylum seekers.

**TABLE 7** Extraction of human computer interactions and design principles.

Examples	Design issues	Digital solution/designs features
Spanhel et al. (2021)	Cultural adaptation applied to Internet and mobile-based interventions. Cultural competency and language alignment	To address successful implementation and adaptation of cultural safety training and Internet and mobile-based interventions, the use of video, online tools, e-learning and language translation software is recommended. Cultural adaptation should consider eight components, including language translation, persons, metaphors, content, concepts, goals, methods and context
Søgaard Neilsen and Wilson (2019)	Social contact and human-computer interaction	Consideration of users' perception of social context, human-like interaction and incorporating social support Building user-friendly and easy-to-use systems for diverse abilities Navigation and instruction (way finding) Layout including colour, image, text size and font tailored to user group developmental life stage, literacy capabilities and interests Log data analytic capacity Credibility, usability, aesthetics, entertainment, update-to-date information, multiple contacts with intervention with feedback mechanism and capacity to incorporate self-management Clear description of design features should be reported to ensure replication studies are possible, and quality of intervention can be evaluated Tailoring to user needs, experiences, cohorts, convenience and aligning to personalised engagement
Morrison et al. (2012)	Human computer design principles	Considerations include design elements: screen/s layout and design, social context and support, contacts with the interaction, tailoring and self-management
Baumeister et al. (2019)	Persuasive technologies refer to interactive systems intended to influence users to change their attitudes and behaviours. These systems are designed based on four groups of principles.	A Primary support task support <ul style="list-style-type: none"> -The primary support task includes successful intervention, eliminating complex behaviour, tailoring and personalising content, self-monitoring functionalities and visualisation and tracking of progress B Computer-human dialogue support <ul style="list-style-type: none"> -The computer-human dialogue support involves supporting users to achieve their goals through various means such as audio, visual/textual aids, direct feedback, positive and negative reinforcement, rewards, gamification credits, points and achievements, reminders and alerts and suggestion and advice. System design should also aim to impress users C System credibility <ul style="list-style-type: none"> -The system credibility factor focuses on enhancing the trustworthiness of the system by establishing verifiability, trustfulness, fair and unbiased information and illustrating competence and experience D Social support <ul style="list-style-type: none"> -The social support component emphasises designing systems that motivate users to adopt the system by leveraging social influence through interactive tools, messaging and chat boxes, social media, group users and sharing functionality

Theme 4: Mapping gaps

The fourth theme identified in this review highlights several gaps in the literature that require further investigation. While Shah et al. (2019) have documented the use of ICTs among refugees and asylum seekers, there is limited research on the perception of refugees regarding the impact of ICTs on their mental health. Additionally, there is a lack of information on refugees' decisions and actions regarding the use of ICTs, as well as any potential barriers they face in accessing digital interventions. This is an area that requires further exploration. Privacy protection is also a concern for refugees and asylum seekers in regard to their personal information and the uncertainty about how their information will be used and protected. The review also revealed a gap in the implementation of DMHIs, with most studies taking place in Europe, and limited research on the use of DMHI in countries such as Australia,

New Zealand, the USA and developing countries such as Uganda, Kenya and Middle Eastern countries, which host a significant number of refugees and asylum seekers. Additionally, most participants in the reviewed studies were of Syrian background, and it is important to include refugees and asylum seekers from diverse backgrounds in future research. The efficacy of digital interventions in reducing PTSD was found to be inconsistent, further highlighting the need for additional research in this area.

DISCUSSION

This review has evaluated the current literature on the utilisation and suitability of DMHIs in supporting the management of mental health disorders among refugees and asylum seekers. The review identified four main themes and two sub-themes: (1) *types of digital health intervention*



apps used; (2) barriers encountered in digital health intervention; (3) user experience of the digital health intervention and (4) mapping gaps. Two sub-themes were identified located in Theme 2: (2.1) language and demographic barriers and (2.2) structural barriers. The literature review found that DMHIs were delivered through various channels such as online websites, wearable technologies, apps, smartphone applications, videoconferencing and audio files. The interventions delivered included evidence-based CBT, telepsychiatry counselling and EMDA. The literature showed that these interventions were effective in reducing symptoms related to PTSD, depression, anxiety and psychotic symptoms (Wirz et al., 2021), and this is consistent with other delivery modalities such as face-to-face treatment that is suitable for priority groups such as refugees and asylum seekers (Wirz et al., 2021).

Studies have supported the use of digital interventions in managing psychiatric illnesses among refugees and asylum seekers (Aadil et al., 2017; Nguyen et al., 2022). A recent meta-analysis of RCTs found a significant reduction in depressive symptoms among participants who used smartphone-based mental health interventions compared to the control group (Firth et al., 2017). Similarly, a meta-analysis of RCTs by Linardon et al. (2019) evaluated the efficacy of app-supported smartphone interventions for mental health problems. The study found that smartphone interventions significantly reduced or improved depressive, generalised anxiety, social anxiety and stress levels symptoms.

Additionally, a recent study conducted in Lebanon found that a WHO-guided digital health intervention for depression in Syrian refugees led to a reduction in depressive symptoms in the intervention group compared to the control group (Cuijpers et al., 2023). The effectiveness of e-health, mobile health and apps in reducing mental health problems has been demonstrated in previous studies (Andrews et al., 2018; Linardon et al., 2019). A meta-analysis of 22 RCTs examining Internet-delivered CBT for anxiety and depression found that iCBT was effective, acceptable and practical for health care (Andrews et al., 2010). In the context of wider literature, there is a convincing body of evidence that supports the notion that digital interventions can be effective in managing mental health disorders among refugees and asylum seekers. While these studies acknowledge that mental health apps are not desirable as a replacement alternative to face-to-face professional clinical support, they do provide for cost-effective, easily accessible and low-intensity interventions for individuals who are unable to receive psychological treatment in person.

Implementation of DMHIs

The implementation of DMHIs has been challenged by various barriers, such as linguistic or demographic barriers, according to recent literature. Linguistic or

demographic barriers encompass various aspects of a person's identity, including language, culture, education, age, socio-economic status, communication preferences and technology literacy (Byrow et al., 2019; Nosé et al., 2017). In addition, delayed access to mental health treatment by refugees and asylum seekers has been linked to their experiences of relocation, which can be a significant source of stress due to cultural, social and economic differences (Fazel et al., 2005).

Despite these barriers, DMHIs offer a potential solution for addressing the challenges faced by refugees and asylum seekers in accessing mental health treatment. The findings of this review aligned with previous studies that have investigated the barriers to mental health care, such as stigma, lack of available and evidence-based services and affordability (Borghouts et al., 2021). Other barriers include language and communication difficulties, lack of knowledge about mental health systems and lack of trust (Liem et al., 2021). A descriptive qualitative study conducted in Chile, by Carreño-Calderón et al. (2020), explored the structural and individual barriers experienced by Latin American refugees and asylum seekers when attempting to access mental healthcare services. They found that poor knowledge of healthcare systems and a lack of appropriate mental health services were the major barriers (Carreño-Calderón et al., 2020).

Moreover, study by Nickerson et al. (2019) has evaluated the efficacy of an online intervention to reduce self-stigma and increase help seeking among refugee men found that the intervention was effective in removing barriers to accessing help for mental health symptoms. Asgary & Segar (2011) also found that poor mental health understanding was a major barrier for refugees and asylum seekers, who often failed to connect their experiences of trauma with mental illness and presented their psychological distress as non-specific complaints of a somatic nature. Röhr et al. (2021) reported that refugees in resettling countries often have limited access to adequate psychological treatment or psychotherapy. Importantly, common barriers to accessing mental health care include stigma, affordability, lack of evidence-based services and concerns related to privacy and data security (Borghouts et al., 2021). However, DMHIs hold promise as a solution to navigate these barriers, particularly for refugees and asylum seekers, who may face additional challenges due to cultural and language differences.

User engagement and experience with DMHIs

The review highlights the critical role of user engagement and experience in determining the success of DMHIs. User experience encompasses satisfaction or dissatisfaction levels with digital devices, online platforms, apps and software. Factors related to satisfactory user experience include acceptability, usability and learnability, while dissatisfaction stems from concerns about privacy and



confidentiality, data security, app technical requirements, financial constraints and perceived discrimination (Gan et al., 2021). Positive user engagement and experience are vital for the success of DMHIs, which rely on factors such as acceptability, usability, privacy and financial accessibility.

Vial et al. (2022) conducted a study that revealed a critical issue in the design process of mental health apps, where the end-user perspective is not adequately considered. This finding aligns with the literature presented by Torous et al. (2018), who discovered that app designers frequently neglect user's concerns regarding privacy and confidentiality. Additionally, Torous et al. (2018) noted that engagement with mental health apps is often low due to the lack of user-friendly designs, inadequate user-centric development and insufficient emergency response features. To enhance user engagement, Torous et al. (2018) recommend incorporating user feedback during the design and testing phases, providing consumer education, developing apps that cater to emergency situations and fostering trust through collaborative efforts with professional designers and game developers.

A number of recent papers have highlighted some important design features that should be included in the development of DMHI, these are presented in Table 7.

Further, researchers have highlighted the critical role of consumer education in the adoption of health information technology and mental health apps. For instance, Mackert et al. (2016) showed that low health literacy was associated with decreased use of these technologies. In addition, they underscored the need to understand the factors that shape patients' trust in healthcare providers, which may influence the implementation of health information technology and mental health apps. Building on this work, Kaveladze et al. (2022) investigated user experience, engagement and popularity of mental health apps and identified several strategies for enhancing engagement. These included incorporating human-centred design principles, creating appealing brands for DMHIs, sending reminders and providing human support. These findings may inform the development and promotion of mental health apps that are effective, user-friendly and accessible to a wide range of patients. Finally, the review indicates that user engagement with DMHIs is impacted by demographic variables such as age, gender, employment, education and housing situation, as well as personality traits including neuroticism, agreeableness, openness and resistance to change. The review also identifies limitations in service delivery, opportunities for enhancing design and research gaps that need to be addressed to guide future research and practice.

This literature review provides evidence supporting the use of DMHIs in supporting the management of mental health disorders among refugees and asylum seekers. DMHIs offer a promising solution to the challenges faced by refugees and asylum seekers in accessing mental health treatment, such as linguistic or demographic

barriers and delayed access to mental health care. However, more research is needed to address the gaps identified in the current literature and to better understand the potential of DMHIs in supporting the mental health of refugees and asylum seekers.

Limitations

This review has several limitations that should be acknowledged. First, the inclusion criteria were restricted to studies written in English, which may have resulted in the omission of articles written in other languages that could have been useful in answering the research questions. Second, the study sample consisted mainly of refugees and asylum seekers of Syrian background. As a result, the findings may only apply to this specific ethnic group and generalisation to other cultural groups may be limited. Third, the studies reviewed had small sample sizes, which may limit the generalisability of the results. It is recommended that future research be conducted with larger and more diverse populations to confirm the findings of these studies.

Ethical consideration

As this review was conducted solely using electronic library databases and peer-reviewed published studies, obtaining ethical clearance was deemed unnecessary. Moreover, all 10 studies analysed in this review had previously obtained ethical clearance. To ensure the accuracy and reliability of the data used, two reviewers carefully screened and evaluated all articles included in the final publication. In instances where disagreements arose regarding data inclusion, a third senior researcher was consulted for impartial judgement. These measures were implemented to uphold the scientific rigour and credibility of the research.

Implication and recommendations

Based on the findings of this integrative literature review, the following implications for future practice and recommendations can be made to improve the care of refugee and asylum seekers with mental health problems:

1. Address linguistic and demographic barriers through the introduction of trained interpreters and translators and to deliver online/videoconference, e-learning for culturally based competency for staff involved in the mental health care of this population.
2. Address structural barriers such as limited access to mainstream mental health services, cost and affordability, institutional perceived racism and discriminations through a coordinated approach



involving UNHCR and local authorities, utilising digital interventions such as online competency-based cultural awareness.

3. Address design problems related to the user of digital intervention by working with end users to develop apps that are person-centred.
4. Authorities in host and settling nations should be obligated to comply with World Health Organization (WHO) recommendations of universal health coverage for all, and partnership with local and international organisations such as UN, NGOs, user groups and professional associations to implement these interventions around the globe to achieve sustainable development goals (SDGs) for universal healthcare access for everyone.
5. Legal restrictions to refugees and asylum seekers access to health/mental health services need to be removed. The review suggests making it mandatory for hosting and resettling nations to allow this population to access mental health services.

In summary, the implementation of these recommendations has the potential to improve the care of refugee and asylum seekers with mental health problems by addressing barriers to mental health treatment via DMHIs. These recommendations should be considered by policymakers, mental health professionals and other stakeholders involved in the care of this vulnerable and priority population.

CONCLUSION

Refugees and asylum seekers are facing record high numbers due to war, conflict, persecution and human rights violations worldwide. The traumatic experiences of refugees and asylum seekers can have a significant impact on their mental health. This review found that DMHIs have the potential to improve mental health care for refugees and asylum seekers, as they can overcome barriers such as limited access to mental health services and language and cultural barriers. However, the implementation of DMHIs is still facing barriers such as linguistic/demographic and structural barriers that need to be addressed for successful implementation. Additionally, more research is needed to address the scarcity and gaps in the use of DMHIs among this population.

Relevance to clinical practice

The findings of this research have important implications for policymakers, refugee and asylum seeker organisations and humanitarian agencies such as the UNHCR and NGOs. The use of technological interventions in mental health care can help to improve

the accessibility and effectiveness of mental health services for refugees, particularly in addressing the challenges posed by language and cultural differences. This research highlights the potential benefits of leveraging technology to provide flexible and culturally sensitive resources that better meet the specific needs of refugees. These findings can inform the development of policies and interventions aimed at promoting the mental health and well-being of refugees and contribute to the improvement of mental health services provided to this population.

ACKNOWLEDGEMENTS

Our first author is a former refugee, bringing a unique insight into the topic under investigation. We convey our respect to all people with lived experience of asylum seeking and as refugees. We acknowledge the refugee and asylum seeker participants in the research findings reviewed in our literature review. Open access publishing facilitated by The University of Newcastle, as part of the Wiley - The University of Newcastle agreement via the Council of Australian University Librarians.

FUNDING INFORMATION

None.

CONFLICT OF INTEREST STATEMENT

Prof Rhonda Wilson is a member of the Editorial Board for *International Journal of Mental Health Nursing*.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available in https://app.covidence.org/reviews/163408/review_studies/sear at https://app.covidence.org/reviews/163408/review_studies/search?utf8=%E2%9C%93&search%5Bterm%5D=refugee, reference number https://app.covidence.org/reviews/163408/review_studies/sear. These data were derived from the following resources available in the public domain: https://app.covidence.org/reviews/163408/review_studies/sear, https://app.covidence.org/reviews/163408/review_studies/search?utf8=%E2%9C%93&search%5Bterm%5D=refugee.

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How to cite this article: Mabil-Atem, J.M., Gumuskaya, O. & Wilson, R.L. (2023) Digital mental health interventions for the mental health care of refugees and asylum seekers: Integrative literature review. *International Journal of Mental Health Nursing*, 00, 1–21. Available from: <https://doi.org/10.1111/inm.13283>