Digital Mental Health and Social Connectedness: Experiences of Women from Refugee Backgrounds

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A detailed understanding of the mental health needs of people from refugee backgrounds is crucial for the design of inclusive mental health technologies. We present a qualitative account of the digital mental health experiences of women from refugee backgrounds. Working with community members and community workers of a charitable organisation for refugee women in the UK, we identify social and structural challenges, including loneliness and access to mental health technologies. Participants' accounts document their collective agency in addressing these challenges and supporting social connectedness and personal wellbeing in daily life: participants reported taking part in community activities as volunteers, sharing technological expertise, and using a wide range of non-mental health-focused technologies to support their mental health, from playing games to supporting religious practices. Our findings suggest that, rather than focusing only on individual self-care, research also needs to leverage community-driven approaches to foster social mental health experiences, from altruism to connectedness and belonging.

CCS Concepts: • Human-centered computing ~ Human computer interaction (HCI) ~ Empirical studies in HCI

Additional Key Words and Phrases: Digital mental health, mental health, wellbeing, social connectedness, self-care, agency, empowerment, altruism, women, refugee, asylum-seeking, immigrant

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1 INTRODUCTION

The world is experiencing unprecedented high rates of global migration [40]. Leaving home because of war, persecution and natural disaster, and seeking a new normal in a new environment can bring about significant opportunities and challenges [6]. Prior work has highlighted that migration can affect people's mental health and adversely contribute to mental illness [30,37,77].

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Mental health is defined by the World Health Organization as *"a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community"* [99]. Galderisi et al. [37] clarify that a state of wellbeing involves not only positive emotions but a wide spectrum of emotions, from happiness to worry. They explain that working productively may require support, in particular, if individual capacities and abilities are limited by health conditions and environmental factors [37]. However, a more holistic mental health understanding entails not only emotional (e.g., happiness), psychological (e.g., personal traits) and social dimensions (e.g., feeling a sense of belonging), but also acknowledges discrepancies between desired positive emotions and lived experiences of inequality and discrimination in daily life [37,48,91].

Digital technologies have potential to support people from refugee backgrounds in understanding and managing their mental health [30,69,90]. The HCI community has increasingly focused attention on the importance of designing a wide range of technologies for and with vulnerable groups, from digital migration experiences and borders [42,52,74] to ethical systems [25] and digital humanitarianism [86] to AI-driven technologies [83] and smart cities [31]. Prior work has not only documented the lived experiences of people from refugees, asylum-seeking, and immigrant backgrounds but also designed innovative approaches to supporting the health and wellbeing needs of people from diverse backgrounds and their support systems. However, people's unique lived experiences make it difficult/inappropriate to create one size fits all digital solutions, in particular, for the assessment and management of mental health conditions within clinical and domestic settings. Instead, we need a detailed understanding of the mental health experiences and needs of people from refugee backgrounds to inform the design of inclusive and culturally appropriate digital technologies and services for mental health [84,85,87].

To address this research gap, we present the findings of an explorative online survey and follow-up interview study conducted in partnership with a charitable organisation for women from refugee backgrounds. Through capturing the mental health views and technology experiences of community workers and members of the multi-ethnic community we provide two contributions.

First, we identify mental health challenges, such as coping with stigma and loneliness, and describe digital inequalities, including access to mental health applications and adverse experiences of using technologies. Furthermore, we describe participants' collective agency and creatively in coping with these challenges. These findings contribute to shifts from narratives that are predefined by people's refugee status to more nuanced accounts that document people's expression of their lived experience in daily life with their strengths, skills, and aspirations [3,15,60].

Second, we derive transferable implications for mental health research and technology design. Our findings echo the importance of raising mental health awareness, challenging mental health stigma, and addressing digital inequalities as part of human-centred and participatory design research with people from refugee backgrounds. Our key implication is that, rather than focusing only on predominant psychotherapeutic approaches to self-help and self-care, mental health research and design need to explore community-led approaches [92] to foster inherently social mental health experiences, from altruism to companionship and belonging.

2 RELATED WORK

To provide background to this work, we first look at HCI research on designing for and with vulnerable groups and then review related literature on understanding and supporting the mental health of women from refugee, asylum-seeking, and immigrant backgrounds.

2.1 Designing for and with People from Refugee, Asylum-Seeking, and Immigrant Backgrounds

Ethnographically-informed studies have focused on capturing a wide range of individual experiences and journeys across physical and digital boundaries. For example, Ertl et al. [30]'s interview study with Syrian and Iranian refugees, volunteers, and psychologists in Germany documents stressful life events and traumatic experiences, such as witnessing the death of relatives and undertaking time-extensive and emotionally challenging migration routes. To support people from refugee backgrounds in coping with stress and trauma, Ertl et al. [30] suggest exploring digital forms of poetry therapy and bibliotherapy. Alternative self-management and coping strategies entail the use of community-driven technologies. For example, an analysis of an online forum [6] illustrates the ways in which refugees seek a new normal in daily life and engage with others online clarifying stereotypical narratives, such as roles of being a victim to proactively excising agency and mental strengths. Potential challenges to normalcy and integration are different levels of trauma, trust, and uncertainly in daily life, including managing non-Halal food in social dinning situations [4].

Further streams of work have applied participatory design approaches to identifying user needs and exploring design spaces for refugee and immigration supportive technologies [5,17,84,85]. For example, Almohamed et al. [5]'s participatory design work with newly arrived refugees originally from Syria and Iraq in Australia identifies influencing factors for rebuilding social capital, including cultural challenges, such as finding employment, developing relationships within neighbourhoods, and overcoming language barriers. In addition, the authors [5] highlight the importance of involving non-governmental organisations in designing technologies considering their essential role in providing guidance and social spaces for developing local networks. Tachtler et al. [85]'s socio-ecologically-informed series of co-design workshops with unaccompanied migrant youth illustrate the design of mental health prototypes with features, such as supporting sleep routines in auditory ways, and show that interrelations between bio-systems (i.e., individual factors, such as age, personality, health), micro-systems (i.e., living environments, peers, physically distant family members, and close social ties), and macro-systems (i.e., resettlement policies) need to be considered in understanding and informing the design of mental health technologies and services.

In addition to ethnographic and participatory work, research has contributed novel technology-driven approaches to supporting the experiences and needs of refugees. For example, prior studies have developed a framework for running simulations of refugee movements [82], proposed low-cost systems for the assessment of post-traumatic stress disorder tested in Bangladesh [77], and developed a testimonies-informed serious game for understanding humanitarian crises and gaining empathy for refugee experiences [62]. Research with people from migrant backgrounds, including Weibert et al. [98]'s iterative design of a digital wizard for tailored language support in Germany and Chen et al. [22]'s personality-focused chatbot approach in Finland, demonstrate empowering experiences and the need to adapt design processes and systems to participants' unique needs and backgrounds.

Prior work has not only provided empirical accounts and prototypical solutions but also offered methodological guidance for human-centred and participatory refugee research [32,33,88,89]. For example, Talhouk et al. [88] share design research-based lessons learnt by reflecting on two design case studies in refugee settlements in Lebanon. While the first case study documents challenges with deploying an "Interactive Voice Response system" for hosting community health talk shows, such as frustrations with deployment bugs, the second case study actions the gained methodological insights reporting on successes of applying a dialogical approach to addressing food insecurity through a set of cards that helped foster conversations and build relationships. In addition, Talhouk et al. [89] provide reflections on a series of research projects with refugee communities in Europe and the Middle East to derive guidelines for researchers, including continuously refining research objectives, roles, and scope according to

research outcomes and participant's needs; contributing to the agenda of refugee communities on local, national, and international levels; building trust; being transparent and flexible; leveraging research collaborations; as well as addressing and supporting the researchers' psychological wellbeing.

2.2. Supporting Mental Health Experiences and Needs of Women from Refugee, Asylum-Seeking, and Immigrant Backgrounds

A recent focus in HCI research has been on women's health and wellbeing [23,53]. For example, studies have documented lived experiences of menopause as social [56] and investigated the potential of technologies to better understand and support the management of enigmatic conditions, including endometriosis [61] and vulvodynia [101]. However, a growing body of research on women's health takes a critical view on existing health and wellbeing technologies. For example, women with eating disorders use but would not recommend available diet and fitness apps to support recovery, given that the design of diet and fitness apps tends to focus on restriction and optimization [27,28]. The design of menstrual self-tracking apps can exclude minorities and fail to support different life stages, such as pregnancy [29]. Accounts of women who engaged in fertility tracking revealed a spectrum of mixed experiences with health and wellbeing data, from positive to burdened, obsessive, trapped, and abandoning [24]. Critical reflections on self-tracking technologies and menopause focused attention to potential negative outcomes, highlighting tensions between medicalised self-tracking approaches and women's lived bodily experiences [41]. These mismatches between system design and lived experience underscore the importance of understanding and supporting the mental health and wellbeing needs of women from diverse backgrounds.

Prior research with women from refugee, asylum, and immigrant backgrounds has shown specific intersectional impacts on mental health, for instance that high stress levels can lead to adverse dietary changes and health outcomes in immigrant women in the US and Canada [72]. Mental health concerns are complicated further with the documented inequalities in accessing mental health services. For example, drawing on a post-colonial feminist approach, Straiton et al. [80]'s interview study with Filipina immigrants in Norway describes reliance on personal beliefs and social support systems, unfamiliarity with the concept of primary mental healthcare, hesitations to ask for professional mental health support, and different expectations of receiving care, from authoritative to participatory. A qualitative study [94] with refugee women living with HIV in the UK, documents similar attitudes towards professional mental health services and proposes group-based mental health interventions to promote mental health awareness and social recovery. Despite individual and environmental barriers to receiving professional mental health support, it should be considered that women from refugee backgrounds have demonstrated resilience and mental strengths in coping with stress and trauma and adapting to new roles and responsibilities in managing their health and wellbeing [39,73].

Within the HCI space, Brown at al. [18] present findings from participatory design sessions with women who immigrated from the Caribbean to South Florida. They identify stressors, including conflict with host families, high workloads due to work and childcare, unmanageable healthcare and insurance costs, unproductive patient-doctor relationships, and a lack of support systems. Based on this understanding, the authors [18] present co-designed artifacts to illustrate design approaches and coping strategies, such as a screen-based plant pot providing recommendations for relaxing physical activities and a digital journal for documenting experiences of migration and sharing Bible passages with family members and friends. Drawing on a participatory action research approach, Weibert et al. [97] utilised a blend of tangible artifacts and storytelling methods to support migrant women in Germany in training digital and conversational skills through visualising migration routes, engaging in photography, and co-creating digital representations of their life stories as part of a computer course.

The mental health views and self-care practices of women from diverse background and their perceived barriers to accessing mental health services are increasingly well documented (e.g., [80,94]). However, recent work has noted that information and communication technology-focused studies *"are heavily skewed towards males, youth and highly educated refugees"* ([69], page 2) and highlighted the importance of improving understanding of the mental health needs of women from refugee, asylum-seeking, and immigrant backgrounds [85], including their lived experience of using existing mental health technologies. This understanding can help inform the design of more inclusive and useful mental health research, technologies, and services.

3 METHOD

Taking a qualitative HCI approach [2,13], we conducted an explorative online survey and follow-up interviews with members of a women-led community for women from refugee backgrounds to understand their mental health experiences and technology needs. This research study has received institutional ethics approval.

3.1 Context

We conducted this research in partnership with a charitable organisation for women from refugee backgrounds in the UK. The charitable organisation runs a wide range of activities, from private drop-in sessions to social events, to support the needs of its members. Applying an explorative research approach to understanding the mental health and technology needs of the multi-ethnic refugee community was a shared objective.

We worked with two employees from the charitable organisations, who highlighted several considerations: (1) supporting people's diverse preferences of taking part in research (e.g., survey and/or interview); (2) allowing participants to anonymously take part in research; (3) supporting multiple languages, such as Arabic and Somali; (4) providing the option to be interviewed by a researcher appropriate to their gender; (5) supporting participants in taking part in the follow-up interview in pairs; (6) providing vouchers for taking part in the online survey rather than offering participants the option to enter a prize raffle which was inappropriate considering the estimated completion effort and likelihood of receiving a reward, and potential associations with gambling; and (7) sharing research findings with participants and the wider community in accessible ways. Our collaborators iteratively provided guidance on the anticipated acceptability of the research design and piloted the online survey and follow-up interview.

3.2 Research Question

Based on the priorities of the charitable organisation and their feedback on our methodology, we aimed to investigate the following research question: what are the mental health experiences of women from refugee backgrounds, and what does this understanding imply for mental health research and technology design?

3.3 Data Collection

The design of the online survey and follow-up interview focused on people's mental health views, self-care practices, coping strategies, and perceptions of consumer health technologies (see Supplemental Material). Drawing on Ayobi et al. [7]'s "*tickets to talk about mental health,"* the online survey comprised a set of open-ended questions (e.g., What thoughts come to mind when you hear the term 'mental health'? What kind of things bring you joy? What type of things in the world around you make you feel uncomfortable? What do you do to relax when you had a tough day? What are your favourite technologies? Are there any digital applications that you avoid?). We introduced each open-ended question with a prompt to support participants in sharing their views and experiences (see Supplemental Material). For example, we used the prompt *"Mental*

Health is something we all have. People from all over the world think and talk about their mental health in many ways." to ask the question *"What thoughts come to mind when you hear the term 'mental health'?"*. The online survey and information sheet were translated by a professional language service and made available in English, Arabic, and Somali. The purpose of the online survey was to support participants in taking part in this research study anonymously and making an informed decision whether they wish to take part in the follow-up interview and talk about their mental health experiences with a researcher. The follow-up interviews were conducted in English and covered follow-up questions based on survey responses (e.g., *"You described that you like to listen to music to relax as part of the online survey. Could you let me more about how listening to music makes you feel?"*). After having reviewed the online survey and follow-up interview guide, the charitable organisation shared our research advert within their internal WhatsApp group.

3.4 Participants

Overall, 15 participants completed the online survey (13 in English and two in Arabic). Nine participants, who completed the online survey, decided to take part in the follow-up interview conducted in English): two community workers employed by the charitable organisation and seven community members who volunteered and/or took part in social events organised by the charitable organisation completed the interview. All 15 participants were female, and two participants preferred to be interviewed by a female researcher. Six participants were in the age range 18-24; seven were in the age range 35-44; and two were in the age range 45-54. Ten participants described their ethnic background as African; three as Asian; and two as White. We do not associate participant identifiers (e.g., P1) with personal information, such as age, gender, and ethnicity, to protect the identity of our research participants.

3.4 Data Analysis

Online survey responses had between 3-25 words and the length of the interviews was between 25-40 minutes. A qualitative data analysis software was used by the first author to code survey and interview data. An inductive thematic analysis [16] was performed and codes were iteratively developed and shared through discussions within the academic project team. We initially focused on the individual experiences of each participant and later investigated each participant group (i.e., community workers, community members, and participants' descriptions of how members of their social cycles perceive mental health). Online survey responses helped to gain empathy for the dataset and develop initial themes. Interview-based codes helped to provide context to the relatively short survey responses. Codes from community workers and community members helped to develop a holistic understanding of participants' digital mental health experiences and needs. To anonymise participants' accounts in the presentation of the findings, we excluded potentially identifiable information, including names, dates, and unique experiences, such as descriptions of migration journeys and traumatic incidents. In the following sections, we mark online survey quotes with "participant identifier-S" (e.g., P1-S) and interview quotes with "participant identifier-I" (e.g., P1-I).

3.5 Positionality Statement

Before presenting the findings of this study, we would like to document how our positionality might contribute to the analysis of participant's accounts. This work was a collective effort within a culturally diverse research team. Two authors identified as belonging to an ethnic minority and three as white British. Three identified as female and three as male. While three authors had lived migration experiences, none of the authors identified as a woman from refugee background. The interviews were conducted by a male and female researcher according to participant's preference.

The research corpus, including memorable insights, memos, and themes, was iteratively analysed within the research team to draw on our collective knowledge on mental health, technology, and culture. The design of the research study and key findings were discussed with members of a charitable organisation for women from refugee backgrounds to ensure that this work was sensitive to the needs of our project collaborator and research participants.

4 FINDINGS

We present the findings of an online survey and follow-up interview study investigating the mental health technology needs of a woman from refugee backgrounds. We first describe participants' mental health views and perceived mental health challenges, such as loneliness. Based on this understanding, we then describe the ways in which participants intertwined technologies with community-led activities and self-care practices to support experiences of social connectedness and personal wellbeing in daily life.

4.1 Mental Health Views

Participants shared diverse views on what mental health entails: while some participants described mental health as a holistic and agency supportive experience, others associated mental health primarily with negative experiences, such as mental illness and stigma within social circles.

4.1.1 Mental Health as a Holistic Experience

Participants described mental health as a holistic experience. They detailed a wide range of feelings from happiness to sadness, acknowledged individual differences, and explained relationships between mental health, physical health, and health behaviour in everyday life. They adopted not only a retrospective but also a prospective lens to highlight how mental health experiences can contribute to a satisfactory quality of life (e.g.: *"it is primitive [basic] to have sound mental health for healthy mind & body leading to healthy life"* (P7-S)).

In particular, participants highlighted the importance of being able to enact autonomy and agency in daily life (e.g., deciding where to live, what profession to take, and what future life goals to pursue). For example, P9 reported that self-managing her mental health involved being able to change her life and being able to pursue her dream to become an independent artist (e.g.: *"I want to improve my life, change my life to best way, […], everything better than now."*). While P7 mentioned that experiencing a lack of freedom can cause discomfort and potentially trauma (*"What does it make me feel uncomfortable is being not free."* (P7-S)), P4 voiced that a holistic mental health understanding needs to acknowledge experiences of freedom and accountability:

> P4: "But for me being free means that I have to make my own decision, I have to make my ... Nobody has to interfere in my life, you know? And I have to do even my own mistakes and everything in my way."
>
> Interviewer: "Could you tell me more about the importance of being able to make mistakes?"
>
> P4: "Yes, it helps to learn because at the end they are your mistakes and it's your mistake, then better do your own mistake than being told what to do and suffer from other's mistakes. You know?"

4.1.2 Mental Health as a Synonym for Mental Illness

A few participants associated primarily negative experiences with the term mental health. They described mental health as a *"difficult situation"* (P4-S) and a *"problem that has to be treated"* (P8-S). Mental health was described as a binary state and associated with mental illnesses, such as depression (e.g.: *"If I'm depressed or no."* (P9-S)). For example, P2 described feelings of being lost and experiencing depressive situations, when sharing her mental health understanding:

> "Is a bad thing to have a mental health because when you have mental health it's like you lost, you know? Not sure what to do, you get annoying for everything, you don't want to do anything. It depends. When I'm depressed I don't want to do anything. I don't want to get up, I don't want to eat, I don't want to do anything." (P2-I)

4.1.3 Mental Health and Perceptions of Social Stigma

Participants explained that intergenerational differences within families and extended social circles can influence the association between the term mental health and perceptions of negativity (e.g.: *"Some of them think in an old way like insanity, or having lost their mind."* (P10-S)). In particular, participants with community work and volunteering experience highlighted cultural differences in understanding mental health. For example, a community worker reported that the Western concept of self-care was often associated with selfishness (i.e., "*Often they see it like it's a selfish thing to do"*(P1-I)). Furthermore, she pointed to underlying challenges that can exacerbate mental health stigma, such as a lack of safe spaces to share mental health experiences and forced social isolation:

> "So, people are worried because when a family member has a mental health [condition] a lot of people think [...] that might bring stigma in their whole family. So often they are hidden away, people don't talk about them, even if they are brothers and sisters, they will actually make sure they're not seen, you know. [...] a lot of people think you've been playing with magic basically and that was the magic that brought back the bad luck to you. Or someone has done magic on you, that's why you're not very well." (P1-I)

Participants particularly valued receiving emotional support from their family members and friends. However, coping with stigmatic views can bring about emotional challenges, as P7 described. She reported feeling uncomfortable in situations in which her social circle addressed her past traumatic experiences in judgemental ways:

> "Like people is too judgmental, people – make me uncomfortable, and especially where because of my past situation that I've been through with [name of a person], sometimes like in my own community if I think it's just unfair, if I see them and if they are talking about the old things, I just suddenly feel so uncomfortable. I don't know. I think it will just take time to heal it because still I am in that trauma and all the pain I am going through, so those kind of things made me feel uncomfortable." (P7-I)

4.2 Mental Health Challenges

Participants reported experiencing a wide range of mental health challenges, including stigma, loneliness, and uncertainty. In addition, they described technologies as potential sources for adverse mental health experiences.

4.2.1 Experiencing Loneliness in Private and Public Settings

Participants explained that being able to cope with loneliness was an important mental health challenge. Participants highlighted the emotional challenges single mothers can experience when pursuing a new life in a new country. In addition, COVID-19 pandemic lockdown measures seemed to exacerbated loneliness and emotional distress (e.g., *"And then with the second lockdown and the third, [...] I find it really difficult with the home learning and not be able to meet friends and family. All this sort of thing is really stressful."* (P3)). P7 appreciated being able to talk with her flatmate in her native language, however, made clear that making new friends was difficult in her current environment:

> "I don't have any friends. I have one flatmate who's in the downstairs, luckily she is from [country] and I can speak [language], sometimes I want to contact with her to talk with her. Otherwise since [a number] years I couldn't make any friend in this area, it's so isolated place." (P7-I)

Beyond private experiences of loneliness described by participants, they also reported that perceived social exclusion in public settings can contribute to loneliness. As part of the online survey, participants described feeling uncomfortable when experiencing feelings of distrust and fraud, feelings of being stared at, and rude and aggressive behaviour. P4 shared that she experienced inequality during social interactions on public transport and in school settings:

> "In schools, in my son's schools. I really don't like to recall the situation but I can say [...] in my son's school, or the simplest thing in the bus, I experienced it, not equality." (P4-I)

4.2.2 Coping with Uncertainty in Daily Life

Participants detailed how experiencing uncertainty in daily life affected their mental health in negative ways. They listed a wide range of activities, personal experiences, and environmental factors, including navigating new bureaucratic systems; getting lost in unfamiliar places; illness of geographically distant family members; employment insecurity; prospect for a satisfactory and fulfilling life; wellbeing and future of their children; as well as the progression of the COVID-19 pandemic and effectiveness of lockdown measures. For example, P5 described her fear of receiving mail in the post in case they had to do with her status in the UK:

> "At the moment, as per my situation with home office, so definitely the letters in the post definitely scares me a lot, so keeping these thoughts makes me uncomfortable. [...] Same like, so you get scared sometimes, "Oh my God, what's going to be the next one now? What's going to happen?" Quite scary, you know." (P5-I)

Participants' accounts suggest that uncertainty can cause worrying experiences in daily life and form negative expectations of the future (e.g., *"[...] being always scared and scared for everything, you know. Expecting things to happen"* (P3-I)). Based on this understanding, P2 explained that it can be challenging to maintain a positive attitude and perspective (*"So, at some times, I'm really happy, you know, to do traditional things [activities of daily living described], but sometimes I don't see the point [to engage in activities of daily living]."*).

4.2.3 Re-Traumatising Experiences of Digital News Content

Participants outlined a wide spectrum of experiences with technologies. They expressed their awareness of potential negative effects of using technologies and demonstrated their agency through developing workarounds, such as selectively tailoring their social media feeds and deliberately avoiding certain social media apps (e.g.,*"Tiktok, it is very addictive"* (P9-S)). At the time of the study, COVID-19 related news was commonplace on social networks, and this triggered negative associations and caused negative emotions for some participants. For example, P5 described content showing deadly consequences of the pandemic as frightening and scary:

> "It was really bad and that makes me more scared, and sometimes they're uploading the videos of people dying, oh my God, that was frightening. The way they have shown us the hospitals are getting full and how they have been digging the graves without any nameplates, no nothing. That was the scariest picture I can imagine, the hospitals are full and people couldn't breathe and they are on ventilators, and they are saying if you want to be safe stay at home." (P5-I)

Participants reported that seeing violence and suffering made them feel uncomfortable (e.g., P5-S: *"Even if I can see if someone suffering it make me very mourn, upset."*). To avoid negative wellbeing and manage news with emotionally challenging photos and videos, participants developed workarounds, such as blocking content providers and skimming over headlines on smartphones rather than consuming multimedia content on larger screens (e.g., P5).

4.2.4 Parental Pressure of Managing Excessive Screen Time

Managing screen time and gaining emotional awareness of potential adverse effects of using technologies was, furthermore, an important parental concern. For example, P7 explained that social networks, such as Facebook, require mindful engagement considering that sharing content and receiving feedback can not only support but also lower confidence:

> "They can even make you really confident and at the same time they can punish you if you really take them seriously. So, we need to be little bit mindful about when we are in that social media, we need to be really strong mentally when we are dealing with this. And this is a bad thing when people do such bad comments." (P7-I)

Participants expressed worry regarding increased screen time of their children during COVID-19 lockdown measures. They acknowledged technologies as educational tools, however, described time-extensive use and sedentary behaviour during the pandemic as *"unhealthy"* (P6-I). P1 reflected on tensions between her changing parenting role over time and the educational potential of technologies in the following way:

> "It was scary how much we used it. […] technology is a big part of our life and how we use it as well has changed over the years, and especially my children are getting older. When they were smaller it was different because I can actually control what they were watching and how they were using the tablets and etc. But now they are older, they're teenagers, it's for me really, really difficult. It's like a second parent actually, so it's me, and they [social media] over the technology. That's kind of given them different messages." (P1-I)

4.2.5 Privacy Concerns as a Barrier to Digital Wellbeing

Participants explained that privacy concerns can influence their emotional relationship with technologies and parental role of supporting their children in using technologies. Some participants reported avoiding sharing personal information on social networks to protect their private family lives (*"Facebook, Instagram I don't like to show my private life to people."* (P7-S)). P4 described being *"paranoid with safety things"* (P4-I) and expressed concerns about sharing private photos and updates on social media sites, such as Facebook.

> "It's been ages that I don't have a Facebook or a ... And idea of uploading pictures and then deleting and then in my mind the picture might stay always there or someone can hack in my account and they can take all the pictures or do ... Everything happens, you know? […] I'm a little bit paranoid with safety things. […] Maybe all this information that you give to this social media for your daily life, something will go, like someone can hack or they can see what you're talking and everything. It's not good, you know." (P4-I)

4.3 Mental Health Supportive Community Practices

We have described the mental health challenges of women from refugee backgrounds, such as loneliness and uncertainty. In the following section, we will report on how participants used technologies to support community-led activities and self-care practices to foster social connectedness and personal wellbeing.

4.3.1 Leveraging Digital Technologies to Support Community Experiences

The charitable organisation involved in this study went through a digital transformation during COVID-19 lockdown measures with P8 reporting *"Technology […], it helps so much that it changed our lives"* (P8-I). Prior to the pandemic, community activities, such as language classes and arts workshops, were run in person. Community workers and volunteers worked to translate these shared social activities collectively into new digital formats using a wide range of technologies. They began with 'wellbeing calls' during the first lockdown to re-connect with their community members:

> "So, we basically, during the pandemic and because of the lockdown, we called the women, like vulnerable women and isolated women, so we talk to them, chat to them like a wellbeing call. Ask if they need any help like with shopping, translating, the government guidelines and things like that." (P3-I)

Community workers then formed a network of WhatsApp groups to organise community activities and taught members how to use the online video conferencing platform Zoom:

> "So, we started WhatsApp, like a system of WhatsApp, and then showing them from there, you know. And then let them now to set up a Zoom, how to load the Zoom, how to download it, you know." (P6-I)

Participants explained that they were able to reach a significant number of community members with the help of communication technologies. However, they highlighted digital inequalities, including a lack of multilingual support, limited knowledge of how to use technologies, lack of access to technologies, having to share technologies, and limited access to the internet. Community workers took an intermediary role between community members, governmental bodies, and public institutions to address some of these digital inequalities, including organising donations of laptops and offering guidance in person, as P6 outlined:

> "So, imagine if they've only got maybe one laptop, or maybe it's not, maybe they can't afford that so maybe they used to use the library when the child needs using the computer. So those are really, they were at risk, and also they didn't know who to ask. Because I know the schools are providing for the kids, but then not everyone knows that. The only thing they ask, because the women come back to us and they said, 'We are facing this and we've only got one laptop' and ... so that of stuff we challenge it daily." (P6-I)

4.3.2 Volunteering for and Taking Part in Community Events to Experience Connectedness

Community members appreciated the support from the charitable organisation not only during COVID-19 lockdown measures (e.g., *"The [name of the charitable organisation] offered us support which really helped during the tough times"* (P11-S)) but also enjoyed volunteering for and taking part in organised community activities prior to the pandemic. Community members particularly valued taking part in sessions, such as yoga, Zumba, reading, and art classes. P7 listed a wide range of community-led events and made clear how much she enjoyed taking part in the well-attended social activities:

> "Yes, yoga, then Zumba classes I can really enjoy, it's really good the yoga and the Zumba, and we had art classes. Lots of people in those, such a great, it was so fun! And we did tissue art. So yes, it was such a pleasure to see lots of people there and we had really fun making all that, it was really nice." (P7-I)

P2 clarified that the community-led events were inherently social involving not only community members but also their extended social circles, including children and friends:

> "Even my son likes to do painting, we did some painting, we did dancing. I love to cook so I used to cook and give it to my all flat mates and sometimes I used to call them just join with us the cooking, and over video call. We did some baking activities, like we got the follow one recipe of cake, over a video call. So yes, those kind of things we did it. And like a singing competition even we did it over video call, that all we did." (P2-I)

Participants explained that volunteering for the community-led social events supported a sense of joy and purpose and helped develop new skills and relationships. While volunteering was considered a form of self-care and used as a coping strategy, it could lead to feelings of a lack of power to sustainably transform lives and environments. However, considering their experiences of loneliness, participants explained that both volunteering for and taking part in online

community events supported social connectedness. *"It was another experience, and every kind of tribe, different tribe […]. Yes, I loved it,"* reported P2, describing her sense of belonging and being part of a supportive community. P4 referred to challenges of being a single mother with a refugee background in daily life and particularly appreciated experiencing acceptance and equality within the refugee community:

> "Well, with [name of charitable organisation], everybody's the same. They treat us the same. But in basic life, I think it's hard for a refugee woman, a single mum and everything. I don't know, it feels different, and it shows different. […] Everybody is treated equal here." (P4-I)

4.4 Mental Health Supportive Self-Care Practices

Participants reported engaging in a wide range of mental health supportive activities that had parallels to those community-driven initiates offered by the charitable organisation for women from refugee backgrounds, including journaling, crafting, painting, breathing exercises and yoga. Participants described inherently social mental health self-care practices, including their preference to use digital technologies in their first language to maintain social ties and utilise non-mental health-focused apps to support experiences of social connectedness and personal wellbeing in daily life.

4.3.3 Using Digital Technologies in First Language to Support Social Ties

Participants explained that their first language, social circles, and faith informed the ways in which they used technologies and managed their mental health. Participants reported that using technologies in their first language supported positive experiences, including a sense of identity and social connectedness. For example, participants described using online sources for watching a familiar video or finding a food recipe in their first language as memorable and joyful moments. P4, who had raised her son bilingually, associated a sense of identity and heritage with watching content in her first language:

> "It's not that I have problems with English, but sometimes watching your own language is different, you know? It's like you find yourself there [laughs] in your language, because even for me sometimes I talk to my son in my language because he's five and he's between both of language because I forget it's easier for me to talk my language. It comes from my mum and now from my mouth directly." (P4-I)

Another mental wellbeing supportive activity was listening to familiar music on online platforms, such as YouTube, and Spotify. P2 explained that she enjoyed listening to music in her first language because it allowed her to connect with lyrics and feel motivated to accomplish daily activities:

> "Especially when I listen to music from my country, because I understand what they say properly, you know, make my mood happy. I want to clean the house, I want to cook, I want to get up, [laughs] yes, I want to do things. Music definitely change[s] my moods." (P2-I)

Furthermore, participants reported that it was important to them to maintain their social ties with their family members and friends living in the UK and abroad (e.g., *"Instagram is really, it made you connect with your family member that are distant from you, like not living with you in UK."* (P6-S)). Participants highly valued and appreciated technological advances of internet-based communication technologies and explained that being in touch with geographically distant members of their support system positively contributed to their mental health (e.g., *"The people who live far away and who know me very well was the best supportive friend, even member of my family"* (P9-I)).

4.3.4 Limited Use of Mental Health-Focused Apps

Four participants had experience with dedicated mental health apps. For example, P3 was trying out the Headspace app and compared the user experience with her experience of praying. She felt that praying and engaging in guided mediation helped her to relax and supported her morning routine, and even engaged her children in shared use of the technology:

> P3: "The Headspace they do like, after the alarm is in the morning, I put the alarm off and then I check Headspace, they do nice one or two minutes, like they're doing the wake up, so it's nice with the calming voice. It's similar to prayer but yes, it's just a good start for the day, and I do it before bed as well. So, it just calms me and make me happy and relaxed doing it. It's just part of my routine now, but before that I just go in a rush and get a hectic morning."
>
> Interviewer: "Could you tell me more about how Headspace helps you to relax?"
>
> P3: "Yes, I would say it helped me to sleep, sometimes, because I struggle during the night, and even if I wake in the middle of the night it helps me to go back to sleep. So, really good using this one, yes. And [my children] like it as well."

Participants mentioned learning about popular wellbeing apps, such as Headspace, from friends and social support workers as well as coming across wellbeing apps online. However, the case of P2 exemplifies that access to mobile internet and subscription fees can hinder the use of wellbeing apps in practice:

> "I don't do it [using Headspace app] all the time because my internet is not that much. I wish I could but I can't do it all the time. It helps though, the first night it really helped but I don't want to use it all the time because my data is not enough." (P2-I)

4.3.5 Recognition of Mental Health Supportive Experience of Non-Mental Health-Focused Apps

During the COVID-19 lockdown, participants especially enjoyed spending time outdoors and walking alone or in groups. For example, P9 described how walking longer distances alone helped her to cope with challenging experiences, such as grief and uncertainty in her life. She liked to occasionally review her step count on her smartphone, but particularly valued using WhatsApp to share photos of her walks within a private group to express her passion for nature and receive photos from her friends *(*e.g., *"They send it as well, and you feel the pleasure they're feeling. And you feel it as a pleasure from the pictures"* (P9-I)).

Instead of using dedicated wellbeing apps to support their mental health, most participants reported appropriating a wide range of systems including social networking, fitness, and entertainment apps. For example, the video platform YouTube was used to access publicly available content on guided meditation and yoga exercises (e.g., P7). P2 described playing games on her smartphone to avoid rumination on mentally stressful aspects of her life and she detailed how her gaming performance and outcomes affected her emotions in mixed ways:

> "When I play Candy Crush, I don't think, I just want to be in a, sometimes I get frustrate when I don't win, and when I win I'm really happy. To be honest, I play Candy Crush almost every day, not all the time but when I'm sitting down doing nothing, I'd rather play instead of thinking. Because when I think, think, think, it take me to a bad place." (P2-I)

Furthermore, participants described creative ways of using community-driven social media applications that were not designed with a primary mental health focus but allowed for wellbeing-supportive appropriation. While P4 utilised Pinterest to collect motivational quotes, P6 followed individuals with inspirational and diverse backgrounds on Instagram to learn about empowerment and independence, and she would share their stories within her social circle:

P6: "The other thing I learnt as well also from Instagram because people who really, people who inspires you, then you can, yes, if they got Instagram then you can follow them and easily learn from their experience."

Interviewer: "Could you tell me more about how you follow people on Instagram and how you learn from their experience?"

P6: "Yes. There is a time that this lady, she lives in [city], and she's a woman and she's a mum of four children and, really, she is a very independent – she empowers the women to be, 'You can do it, you can be anything, you can do everything.' […] So those kinds, I follow people who really inspire me, it's not only that woman but it's so many from many backgrounds."

4.2.6 Drawing on Digital Technologies to Support Spiritual and Religious Experiences

Moreover, participants highlighted religion and faith in managing their mental health. Praying provided structure in daily life and offered significant mental health benefits for many participants. This benefit was realised not only through tangible reglious objects and personal prayer, but also through technology means. For example, P6 reported that praying strengthened and empowered her to cope with daily mental health stressors. She explained that video platforms and dedicated apps supported her in instantly accessing religious content:

P6: "So, when I feel stress and overwhelmed, I do my prayers and this does relieve me a bit, I feel comfortable doing that, and after doing that I feel like it's empowered me to carry on with my life. So, for me as a Muslim woman, we follow the Qur'an, listening to it. Everything that you are suffering from there is a specific Torah. So, if you try reading that, it makes you much, much better and relief. So, during the lockdown, really this is what kept me strong."

Interviewer: "Could you tell me what tools you use to listen to the Qur'an?"

P6: "We've got like a holy Qur'an book, and we got it and if you want to read it you can read it from there. And, if you want to listen, then there is an app, you can download it. So, many apps there for Qur'an. Or you can go to YouTube and turn on a specific one that you wanted it, and you turn on, you can watch, make you, yes, to listen."

5 Discussion

Taking calls for more inclusive research inquiries into the mental health experiences of people from a wide range of diverse backgrounds [69,70,85], we have investigated the mental health experiences and digital technology needs of women from refugee backgrounds in partnership with a charitable organisation. Our findings highlight the collective agency of the charitable organisation and their volunteering network in supporting experiences of social connectedness and personal wellbeing within the community for women from refugee backgrounds. Participants reported that the charitable organisation provided safe spaces for social exchange; organised regular events, such as yoga and dancing classes; offered volunteering opportunities; conducted wellbeing calls; and tackled digital inequalities through organising donations of laptops and mediating digital skills (e.g., how to use WhatsApp and Zoom). Importantly, participants reported adopting these mental health supportive activities in daily life, such as practicing yoga and organising social cooking events. They intertwined community-driven activities with self-care practices and used a wide range of non-mental health-focused technologies to support their mental health, including apps to support religious practices, play games, and share experiences of everyday living within private WhatsApp groups. Based on this understanding, we discuss the importance of adopting holistic mental health views and exploring community-led approaches to foster inherently social mental health experiences. Future human-centred and participatory research projects need to support charitable organisations in raising mental health awareness,

addressing digital inequalities, and strengthening their mental health supportive initiatives and volunteering networks.

5.1 Informing Holistic Mental Health Views

Human-centered mental health research and design requires an inclusive and holistic mental health understanding [37,85,91]. For example, the World Health Organization defines mental health as *"a state of well-being in which an individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and is able to make a contribution to his or her community"* [99]. While this definition offers guidance to gaining an initial understanding of mental health, scholars have argued that it is imperative to acknowledge spectra of emotions, individual capacities and abilities, as well as sociocultural and environmental factors when conducting mental health research [37,48] and informing the design of mental health technologies [85,91].

Similar to research with ethnic minority groups [49], our study with women from refugee backgrounds documents diverse mental health views, including associations between selfishness and mental illness, underscoring the importance of raising mental health awareness and challenging mental health stigma as part of designing mental health technologies and conducting mental health interventions. Promising research directions involve the design of support tools for sharing mental health views in tangible ways, as exemplified by the design of "dialogue cards" to foster conversations about food insecurity with refugees [88]. However, taking holistic perspectives to understanding lived experiences and creating design artefacts requires awareness of complex ecologies of different stakeholders with conflicting goals and power dynamics, including potential tension between researchers and participants [54].

Furthermore, our findings contribute to a holistic mental health understanding by focusing attention to the emotional benefits of being able to enact human agency in daily life. While agency entails capacity to make choices and act in a given environment [81], perceived control is associated with good physical and mental health [8,68,96]. In our study, women from refugee backgrounds voiced a strong emotional desire to exercise their agentive capacities: being able to decide where to live, what profession to take, and what future life goals to pursue, as well as being able to make mistakes, learn, and grow. These findings echo the shift from reductive characterisations of people with refugee background as *'powerless,'* to more nuanced accounts that document people's lived experience in their daily life; this is inclusive of not only perceived challenges, but also their strengths, knowledge, skills, achievements, and aspirations [3,15,60,69]. For example, prior work has described refugee and immigrant women's resilience in coping with violence and trauma [39,73] and refugees' intentions of appropriating technologies for learning and assimilation purposes [3]. Our findings illustrate how women from refugee backgrounds managed their mental health and contemporary digital wellbeing challenges [21], expanding on our understanding of unintended effects and harmful consequences of using technologies [21,36,41,67].

Participants described not only their emotional awareness of adverse technology use but also their agency in developing workarounds. For example, while a participant avoided reading emotional challenging news content in her laptop browser and instead decided to occasionally skim over news headlines on her smartphone (see section 4.1.4, P5), another participant considered that staged presentations and inappropriate comments on social networks can negatively impact confidence, deciding to follow primarily women who share empowering life stories on Instagram (see section 4.2.3, P6). Other participants decided to entirely avoid using social networks, such as Facebook, because of privacy concerns and worries that sharing personal data might lead to unforeseeable and irreversible consequences to their family lives and futures (see section 4.1.4, P4).

The fact that four of the 15 participants had experience using dedicated mental health apps, such as Headspace, points to the potential for technology to support wellbeing within this group but also the individual and social barriers. These barriers included knowledge of existing mental health apps, willingness to use dedicated apps to self-manage mental health, financial access to subscription-based mental health services, lack of internet access and preferences to engage in non-digital coping strategies, such as walking and talking with family and friends. However, even then some participants were creating private social networks through WhatsApp to digitally share encounters with nature.

Furthermore, our findings show that participants recognised mental health supportive benefits of technologies that are not explicitly designed to support people's mental health. For example, participants reported mental health supportive experiences, such as playing games, like Candy Crush, to manage difficult thoughts (see section 4.2.2, P2) and appropriating the video platform YouTube in creative ways from finding childhood food recipes to supporting religious practices (see section 4.2.2, P5-7). These findings are in line with research beyond a refugee context that also shows the potential mental health benefits of using technologies, such as smartphone apps [79] and commercially available games [50].

Moreover, our qualitative accounts of women from refugee backgrounds exemplify how understanding digital mental health experiences can help move *"away from the claustrophobic definition of their lives as defined by their past refugee [or asylum-seeking] status"* ([38], page 573), towards a more holistic understanding of the roles technologies can play in supporting people with diverse migration experiences in pursuing their current needs and future life goals. In doing so, it is important not only to consider life transitions, personal growth, and evolving wellbeing needs, but also develop longer-term and sustainable research partnerships and design interventions over time [54].

5.2 Supporting Social Mental Health Experiences

Understanding the mental health experiences and needs of women from refugee, asylum-seeking, and immigrant backgrounds is important for informing the design of inclusive mental health research, technologies, and services [69,70,85]. Based on our findings, we discuss how mental health research and design could explore community-led approaches to foster inherently social mental health experiences, rather than focusing only on personal and therapeutic approaches to encourage self-help and self-care.

Whilst prior work has developed evidence-based recommendations and identified potential benefits of mental health apps, such as increases in positive affect [11], a recent feminist analysis of mental health self-care apps points to significant mismatches between scientific mental health views and *"overly simplistic, individualistic and potentially harmful"* mental health narratives [78]. There is a tendency toward medical models of mental health that present self-management as an individual self-discovery and self-improvement process overlooking people's diverse needs and sociocultural backgrounds [78]. As a response, Spors et al. [78] urge user experience writers, designers, and developers to present mental health not as a personal self-care issue, but as a social and collective experience and concern. While Sanches et. al [76]'s systematic review identifies innovative progress in self-tracking and methods to automatically assess mental health conditions, it has become clear that self-care needs go beyond self-reflection, self-awareness, and self-optimisation [63,64].

Prior work has documented how women use digital technologies to support their health and wellbeing within women-led communities [95,100]. For example, Younas et al. [100]'s analysis of a closed women-only Facebook group in Pakistan identifies not only a sensitive cluster of anonymous topic post, such as psychological abuse, anxiety, and depression, but also mental health supportive strategies, including disclosing shared experiences and providing advice. Their work exemplifies how women leverage technologies to create anonymity and privacy supportive

digital spaces for social exchange and collective coping within a patriarchal context. This research study has focused on women from refugee backgrounds in the UK and has documented women's agentive capacities in creating digital and non-digital social support systems driven by a women's led charitable organisation. While fundamental cultural and structural differences exist between the Global South and the UK, our findings have documented cross-cutting mental health challenges (e.g., experiencing loneliness and trauma) and collective coping strategies (e.g., receiving social support within women-led communities of practice.) These findings highlight the importance of gaining cultural sensitivity and supporting people in enacting their identity and culture within new and changing life worlds [35,65,100].

Our findings improve understanding of the social dimensions of mental health self-management within a community for women from refugee backgrounds. Within this context, we identify not only mental health challenges, such as loneliness, but also find that volunteering for and taking part in mental health supportive online and offline community activities informed self-management practices and supported experiences of social connectedness and personal wellbeing. Social connectedness develops throughout one's life and can be considered *"an attribute of the self that reflects cognitions of enduring interpersonal closeness with the social world in toto"* ([58], page 310). While a sense of loneliness is defined by emotions associated with a loss of relationships, social connectedness involves social relationships and feeling connected with the social world [26]. Low social connectedness is interlinked with dysfunctional interpersonal behaviour and mental health illness [55,58], whilst high social connectedness has been linked with user engagement as part of digital mental health interventions [14].

This research did not quantitatively measure social connectedness; however, participants' accounts of volunteering for and taking part in community activities describe feelings of social connectedness, including acceptance, relatedness, and belonging. In particular, being a proactive member of a *"tribe"* (P2) and experiencing *"equality"* (P4) exemplify participants' appreciation of being a proactive member of the charitable organisation, and indeed a group they feel like they belong to in a country and culture that can feel isolating. Contributing factors seemed to be not only shared lived experiences within the women-led community for women from refugee backgrounds but also their cultural diversity offering opportunities for exchange and learning.

Similar as within a women-only maker community [95], participants in this study reported finding joy in helping others. In addition, they recognised not only pragmatic benefits, such as improving their interpersonal skills and working towards employment and independence, but also emotional benefits, such as enjoying being able to focus their attention to their personal wellbeing outside their private spaces (see section 4.2.1). The design of digital mental health technologies and interventions needs to support these experiences of social connectedness, from proactive participation in community-driven events to enacting altruism as part of volunteering engagements.

5.3 Designing for Social Mental Health Experiences

The design of mental health supportive technologies and interventions can focus on strengthening social connectedness within existing social circles but also help develop new social ties outside a community of practice [5,10]. A key consideration for such endeavours is to co-design research projects with leading community members, aligning research objectives with the priorities of a community organisations, and making time for gaining cultural sensitivity and insight into the anticipated acceptability of recruitment and consent processes. For example, our collaborators made us aware of the importance of offering participants the options to take part in this research anonymously via an online survey, choose specific languages, and participate in an interview with a gender appropriate researcher.

There are different approaches to implementing peer-support based technologies for the diagnosis and management of mental health conditions. For example, Lederman et al. [57] show

how the design of Moderated Online Social Therapy (MOST)-based technologies can draw on principles of accountability and positive psychology to support mental strength and a sense of belonging. The design of mental health peer support technologies needs to prioritise accessibility of audio, visual, and textual content; mitigate risks of disclosing private and sensitive information; and focus on shared lived experiences, such as values, emotions, and feelings, rather than clinically informed measures [66]. Our work has documented how members of a community for refugee women have created personal and community-driven *"technology ecosystems"* [19,20] to foster mental health supportive experiences, including traditional technologies (e.g., telephone), mental health-focused technologies (e.g., Headspace), and non-mental health-focused technologies (e.g., apps to support religious practices). In doing so, our findings illustrate the importance of understanding and supporting the fundamental role of a charitable organisation in leveraging not only digital but also non-digital social networks for women from refugee backgrounds. Participant's accounts describe the mental health supportive role of the charitable organisation in fostering social connectedness and personal wellbeing through providing physical space, organising social events, tackling digital inequalities, mediating digital literacy, and offering volunteering opportunities. Considering this fundamental societal contribution, we suggest that human-centred research projects need to strengthen, in particular, the social mental health supportive work practices of a charitable organisation rather than prioritising individualistic and technology-centric mental health approaches.

Prior work has described how women in South Asia manage their privacy on shared mobile phones and derived implications for the design of privacy preserving technologies, such as supporting multiple accounts and content hiding [75]. While all participants in this study owned a personal smartphone and/or mobile phone, they explained sharing laptops within family settings and using closed WhatsApp groups to share personal experiences within the community specifically for women from refugee backgrounds. Furthermore, participants reported feeling more comfortable to share lived experiences within private WhatsApp groups rather than social networks, such as Facebook. A promising research direction is to investigate what community practices and specific design patterns make different digital communication and social network applications preferable and trustworthy.

Designing for social connectedness also entails overcoming digital inequalities. Prior work with people from refugee backgrounds has revealed associations between digital and social inclusion and highlighted roles of technologies in enabling and strengthening connections with the social world [3]. Our case documents the crucial role of a charitable organisation to support community members in overcoming bureaucratic barriers to receive governmental support for technologies, and also in teaching how to use technologies to support connectedness and wellbeing, such as the Zoom tutorials offered at the time of the COVID-19 pandemic when lockdown measures significantly impeded social life (see section 4.2.1 and [43]. Our findings highlight that human-centred mental health research needs not only raise mental health awareness but also address digital challenges, such as limited mobile data, shared technology ownership, and trust in personal data-driven technologies.

Designing digital mental health technologies involves managing contradicting needs of multiple organisational stakeholders, different actors of people's direct and peripheral support networks, power imbalances, and cultural and structural tensions [47,51,64]. An important implication for the design of mental health supportive systems is to acknowledge women's social bonds within and outside a community organisation, including their essential social ties with their children, as well as local and geographically distant support systems, from housemates to family relatives in their country of origin. To address these complex ecologies in supporting women's wellbeing, Kumar et al. [54] suggest drawing on education science and design-based implementation research [34], an iterative and collaborative research approach that is particularly suitable for sustainably addressing complex problem spaces from multi-stakeholder perspectives and advancing existing theory and knowledge.

Promising research agendas can move away from framing migration experiences as problems that need psychotherapeutic solving towards a culturally sensitive engagement with the diversity of the situations of the participants and of the interconnected social encounters, where researchers can take scaffolding roles to learn from the expression of lived experience (cf., [71]). Studies with people from refugee, asylum-seeking, and immigrant backgrounds could go beyond design-scaffolded interviews to instead understanding changing roles of technologies in supporting longer-term experiences of active citizenship and also values-led co-design approaches with principles of diversity, empathy, and collective creativity [12,44,59,93]. Rather than focusing only on the visualisation of migration routes and the design of self-help and self-care tools, such participatory work can leverage embedded cultural practices, such as arts and craft-based design [1,9,71,95], to explore digital avenues for mental health support. Our research has identified mental health supportive opportunities for technology design that veer away from the focus on the individual towards less narrow notions of support through experiences of social connectedness, from altruism to companionship and belonging.

6 LIMITATIONS

We have investigated the digital mental health needs of women from refugee backgrounds in partnership with a charitable organisation through an online survey (n=15) and follow-up interviews (n=9). The lack of data regarding participants' socioeconomic status and time spent in the UK might be considered a limitation. We used an open-ended question intended to support participants in sharing information according to their personal disclosure preferences (i.e., *'How would you describe your ethnic background? You can also write about your family's country of origin and the places you lived so far.'*). Furthermore, it should be noted that our qualitative account masks potential differences regarding participants' diverse ethnic backgrounds which limits the transferability of this work. Working with researchers from refugee backgrounds and collaborating with interpreters to involve participants with diverse language preferences and members of their social networks, such as life partners and friends, could have provided a more holistic understanding of mental health experiences and implications for digital technologies within this context.

Furthermore, it needs to be acknowledged that our data collection and analysis was informed by a holistic mental health understanding according to Galderisi et al. [37]. Therefore, our thematic analysis entails potential deviations between our holistic mental health understanding and participants' diverse mental health views and actual lived mental health experiences. While participants' accounts suggest that they recognised mental health supportive benefits of community-led activities and self-care practices (e.g., feeling a sense of connectedness), future research projects could apply mixed-methods approaches to investigate, for example, to what extend community-driven activities can support a sense of social connectedness and contribute to people's mental health.

Another limitation of this research study are the relatively short online survey responses. The online survey offered participants an option to share their mental health experiences anonymously and decide whether they want to take part in a follow-up interview. In addition, the online survey responses informed follow-up interview questions, helped develop initial themes, and were selectively used to illustrate participants' mental health understanding and use of digital mental health applications. However, the survey responses alone were not sufficient to gain an in-depth understanding of the lived mental health experiences of the six participants who did not take part in the follow-up interview, compared to the nine participants who took part in the follow-up interview. An alternative approach would be to initially investigate people's willingness to take part in research studies and their preference of using different types of research methods. A promising research direction could be to take advantage of mobile instant messaging tools to learn about people's lived mental health experiences in flexibly ways [45,46].

7 CONCLUSION

We have presented the findings of an online survey and follow-up interviews conducted in partnership with a charitable organisation for women with refugee backgrounds. Participants highlighted mental health challenges, such as loneliness and access to mental health applications. Nonetheless, participants' accounts describe their collective agency and creativity in addressing these mental health challenges in daily life: to support social connectedness and personal wellbeing, participants volunteered for and took part in online and offline community activities and used a wide range of non-mental health-focused technologies to support their mental health, such as using apps to support religious practices, play games, and share experiences of everyday living within private groups. These findings contribute to shifts from narratives that are predefined by people's refugee status to more nuanced accounts that document people's expression of their lived experience in daily life, including their strengths, skills, and aspirations [3,15,60]. Based on this understanding, we have discussed how mental health researchers and designers could leverage community-led approaches to support inherently social mental health experiences, such as altruism, companionship and belonging, rather than focusing only on mainstream therapeutic approaches to individual self-care.

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