Serving the underserved:

A holistic and low-threshold approach

to promote quality of life among refugees in Switzerland

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To those who lost their voice in the fight for humanity

من أجل أولئك الذين فقدوا صوتهم في النضال من أجل الإنسانية

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Abstract

Refugees face complex mental health challenges shaped by pre-migration trauma, post-migration stressors, and significant barriers to accessing care. Despite the high prevalence of psychological distress, culturally sensitive and accessible mental health support remains limited. While face-to-face therapy is vital, alternative approaches, such as digital mental health interventions, offer promising solutions to overcome structural and socio-cultural barriers.

This dissertation aims to advance the understanding and development of holistic, scalable, and culturally sensitive mental healthcare for refugees in Switzerland. It introduces a multi-levelled framework for mental health support and describes the development, cultural adaptation, and evaluation of two digital mental health interventions: the Sui SRK app, a holistic psychosocial support tool to enhance quality of life for Arabic-speaking refugees, and a grief support app specifically for Syrian refugees.

Findings from the participatory cultural adaptation process of the Sui SRK and the grief app provide valuable insights into refugees' needs, preferred formats and key cultural and contextual considerations for user-centred app development. Results from a mixed-methods randomised controlled trial of the Sui SRK app indicate high user satisfaction but no significant improvements in quality of life or mental health outcomes, highlighting the challenges of digital intervention efficacy.

Based on these findings, the dissertation discusses the need for interdisciplinary integration, examines the potential mechanisms of change and iterative cultural adaptation, and outlines the strengths and limitations. It then offers recommendations for future research on digital mental health interventions for refugees. Finally, it concludes with reflections on the broader implications for refugee mental healthcare in Switzerland and the potential for scaling culturally sensitive digital interventions within existing support systems.

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1. Introduction

The global number of forcibly displaced individuals has exceeded 122 million in 2024 according to the United Nations High Commissioner (UNHCR), including 43.7 million refugees who have crossed international borders in search of protection. Refugees often endure a multitude of distressing events prior to and during migration, including violence, detention, or life in refugee camps (Ben Farhat et al., 2018; Chen et al., 2017). Many experience grief not only for deceased loved ones but also for diverse forms of loss, including emotional, material, and social losses (Hassan et al., 2016). These challenges increase their vulnerability to highly prevalent mental health disorders, including post-traumatic stress disorder (PTSD), depression, and anxiety (Blackmore et al., 2020; Mesa-Vieira et al., 2022; Turrini et al., 2017).

In host countries, post-migration stressors exacerbate this vulnerability by mediating the impacts of persecution and conflict-related experiences on psychological well-being (Bogic et al., 2015; K. E. Miller & Rasmussen, 2017; Porter & Haslam, 2005; Renner et al., 2021; Walther et al., 2020). These stressors include, but are not limited to, housing conditions, financial insecurity, employment challenges, language barriers, legal restrictions, social isolation, and discrimination (Drescher et al., 2021; K. E. Miller & Rasmussen, 2017).

By the end of 2023, Switzerland recorded approximately 220,000 people in the asylum sector, primarily from Ukraine, Eritrea, Afghanistan, Syria, and Turkey (State Secretariat for Migration, SEM, 2024). Despite the high prevalence of mental health disorders among refugees, access to adequate mental healthcare remains insufficient (T. Maier et al., 2010). Swiss psychotherapists have identified the lack of funding as a significant barrier to treat refugees (Kiselev, 2020). Psychotherapy was since added to basic medical insurance in Switzerland in 2022 to be provided autonomously by psychotherapists, which may alleviate this issue to a certain degree (Federal Office of Public Health, 2024). However, inconsistent national cost coverage and the lack of systematic organisation of interpreting services in healthcare continue to hinder access to care (F. Müller et al., 2018), which accentuates language barriers. In addition, structural barriers, including long waiting lists, limited childcare options, insufficient information, transport costs, and inadequate referring systems, further

impede refugees' ability to access appropriate care (Bartolomei et al., 2016; Jaeger et al., 2019; Kiselev, Pfaltz, Haas, et al., 2020). On a socio-cultural side, differences between local services and refugees' needs, alongside fear of stigma and limited mental health awareness, present compounding challenges (Bartolomei et al., 2016; Kiselev, Pfaltz, Haas, et al., 2020).

A report on refugee mental health, commissioned by the Federal Office of Public Health of Switzerland, recommends expanding accessible psychosocial services and exploring innovative solutions to overcome language barriers (F. Müller et al., 2018). In this regard, internet-based tools present promising alternatives. These tools can address multiple barriers by providing multilingual, anonymous support, regardless of time or place and have been shown to be acceptable in refugee populations, particularly when designed following a user-centred approach (Burchert et al., 2019; Goodman et al., 2021; Matlin et al., 2025).

To date, internet-based interventions for refugees have primarily targeted specific mental health conditions (e.g., PTSD, depression, anxiety) (El-Haj-Mohamad et al., 2023; Hynie et al., 2023). However, the interplay between the aforementioned post-migration stressors and mental health problems calls for more holistic solutions to meet refugees at their immediate needs (Gleeson et al., 2020; Jannesari et al., 2020; Laban et al., 2005; Li et al., 2016). Refugees often prioritise immediate daily stressors, such as legal issues, integration challenges, and cultural differences, over psychological symptoms (Kiselev, Pfaltz, Schick, et al., 2020). Although post-migration stressors are considered hindering factors within psychotherapy (Mirdal et al., 2012), they also serve as a key motivator for refugees to seek therapeutic support in the first place (Al-Roubaiy et al., 2017). Therefore, interdisciplinary concepts that address both the daily challenges and the mental health needs of refugees are crucial for providing comprehensive care and improving access (Giacco et al., 2018).

To address refugees' mental health within the context of a post-migration society, adopting the multiple-domain quality of life (QOL) framework (WHOQOL-Group, 1998) provides a holistic assessment that integrates psychological and socio-structural factors. By considering physical, psychological, social, and environmental domains, this framework captures the broader context of refugees' lived experiences. A QOL-based intervention development perspective addresses the daily

challenges and priorities of refugees, offering a more inclusive foundation for accessible and culturally sensitive support systems. Following a culture-sensitive approach, which emphasises inclusivity over specificity, allows interventions and services to be developed with an unprejudiced attitude (Schnyder et al., 2016).

This dissertation aims to advance the understanding and development of holistic, scalable, and culturally sensitive mental health and psychosocial support interventions for refugees in Switzerland. It examines the intersection of psychological distress, post-migration stressors, and QOL through multidimensional concepts. Specifically, it (1) presents a theoretical foundation for the integration of mental health support into interdisciplinary care for refugees, (2) details the development, cultural adaptation and evaluation of two mental health apps, and (3) discusses the findings in the context of interdisciplinary, user-friendly, and culturally adaptable digital solutions for enhancing refugee well-being. The dissertation concludes with an outlook on potential future research to advance multi-levelled mental healthcare for refugees.

2. Theoretical Background

2.1. Modelling the vulnerable situation of refugees

Unless otherwise specified, this dissertation uses the term ‘refugee’ to refer to all individuals who have left their home country seeking protection, following the UNHCR definition, irrespective of their current asylum status. When considering the refugee population as a whole, commonalities emerge across different nations and cultures. Several models in the literature have aimed to show the effects of war and persecution in combination with post-migration life on refugees’ well-being (e.g., Idemudia & Boehnke, 2020; Kashyap et al., 2021; K. E. Miller & Rasmussen, 2017).

The Adaptation and Development after Persecution and Trauma (ADAPT) model by Silove (2013) is a comprehensive but simple model that conceptualises the collectively fractured situation of refugee populations. It lays a conceptual foundation for raising awareness for the recovery of conflict-affected populations with an interdisciplinary approach that goes beyond psychological care. This framework postulates five core pillars: safety/security, bonds/networks, justice, roles and identities, and existential meaning. It describes psychosocial interventions necessary to establish resource-orientated recovery conditions. These include normalising stress, ensuring protection and stability of the environment (safety/security), restoring social relationships and addressing grief (bonds/networks), promoting human rights (justice), facilitating integration through work and educational opportunities (roles and identities), and reducing discrimination and respecting diverse worldviews (existential meaning). The ADAPT model was confirmed by professionals in Jordan, who have outlined the psychosocial needs of refugees (Wells et al., 2018). Similarly, Rohingya refugee focus groups endorsed the model, metaphorically describing the restoration of its five core pillars as the foundation of a ‘happy house’ (Tay et al., 2020). Building on the ADAPT model's conceptual understanding of the psychosocial pillars critical to refugee recovery, the next step is to quantify and assess the impact on refugees' lived experiences.

2.2. Quality of life of refugees

While the ADAPT model identifies psychosocial disruptions and interventions to recovery, understanding the broader impacts requires a complementary framework that can assess refugees' overall well-being. Refugees face a particularly vulnerable situation shaped by various complex

factors, which necessitate comprehensive and measurable approaches to evaluate their mental health and QOL. Aspects influencing QOL among refugees have been reported to be physical health, psychological well-being, social relationships, environmental conditions, and spiritual factors (De Vries & Van Heck, 1994). The World Health Organization (WHO) defines health as 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity' (WHO, 1946). Based on this definition, the WHOQOL-BREF questionnaire was developed to measure health-related QOL in four domains: physical, psychological, social, and environmental (Skevington et al., 2004; WHOQOL-Group, 1998). The following paragraphs sketch out these domains in the context of refugees, beginning with the physical domain.

Refugees frequently report physical health challenges arising from their migration experience, including chronic pain (Morina et al., 2018), sleep disturbances, and fatigue (Al-Smadi et al., 2019; Jamil et al., 2005). Furthermore, high levels of somatisation of psychological distress have widely been documented in refugee populations (Hassan et al., 2016; Moran et al., 2023; Rohlof et al., 2014). The physical domain of the WHOQOL-BREF captures these experiences through measures of pain, sleep, energy levels, mobility, ability to do activities, dependence on medication, and work capacities.

In addition to physical symptoms, refugee prevalences report high rates of mental distress, including anxiety, depression, and PTSD (Patanè et al., 2022; Turrini et al., 2017). However, refugee psychological well-being extends beyond clinical diagnoses; it is also influenced by factors such as loneliness (T. P. Nguyen et al., 2024), stress (Al-Smadi et al., 2017), and concentration problems, which can hinder language acquisition (Al Ajlan, 2021; Renner et al., 2020; Schiess-Jokanovic et al., 2023). Evidence suggests that a hopeful disposition (Umer & Elliot, 2021) and reinforced spiritual or religious coping (K. Maier et al., 2022) are protective of refugees' well-being. The WHOQOL-BREF's psychological domain addresses these broader concerns by measuring positive feelings, concentration, self-esteem, body image, negative feelings, and meaning in life (spirituality). Notably, among Syrian refugees in Germany, the psychological domain of QOL was reported as the second lowest, only after the social domain (Al Masri et al., 2021), reinforcing the importance of addressing these challenges.

Displacement often disrupts family structures and community ties, leading to isolation and decreased social capital (T. P. Nguyen et al., 2024; Strang & Quinn, 2021). Research has consistently

shown that perceived social support in war-affected populations is strongly linked to mental health and life satisfaction, underscoring the critical importance of strengthening these support systems (Haindorfer et al., 2024; A. Miller et al., 2018; K. E. Miller & Rasmussen, 2010; Schilz et al., 2023; van der Boor et al., 2020). Social support can take various forms, including practical assistance, emotional comfort, informational guidance, or a sense of affiliation (Wachter et al., 2022), each contributing to the well-being of individuals. The WHOQOL-BREF's social domain assesses relationship satisfaction, perception of social support, and sex life.

Structural factors such as income, employment, housing, language acquisition, asylum process, and discrimination play a critical role in refugee mental health and its promotion (Hynie, 2018; Purgato et al., 2022). For example, in Germany, the quality of post-migration living conditions has been shown to be negatively associated with mental health outcomes (Schilz et al., 2023). However, the environmental situation of refugees largely depends on the host country's conditions and the asylum and integration practices prevailing there. The subsequent section will further explore post-migration life in Switzerland. Items of the WHOQOL-BREF environmental domain encompass refugees' safety, living conditions, financial security, access to healthcare, information, leisure activities, environmental quality, and transportation possibilities.

The WHOQOL-BREF questionnaire is commonly used to assess subjective QOL among refugees due to its availability in nearly 80 languages and its ability to capture mental health while also considering surrounding contextual factors. The term well-being, often used as a synonym for QOL, is frequently assessed using the WHO-5 Well-Being Index, which focuses mostly on depressive symptoms, an essential component of QOL (Topp et al., 2015). It does, however, lack the broader multidimensional perspective needed to fully capture the complexities of refugee QOL.

Another widely used multidimensional instrument for measuring QOL, besides the WHOQOL-BREF, in refugee populations is the Short-Form 36 (SF-36) (Ware & Sherbourne, 1992) as well as its shorter versions. A meta-analysis examined QOL outcomes among refugees using the SF-36 across eleven studies (N = 18.418) and found that refugees generally report lower QOL compared to general populations, though results varied significantly between studies (Essex et al., 2024). While the SF-36 primarily emphasises physical health, it also assesses social and emotional functioning as well

as mental health. However, a key limitation of the SF-36 is its lack of an environmental domain that considers post-migration stressors. The WHOQOL-BREF addresses this gap with its environmental domain, allowing for a more comprehensive assessment of refugees' QOL in the post-migration setting.

Lower QOL measured with the WHOQOL-BREF has been reported across all domains among Syrian refugees in Germany compared to a Western norm population, with age, housing conditions, and marital status identified as predictive factors (Al Masri et al., 2021). Additionally, employment status appears to be a determinant of QOL, as a study from Norway found that unemployment among refugees was correlated with all four domains of QOL (Teodorescu, Siqveland, et al., 2012). A study of multinational refugees in Sweden found lower QOL scores across all domains compared to a norm population (Leiler et al., 2019). The authors further reported significant negative correlations between QOL and mental health outcomes such as anxiety, depression and PTSD. These correlations were confirmed in a systematic review, which additionally highlighted the positive impact of social support on QOL (van der Boor et al., 2020). Another systematic review reconfirmed the lower QOL of refugees compared to a general population and, furthermore, reported that a clinical refugee sample showed particularly poor outcomes in the physical and psychological domains with variability across studies (Gagliardi et al., 2021). While these findings highlight the low QOL among refugees in various European host countries, the post-migration context can differ significantly depending on national policies, asylum procedures, and integration support.

2.3. Post-migration life in Switzerland

This basic understanding of the asylum legal system is vital in order to appreciate the intricacies individuals are confronted with when adapting to a new context in Switzerland, frequently while dealing with a difficult past. Under the Swiss Asylum Act (Asylum Act, 1998) , individuals applying for asylum are initially considered asylum seekers. Following an interview, they receive a contestable decision, which may be positive or negative, with or without subsidiary protection. Refugees are granted asylum under the Geneva Refugee Convention (UNHCR, 2010) due to individual persecution in their home country. Individuals whose asylum application has been rejected but who cannot reasonably be expected to return to their home country for humanitarian reasons (e.g.,

because of war) receive a temporary residence permit. A collective protection may be extended to population groups by the Federal Council, as was decreed for Ukrainians in 2022 (The Federal Council, 2022). People with these aforementioned permits account for approximately 220,000 people (State Secretariat for Migration, 2024b). Those receiving a negative decision without subsidiary protection remain undocumented, known in Switzerland as 'Sans-Papiers' (Efionayi-Mäder et al., 2010), numbering an estimated 76,000 (The Federal Council, 2020). Asylum decisions are based on the credibility of the interviews, submitted evidence, and legal practice.

The different residence statuses drastically influence refugees' opportunities and largely determine their living conditions, with more stable permits generally associated with more rights. For example, people with asylum seeker and provisional protected status tend to live in lower-quality housing compared to others (Heye et al., 2017) and take longer to transition from asylum to private accommodation (Lacroix & Bertrand, 2024). Although refugees and temporarily admitted individuals are permitted to work in Switzerland, the employment rate seven years after immigration is only 56% (State Secretariat for Migration, 2024a). This low rate is compounded by the cumulative negative effects of long-term unemployment on future job prospects (T. Müller et al., 2023). For asylum seekers, work permits are severely restricted, which can affect their ability to navigate employment regulations, especially due to the fact that they are mostly provided in a Swiss national language (Roos et al., 2018). Similarly, access to higher education requires complex application procedures and poses challenges related to the recognition of diplomas (Sonntag, 2018). Financial aid for asylum seekers and provisionally protected people is lower than that provided to recognised refugees and Swiss residents, as stipulated by the Asylum Act (1998). Furthermore, it has been reported that social workers in Switzerland are generally overwhelmed with the number of assigned cases (Höglinger et al., 2021), which delays the transition away from social welfare (Eser Davolio et al., 2019). As a final point, health insurance access varies for all permits by canton and is particularly difficult for Sans-Papiers, who rely on local organisations for registration while fearing the discovery of their unauthorised stay (Efionayi-Mäder et al., 2010). In this respect, successful integration depends on the course of the asylum procedure (Bertrand, 2019).

Additionally, integration can be influenced by various other barriers, such as language difficulties or homesickness, and resources like social support and personal qualities, as reported in a qualitative Swiss study (Udayar et al., 2021). These and other contextual factors in post-migration life are closely linked to refugees' mental well-being (Hajak et al., 2021). Furthermore, the level of integration has been associated with both mental health symptoms and QOL (Schick et al., 2016). It this context, emotional distress has also been found to mediate the relationship between post-migration stressors and longitudinal general health (James et al., 2019).

At the systemic level, structural factors play a crucial role in shaping refugees' post-migration experience. In Switzerland, according to primary care workers, the priority needs of asylum seekers include adequate housing conditions, security, financial resources, employment, legal assistance, and access to mental and dental care (Bartolomei et al., 2016). Similarly, another Swiss study found that over 60% of refugees considered employment difficulties, housing challenges, and family separation to be moderate to very severe post-migration stressors (Spaaij et al., 2023). Due to the fact that these challenges not only impact integration efforts but also contribute to refugees' heightened vulnerability to mental health issues, addressing them is essential.

2.4. Advances in global scalable mental health and psychosocial support

The elevated vulnerability to mental health disorders (Blackmore et al., 2020; Patanè et al., 2022; Turrini et al., 2017), the high occurrence of post-migration stressors and the associated reduction in refugees' QOL (Sengoelge et al., 2022; Teodorescu, Heir, et al., 2012), compounded by substantial barriers to accessing mental healthcare (Boettcher et al., 2021; Kiselev, Pfaltz, Haas, et al., 2020; T. Maier et al., 2010; Satinsky et al., 2019), can result in a high number of refugees remaining untreated (Dumke et al., 2024). In light of the continuous number of ongoing armed conflicts (59 state-based conflicts in 2023) (Davies et al., 2024) and the steadily increasing number of displaced people (United Nations High Commisioner for Refugees, UNHCR, 2024a), host countries can expect a sustained influx of refugees.

To address these challenges, the Lancet Commission on Global Mental Health and Sustainable Development proposed four key elements to enhance the availability of psychosocial interventions: integrating psychological skills with social work components, implementing task-sharing models

involving trained nonspecialists, delivering interventions within community settings, and offering brief interventions to increase acceptability (Patel et al., 2018). Furthermore, they recommended strengthening primary and specialised care, as well as the use of digital platforms to provide interventions along the continuum. A literature review suggested the use of digital technologies and the involvement of peers as the two key factors to improve access to mental healthcare for migrants (Marchi et al., 2024). In line with these recommendations, the evaluation of digital mental health and psychosocial support services has been identified as one of the top research priorities in humanitarian settings (Tol et al., 2023).

The WHO has developed and evaluated a range of scalable task-sharing psychological interventions to broaden accessibility to mental healthcare for populations facing adversity. The transdiagnostic Problem Management Plus (PM+) trains nonspecialists to teach other refugees strategies for arousal reduction, problem solving, behavioural activation, and accessing social support (Dawson et al., 2015). There is evidence that PM+ reduces post-migration living difficulties (Spaaij et al., 2023), depression, anxiety, PTSD, and self-identified problems (de Graaff et al., 2020) in individual sessions with distressed and functionally impaired refugees. Furthermore, in group PM+, one study demonstrated effectiveness in reducing functional impairment (Acarturk et al., 2022), while another found it helped alleviate depression and self-identified problems (Bryant et al., 2022).

The WHO's multimedia Self-Help Plus (SH+) intervention, based on acceptance and commitment therapy, is another task-sharing approach, in which nonspecialists introduce stress management strategies in groups (Epping-Jordan et al., 2016). In a multinational trial, SH+ significantly reduced current mental disorders, psychological distress, depression, and self-identified problems (Purgato et al., 2021). It also showed preventive effects at 6-months follow-up in a trial with distressed Syrian refugees (Acarturk et al., 2022). Furthermore, the combination of SH+ (self-help format) and PM+ (peer-provided) in a stepped-care model showed positive effects in reducing anxiety, depression, PTSD, and self-identified problems among migrants in Italy (Purgato et al., 2025).

Another transdiagnostic intervention, the Common Elements Treatment Approach (CETA), also provided by trained nonspecialists, offers components based on the client's symptomatology (Murray et al., 2014). An RCT showed a significant reduction in symptoms of depression, PTSD, anxiety, and

functional impairment in a sample of depressed or traumatised Burmese refugees in Thailand (Bolton et al., 2014), as well as among survivors of torture and militant attacks in Iraq (Weiss et al., 2015).

Based on the ADAPT model, the Integrative Adapt Therapy (IAT) was developed to treat refugees to connect adverse past experiences, personal responses and coping with ongoing, as well as future challenges, by providing psychoeducation, storytelling, problem solving, stress management, emotion regulation, cognitive reappraisal, meaning making, behavioural activation, and strengthening social support (Tay et al., 2020). IAT has shown significant reductions in symptoms of current mental disorders with sustained effects, comparable to a cognitive behavioural therapy among refugees in Myanmar (Tay et al., 2022). Similarly, Value Based Counseling (VBC), another novel resource-oriented approach, has shown significant effects in improving resilience and perspective-taking among refugees in Germany, compared to a waitlist control group (Orang et al., 2023).

Such face-to-face approaches can be complemented by digital technologies for mental healthcare (Patel et al., 2018). The advantages of internet-based interventions may overcome structural and socio-cultural barriers faced by refugees. These advantages include enhanced accessibility independent of time and place, promotion of self-efficacy, anonymity, easy translation and cultural adaptation, as well as potential scalability (Andersson & Titov, 2014; Moock, 2014; Musiat & Tarrier, 2014; Schröder et al., 2016).

Their effectiveness in treating mental health disorders has been shown to be comparable to traditional treatments (Karyotaki et al., 2023), especially if they are guided by humans (Koelen et al., 2022; Leung et al., 2022). Also for refugees, web-based interventions have shown effective results in reducing PTSD, anxiety, and depression (El-Refaay et al., 2024; Liem et al., 2021), while smartphone-based interventions were found less effective (El-Haj-Mohamad et al., 2023). However, two studies conducted in Lebanon and Egypt found that the smartphone-based intervention Step-by-Step (based on PM+) was effective in reducing mental health problems among Syrian refugees (Burchert et al., 2024; Cuijpers et al., 2022). Additionally, smartphones are widely used among the refugee population for various migration-related purposes (Alencar et al., 2019), such as geographic orientation, language learning, everyday translation, accessing information, and staying in contact with family members

(Kaufmann, 2018). Despite the mixed evidence regarding their effectiveness, smartphones present a valuable opportunity to reach refugees and expand access to mental healthcare.

2.5. Participatory, culturally sensitive, and user-centred approaches

Digital approaches hold significant potential; however, their versatility introduces challenges for feasible implementations. While refugee trial participants often report to be satisfied with the provided digital mental health interventions, high dropout rates remain a major challenge (El-Haj-Mohamad et al., 2023). In health research involving migrant populations, participatory methods have shown to enhance intervention relevance, helped establish long-term partnerships, fostering trust and engagement between researchers and communities (Rustage et al., 2021). Participatory research empowers the voice of potential end-users, by involving them in the development and design process, ensuring interventions to be relevant and acceptable (Cargo & Mercer, 2008).

In digital mental health, user-centred design - a form of participatory software development - emphasises iterative loops of co-design and evaluation, allowing end-users to actively contribute to the intervention's usability and effectiveness (usability.gov, n.d.). Such approaches involve collaboration with stakeholders and refugee populations to assess their technical skills and understand their socio-cultural contexts, facilitating the adaptation of interventions through top-down modifications or bottom-up development (Burchert et al., 2019; Goodman et al., 2021). This approach prioritises empathy for user needs and preferences, ensuring that digital solutions are not only technically functional but also context- and culture-appropriately adapted.

Cultural adaptation needs to include a broad contextual consideration, by not only understanding background information such as language, religion, typical traumas and psychopathological dimensions but also current concerns and stressors, structural access barriers, and local resources (Hinton & Jalal, 2014). Meta-analyses have demonstrated significant advantages of culturally adapted mental health interventions compared to non-adapted ones (Hall et al., 2016; Harper Shehadeh et al., 2016), while another review found no strong differences in effectiveness between adapted and non-adapted approaches (Spanhel et al., 2021). A persistent challenge in assessing the impact of cultural adaptation is the lack of standardised procedures and documentation in many studies, which limits their replicability and comparability (McDermott et al., 2024).

The Reporting Cultural Adaptation in Psychological Trials (RECAPT) framework suggests a culture-sensitive, rather than a culture-specific, procedure to effectively adapt mental health interventions for heterogeneous populations such as refugees (Heim et al., 2021a). As such, RECAPT describes three key areas of adaptation: cultural concepts of distress, intervention components, and surface adaptation. This procedure can be documented in a provided reporting criteria template in order to enhance replicability and comparability (Heim et al., 2021b).

3. Research Articles

This dissertation encompasses four articles focusing on addressing the psychosocial and mental health needs of refugees, with a particular emphasis on culturally sensitive approaches and leveraging smartphone apps to overcome barriers to accessing care. First, a general framework highlights the necessity of adopting treatments for refugees within the primary mental healthcare system. Second, the development and cultural adaptation of a novel, holistic, smartphone-based support app for refugees, Sui SRK, is described. Third, the evaluation of the Sui SRK app through an RCT is reported. Fourth, the cultural adaptation of another smartphone app intervention for grieving Syrian refugees is presented. Both articles on cultural adaptation followed the recommendation and documentation system of the RECAPT framework (Heim et al., 2021b). The main focus of this dissertation is the Sui project, which aimed to enhance QOL of Arabic-speaking refugees by providing an accessible tool with additional peer support. All four articles can be found in full length in the appendices of this dissertation.

3.1. Transcultural health systems: A level-appropriate approach

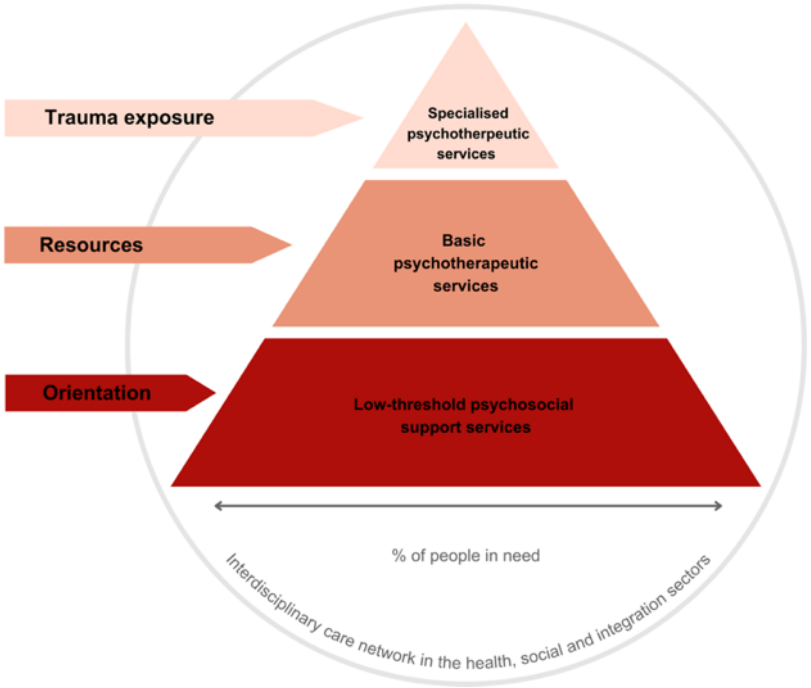
In Article I, *Transkulturelle Gesundheitssysteme: ein stufengerechter Ansatz*, the importance of a needs-oriented and transculturally applicable healthcare system, specifically for refugees who are potentially traumatised, is described. The article argues that the high-threshold, specialised therapies alone, even if expanded, are insufficient to bridge the care gap for potentially traumatised refugees. A stepped-care model of healthcare is introduced, based on three pyramid levels (see Figure 1): low-threshold psychosocial support services, basic psychotherapeutic care, and specialised psychotherapeutic care. As the base of the pyramid, low-threshold psychosocial support services serve

a broad range of people in need. These services include measures for orientation and everyday support, for example, by delivering psychoeducation about stress reactions, as well as skills for stress management, which may include exercises for body awareness and regulating thoughts and emotions. The second level, basic psychotherapeutic care, focuses on strengthening and activating resources to enhance functioning and stabilisation in the post-migration living context. Finally, the top of the pyramid represents therapy with trauma exposure, which requires specialised expertise and a stable psychological base for the affected individuals.

The main message of the article is that a stepped, integrative model of healthcare tailored to the needs and current state of refugees is essential to provide adequate access to psychosocial support

Figure 1

Care pyramid of trauma therapy with three levels based on the 'Mental Health and Psychosocial Support Framework' of the International Red Cross and Red Crescent Movement.



and trauma therapy. This approach advocates for an advancement of support on all levels, including the use of nonspecialists and digital tools, and fostering close collaboration between healthcare, social, and integration sectors. The underlying idea is that understanding a specific culture in depth is not necessary to treat refugees. Instead, the key is to work interdisciplinary and culturally sensitive, fostering an inclusive interaction without the fear of cultural unfamiliarity. If advancements are made

on all three pyramid levels, early access to culturally sensitive orientation services, strengthening resources in basic psychotherapeutic settings, and providing trauma-specific treatment if indicated, psychological healthcare gaps can be overcome gradually.

3.2. Holistic app-based support: The Sui project

The unmet demand for psychological healthcare among refugees, particularly at the outpatient clinic of the Swiss Red Cross in Bern with high rejection rates, was the decisive reason to launch the Sui project. The primary aim of the Sui project was to reach more individuals who otherwise could not access any psychological support. The main goal of the associated research was to investigate the development and evaluation of an internet-based smartphone application to support the psychological well-being of refugees. Object of research was the emerging Sui SRK app, which was subsequently evaluated in a three-armed randomised controlled trial.

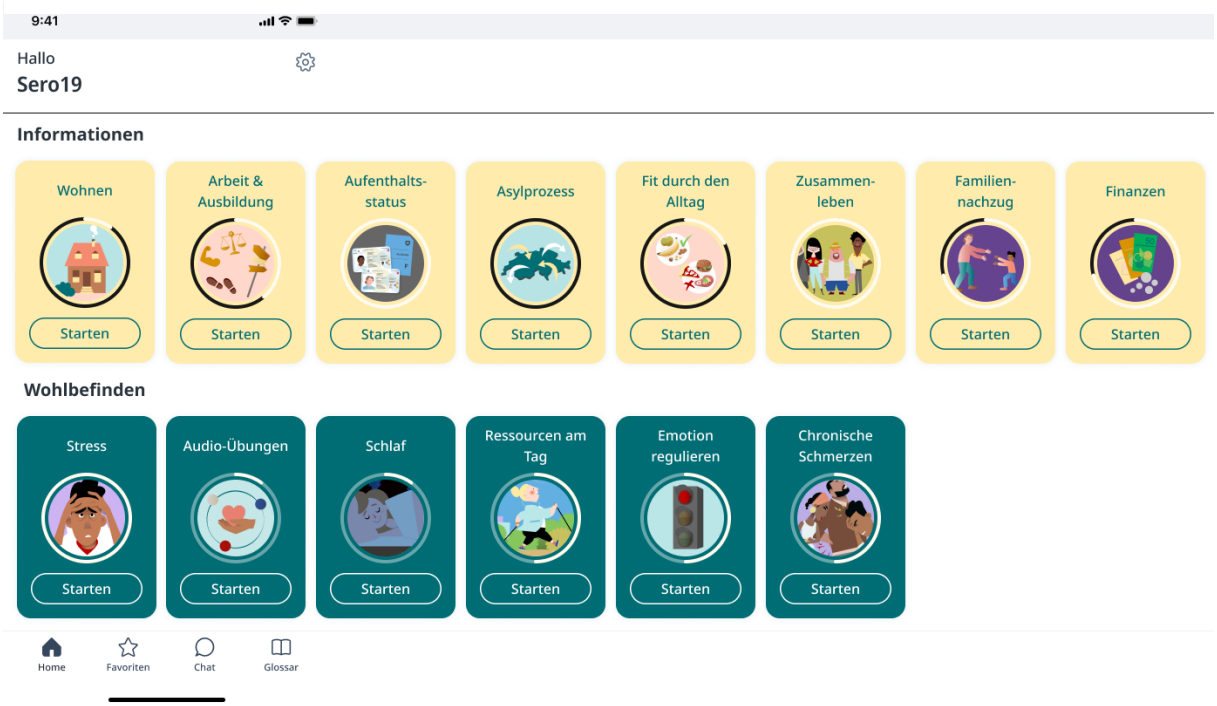
3.2.1. Development and cultural-contextual adaptation

In Article II**,** *Development and Cultural-Contextual Adaptation of a Low-Threshold Digital Psychosocial Service for Refugees Living in Switzerland: Sui App*, the following process is described: As part of the preparation phase, a short desk review was conducted, then the needs of refugees with semi-structured interviews with asylum experts, a few intercultural interpreters and target group representatives were assessed, and finally, an initial concept to start the development was proposed. It was decided to focus on enhancing QOL according to the holistic WHOQOL-BREF concept (WHOQOL-Group, 1998) and test an Arabic-speaking target group to produce a first version. In the development phase, the content and technical development loops are described, which entailed advisory board discussions, a complex translation process for the multi-national Arabic language, app testing, and iterative technical and content adaptations. The final product, the Sui SRK app, reflects a three-part concept: First, *self-help* is provided in five chapters containing psychoeducation (stress, sleep, pain, resources, difficult emotions) and resource-oriented tools (activating, mindfulness, and body exercises). Second, chat *support* from a trained peer offers motivational messages and individual answers to specific questions while referring to app content. Third, *information* about the post-migration living context in Switzerland is provided in nine chapters (asylum process, residence status, family reunification, finances, healthcare system, social integration, health tips, housing) with the aim

to give users information that is otherwise not available in their language. An overview of the included chapters can be seen in Figure 2. The content delivery formats include text in simple language, illustrations, vignettes, audio, video testimonials, and resource-oriented body, movement and mindfulness exercises.

Figure 2

Overview over the Sui SRK app's content divided into the two main chapters information and well-being



3.2.2. Evaluation of the Sui SRK app

In Article III, *Psychosocial support for Arabic-speaking refugees residing in Switzerland (Sui SRK app): a mixed-methods randomised controlled trial,* the evaluation of whether the Sui app, with or without peer support, could improve QOL compared to a waitlist control group is described. To address this research question, 170 Arabic-speaking individuals who had been residing in Switzerland for no more than five years were randomised into one of three study groups: In the first active condition, the *Sui app with peer support (Sui+)*, participants received access to the Sui app, as well as additional weekly chat messages from a trained peer companion and individualised responses within 48 hours. The participants in the second active condition, *Sui without peer guidance (Sui)*, were provided access to the Sui app without additional chat messages. Participants in this group only

received automated push notifications as reminders if they had not logged into the app for five days. Finally, participants in the *waitlist control group (WL)* received delayed access to the Sui SRK app without peer support after the post-assessment, 8 weeks after randomisation.

The linear mixed model analyses with the Intention to Treat (ITT) sample revealed no significant group-by-time interaction effects on the primary outcome, QOL, at post-assessment on neither of the four domains ((physical: $F(2,128.27) = 0.26$, $p = .77$, psychological: $F(2,134.67) = 1.85$, $p = .16$, social: $F(2,125.92) = 0.86$, $p = .42$, environmental: $F(2,120.67) = 0.56$, $p = .57$)). There were also no significant group-by-time interaction effects on any of the secondary outcome measures (depression, anxiety, PTSD, somatic symptoms, post-migration living difficulties, self-stigma) at the post-assessment. Satisfaction, measured with the CSQ-8 questionnaire on a 1-4 Likert scale (Attkisson & Zwick, 1982) revealed good satisfaction with the Sui SRK app ($M = 2.84$, $SD = 0.55$, $n = 87$). The two active condition groups did not differ regarding their satisfaction scores ($W = 1002$, $p = .62$). Regarding the number of minutes spent in the app, *Sui+* ($M = 89.95$, $SD = 174.72$) and *Sui* ($M = 32.29$, $SD = 56.22$) also showed no statistically significant difference ($W = 2698.5$, $p = 0.09$).

Qualitative analyses were conducted using data from 41 semi-structured telephone interviews, in which participants provided detailed feedback on their app-related impressions and experiences. Additionally, they identified the daily needs and challenges in their lives. Participants generally appreciated the app's content and chapter selection. While some favoured the well-being chapters and audio exercises, others preferred the informational chapters. The video testimonials were particularly well-received. Nearly all *Sui+* participants were satisfied with the peer support feature, and those who did not use it, as well as *Sui* participants without support, considered peer support as a valuable concept when it was described. Low engagement times were linked to several factors mentioned in qualitative interviews. Many participants reported limited free time to use the app and engaged only when they sought specific information. Additionally, the app's purpose and intended use were not clear to some from the beginning. Technical issues (loading times, crashes) also hindered usage, with a few participants noting this as a barrier. Suggestions for improvement included a preference for more personalised information and opportunities to socially interact with people. Overall, the app’s content was well-aligned with the daily challenges and needs described by participants.

3.3. Cultural adaptation of an app for bereaved Syrian refugees

Article IV, *Cultural Adaptation of an Internet-Based Self-Help App for Grieving Syrian Refugees in Switzerland*, addresses the additional challenge of grief for deceased loved ones, which is a common experience in populations affected by armed conflict (Bryant et al., 2020; Comtesse & Rosner, 2019).

Based on a preceding literature review (Aeschlimann et al., 2024) and an evaluation of culturally relevant symptoms of grief among Syrian refugees (Killikelly et al., 2021), the article reports on the cultural adaptation of an app-based intervention designed to support grieving Syrian refugees. The adaptation process involved an iterative approach through three rounds of interviews with three groups, totalling 19 experts and potential users. The results from the interview data highlight the importance of addressing community needs, cultural diversity, and cultural concepts of distress. Key adaptations included addressing post-migration stressors, integrating culturally relevant rituals, providing psychoeducation, and incorporating religious elements while acknowledging individual differences and secondary losses. The intervention normalises mental health challenges and delivers content using simple language, culturally relevant ritual exercises, case vignettes, videos, audio, and illustrations.

4. Discussion

The overarching goal of this dissertation is to evaluate and discuss culturally sensitive, accessible, and scalable mental health approaches that holistically address the psychological and socio-structural needs of refugees. The following sections discuss the findings from the summarised four articles above. Furthermore, this section outlines the strengths and limitations of this dissertation and then provides recommendations for future research on serving the underserved population of refugees.

4.1. A practical perspective to enhance care

The mental health challenges faced by refugees are multifaceted. They stem from post-migration stressors, barriers to healthcare, and limited available support. These challenges highlight an urgent need for expanded culturally sensitive and accessible solutions (Duden & Martins-Borges, 2021; Gruner et al., 2020; Hynie, 2018).

The stepped-care model presented in Article I describes a framework for addressing refugees by meeting their current mental health needs on three levels of a pyramid. It recognises that specialised trauma therapy alone (highest level) is insufficient to treat all potentially traumatised refugees and that interventions must be available at multiple levels, to meet the high demand for psychosocial care. This is in line with the high number of untreated refugees with mental health problems (Boettcher et al., 2021; Satinsky et al., 2019). At the middle level psychotherapists are encouraged to use their available techniques for people from different backgrounds. This requires not only the therapists' available skills but also an open, culture-sensitive attitude toward refugee patients (Schnyder et al., 2016). A study from Germany suggests that psychotherapists more often exhibit therapy-hindering attitudes (e.g., trauma-specific stigma, lower expectations of therapeutic alliance, heightened fear/worry) towards refugee patients than towards non-refugee patients (Dumke & Neuner, 2023). To address these "othering" tendencies, cultural sensitivity training, using interpreter services, and flexible treatment models that address refugees' socio-structural and psychological needs were recommended (Dumke & Neuner, 2023). With these strategies, the basic psychotherapeutic care as described in Article I could be provided by psychotherapists who are not specifically trained to treat traumatised refugees, but who could offer resource-oriented stabilisation.

Nevertheless, even if existing psychotherapeutic structures were more welcoming of refugee patients, additional social and structural access barriers persist (e.g., fear of stigma, lacking awareness, transportation costs, lack of childcare options) (Bartolomei et al., 2016). Both the lowest and middle levels of the pyramid in Article I highlight the importance of expanding low-threshold services for a broad population, aligning with previous calls for more sustainable and accessible mental health support (Koesters et al., 2018; Patel et al., 2018). As many refugees remain in the asylum or welfare system for many years, this provides an opportunity to introduce alternative support directly and early through peer programmes, group activities, and digital services.

Yet, the acceptability of these methods depends on their relevance to individuals' needs and treatment preferences (Turrini et al., 2025). Even though shared experiences among refugees may provide common ground for intervention strategies, individual circumstances and personal contexts differ significantly (K. E. Miller & Rasmussen, 2017; Silove, 2013). Encouragingly, recent

developments in psychosocial interventions reflect an increasing emphasis on approaches designed to address these diverse needs (A. J. Nguyen et al., 2023; Silove et al., 2017; Turrini et al., 2019; Articles II-IV). There is no evidence yet of the effectiveness of interventions implemented in asylum facilities in Switzerland. However, the well-received and effective PM+ (Spaaij et al., 2022, 2023) is currently being introduced in several centres across Switzerland (SPIRIT Network, n.d.).

Despite this progress, mental health interventions in research for refugees have rarely been combined with practical social support, although there are recommendations for closer collaboration between mental health and social work professionals (Fennig, 2021; Mitschke et al., 2017). To date, interdisciplinary programmes remain uncommon, and their implementation and evaluation are still scarce (Bangpan et al., 2019; El-Haj-Mohamad et al., 2023; Nascimento et al., 2023). In conclusion, the stepped-care model (Article I) underscores the importance of including mental health support services in diverse existing structures to ensure that refugees can access timely and context-appropriate care early after their arrival in Switzerland.

4.2. Mechanisms of change of the Sui app

The potential role of digital tools in the holistic conceptualisation of refugee mental healthcare is explored in this section based on the evaluation of the Sui SRK app. Despite its promising design, the Sui SRK app did not demonstrate significant group-by-time interaction effects on QOL at post-assessment (Article III). A possible explanation is the comparably high baseline QOL score in the studied sample, which may have resulted in a ceiling effect of the WHOQOL-BREF scores (Skevington et al., 2004). Nevertheless, the limited impact on all outcomes warrants a closer examination of the potential mechanisms of change of the Sui SRK app.

The Sui SRK app's approach was grounded in a holistic concept of care, recognising mental health as a fundamental human right that must be accessible for vulnerable populations such as refugees (Patel et al., 2018). It considered the theoretical background described in the ADAPT model with its five core pillars (Silove, 2013), which explain the shared vulnerabilities among conflict-affected populations and provide principles on how to address recovery. QOL was chosen as the primary assessment measure due to its broad, contextually inclusive definition (WHOQOL-Group, 1998) and its strong correlation with mental health symptoms (Aigner et al., 2006). The app aimed to

improve QOL by offering important information about refugees' post-migration life context, while also providing psychoeducation and resource-focused exercises. Simplified explanations of the Swiss systems in the native language of the target group (Arabic in Article III) were included with the intention of facilitating understanding, increasing the sense of control and promoting self-efficacy. Refugees in the United Kingdom reported that receiving explanations on country-specific systems and improving access to employment, language classes, and social life would lead to self-efficacy and positive affect (Tip et al., 2020). However, the covered topics in the Sui SRK app are inherently abstract through their juridical nature (e.g., asylum process, family reunification) and opaque processes (e.g., getting a job or an apartment, reason for asylum decision) and often lie beyond the control of individuals. As a result, simply providing this complex information in simple Arabic might not have been sufficient to foster feelings of self-efficacy and might need additional support.

To assist participants in using the Sui SRK app and responding to their individual needs, the peer chat support feature was developed. Based on prior research, digital interventions generally achieve greater efficacy when they are guided by humans, including interventions specifically designed for refugees (Burchert et al., 2024; Cuijpers et al., 2022; Koelen et al., 2022; Leung et al., 2022). In the Sui SRK app, the peer support included introductions to navigate the app, motivational messages, and additional individual responses to questions from the participants. This had the potential advantage that complex questions from participants in the *Sui+* group could have been discussed with their assigned peer. The Sui study, however, did not find statistically significant differences in outcomes between groups with or without peer support (Article III). Yet, although the p-value exceeded the conventional threshold for significance, participants in the support group (*Sui+*) tended to spend more time using the app ($W = 2698.5$, $p = 0.09$). This aligns with meta-analytical evidence on adherence to digital interventions (Musiat & Tarrier, 2014). Furthermore, qualitative analyses from the Sui study showed that participants generally appreciated the peer support feature and consistently expressed a need for social interaction and support (Article III).

Notwithstanding, the Sui SRK app, even when paired with peer support, does not appear to achieve the desired results and may require further socio-structural integration. As mentioned above, topics covered in the informational chapters are complex and often need guidance from legal

representatives in asylum centres or social workers. However, those professional capacities and scope of responsibilities are significantly limited (Höglinger et al., 2021; Schweizerische Flüchtlingshilfe, SFH, n.d.). Integrating the Sui SRK app into existing support structures or empowering volunteers working with refugees to use the app as a tool for information dissemination could help alleviate some of this limited assistance. A recently published meta-analysis in psychotherapy research suggests that blended formats improve patient uptake and adherence and are at least as effective as traditional methods for treating depression (Ferrao Nunes-Zlotkowski et al., 2024). Implementing a blended approach - combining digital and in-person support - in the usually strained social and legal counselling services for refugees could be worth exploring.

Another assumption underlying the Sui concept is that refugees may initially engage with the Sui SRK app's structural and practical information chapters and then transition to its psychological chapters. This mechanism has the potential to attract refugees' attention by addressing their prioritised needs on structural and practical issues and to circumvent barriers like stigma and lack of mental health awareness, which are significant barriers to help-seeking (Byrow et al., 2020; Kiselev, Pfaltz, Schick, et al., 2020). Implementing a concept like Sui, which addresses the perceived priorities to improve QOL, may be particularly suitable for a broad refugee population, rather than a specific subgroup with certain diagnoses. It offers a more accessible and flexible support, firmly aligned with everyday realities. This 'means to an end' strategy resonated with the often reported post-migration stressors (Gleeson et al., 2020; Jannesari et al., 2020; Li et al., 2016), which were again confirmed by participants in the Sui qualitative interviews, many of which are addressed by the Sui app (Articles II and III). Moreover, usage data from the Sui participants indicated that while many participants accessed the informational chapters (50.7% accessed at least one chapter), a substantial proportion also engaged with the psychological content (37.5%), suggesting that this approach may encourage a pathway from practical issues to mental health support.

Nevertheless, there were no significant effects on enhancing QOL or on reducing psychological symptoms such as depression, somatisation, anxiety, PTSD, self-stigma or post-migration stressors (Article III). These findings could indicate that participants did not use the app in ways that benefited them. Given these insights, it is important to examine how the overall user

experience in the Sui SRK app, but also in mental health apps in general, can be enhanced to ensure that such tools effectively meet the users' needs.

4.3. Enhancing user experience in mental health apps

As described in Article II, the development process of the Sui SRK app followed the recommendations to develop culture-sensitively (Heim et al., 2021b; Hinton & Jalal, 2014). Furthermore, it adopted a user-centred and active participation process that involved the target group in the development at an early stage (Burchert et al., 2019; Rustage et al., 2021). Predictably, one key finding emerging from this approach was that post-migration socio-structural challenges significantly shape refugee mental health. This is consistent with previous research (Jannesari et al., 2020; Kiselev, Pfaltz, Schick, et al., 2020; K. E. Miller & Rasmussen, 2010) and is concretely addressed in the Sui SRK app. Furthermore, barriers to care and potential facilitators were explored together with various stakeholders (Article II). To improve access to mental healthcare, a recent systematic review reported the following key strategies: providing psychoeducation, linguistically accessible information, counselling, and peer support, the use of digital tools, and culturally appropriate relaxation and movement exercises (Marchi et al., 2024). These factors align well with the chosen techniques for the final product of the participatory-developed Sui SRK app, as described in Article II. Thus, the Sui project was based on best practice examples and current guidelines for user-centred development and drew on a theoretical background on the vulnerable situation of refugees.

Yet, several participants found the apps' purpose unclear and felt it was not introduced comprehensible at the outset. The diverse content may have been overwhelming, suggesting a user choice format ('buffet-style') may not effectively guide users to the chapters most relevant to their needs. Nonetheless, overall satisfaction with the Sui SRK app was generally positive, consistent with findings from previous smartphone-based interventions (El-Haj-Mohamad et al., 2023). The strictly participatory approach resulted in a complex but holistic solution, whose implementation in an app remains under-researched.

The adaptation process of the grief app for Syrian refugees, as described in Article IV, followed a similar culture-sensitive and participatory approach. Unlike the Sui SRK app, the grief app followed a structured, linear format designed specifically for individuals experiencing grief. A pilot-

RCT (N = 30) demonstrated high acceptance and feasibility of the grief app, as well as promising effects on prolonged grief symptoms (Aeschlimann et al., 2025). The app's success was attributed to its culturally sensitive adaptation, early introduction of treatment goals, interactive elements, and clear, structured progression.

The first key distinction between the Sui SRK and the grief app lies in their structural design and level of specificity. The grief app contains a linear structure, targeting a specific symptomatology, a typical characteristic of most previously evaluated internet-based mental health interventions for both refugees (El-Haj-Mohamad et al., 2023) and the general population (Weisel, 2019). In contrast, the Sui SRK app adopted a nonlinear structure, allowing users to select from chapters according to their individual needs rather than following a predetermined progression. While this flexible design enables personalised engagement (Hornstein et al., 2023), it may also pose challenges in terms of navigation and independent identification of relevant content. Findings from other fields, such as health app design for elderly users, suggest that a linear task flow can facilitate navigation and improve user experience (Morey et al., 2019). Applying similar usability research to different refugee subgroups could provide insights into the key design elements necessary to enhance accessibility and engagement in digital mental health interventions.

Another distinction between the Sui SRK and the grief app was in the mode of introduction. The grief app was personally introduced by the study team, with a follow-up appointment after the active study phase. Meanwhile, the Sui SRK app was self-guided, with users only receiving instructions via SMS and after successfully logging into the app via peer support (only *Sui+* group). The personal introduction to the grief app may have allowed for the immediate resolution of technical issues, ensuring a smoother user experience, while the follow-up appointment could have reinforced engagement and a sense of commitment to the intervention.

While both app adaptation processes followed the RECAPT framework (Heim et al., 2021b), their implementation differed strongly due to the distinct goals, which is permissible within the flexibility of the framework. While the grief app (Article IV) was primarily informed by specific literature on the cultural understanding of grief among Syrian refugees (Aeschlimann et al., 2024; Killikelly et al., 2021), the Sui SRK app was guided more by practical recommendations provided by

stakeholders (Article II). The subsequent development processes also varied, with the grief app incorporating insights from three rounds of interviews and the Sui SRK app relying on discussions with several advisory groups. Despite these differences, both apps received positive feedback regarding the delivery of content, illustrations, videos, and audio exercises (Aeschlimann et al., 2025; Article III). Thus, the flexibility of the RECAPT framework supports these differing implementations of adaptations, and their transparent documentation serves as a replicable model and allows for comparison with future applications.

4.4. Strengths of this dissertation

The Sui project (Articles II and III) makes an important and much-needed contribution to the research field of serving the underserved refugee populations by integrating a holistic, interdisciplinary approach into an accessible app-based service. While the importance of such integration has long been recognised, practical implementation remains rare due to disciplinary silos and the complexity of combining different fields. The Sui SRK app stands out as the first intervention to merge concrete, practical information for refugees with psychological support, bridging a critical gap in research.

Furthermore, the Sui SRK app's unconventional nonlinear structure provides the first insights into user engagement of an app-based intervention integrating both practical information and psychological support for refugees. Even though no significant changes were observed, the mixed-methods evaluation enriches the discourse on interdisciplinary approaches, reinforcing the necessity and feasibility of breaking traditional boundaries in refugee mental health research. Additionally, a set of well-received components of the Sui SRK app were found and can be emphasised in a forthcoming revised version.

Similarly, the grief app addressed a transdiagnostic issue that is highly relevant throughout all refugee populations yet remains under-researched in non-Western contexts (Aeschlimann et al., 2024). The advancing research and expansion of specialised mental healthcare to address common psychological disorders (Turrini et al., 2017), as well as less researched disorders common in refugee populations, such as prolonged grief disorder (Bryant et al., 2020), are just as important as the advancement of more holistic approaches. Therefore, the research surrounding the grief app

contributes valuable knowledge in this sparsely researched area, further enriching the discourse on digital, culturally sensitive mental healthcare solutions.

Furthermore, the Sui SRK app, as well as the grief app, were developed according to the RECAPT guidelines in a structured, systematic way with extensive adaptation documentation to ensure replicability and transparency. Following such guidelines allows future comparisons and advancements in adapting interventions in a culture-sensitive way. Both apps adopted a participatory development process with high involvement of people from the target group, which is reported to be rare in previous participatory approaches with migrants (Rustage et al., 2021). This approach empowers development collaborators by giving them a voice in decision-making and ownership.

4.5. Limitations of this dissertation

Several limitations of this dissertation should be considered. Besides the specific limitations discussed in each article in the appendices, there are also some broader methodological and conceptual aspects to keep in mind. First, external events during the development and study periods (2021-2024), including the rise of far-right political movements in Europe, the ongoing conflicts in Arabic-speaking countries, such as Syria, Palestine, Yemen, Sudan, Libya and Iraq, and natural disasters such as the earthquakes in Syria, Turkey and Morocco and the floods in Libya and the Persian Gulf, may have influenced the overall context in which the apps were developed and evaluated. These events could have led to shifting priorities, affected the overall feasibility of implementation by recursively introducing new stressors, and might have had an impact on the mental well-being of the target population.

Second, a significant portion of the contributors involved in the development phases of the Sui and the grief app were from Syria. Additionally, the RCT sample in the Sui study primarily consisted of refugees from Syria (64.7%), and the cultural adaptation of the grief app was specifically tailored to Syrian refugees. As a result, the generalisability of findings from both the cultural adaptation processes and the RCT to other Arabic-speaking populations may be limited.

Third, the quality of insights from the peer support might be limited because less than half of the *Sui+* participants actively interacted with their assigned peer in the chat, while the grief app did not use peer support at all. While existing research highlights the benefits of human guidance in digital

mental health interventions (Leung et al., 2022; Musiat et al., 2022), its effectiveness could not be confirmed in this dissertation, nor could it be explored in depth, leaving open questions about its potential impact and optimal implementation in the context of the presented apps.

4.6. Future directions

Further analyses should explore the effectiveness of the Sui SRK app by analysing which participant groups might have benefitted the most and what level of engagement is necessary to produce meaningful improvements. Given that the required 'dosage' of the app use remains unclear, additional exploratory analyses could provide valuable insights into the relationship between usage patterns and intervention outcomes.

Before replicating the Sui SRK app trial, several adaptations should be considered. First, the assessment tools could include more straightforward instruments, such as a self-reported knowledge questionnaire or brief comprehension checks to measure users' understanding of their chosen key topics. In regard to measuring the mechanisms of change, a self-efficacy questionnaire such as the Generalized Self-Efficacy Scale (Schwarzer et al., 1995) could be added. This could be used to assess whether the app helps users feel more in control of their challenges, such as navigating post-migration stressors or managing psychological distress. If self-efficacy improves, it may explain how the intervention indirectly contributes to better well-being, even if direct effects on quality of life or symptom reduction are not significant. Second, the navigation through the app could be improved with the help of the results at hand and additional user experience testing. Furthermore, a personal introduction to the app should be considered. Third, further thoughts on strategies to reduce the app's content with personalisation mechanisms could improve the simplicity of the app and the focus on individually relevant content, a strategy that was recommended in previous research (Hornstein et al., 2023; Morey et al., 2019). Fourth, the Sui SRK app should be adapted for other linguistic refugee populations to test the transferability and differences in user engagement and benefits.

Beyond the effects of app-based interventions, further studies should examine the potential impacts on peers in the context of using peer support in digital mental health for refugees. Paloma et al. (2020) introduced a peer-mentoring training aimed at enhancing resilience and empowerment, drawing on the theoretical framework of Brodsky & Cattaneo (2013) who conceptualised resilience as

an internal process (inner strength) and empowerment as a socially driven transformation (becoming active). Their findings suggest that training refugees as peer mentors strengthened their own resilience and empowerment while reinforcing their ability to support others (Paloma et al., 2020). The assessment of peers and the potential benefits for them should be included in further peer-based approaches.

Beyond the focus on peer supporters, these findings offer interesting considerations on participatory research, which might benefit the involved parties (Rustage et al., 2021). Future approaches that actively involve the target group in research and intervention development could explore the impact on contributors rather than focusing solely on the end-users. Investigating these secondary gains could provide deeper insights into the wider benefits of participatory methods, including their potential to enhance the resilience and empowerment of those who facilitate the intervention by building up their inner strength and becoming active.

Moreover, the integration of interdisciplinary approaches towards refugee mental health seems to be a logical consequence when aiming to rebuild the disrupted pillars from the ADAPT model (Silove, 2013). The heterogeneity of problems faced by refugees calls for heterogeneous solutions to care with an implementation in the regular healthcare system as outlined in Article I. Exploring blending digital formats with existing face-to-face services presents a promising avenue for developing sustainable approaches that provide more comprehensive support to underserved populations.

5. Conclusion

This dissertation highlights the urgent need for advancements in holistic, scalable, and culturally sensitive mental health interventions for refugees. The Sui project demonstrated the value of integrating psychological and socio-structural support through a digital tool, while the grief app provided an example of an intervention targeting a specific psychological need. Both projects underscore the importance of participatory approaches, culturally sensitive collaboration, and tailoring interventions to user needs.

Although the Sui SRK app did not yield significant quantitative improvements in QOL or psychological outcomes, qualitative findings indicate that the app's concept, in general, as well as its informational and psychological support components, were well-received. This suggests that digital interventions can offer meaningful support, particularly when designed to address the lived realities of refugees. Further research is needed to better understand the mechanisms of change, optimise user engagement, and refine the role of peer support to improve the effectiveness of the app.

Beyond technological and methodological advancements, this dissertation also underscores the broader societal and political responsibilities in not only supporting refugee mental health but also for creating favourable living conditions that facilitate successful integration. By applying these insights, future efforts can continue to develop accessible, interdisciplinary solutions that extend beyond digital interventions and contribute to more equitable mental healthcare.

6. References

Automatische Updates der Zitationen sind deaktiviert. Um das Literaturverzeichnis anzuzeigen, klicken Sie auf Aktualisieren im Zotero-Reiter.

7. Personal Contribution Statement

This author's personal contribution to the projects outlined in this dissertation include:

Theoretical concept: Article I:

- Conceptualisation and writing of Article I in close collaboration with the co-authors

The Sui project: Article II, III:

- Writing of university ethics applications for the conduction of research of Article I
- Writing of the cantonal ethics application for the conduction of the RCT under supervision of Prof. Dr. Thomas Berger
- Development of the psychological chapters of the Sui SRK app with inputs from several psychotherapists working with refugees.
- Support of the development of the informational chapters of the Sui SRK app together with the Swiss Red Cross team and external advisors
- Co-leading the technical software development coordination in cooperation with the technical parent project 'Direct' at the Department of Clinical Psychology and Psychotherapy, Freie Universität Berlin, led by Prof. Dr. Christine Knaevelsrud.
- Co-leading advisory board discussions, data collection, training and supervision of master's students who supported the project
- Execution of the Sui SRK RCT, including study planning, recruitment of participants (e.g., via social media, flyer distribution, visits at asylum centres), data collection, data analyses and drafting the first version of both articles, supervised by Prof. Dr. Thomas Berger

The grief project: Article IV

- Support of the realisation, data interpretation, revision of the manuscript of the grief project's cultural adaptation paper, as well as the subsequent pilot-RCT
- Training and support of the technical realisation of the grief app

8. Appendices

Appendix A: Article I

Stöckli, R., Nöthiger, J., Scholer, M., & Aebersold, M. (2025). Transkulturelle Gesundheitssysteme: ein stufengerechter Ansatz. *PiD – Psychotherapie im Dialog*, *26*(01), 1-4. https://doi.org/10.1055/a-2289-6086. [Manuscript in print].

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Transkulturelle Gesundheitssysteme: Ein stufengerechter Ansatz

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Schlüsselwörter: Versorgungspyramide, Posttraumatische Belastungsstörung, Geflüchtete, Psychosoziale niederschwellige Angebote, Ressourcenstärkung

Vorspann

Ein bedürfnisorientiertes, transkulturell anwendbares Gesundheitssystem ermöglicht traumatisierten geflüchteten Menschen einen chancengerechten Zugang. Geschulte Laien und Fachpersonen können in einer kultursensitiven Weise frühzeitig mit Orientierung und Ressourcen unterstützen – eine notwendige Investition angesichts der überlasteten hochschwelligen Therapieangebote.

1. Prävalenz von Traumafolgeerkrankungen

Geflüchtete erleben häufig traumatische Ereignisse vor und während der Flucht, sind aber auch im Aufnahmeland postmigratorischen Belastungsfaktoren ausgesetzt. Dazu zählen ein unsicherer Aufenthaltsstatus, die Angst um zurückgelassene Familienangehörige in Konfliktgebieten, Schwierigkeiten bei der sozialen und beruflichen Integration oder erlebte Diskriminierung in der Gesellschaft. Solche Erfahrungen erhöhen bei Asylsuchenden und Geflüchteten das Risiko für psychische Störungen [1]. Studien berichten Prävalenzraten der posttraumatischen Belastungsstörung (PTBS) bei Geflüchteten von 9-36% [2,3].

2. Psychologische Gesundheitsversorgung

Hohe Prävalenzen von psychischen Belastungen bei Geflüchteten stehen auch in wirtschaftsstarken Ländern vielen strukturellen und individuellen Hürden in der Gesundheitsversorgung gegenüber. Zu diesen Hürden zählen beispielsweise ein überlastetes Gesundheitssystem, fehlende Maßnahmen zur Früherkennung und Überweisung aufgrund mangelnder transkultureller Sensibilität, Diskrepanz zwischen dem «westlichen» Diagnose- und Behandlungssystem und den Gesundheitskonzepten von Geflüchteten, Sprachbarrieren sowie die fehlende Kostenübernahme von Dolmetscherleistungen [4]. Die Unterversorgung von Geflüchteten wird durch ihre sozioökonomisch schwierige Situation, fehlendes Bewusstsein über Störungen und die Angst vor Stigmatisierung noch verschärft. In der Folge verfügen Geflüchtete oft nicht über ausreichend Ressourcen und Informationen, um sich selbstständig über verfügbare Angebote zu informieren und ihr Recht auf Gesundheitsversorgung wahrzunehmen [5].

Angesichts der steigenden Zahlen von Geflüchteten, der bestehenden Versorgungslücke und des Fachkräftemangels wird deutlich, dass hochschwellige, spezialisierte Therapien allein keine ausreichende Lösung für die Mehrheit der Betroffenen darstellen können. Darüber hinaus ist in der Praxis zu beobachten, dass psychologische Fachkräfte häufig ein einseitiges Verständnis des Begriffs Traumapsychotherapie haben, wobei viele darunter nur die eigentliche Traumaexposition verstehen. Der Prozess der Therapie mit traumatisierten Menschen beginnt jedoch viel früher und umfasst mehrere Stufen.

3. Stepped-Care: Mehrere Stufen zur bedürfnisorientierten Gesundheitsversorgung

Die vorgeschlagene Versorgungspyramide (Abb. 1) zeigt drei integrative Stufen einer Traumatherapie, die aufeinander aufbauen und eine interdisziplinäre Zusammenarbeit des Gesundheits-, Sozial- und Integrationsbereichs, sowie den Ausbau zugänglicher, innovativer und skalierbarer Ansätzen erfordern [6]. Die unterste Stufe bildet die grundlegende psychosoziale Unterstützung, die möglichst niederschwellig zugänglich sein muss. Sie bildet das Fundament für alle, die Unterstützung benötigen und beinhaltet Massnahmen zur Orientierung. In der zweiten Stufe werden Ressourcen in einem therapeutischen Setting erarbeitet. Die Spitze der Pyramide stellt dar, dass nur ein Teil der Betroffenen eine Traumaexposition benötigt, die spezifische Trauma-therapeutische Methoden verlangt. Die Stufen sind in der Praxis nicht strikt getrennt, sondern gehen fliessend ineinander über, wobei untere Stufen oft in höhere eingebunden werden. Im Kontakt mit potenziell traumatisierten Geflüchteten geht es zunächst darum, ihre soziale Situation und psychische Disposition zu verstehen und darauf basierend die passenden, bedürfnisorientieren Unterstützungsangebote aus der richtigen Stufe abzuleiten.

Eine Traumatherapie mit geflüchteten Menschen setzt die Phasen der Orientierung und Ressourcenarbeit voraus, gleich wie bei der Klientel ohne Migrationshintergrund.

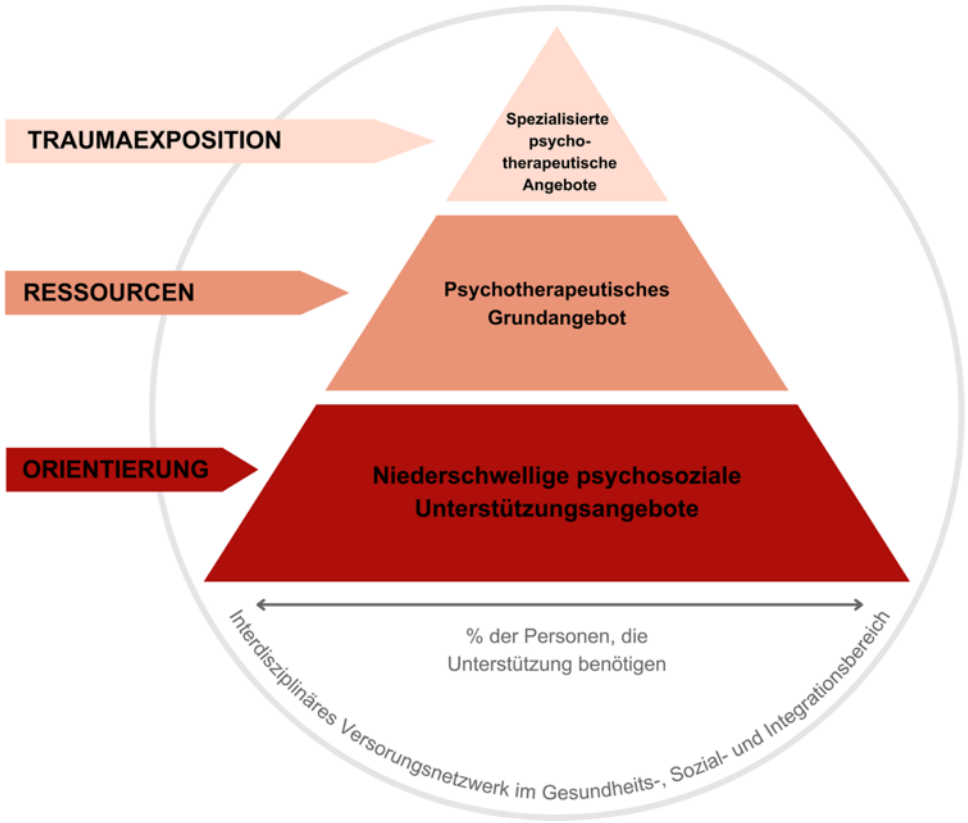

Abbildung 1. Integrative Stufen einer Traumatherapie.

3.1 Niederschwellige psychosoziale Unterstützungsangebote: Orientierung

Postmigratorische Faktoren dominieren oft den Alltag von Geflüchteten und sind äusserst herausfordernd. Für Betroffene mit PTBS kann diese belastende Gegenwart so überwältigend sein, dass ihr Stress-Toleranzfenster für eine spezialisierte Traumaexposition derzeit nicht geeignet ist. Niederschwellige psychosoziale Angebote (unterste Stufe) können hier bereits einen therapeutischen Effekt haben, weil sie mittels Alltagsunterstützung und Orientierung zur Stabilisierung und einem verbesserten Sicherheitsgefühl beitragen [7]. Beispielsweise kann Psychoedukation Orientierung bieten, indem sie Betroffene über ihre normale Reaktion auf ein abnormales Ereignis aufklärt. Sie kann von therapeutischen Fachpersonen durchgeführt werden, auch wenn diese keine spezialisierte Fortbildung in Traumatherapie haben. Genauso erfolgreich können psychoedukative Inhalte durch geschulte Laien aus der Zielgruppe (Peers) in der jeweiligen Erstsprache vermittelt werden (Task-Sharing) [8].

Infobox: Wirkung von Psychoedukation

Psychoedukation «normalisiert» das erlebte Leiden – nicht im Sinne einer Bagatellisierung, sondern durch Bezugnahme auf eine objektive Norm. Das diffus wahrgenommene Leiden bekommt einen Namen und bis anhin unspezifische Symptome wie plötzliche Schreckhaftigkeit und das chronische Gefühl auf der Hut sein zu müssen, werden als Symptome erkannt, anerkannt und benannt. Zusammenhängend können praktische Skills zur Stressregulation vermittelt werden. Dazu zählen die Anwendung von Atemübungen, Übungen zur Körperwahrnehmung, Gedanken- und Emotionsregulierung. Diese Skills können in Momenten des Stresserlebens angewandt dazu beitragen, dass sich die jeweilige Person selbst beruhigen oder aus einer Gefühlsstarre selbst aktivieren kann. Dies führt zu einer besseren Stressregulierung und einem Gefühl der Sicherheit und Kontrolle.

Auch digitale Dienste können eine effektive erweiternde Alternative zu herkömmlichen Psychotherapien darstellen und psychoedukative Inhalte vermitteln [9]. Weil digitale Angebote anonym, flexibel und unabhängig im eigenen Tempo genutzt werden können, können einige Hürden in der Versorgung von Geflüchteten überwunden werden. Ein Ansatz für ein niederschwelliges digitales Unterstützungsangebot mit der Einbindung von Task-Sharing wurde vom Schweizerischen Roten Kreuz (SRK) verfolgt: Die «Sui SRK» App, ein niederschwelliges digitales Unterstützungsangebot. Sie bietet Geflüchteten psychologische Selbsthilfe, Informationen zum Leben in der Schweiz und Peer-Unterstützung per Chat [10]. Die App ist jetzt auf Arabisch und Deutsch in den App-Stores verfügbar und weitere Sprachen werden laufend entwickelt.

«Fallbeispiel: Frau D. lebt mit ihren beiden kleinen Kindern in einem abgelegenen Asylzentrum, das nach 14:30 Uhr aus der Stadt nicht mehr mit öffentlichen Verkehrsmitteln erreichbar ist. Sie leidet unter Schreckhaftigkeit, Magenschmerzen, Schlafstörungen und erlebt täglich Alltagsstress. Vermittelt durch die Sui SRK App versteht sie ihre Schmerzen, hat einfache Bewältigungsstrategien für ihre Schlafhygiene und den Umgang mit Stress gelernt, sich Videos von anderen Betroffenen mit hilfreichen Tipps angesehen und kommuniziert per Chat mit einer Begleitperson auf Arabisch. Das hilft ihr, sich weniger verloren und allein zu fühlen.

3.2 Psychotherapeutisches Grundangebot: Ressourcen

Die Ressourcenarbeit ist zentral für die Funktionsfähigkeit im postmigratorischen Lebenskontext und kann sowohl von geschulten Laien wie auch Fachpersonen durchgeführt werden.

Im psychotherapeutischen Grundangebot (zweite Stufe) spielen nach der Orientierung die Stärkung und Aktivierung von Ressourcen im therapeutischen Sinne in der Traumaarbeit mit Geflüchteten eine bedeutende Rolle. Ressourcen, die dazu beitragen Stress abzubauen, sind essenziell, um die notwendige Kraft aufzubringen, überhaupt die eigenen traumatischen Inhalte bearbeiten zu können. Zudem lernen Betroffene in dieser Stufe mit dem Unveränderlichen umzugehen. Eine verfrühte Traumaexposition bei fehlenden Ressourcen kann Betroffene unerwünscht destabilisieren und verfehlt somit das Ziel [11].

Wie auch in der ersten Stufe können therapeutische Fachpersonen ohne spezialisierte Traumapsychotherapie durch Ressourcenarbeit einen wichtigen Beitrag zur Stabilisierung leisten. Als Ressourcen können beispielsweise Fertigkeiten, soziale Kontakte, Objekte, religiöse Rituale oder Kraftorte identifiziert werden. Die Festigung dieser Ressourcen und das Erlernen des Verständnisses für den eigenen Gesundheitszustand sind wesentliche Voraussetzungen für eine spätere Traumaexposition. Daher sollte die Unterstützung rund um Orientierung und Ressourcen wertgeschätzt und priorisiert werden. Diese ist unabhängig vom Schweregrad der PTBS elementar und durch ihre greifbaren und anschaulichen Schritte für Betroffene jeder Herkunft anwendbar. Ein Projekt der Universität Zürich, «SPIRIT», das der zweiten Stufe zugeordnet werden kann, zielt darauf ab, die Resilienz von Geflüchteten zu stärken [12]. Geschulte Peers vermitteln anderen Geflüchteten Selbstmanagement-Kompetenzen zur Reduktion von Belastung im Alltag anhand der WHO-Kurzintervention Problem Management Plus.

Fallbeispiel: Herr B. nimmt regelmässig an einem gruppentherapeutischen Angebot in der Natur teil. Gemeinsam mit anderen geflüchteten Menschen aus unterschiedlichen Herkunftsländern trifft er sich wöchentlich draussen, besucht verschiedene Orte rund um seinen Wohnort und erlernt einfache Achtsamkeits-Übungen, die er selbst praktizieren und als Ressourcen nutzen kann. Herr B. ist durch

die Gruppe sozial besser vernetzt, lernt Naherholungsgebiete kennen, macht die Erfahrung, mit seinem Erleben nicht allein zu sein und lernt, seinen Stress mittels praktischer Übungen zu regulieren.

3.3 Spezialisiertes psychotherapeutisches Angebot: Traumaexposition

Die Spitze der Versorgungspyramide, die Durchführung einer Traumaexposition, bedarf speziellen Fachwissens in der Anwendung von Trauma-psychotherapeutischen Methoden. Unabhängig von der gewählten Methode (z.B. EMDR, NET, Life-Span Integration) wird ein traumatisches Ereignis in die Lebenschronologie eingeordnet und die traumatischen Inhalte durch dosierte und kontrollierte Exposition und unter stetem Einbezug der Gegenwart integriert. Ein stabiler Zustand der betroffenen Person und eine gute Therapiebeziehung sind unabdingbar für diese intensive und emotionale Auseinandersetzung.

Fallbeispiel: Frau Santos ist als «Flüchtling» anerkannt und verfügt somit über einen gesicherten Aufenthaltsstatus. Sie geht einer beruflichen Tätigkeit nach und lebt zusammen mit ihrer Familie. Sie hat gelernt, was passiert, wenn sie plötzlich Panikattacken erlebt (Orientierung) und hat einen Umgang damit gefunden (Ressourcen). Mit Hilfe von EMDR kommt sie nochmals kontrolliert in Kontakt mit ihren traumatischen Erlebnissen, während sie mittels bilateraler Stimulation (Augenbewegungen) im Hier und Jetzt verankert bleibt. Sie berichtet, dass die Erinnerung an die Ereignisse in der Folge “weiter weg” erscheinen und somit weniger störend sind.

Fazit

Eine bedürfnisorientierte und stufengerechte Gesundheitsversorgung für Geflüchtete ermöglicht traumatisierten geflüchteten Menschen einen chancengerechteren Zugang. Durch die Einbindung von innovativen Angeboten, geschulten Laien und Fachpersonen kann frühzeitig kultursensitiv orientiert und unterstützt werden. Die Versorgungspyramide, bestehend aus psychosozialer Unterstützung, Ressourcenarbeit und spezialisierter Traumaexposition, bietet ein flexibles und integratives Modell, das den vielfältigen Bedürfnissen der Geflüchteten gerecht wird und auf eine nachhaltige Gesundheitsversorgung abzielt. Dieser Ansatz fördert die Stabilität der Betroffenen und trägt zur

Überwindung der strukturellen und individuellen Hürden in der psychologischen Gesundheitsversorgung bei.

Referenzen

[1] Jannesari S. Post-migration Social–Environmental Factors Associated with Mental Health Problems Among Asylum Seekers: A Systematic Review. Journal of Immigrant and Minority Health 2020; 10

[2] Turrini G, Purgato M, Ballette F, et al. Common mental disorders in asylum seekers and refugees: umbrella review of prevalence and intervention studies. Int J Ment Health Syst 2017; 11: 51. doi:10.1186/s13033-017-0156-0

[3] Blackmore R, Boyle JA, Fazel M, et al. The prevalence of mental illness in refugees and asylum seekers: A systematic review and meta-analysis. PLoS Med 2020; 17: e1003337. doi:10.1371/journal.pmed.1003337

[4] Kiselev N, Pfaltz M, Haas F, et al. Structural and socio-cultural barriers to accessing mental healthcare among Syrian refugees and asylum seekers in Switzerland. European Journal of Psychotraumatology 2020; 11: 1717825. doi:10.1080/20008198.2020.1717825

[5] Bartolomei J, Baeriswyl-Cottin R, Framorando D, et al. What are the barriers to access to mental healthcare and the primary needs of asylum seekers? A survey of mental health caregivers and primary care workers. BMC Psychiatry 2016; 16: 16–336. doi:10.1186/s12888-016-1048-6

[6] Munz D, Melcop N. The psychotherapeutic care of refugees in Europe: treatment needs, delivery reality and recommendations for action. European Journal of Psychotraumatology 2018; 9: 1476436. doi:10.1080/20008198.2018.1476436

[7] Einführung in die Integrative Körperpsychotherapie IBP (Integrative Body Psychotherapy). 1. Auflage. Bern: Hogrefe; 2016

[8] Patel V, Saxena S, Lund C, et al. The Lancet Commission on global mental health and sustainable development. The Lancet 2018; 392: 1553–1598. doi:10.1016/S0140-6736(18)31612-X

[9] Sijbrandij M, Kunovski I, Cuijpers P. Effectiveness of Internet-Delivered Cognitive Behavioral Therapy for Posttraumatic Stress Disorder: A Systematic Review and Meta-Analysis: Review: Internet-Delivered CBT for PTSD. Depress Anxiety 2016; 33: 783–791. doi:10.1002/da.22533

[10] Stoeckli RT, Berger T, Aebersold M, et al. Development and Cultural-Contextual Adaptation of a Low-Threshold Digital Psychosocial Service for Refugees Living in Switzerland: Sui App (Preprint). 2024;

[11] Reddemann L, Piedfort-Marin O. Stabilization in the treatment of complex post-traumatic stress disorders: Concepts and principles. European Journal of Trauma & Dissociation 2017; 1: 11–17. doi:10.1016/j.ejtd.2017.01.009

[12] SPIRIT - Scaling-Up Psychological Interventions in Refugees in Switzerland. 2024; Im Internet: https://www.spirit-network.ch

Appendix B: Article II

Stoeckli, R. T., Berger, T., Aebersold, M., Zoellner, V., Haji, F., Hunziker, M., Jesus Ferreira, B., Hosmann, M., Burchert, S., Wabiszczewicz, J., Knaevelsrud, C., & Heim, E. (2024). *Development and Cultural-Contextual Adaptation of a Low-Threshold Digital Psychosocial Service for Refugees Living in Switzerland: Sui App*. [Manuscript submitted for publication].

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Development and Cultural-Contextual Adaptation of a Low-Threshold Digital Psychosocial Service for Refugees Living in Switzerland: Sui App

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Abstract

Background: Upon arriving in host countries, forcibly displaced people face a multitude of psychological, cultural, as well as socio-structural challenges. The urgent need for psychological and psychosocial support remains substantially unmet, impacting practically all asylum seekers and refugees. Beyond the direct impact on individuals, this care gap also affects host countries' existing structures, necessitating holistic approaches in parallel to an expansion of specialised care. Digital services offer promise in addressing these challenges, given their potential for scalability and accessibility. The latter is particularly relevant for refugee groups as they often face geographical, structural, and linguistic barriers. However, the understanding and implementing cultural and contextual adaptation in interventions remain limited and require systematic processes and reporting.

Objective: This article presents the participatory development process of the culture- and context-sensitively adapted "Sui App". Sui is a digital low-threshold psychosocial support service tailored to recently arrived refugees in Switzerland, focusing on those from Arabic-speaking backgrounds. The app can be utilised independently or augmented with peer support through an in-app chat feature.

Methods: We employed a user-centred participatory approach across the project's preparation, development, and finalisation phases. Cultural and contextual considerations were documented using the RECAPT framework. We conducted a desk review, qualitative interviews, iterative advisory group meetings, and a beta test to finalise a version of the app for a subsequent evaluation in a randomised controlled trial (RCT).

Results: To enhance the psychological well-being of recently arrived asylum seekers and refugees in Switzerland, both socio-structural and psychological factors should be included. A digital service aimed at meeting their needs in everyday life should incorporate those factors. In the iterative development process, the app Sui evolved. The app contains practical information on nine relevant, everyday life topics and five psychological topics to promote overall well-being in a resource-oriented way. Additionally, users can be supported by trained peers through an in-app chat. Essential for the participatory process was the multi-levelled translation process through which a widely understandable translation could be provided, allowing the advisory groups to focus on the content.

The written content is accompanied by illustrations of fictional protagonists, video testimonies from other refugees telling their stories, and various audio exercises.

Conclusions: Through engagement with stakeholders and adherence to the RECAPT framework, we carefully considered the cultural and contextual circumstances of Arabic-speaking refugees who have newly arrived in Switzerland. Our iterative development process, spanning a preparation, development, and finalisation phase, highlighted the importance of integrating socio-structural factors along with low-threshold psychological health promotion in a new digital support service. Despite encountering challenges such as technical issues during beta testing, our findings underscore the potential of digital services in bridging care gaps for marginalised populations.

Keywords: e-mental health; cultural adaptation; psychosocial support; digital mhpss; refugees; participatory research; peer support; Arabic

Introduction

Forced displacement, which happens primarily in low- and middle-income countries (LMICs), poses urgent humanitarian challenges worldwide. The number of individuals fleeing armed conflict, persecution, or environmental threats has increased to over 108 million people worldwide [1]. This mass movement imposes substantial challenges on the socio-structural dynamics on the side of host countries [2]. On the side of the affected individuals, the impact is apparent on several levels of their well-being.

Refugees and other forcibly displaced people may encounter psychological difficulties, including posttraumatic stress disorder (PTSD), anxiety, depression, psychosomatic disorders [3–8], and low quality of life [9,10]. Pre-migration traumatic events that influence mental health [11] are further compounded by life-threatening events occurring on the migration route [12]. Finally, in countries of destination, socio-structural impediments and cultural differences may deteriorate the potentially vulnerable mental health state in which refugees find themselves [13–16]. In literature, those post-migration living difficulties (PMLDs) were found to have an impact on mental health beyond the effect of pre-migration events [14,17–22] or at least increase mental health difficulties [23–25]. In the Adaptation and Development after Persecution and Trauma (ADAPT) model, Silove [16] postulates the five core pillars “Safety/Security”, “Bonds/Networks”, “Justice”, “Roles and Identities”, and “Existential Meaning” as a holistic approach to explain the interplay of past and ongoing challenges affecting psychosocial well-being of displaced people. Restoring those core pillars interdependently is explained to be crucial to promoting psychosocial recovery.

Care Gap

Disconcertingly, the critical need for psychological and socio-structural support is largely unmet, both in LMICs and in higher-income countries (HIC) [2,26,27], such as Switzerland [28,29]. The limited access to essential mental health and psychosocial support services (MHPSS) is often caused on two levels. On the structural level, there is, e.g., in Switzerland, a lack of mental health specialists working in the field of refugee mental health [29] and an immense overload weighing on social workers [30]. The latter results in fewer individuals being able to transition away from social welfare [31]. In addition, there is a lack of interpreters’ cost coverage [32], trained interpreters, childcare, and

transportation (e.g., to therapy) possibilities [27]. On the individual's level, fear of stigma, language barriers, financial worries, and lack of self-perception of the mental health state are mentioned as barriers to psychological care [33–35]. For these reasons, the broad population of refugees, all of whom are facing major life changes, do not receive adequate psychosocial support [28]. More low-threshold psychosocial interventions are required targeting the ADAPT model's core pillars, PMLDs, and symptoms of mental distress to meet refugees' psychological needs while taking into account their current life circumstances [16,25,36].

Scalable Approaches

The World Health Organization (WHO) has developed community-based and accessible interventions (PM+ and SH+) to reduce symptoms of depression, anxiety and PTSD [37], to alleviate PMLDs [38], to prevent mental disorders [39], and to improve mental well-being [40]. A transdiagnostic treatment approach to reach refugees at symptom level (the Common Elements Treatment Approach) was proven to be effective in two LMICs [41].

In Switzerland, while several low-threshold short interventions for distressed refugees have been documented, only a few have been tested through randomised controlled trials (RCTs) [42]. However, to our knowledge, no service has been evaluated that addresses the lack of social assistance within the context of psychosocial support. Given these persistent challenges in providing psychological and socio-structural support for refugees, exploring innovative solutions is imperative.

Emerging digital interventions have gained current and prospective research priority in humanitarian MHPSS settings [43]. Digital interventions have been shown to improve mental health difficulties such as depression, anxiety, post-traumatic symptoms, functioning, well-being, and quality of life among minority communities with large effect sizes [44]. A meta-analysis focusing on LMICs reported moderate to large effects of digital interventions on depression and anxiety, and small impact on quality of life [45]. Digital mental health interventions offer the opportunity to overcome barriers such as limited structural or geographical access to specialists, language barriers, and fear of stigma [2,46]. This is particularly relevant for asylum seekers who, e.g., in Switzerland, often reside in centres with limited access to urban areas [47], but usually have access to a smartphone [48,49]. Moreover, studies on internet-based interventions treating various mental disorders report comparable

effectiveness as face-to-face interventions [50,51] with a conceivable advantage in cost-effectiveness [52] and a large potential for scalability [53].

The Lancet Commission on Global Mental Health has encouraged task-shifting interventions, including the involvement of non-specialists in service provision, and advocates adopting digital platforms to scale up support for broader populations of people affected by mental ill health [54]. Internet-based interventions tend to be more effective [55] and have greater adherence [56] when they include human guidance, as opposed to unguided interventions. Interestingly, the professional education of the guide does not seem to be a critical factor [57,58]. The WHO's Step-by-Step digital intervention for treating depression trained non-specialists to guide participants with weekly contact, and demonstrated moderate effects in an RCT [59]. Using the task-shifting approach presents the opportunity to train peers who speak the target group's first language and share similar migration experiences [60].

Cultural and Contextual Adaptation

Studies focusing on culturally adapting psychological interventions aim to increase the acceptability and improve health outcomes for underserved target groups [61,62]. Cultural adaptation studies have mostly used "top-down" approaches in which pre-existing psychological interventions were adapted [68]. In contrast, "bottom-up" processes incorporate cultural aspects from the outset when developing new interventions [68].

A challenge of cultural adaptation remains the definition of the term. Resnicow and colleagues [70] explain cultural adaptation in two dimensions. On the observable dimension, so-called surface adaptations are made in order to increase acceptance. This includes visuals, audio, language, and delivery formats. In the second dimension, the deep structure is adapted. This includes a deep understanding of the social, cultural, historical, environmental, and psychological constructs that influence the health behaviour of the target group. In the case of refugees, these constructs can be strongly influenced by various psychosocial pillars [16].

The term "culture", therefore, does not only comprise the individual's upbringing background (such as language, ethnicity, traditions, and country of birth). Culture is also dynamically shaped by recent experiences (e.g., traumatic events during migration, interaction with the host community) and

the current surroundings (e.g., living in asylum centres, access to health care, availability of digital devices). Thus, we highlight the sensitivity to context as part of the cultural adaptation.

The benefits of cultural adaptation in psychological interventions are discussed in the literature. Some research has found superior effects of culturally adapted interventions compared to non-adapted interventions [63], whereas the extent of adaptation could play a role [64]. Other research suggests that the effects of psychological interventions do not depend on cultural adaptation [45,65,66]. In any case, it remains unclear what cultural adaptations of interventions have precisely entailed.

Various classification systems for reporting cultural adaptation to compare interventions have been developed for research [63–65,67]. Considering the inconsistent and varied classification methods, the "Reporting Cultural Adaptation in Psychological Trials" (RECAPT) was developed by a large consortium of researchers [68]. A growing body of studies adhering to standardised reporting criteria could enhance the replicability, comparability and transparency of adapted interventions in the field of cultural clinical psychology [69].

Objective

In this article, we report on the development process of the "Sui App", a digital low-threshold psychosocial support service for individuals who have recently arrived in Switzerland. "Sui" stands for self-help, support, and information (in German: Selbsthilfe, Unterstützung, und Information) and is provided by the Swiss Red Cross (SRC). Initially, we targeted Arabic-speaking refugees and asylum seekers who have recently arrived in Switzerland. Our approach draws on participatory methodologies, which have been proven to be effective in tailoring health interventions for migrants [71]. Participation intends to establish sustainable partnerships and trust between research and the target community. Participatory research empowers the voices of potential end-users throughout the development and design process [72]. In software development, user-centred approaches are used as a form of participatory and are characterised by iterative loops collaborating with end-users [73]. We used this approach to deeply empathise with the needs and preferences of end-users and adapt the service accordingly.

We plan to adapt the Sui app later to accommodate additional languages spoken by refugee communities. To approach inclusivity across different refugee backgrounds, we emphasise the importance of including context in the development and lay focus on bottom-up processes.

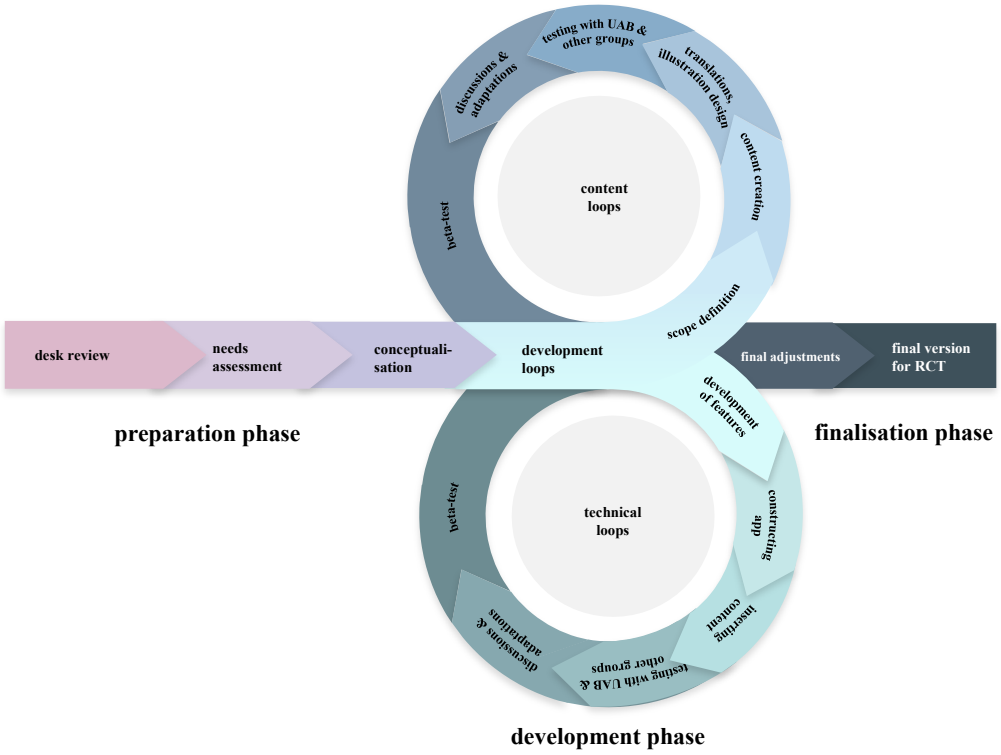
Methods

Overview

The Sui app was developed based on a user-centred, participatory, and mixed-methods approach to provide a scalable low-threshold MHPSS service for asylum seekers and refugees having recently arrived to live in Switzerland. Below, we describe the procedure of development and adaptation of the app Sui in three phases: *preparation, development,* and *finalisation* (see Figure 1). In the following, the term "refugees" is used inclusively to refer to both asylum seekers and individuals granted refugee status unless otherwise specified.

The documentation of cultural adaptation followed the RECAPT criteria by Heim et al. [68]. See supplementary materials for the details on Chapter A: Set-up, Chapter B: Formative Research, Chapter C: Intervention Adaptation, and Chapter D: Measuring Outcomes. In RECAPT, formative research is conducted in an iterative fashion before and during the process of adaptation. Formative research includes a literature review, as well as a broad stakeholder consultation at different stages. In addition, a documentation system is established from the beginning of the project to increase transparency and keep track of decisions made during the development process.

Figure 1. User-centred development process of the Sui App



Phase 1: Preparation Phase

The preparation phase aimed to evaluate the status quo and to identify the gaps in MHPSS care, specifically in Switzerland that could potentially be approached with a guided or non-guided digital self-help service. A desk review, a needs assessment, and a conceptualisation process were conducted in this phase.

Desk Review

First, a desk review of the literature [74] was conducted to gain an overview of the mental health and care situation of and for refugees in host countries and Switzerland in particular. This included gaining an understanding of barriers for refugees in accessing mental health services and evaluating opportunities and risks of digital mental health interventions in general. Specific questions that were addressed included the following:

1. What is the mental health situation of refugees?
2. What is the current mental healthcare situation?

3. What are the barriers for refugees to accessing mental health services?
4. What are the opportunities and risks of digital mental health interventions for the care of refugees?

To gather relevant literature, the ResearchGate database was searched for review articles and meta-analyses without the aspiration to be exhaustive and in awareness of bias risks. The articles that were found were revised, and the insights were described in an unpublished report in December 2019. Below, we provide a summary of the findings.

Needs Assessment

The research question guiding the needs assessment aimed to gain insights into the psychosocial circumstances of refugees living in Switzerland and explore the feasibility of a potential digital care tool. For this purpose, interviews were conducted with psychotherapists, social workers, marketing, and innovation professionals, as well as with residential care and healthcare professionals working in asylum contexts (*asylum experts,* AE, *n*=22). Moreover, we included interviews with *intercultural interpreters* (ICI, *n*=2) who live and work in Switzerland. Additionally, we interviewed four people from the initial target group (*target group interviewees,* TGI), consisting of Syrian refugees living in Switzerland (*n*=4). A professional intercultural interpreter translated these interviews. This phase of interviews lasted from November 2019 until March 2020. In semi-structured interviews, MA, RS and MH asked questions according to an interview guideline and added upcoming ad-hoc questions. In preparation for the interview, participants were given a short explanation of the planned project on digital mental health for trauma-affected refugees from all backgrounds living in Switzerland.

The first author (RS), with an educational background in clinical psychology, analysed the data. The recorded interviews were processed according to the summarising content analysis described by Mayring [75], which is suitable for recognising central statements. It follows the subsequent steps: determination of units to be analysed (recorded and transcribed interviews), paraphrasing according to Z1-Z4 rules (reduction to essential and bundling of similar statements), the composition of reduced statements to a category system, re-evaluation of the category system with the reduced material, and finally interpretation of the final categories. To streamline and condense the content for this article, only categories with five or more codes from separate AE are reported with their according

frequencies. However, since the interviewees' backgrounds were very heterogeneous, we considered all interview data for the conceptualisation phase (for the entire collection of categories from AE interviews, see supplementary materials Chapter B, criterion 6). The interviews with ICI and TGI were less structured, and the low number of interviews does not allow for the meaningful use of frequencies. The summarised codes are reported following the AE results.

Conceptualisation

A user advisory board (UAB) was formed to discuss the desk review and needs assessment results and to accompany the further development process. It consisted of eight participants and one intercultural interpreter (N=9) from Syria. The UAB participants were recruited with the help of the Swiss Red Cross (SRC), local aid organisations and personal contacts. The goal was to form a diverse group with younger and older people (age range = 19-55 years), different ethnic affiliations (4 Kurdish, 5 Arabic), educational backgrounds and balanced gender (4 female, 5 male). The intercultural interpreter also became part of the core team to be strongly involved in final decisions (see supplementary materials, Chapter A). In the preparation phase, four meetings were held with the UAB to brainstorm. The UAB participants signed an informed consent form agreeing to use their feedback in this paper. The Ethics Committee of the University of Bern in Switzerland approved the formative research with UAB members (2021-09-00003).

Additionally, in collaboration with a software consultancy agency, we deliberated on the desk review and needs assessment findings. With their help, we formulated the technical requirements and scoped out the project with agreed focus areas for the planned digital service. We used iterative design thinking strategies such as creating user personas, brainstorming, paper prototyping and testing digital mock-ups (see e.g., Interaction Design Foundation, 2024). Following this, we evaluated potential approaches to software development.

Phase 2 and 3: Development and Finalization

In the development phase, the content and design were created according to the concept constructed during the conceptualisation phase. In collaboration with Freie Universität Berlin, a pre-existing software platform, the Digital Research Creation Tool (DIRECT), was utilised and expanded by a sub-contracted software development agency according to the identified requirements. The

technical environment, as well as the content, including the design along with the text, were developed in loops involving various stakeholders: the core team, the asylum-information expert group, the translation group, the UAB, the Swiss Refugee Council (SFH), social services from the SRC, mental health experts, a design agency, a copywriter agency, and selectively other people.

Development Loops

Based on the conceptualisation, the chapters' content was developed collaboratively. Each chapter was revised or partially written by respective experts (mental health experts, asylum-information experts, social services, and legal services). A professional interpreter translated the first version of each chapter, which was then revised by the translation group. This group was formed to cover understanding across various Arabic dialects. It consisted of one person each from Palestine, Tunisia, Egypt, Yemen, and Syria (2 female, 3 male). The core team's intercultural interpreter consolidated the feedback into a final translation. The finalised translation was then revised in UAB meetings.

The previously formed UAB (see above) was involved in six meetings for design and surface discussions (prototyping, voting) and 13 meetings for content revisions (feedback and inputs on each chapter). Moreover, the UAB received homework (e.g., reading texts or listening to audio exercises) to prepare for the meetings. In the initial meetings, discussions were held with the whole group. Still, over time, we divided the UAB into smaller groups so that discussions could be held in their native language (Kurdish or Arabic) and at different paces. Core statements of each group were reported and translated at the end of the meetings. Technical tests were conducted concurrently with content evaluations. The development loops were conducted between April 2021 and June 2022.

Beta Test

In a beta test, the Sui app was tested by nine participants (N=9). The participants were recruited with the help of a local social counselling organisation and had no prior involvement in developing the Sui app. Five women and four men from Syria, with an average age of 28.44 (SD=10.57), took part in the beta test. All participants completed an initial User Experience (UX) test in a face-to-face meeting, tested the app for four weeks, and then took part in another face-to-face

semi-structured interview about the Sui app and optimal peer support at the end (for details on the UX test and interview guideline see supplementary materials D) Measuring Outcomes, criterion 10).

To evaluate how a contact person behind the app could be advantageous, a first concept for digital peer support was tested in the beta test with the aim of further developing it for the subsequent RCT. This rough concept was based on the experiences of previous scalable interventions for refugees, such as Step-by-Step [77], Doing What Matters in Times of Stress [78], PM+ [79], as well as other internet-based treatments for depression and loneliness [80,81]. The SRC trained two Arabic-speaking people with a migration background to provide a weekly message exchange with the app users. The training included getting familiar with the content of the Sui app, practising writing support messages with standardised text templates, and thereby using skills like active listening, paraphrasing, validating suffering, normalising psychological symptoms of stress, and suggesting adequate sub-chapters of the app. They were also introduced to monitoring usage behaviour (completed sub-chapters) and activity (usage time). Additionally, they had a supervision exchange with an Arabic-speaking psychotherapist. Findings from the beta test were used to understand the content and technical processes, develop a sensible structure for the motivational messages, understand the technological use in practice, evaluate the amount of support, and get an idea of what reactions would come from the participants.

Five of the nine beta test participants were randomly assigned to receive weekly peer support during the testing period. The test peers (one male, one female, N=2) were Arabic-speaking people who had migrated to Switzerland. The test peers were interviewed in a semi-structured interview at the end of the test period (see supplementary materials, Chapter D, criterion 10). The UX test, as well as the qualitative interviews, were conducted by two master's students and interpreted from Arabic to German simultaneously. The beta test was approved by the local ethics committee of the Faculty of Human Sciences of the University of Bern (2022-06-00001) and was conducted between June and August 2022.

Final decisions and adjustments were applied based on the findings from the beta test. The peers were trained with an improved concept version, and the app changes were mainly bug fixes and minor content revisions. The app was prepared to be used in the RCT testing the effectiveness of Sui

as a peer-guided or unguided service against a waitlist control group. The finalisation phase lasted from July until October 2022.

Results

Phase 1: Preparation Phase

Desk Review

The desk review yielded five valuable key insights that contributed to shaping the further research questions. These were subsequently discussed in interviews with professionals working in the asylum context and refugees living in Switzerland.

First, mental health issues often seem to carry a social stigma, leading many refugees to avoid seeking help due to fears of social consequences or beliefs that their condition is untreatable. Addressing this stigma could potentially enhance the effectiveness of mental health interventions aimed at this population. Second, refugees exhibit diverse health literacies, understandings of illness, help-seeking behaviours, and treatment needs. This suggests that mental health interventions may be most effective when tailored to align with the beliefs, values, and needs of the recipients. Third, interventions for refugees may need to extend beyond solely addressing mental health symptoms to consider the broader context of their living conditions. It is conceivable that addressing only symptoms may not necessarily lead to an overall improvement in the quality of life for refugees. Fourth, the effectiveness of digital mental health interventions seems to hinge significantly on participants' adherence and compliance, which are influenced by perceived benefits. Thus, implementing various strategies to enhance adherence could have a positive impact on the effectiveness of interventions. Fifth, adopting a task-shifting approach shows promise for alleviating stress symptoms and improving refugees' psychosocial well-being.

Moving forward, it was important to explore further the implications of these findings for implementing a digital mental health service aimed at improving the care situation of refugees in Switzerland, considering realistic opportunities and risks associated with such projects.

Needs Assessment

The results from the needs assessment with AE are presented in two sections. First, the prevailing status characterising the psychological state of refugees in Switzerland is described. Table 1

lists the psychosocial problems of refugees living in Switzerland, as identified by AE. Secondly, the potential of a digital tool to address the existing issues is elaborated. Table 2 illustrates the primary aspects highlighted by AE regarding the potential of a digital psychosocial support service. Subsequently, the summarised results from interviews with ICI and TGI are reported.

Table 1.

Results on the current psychosocial problem situation in refugees residing in Switzerland: Frequency of coding references (≥ 5) from the needs analysis found in semi-structured interviews with asylum experts working with refugees in psychological, medical, social, residential care (N = 22).

Categories	Number of AE[a] (%)
Main psychosocial problems	
Sleep disturbances	9 (41)
Asylum situation (decision, rights, family reunification, traveling)	9 (41)
Physical pain/tension as an expression of psychological burden	8 (36)
Occupational integration	8 (36)
Social inclusion	6 (27)
Housing	5 (23)
Obstacles to healing	
Asylum situation	13 (59)
Feelings of shame	7 (32)
Fear of being categorized as «crazy»	6 (27)
Resources	
Often strong resilience	11 (50)
Daily structure and activities	8 (36)
Social network	6 (27)
Feeling of being needed (identity)	6 (27)

Note. [a]AE = asylum experts

Psychosocial Problems Reported by Asylum Experts.

In the interviews, the most prominent psychosocial challenges mentioned to be occurring in refugees were sleep disturbances, the overall asylum situation (including the asylum decision, process,

and rights), physical pain or tension, occupational integration, social inclusion, and housing. Physical pain was frequently reported to be serving as an expression of psychological burden in the target population.

Apart from being a psychosocial challenge, the asylum situation was mentioned as one main hindering factor for refugees to start a healing process or seek treatment since the focus is often on the structurally problematic situation. Other than that, feelings of shame and fear of being categorised or stigmatised as “crazy” were mentioned to be obstacles for people to express the need for help or seek treatment.

AE frequently mentioned that they perceive a resilience in many refugees that is difficult to describe but serves as a vital resource. Furthermore, more tangible resources mentioned were having a daily structure and activities, having a social network, and feeling of being needed, contributing to the improved well-being of refugees.

Potential of a Digital Tool Evaluated by Asylum Experts.

Concerns of AE were that a digital tool could not build up a relationship or trust, which they perceive as essential in traditional psychotherapy. Another concern was that a tool could not detect emergencies or individual triggers and not react adequately. Similarly, they stressed that a digital tool cannot address individuality (e.g., individual questions) properly.

However, a digital service was seen to be useful in approaching the present care gap. The potential of the digital tool can lie in addressing the existing treatment gap, acting as a bridging, or filling additional service”, one AE said. It was also envisioned as a tool supporting ongoing therapy, allowing clients to repeat information or exercises. In any case, a contact person behind the tool was considered advantageous for the users. According to the AE, a primary goal of the tool should be mental stabilisation. Moreover, a digital tool was perceived as future-oriented, as most people own a smartphone. It was also recognised that the tool could benefit not only the target group but also professionals and relatives seeking information on psychosocial support for those affected. Nevertheless, it was emphasised that the digital tool cannot replace traditional face-to-face services.

Regarding the tool’s content, consistent suggestions were psychoeducation, particularly on symptoms related to PTSD. Typical psychotherapy exercises, especially body-focused exercises, were

also deemed digitisable and effective. AE highlighted the importance of activating the individual's existing resources (e.g., asking about personal strengths). Along with psychological content, many AE suggested including socio-structural information typically provided by social services. Those include information about housing (e.g., how to find an appropriate apartment), about the Swiss (mental) health system (e.g., rights, existing services, access) and occupational integration (e.g., how to find a job or start an education). Additionally, a connection to "real" social life (e.g., lists of communities, social clubs, free activities) was considered indispensable. Besides providing information on everyday life, AE suggested integrating asylum-related legal information (e.g., differences in residency status and family reunification).

Technical considerations of the tool involved striking a balance between generic use and individual tailoring. Anonymity was said to be paramount to ensure safety and to mitigate the fear of stigmatisation towards psychological problems. Thanks to this anonymity, more people can be reached.

A consensus emerged on delivering content in a concise and straightforward manner, incorporating various formats, such as images, illustrations, example stories, short texts, and videos. It was advised that communication should adopt a resource-oriented approach: normalising, empowering, validating, taking seriously, being hopeful, patient, humorous, listening, being positive, and asking. It was also stressed that the use of often stigmatised terms (e.g., "patient" and "psychological disease") should be avoided, even though they can vary across cultures.

Collaboration with the target group in both development and dissemination was strongly advocated. Furthermore, AE advised focusing on individual psychological symptoms as an entry point to the tool. Providing information on everyday life challenges that typically occur after migration can serve as another entry point to the tool.

Table 2.

Results on the potential of a digital psychosocial support service for refugees living in Switzerland: Frequency of coding references (≥ 5) from the needs analysis found in semi-structured interviews with asylum experts working with refugees in psychological, medical, social, residential care (N = 22).

Categories	Number of AE[a] (%)
Concerns and obstacles towards digital tool	
No relationship and trust building	7 (32)
Lacking sensitivity of digital tool towards emergencies and triggers	5 (23)
Lack of individuality	5 (23)
Potential use of a digital service	
Bridging tool (preparation, filling)	13 (59)
Support for ongoing therapy	9 (41)
Most people have a smartphone, digitalization is future-oriented	8 (36)
Contact person behind the tool would be advantageous	8 (36)
No replacement for existing face-to-face services	7 (32)
Tool as source for professionals and relatives of affected	6 (27)
Emergency plan (advice)	5 (23)
Stabilization as primary goal	5 (23)
Digitizable content	
Psychoeducation	16 (73)
Psychoeducation on PTSD symptoms	8 (36)
Information, explanations on socio-structural everyday aspects/integration:	14 (64)
• Housing	
• (Mental) health system	5 (23)
• Occupational / educational integration	5 (23)
	5 (23)
Standardized exercises	14 (64)
• Body-focused	
Activation of existing resources	12 (55)
Connection to social life and activities	9 (41)
Asylum-related legal information	7 (32)
Important technical aspects to consider	
Balance between tailored and generic use	9 (41)
Anonymity: as priority and possibility to reach people	9 (41)
Advice on the delivery formats	
Simple design and diverse formats:	15 (68)
• Images/illustrations	7 (32)
• Example stories	7 (32)
	5 (23)

• Short texts • Videos	5 (23)
Advice for psychological language within the tool	
Resource-oriented psychological language: Normalising, empowering, validating, taking serious, hopeful, patient, humorous, listening, positive, asking	10 (45)
Avoid stigmatized terms	7 (32)
Advice for better accessibility	
Participation of target group in development and dissemination	9 (41)
Access through symptomatology	8 (36)
Access through information of everyday (asylum) life	6 (27)

Note. [a]AE = asylum experts

Findings of Intercultural Interpreter Interviews.

The two ICIs reported similar psychological issues and PMLDs as the AE did. The reported problems included fear of being stigmatised as "crazy", sleep disturbances, general mistrust, lacking awareness regarding treatment options, worries about family left back home, residency status, and occupational integration challenges. One ICI explained that mental disorders are perceived as intrinsic to life and require time to pass. The other ICI stated that refugee traumatisation should not be pathologised as a mental illness but rather viewed as adverse experiences that require strategies and possibly medication. Stigmatisations, linguistic barriers, and difficulties in occupational and cultural integration were identified as obstacles to healing, while rapid networking within refugee communities and individual initiatives were recognised as resources. A digital support service should incorporate socio-structural assistance, such as links and addresses to social support resources, success stories, information on family reunification and other asylum-related topics, and general challenges encountered when arriving in Switzerland. Psychological content, including "dealing with mental disorders", breathing exercises and their efficacy, and self-help techniques for crises, was also highlighted. The primary recommendation emphasised the significance of ensuring anonymity.

Findings of Target Group Interviews.

The main additional findings from the four interviews with TGI were that they all use smartphones regularly, mainly to maintain contact with relatives, translate daily tasks, and access

several consumer apps. Concerning psychological issues, all TGI expressed that they will never be able to forget what they have survived and voiced concerns about the well-being of their family members left behind and have tried to reunite them in Switzerland. Some TGI spoke about physical complaints that have occurred since their migration, alongside psychological challenges, such as stress, guilt, and shame. The encountered PMLDs among TG were as diverse as described by the AE, encompassing difficulties with language acquisition, residency status, occupational integration, waiting times, experienced discrimination, and navigating Swiss legal frameworks. Despite these challenges, all TG were able to identify positive aspects of their lives in Switzerland, citing factors like overall health, natural surroundings, happy people, tranquillity, and being treated well. Reported resources included being grateful, having religious faith, fulfilling parental duties, ongoing efforts to reunite with family members, and receiving support from friends, family, or social counsellors. Regarding the idea of a new support app, their imagination was limited to the knowledge of existing consumer apps and leisure activities. Consequently, they were rather unclear about the potential benefits of such a digital service.

Conceptualisation

The results from the conceptualisation phase include decisions on technological aspects, the scope of the content and its delivery formats. Additionally, a rough concept of peer-to-peer support to be used in the app is presented.

Technology.

The digital service was decided to be delivered in the form of a cross-platform app that behaves like a native app, can be downloaded on iOS and Android app devices, and is easily installable and updateable. At the time of making this decision, compared to progressive web apps, this format was seen as more accessible, robust, and better applicable on iOS devices for installation and receiving push notifications. Thanks to the compatible requirements, a mutually beneficial collaboration was agreed upon with the Department of Clinical Psychological Intervention at Freie Universität Berlin: Their "DIRECT" software can be used to create custom apps that can be adapted to the respective needs of the project and are specifically suitable for research in the field of mental health [82].

Table 3.

Overview over the content of the Sui app

Information Chapters[a]	*Well-being Chapters*[a]	*General Chapters*[a]
Asylum Process	Stress	Emergency Information
Family Reunification	Sleep	Feedback
Finances	Resources	Introduction
Health Promotion	Chronic pain	Sui's Neighborhood
Health System	Emotion regulation	
Housing	Audio Exercises	
Residence Status		
Social Living		
Work & Education		

Note. [a]The Sui app is divided into two main content chapters "information" and "well-being" and contains an additional general chapter.

Scope of the Content.

Regarding the content, the project team decided to combine socio-structural information with simple psychological well-being tools. The importance of focusing on socio-structural challenges in the asylum context was a key finding from the needs assessment (see above). Therefore, nine chapters to provide socio-structural information and five psychological chapters were identified. The development of those chapters is described below. Following the recommendations of the AEs, additional explanatory chapters were developed: national emergency contacts, introduction to the app, feedback on the app, and introduction of the storyline (for an overview see Table 3). All content is made available directly after account setup since the target group and their needs are heterogeneous.

Delivery Formats.

Emerging from the needs assessment's results, various delivery methods were decided to be used: simple texts, illustrations, stories, animations, explanation videos, video testimonials of refugees talking about personal experiences, audio exercises, list exercises, details of contact centres, and links to websites. We decided to create fictional characters to tell stories that our target group can identify with.

Peer Support.

Due to significant concerns regarding security complexity, including the structured moderation of messages, we decided to abstain from implementing a feature that allows direct communication (e.g., forum exchange) between users. Nonetheless, the recommendation for a designated contact person within the app was strong. Given the demonstrated efficacy of guided formats in previous internet-based mental health intervention studies, we chose to integrate a guided version of the app. Furthermore, drawing from insights from experience with prior peer-to-peer programs, we capitalised on the benefits of providing support through individuals sharing similar migration backgrounds with the target group (such as a shared language, cultural backgrounds, life experiences, and current challenges).

Phase 2 and 3: Development and Finalization

Development Loops

The reported results from the development loops only include a summary of the findings from the iterative development process. In the following, the results of this iterative adaptation process for design, language and each chapter of the Sui app are described. Refer to Chapter C (criteria 7, 8, and 9) in the supplementary materials for a comprehensive description of the Sui app's content, surface, and the associated adaptation and decision-making process.

Illustrations.

The bird "Sui" was introduced as the mascot of the app. Its name and colour were accepted by all expert groups and the UAB, and it was preferred over a customisable avatar. The storyline around the app's content introduces twelve fictional protagonists living together in an apartment block in Switzerland. They are from diverse socio-demographic backgrounds and countries, not only Arabic-speaking, to expand the app to other target groups at a later date. Their representation was evaluated by the UAB and by representatives of each of the characters' ethnic groups. Each image was revised by the UAB, along with the corresponding content. Criticised features were adapted by the design agency and included, e.g., lighter and more diverse skin colours, the use of a hijab, hairstyles, generally happier faces, change of clothes, or change of names.

Language.

Originally produced in German, the written content was proofread by a Swiss copywriter agency to ensure simplicity and adherence to "plain language" principles. This involved minimising complexity and shortening sentences, consistent with the recommendations from expert interviews (as reported above). We also found that the use of plain language facilitates subsequent translation and reading comprehension for people with low levels of education. Technical terms are explained in the glossary of the app and as a tooltip feature within the text. Arabic is an official language in more than 20 countries, including many different countries that face political conflict and economic crises that often lead to the displacement of people. We, therefore, wanted to use an understandable version devoid of specific regional dialects. The translation group opted a "Levantine Arabic+" that would be widely comprehensible across the Arabic-speaking population. We supplemented the initial Middle Eastern Levantine translation, done by a professional translator, with additional synonymous words suggested by the translation group. This approach aimed to achieve cross-national understanding. The UAB then made revisions and suggested minor changes. The intercultural translator integrated all feedback into a final version, focusing on an analogous translation and following the same principle as in the German version of offering the simplest possible language. This multi-level translation process was necessary to allow the UAB to understand every sentence and focus on the content rather than the language specifics. In addition, after UAB discussions, we agreed to add both a male and female Arabic version, as the second person pronoun ("you") in Arabic distinguishes between two genders. The preferred form of address is set during account creation in the app.

Audio Exercises.

Audio Exercises, featured in all psychological chapters and consolidated in one overview section, draw from several sources. However, most stem from the trauma-sensitive yoga founded by trauma therapist Dagmar Härle [83–85]. The UAB deemed all exercises appropriate but generally preferred short durations. They particularly favoured breathing exercises. Two voices, male and female, were chosen through a voting process involving the UAB and the translation group. Both female and male users hear both voices equally often. However, Arabic speakers will be addressed in either the female or male version of "you" based on preferences set during account creation.

Information Chapters.

The nine chapters on socio-structural information were developed based on existing first information material in collaboration with respective professionals, such as SRC social services, the Swiss Refugee Council and an additional asylum expert group. The UAB revised each chapter. Because of the federal Swiss system, the depth of information was restricted to a national level since providing detailed information for each of the 26 cantons would have been impossible to implement simply. The chapters consist mainly of text-based step-by-step explanations but also include illustrations, video testimonies from refugees, and explanation videos.

The main results from the UAB meetings are elucidated: Housing covers everything important about the topic and includes valuable templates. However, they suggested incorporating more elements that convey hope for success into the content. For Work & Education, recommendations included adding more information on the education system, a job consultancy tool, a job platform and instructions for CVs and application letters. Regarding the three asylum topics, Asylum Process, Residence Status, and Family Reunification, they emphasised that highlighting accuracy due to prevalent misinformation is important. Social Living was deemed clear and important, with suggestions to list free activities, new events, and information about language courses. The Health System chapter should clarify which problems people can go where, how to access care and provide information on pregnancy and contraception equally for men and women. The chapter Finances was first considered too complex because several systems were not known in the UAB (e.g., three-pillar system, old-age and survivors' insurance). It was therefore expanded with information and was rated important, with suggestions for including money-saving ideas and differentiating between asylum social assistance and general social assistance. In the Health Promotion chapter, the UAB underscored the importance of avoiding any implications suggesting universal tobacco or alcohol consumption among refugees. Furthermore, they made recommendations on how healthy nutrition is possible despite a low budget.

Well-being Chapters.

The five chapters on psychological well-being were developed based on existing materials described below and adapted by the first author (RS) according to the recommendations from the needs assessment. They were then reviewed by psychotherapists and researchers in the field of clinical

psychology before the UAB gave feedback. The chapters consist of psychoeducation, written exercises, audio exercises, illustrations, and video testimonies from refugees.

The principal outcomes of the UAB revisions to each chapter are reported: Stress, partly inspired by the DWM self-help guide [86,87], was considered important, mainly to understand the sources, to distract from and maybe speak to someone about the experienced stress. Sleep, adapted from the content of a self-help book developed for traumatised refugees [88], includes sleep hygiene tips, body-focused exercises, and an introduction to sleep rituals. The UAB criticised using only smartphone-based exercises and recommended integrating exercises that can be carried out without a smartphone. The chapter Resources integrates planning activities, gratitude journaling, and strength activation, primarily inspired by the self-help book mentioned above [88]. It also features two sub-chapters on identifying values and staying present, derived from the DWM self-help guide (WHO, 2020). Although the UAB deemed this chapter "not very important", they expressed overall appreciation for its content and expanded the list of activities. Emotion Regulation aims to manage intense emotions using the "problem-solving therapy" by Nezu et al. [89], which was tested in an e-mental health intervention for depression [90]. The shortened and adapted version of the Sui app focuses only on the first two non-cognitive steps of "stopping" and "slowing down" before acting. It uses a traffic stoplight metaphor and presents three case examples of Sui's neighbourhood residents, whose relatable everyday life situations were appreciated by the UAB. For Chronic Pain, based on two self-help books [91,92] the UAB advised changing the psychoeducational texts divided into a shorter and longer version and rated the exercises as recommendable.

Beta Test

The results from the beta test, including the UX tests as well as the interviews are summarised in the following.

App Satisfaction.

Most of the participants used the app several times a week and said that they were motivated to use the app. The functionality and structure of the app were unanimously rated as logical and simple. However, all participants complained about slow loading times during the interview and UX test. This led to reported problems accessing content or links within the app and app crashes. Most

participants rated the illustrations as beautiful, appropriate, and compatible with the content. The illustrated protagonists were rated to be realistic, and participants could visually relate to them. Most participants rated the Arabic language as clear and understandable.

Half of the participants highlighted the chapters “Social Living”, “Housing” and “Health System” to be helpful. Some participants rated “Sleep” to be good, particularly the exercises for falling asleep. However, some rated the included sleep hygiene tips to be superficial. Additionally, “Stress” and “Chronic Pain” were perceived as useful. Most participants appreciated the audio exercises, while a few had not used them. Some participants wished for more links, concrete realisation examples or more socio-structural chapters, e.g., on drugs, forced marriage or old-age and survivors’ insurance.

Satisfaction With Peer Support.

Concerning peer support, a fast response rate in the chat was desired (6-72 hours). The messages should be formulated professionally but also in an everyday language and adapted to the user. Support was also wished for technical issues. Some said that they would like to know some basic facts about the peer (e.g., age, country of origin, length of time in Switzerland) to be sure that they speak with a human and not with a computer. Having a peer companion was reported to enhance to motivation to use the app.

The test peers agreed that a one-week response time was too long and should be shortened. They reported that, particularly for technical inquiries, they would suggest a response time of 48 hours. They stated that they would have preferred to write the messages more individually, and text templates use should be reduced, to provide the feeling of being a real person instead of automatic answers. The prior training was valued by both peers and rated to be important as a preparation. Additionally, both agreed that continuous supervision and feedback on their work was important to seek help and reduce fears. Both highlighted that their messages motivated the users to use the app.

Final Adjustments.

Final adjustments on technical features and content were applied according to these beta test results before releasing a version for the RCT. Loading times were improved, and the introductory chapter was expanded with explanations of features that were not self-explanatory (e.g., explanation of

the chat, the categories “Information” and “Well-being”, and the “Audio Exercises” chapter). For the peer concept, the peers’ general response time was reduced to 48 hours and more intensive support for the peers regarding questions was introduced. The text templates were not reduced but rather complemented and rephrased to sound less “robotic”, as they were to remain standardised for comparability in the trial. The peers’ first messages will provide a more personal yet anonymous introduction, and peers will include their observations from the user behaviour monitoring in their messages. Figure 2 displays screenshots of the final product.

Figure 2.
Screenshots of the final Sui app in German and Arabic

Discussion

Principal Results

Based on user-centred and participatory methodologies, we iteratively developed a digital psychosocial support service tailored for asylum seekers and refugees newly arrived in Switzerland. Engagement with various relevant stakeholder groups helped us to deeply understand the needs and

preferences of our target group. We considered cultural and contextual nuances relevant to asylum-related everyday life and focused in particular on people from Arabic-speaking backgrounds to test a first version in Arabic language. For this purpose, we aligned with the RECAPT framework and documented the process accordingly [59]. An abbreviated version of the detailed decision process and description of the final product, the Sui app, can be found in the supplementary materials. The development and adaptation process included three phases (preparation, development, and finalisation).

During the preparation phase, it became clear that to reach the diverse refugee population, our service needs to incorporate both psychological and socio-structural factors. Additionally, the expected potential of a digital service helping to bridge care gaps for marginalised groups was favourably evaluated. To our knowledge, this is the first study that includes practical information on asylum-related everyday challenges in a digital mental health intervention.

For the second phase, i.e., the development of technology and content, an iterative process included co-working with professionals and advisory groups. While the engagement of various stakeholders provided valuable insights, it demanded significant organisational, financial, and temporal resources. During the beta test, an initial draft version of the app was evaluated. Participants generally found the content helpful and the design appealing, although technical malfunctions hindered deeper insights into user-app interactions. The final version was prepared for testing in an RCT, with continuous bug fixing and minor adjustments to content and structure on-the-fly.

Lessons Learned

Concerning language, we learned that an elaborate process involving various linguistic experts to achieve a correct but simple Arabic version was crucial for the UAB to focus on the content itself.

The UAB meetings became more productive with repetition until we had a well-regulated process in the final meetings, where all members could work at their own pace and were still heard. We therefore recommend scheduling regular meetings with consistent time intervals and standardised agendas, ensuring that participants become familiar with the process. This facilitates efficient meetings with realistic expectations.

Software development is often associated with unexpected technical challenges, for which we recommend allowing sufficient time for testing, and planning enough budget for customisation and maintenance, as well as a sensible reduction in the complexity of features and processes.

Limitations

Various limitations of this study have to be considered. First, the focus of the participatory approach was placed on the development of the service, whereby the science-specific parts were not involved. These would have included the understanding of study information, the self-assessments, or the recruitment materials.

In the preparation phase, only four representatives of the target group were interviewed. As a result, we only had a limited subjective view of refugees at the beginning. During the development phase, some of the chapters were discussed multiple times with the UAB, whereas other chapters were only revised once due to time limitations.

Another limitation was that in initial UAB meetings, discussions were translated simultaneously, which led to a fragmented flow of conversation and, thereby, frustration among the participants. This process was changed as soon as concrete drafts of the content chapters were available. From then on, discussions were held in smaller groups, in Arabic or Kurdish, and each group presented the main discussion points and remarks in summary. The documentation of the discussions was, therefore, limited to these summaries in the end.

Additionally, the beta test faced technical malfunctions, including long loading times and non-functional push notifications, such as those intended to indicate new messages from the test peer. Given a tight time plan, these difficulties could not be resolved in advance, significantly affecting the beta test results, as participants struggled to engage with the app's content.

These limitations could have led to a bias in several interpretations and decisions made during the development process.

Conclusions

Being forced to move to a new country comes with challenges on various levels that affect almost every individual. The lack of support is not only limited to psychological treatment but also

socio-structural help. Using digital and task-shifting approaches can be promising in addressing this care gap by providing low-threshold support with trained peers to more people affected.

This study documented the elaborated adaptation and development process of the Sui app. Detailed and transparent documentation can facilitate accurate comparison regarding the extent and specifics of contextually and culturally adapted interventions.

In a subsequent 3-armed RCT the effectiveness of the Sui app will be tested with Arabic-speaking migrants who have recently arrived in Switzerland. Two active study groups (app standalone, app with peer support) are compared to a waitlist control group.

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The project around the Sui app is multidisciplinary and has included multiple stakeholders who have essentially contributed to the development of the app and the subsequent RCT.

The authors variably contributed to this study, conducting the desk review (MA), creating or editing content for the app (RS, TB, VZ, MA, FH, EH), participating in discussion and decision-making processes (RS, TB, MA, VZ, FH, MH, EH), and executing the beta test and analysis (MH, BJF). We had a very fruitful technological collaboration in which we were able to draw on extensive expertise in the field and were continuously supported with patience (SB, JW, CK) to make technological decisions (MH, RS).

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Conflicts of Interest

None declared.

Abbreviations

ADAPT: Adaptation and Development after Persecution and Trauma

AE: Asylum Experts

HIC: Higher Income Country

ICI: Intercultural Interpreters

LMIC: Low- and Middle-Income Country

MHPSS: Mental Health and Psychosocial Support Services

PMLD: Post-Migration Living Difficulty

PTSD: Posttraumatic Stress Disorder

RCT: Randomized Controlled Trial

RECAPT: Reporting Cultural Adaptation in Psychological Trials

SFH: Swiss Refugee Council

SRC: Swiss Red Cross

TGI: Target Group Interviewees

UAB: User Advisory Board

UX: User Experience

WHO: World Health Organization

Multimedia Appendix 1

Supplementary material.

References

1. United Nations High Commissioner for Refugees U. Global Trends. Forced displacement in 2022. 2023. Available from: https://www.unhcr.org/global-trends-report-2022

2. Sijbrandij M, Acarturk C, Bird M, Bryant RA, Burchert S, Carswell K, de Jong J, Dinesen C, Dawson KS, El Chammay R, van Ittersum L, Jordans M, Knaevelsrud C, McDaid D, Miller K, Morina N, Park A-L, Roberts B, van Son Y, Sondorp E, Pfaltz MC, Ruttenberg L, Schick M, Schnyder U, van Ommeren M, Ventevogel P, Weissbecker I, Weitz E, Wiedemann N, Whitney C, Cuijpers P. Strengthening mental health care systems for Syrian refugees in Europe and the Middle East: integrating scalable psychological interventions in eight countries. European Journal of Psychotraumatology 2017 Nov 24;8(sup2):1388102. doi: 10.1080/20008198.2017.1388102

3. Blackmore R, Boyle JA, Fazel M, Ranasinha S, Gray KM, Fitzgerald G, Misso M, Gibson-Helm M. The prevalence of mental illness in refugees and asylum seekers: A systematic review and meta-analysis. Spiegel P, editor. PLoS Med 2020 Sep 21;17(9):e1003337. doi: 10.1371/journal.pmed.1003337

4. Henkelmann J-R, De Best S, Deckers C, Jensen K, Shahab M, Elzinga B, Molendijk M. Anxiety, depression and post-traumatic stress disorder in refugees resettling in high-income countries: systematic review and meta-analysis. BJPsych open 2020 Jul;6(4):e68. doi: 10.1192/bjo.2020.54

5. Hoell A, Kourmpeli E, Salize HJ, Heinz A, Padberg F, Habel U, Kamp-Becker I, Höhne E, Böge K, Bajbouj M. Prevalence of depressive symptoms and symptoms of post-traumatic stress disorder among newly arrived refugees and asylum seekers in Germany: systematic review and meta-analysis. BJPsych open 2021 May;7(3):e93. doi: 10.1192/bjo.2021.54

6. Nesterko Y, Jäckle D, Friedrich M, Holzapfel L, Glaesmer H. Prevalence of post-traumatic stress disorder, depression and somatisation in recently arrived refugees in Germany: an epidemiological study. Epidemiol Psychiatr Sci 2020;29:e40. doi: 10.1017/S2045796019000325

7. Patanè M, Ghane S, Karyotaki E, Cuijpers P, Schoonmade L, Tarsitani L, Sijbrandij M. Prevalence of mental disorders in refugees and asylum seekers: a systematic review and meta-analysis. Glob Ment Health 2022;9:250–263. doi: 10.1017/gmh.2022.29

8. Turrini G, Purgato M, Ballette F, Nosè M, Ostuzzi G, Barbui C. Common mental disorders in

asylum seekers and refugees: umbrella review of prevalence and intervention studies. Int J Ment Health Syst 2017 Dec;11(1):51. doi: 10.1186/s13033-017-0156-0

9. Al-Smadi AM, Tawalbeh LI, Gammoh OS, Ashour AF, Alshraifeen A, Gougazeh YM. Anxiety, stress, and quality of life among Iraqi refugees in Jordan: A cross sectional survey: Quality of life among refugees. Nursing & Health Sciences 2017 Mar;19(1):100–104. doi: 10.1111/nhs.12323

10. Leiler A, Bjärtå A, Ekdahl J, Wasteson E. Mental health and quality of life among asylum seekers and refugees living in refugee housing facilities in Sweden. Soc Psychiatry Psychiatr Epidemiol 2019 May;54(5):543–551. doi: 10.1007/s00127-018-1651-6

11. Mesa-Vieira C, Haas AD, Buitrago-Garcia D, Roa-Diaz ZM, Minder B, Gamba M, Salvador D, Gomez D, Lewis M, Gonzalez-Jaramillo WC, Pahud de Mortanges A, Buttia C, Muka T, Trujillo N, Franco OH. Mental health of migrants with pre-migration exposure to armed conflict: a systematic review and meta-analysis. The Lancet Public Health 2022 May;7(5):e469–e481. doi: 10.1016/S2468-2667(22)00061-5

12. Giacco D. Identifying the critical time points for mental health of asylum seekers and refugees in high-income countries. Epidemiol Psychiatr Sci 2020;29:e61. doi: 10.1017/S204579601900057X

13. Aragona M, Pucci D, Mazzetti M, Geraci S. Post-migration living difficulties as a significant risk factor for PTSD in immigrants: a primary care study. Italian Journal of Public Health 2012 Sep 13;9(3). doi: 10.2427/7525

14. Carswell K, Blackburn P, Barker C. The Relationship Between Trauma, Post-Migration Problems and the Psychological Well-Being of Refugees and Asylum Seekers. Int J Soc Psychiatry 2011 Mar;57(2):107–119. doi: 10.1177/0020764009105699

15. Kaltenbach E, Schauer M, Hermenau K, Elbert T, Schalinski I. Course of Mental Health in Refugees—A One Year Panel Survey. Front Psychiatry 2018 Aug 3;9:352. doi: 10.3389/fpsyt.2018.00352

16. Silove D. The ADAPT model: a conceptual framework for mental health and psychosocial programming in post conflict settings. 2013;11(3):12.

17. Chen W, Hall BJ, Ling L, Renzaho AM. Pre-migration and post-migration factors associated with mental health in humanitarian migrants in Australia and the moderation effect of post-migration

stressors: findings from the first wave data of the BNLA cohort study. The Lancet Psychiatry 2017 Mar;4(3):218–229. doi: 10.1016/S2215-0366(17)30032-9

18. Drescher A, Kiselev N, Akhtar A, Acarturk C, Bryant RA, Ilkkursun Z, von Känel R, Miller KE, Pfaltz MC, Schick M, Schnyder U, Sijbrandij M, Spaaij J, Morina N. Problems after flight: understanding and comparing Syrians' perspectives in the Middle East and Europe. BMC Public Health 2021 Dec;21(1):717. doi: 10.1186/s12889-021-10498-1

19. Gorst-Unsworth C, Goldenberg E. Psychological sequelae of torture and organised violence suffered by refugees from Iraq: Trauma-related factors compared with social factors in exile. Br J Psychiatry 1998 Jan;172(1):90–94. doi: 10.1192/bjp.172.1.90

20. Hajak VL, Sardana S, Verdeli H, Grimm S. A Systematic Review of Factors Affecting Mental Health and Well-Being of Asylum Seekers and Refugees in Germany. Front Psychiatry 2021 Mar 18;12:643704. doi: 10.3389/fpsyt.2021.643704

21. Schick M, Zumwald A, Knöpfli B, Nickerson A, Bryant RA, Schnyder U, Müller J, Morina N. Challenging future, challenging past: the relationship of social integration and psychological impairment in traumatized refugees. European Journal of Psychotraumatology 2016 Dec;7(1):28057. doi: 10.3402/ejpt.v7.28057

22. Schweitzer RD, Brough M, Vromans L, Asic-Kobe M. Mental Health of Newly Arrived Burmese Refugees in Australia: Contributions of Pre-Migration and Post-Migration Experience. Aust N Z J Psychiatry 2011 Apr;45(4):299–307. doi: 10.3109/00048674.2010.543412

23. Gleeson C, Frost R, Sherwood L, Shevlin M, Hyland P, Halpin R, Murphy J, Silove D. Post-migration factors and mental health outcomes in asylum-seeking and refugee populations: a systematic review. European Journal of Psychotraumatology 2020 Dec 31;11(1):1793567. doi: 10.1080/20008198.2020.1793567

24. Jannesari S. Post-migration Social–Environmental Factors Associated with Mental Health Problems Among Asylum Seekers: A Systematic Review. Journal of Immigrant and Minority Health 2020;10.

25. Miller KE, Rasmussen A. War exposure, daily stressors, and mental health in conflict and post-conflict settings: Bridging the divide between trauma-focused and psychosocial frameworks. Social

Science & Medicine 2010 Jan;70(1):7–16. doi: 10.1016/j.socscimed.2009.09.029

26. Fuhr DC, Acarturk C, McGrath M, Ilkkursun Z, Sondorp E, Sijbrandij M, Ventevogel P, Cuijpers P, McKee M, Roberts B. Treatment gap and mental health service use among Syrian refugees in Sultanbeyli, Istanbul: a cross-sectional survey. Epidemiol Psychiatr Sci 2020;29:e70. doi: 10.1017/S2045796019000660

27. Satinsky E, Fuhr DC, Woodward A, Sondorp E, Roberts B. Mental health care utilisation and access among refugees and asylum seekers in Europe: A systematic review. Health Policy 2019 Sep;123(9):851–863. doi: 10.1016/j.healthpol.2019.02.007

28. Maier T, Schmidt M, Julia M. Mental health and healthcare utilization in adult asylum seekers. Swiss Med Wkly 2010 Nov 19; doi: 10.4414/smw.2010.13110

29. Müller F, Roose Z, Landis F, Gianola G. Psychische Gesundheit von traumatisierten Asylsuchenden: Situationsanalyse und Empfehlungen. 2018 Jun.

30. Höglinger D, Rudin M, Guggisberg J. Analyse zu den Auswirkungen der Reduktion der Fallbelastung in der Sozialberatung der Stadt Winterthur. 2021;1–73.

31. Eser Davolio M, Strohmeier Navarro Smith R, Gehrig M. Auswirkungen der Falllastreduktion in der Sozialhilfe auf Ablösequote und Fallkosten : Entschleunigung zahlt sich aus. Schweizerische Gesellschaft für Soziale Arbeit; 2019; doi: 10.5169/SEALS-855356

32. Oetterli M, Niederhauser A, Pluess S. Kurzbericht zuhanden des Bundesamts für Migration BFM. 2013;25.

33. Bartolomei J, Baeriswyl-Cottin R, Framorando D, Kasina F, Premand N, Eytan A, Khazaal Y. What are the barriers to access to mental healthcare and the primary needs of asylum seekers? A survey of mental health caregivers and primary care workers. BMC Psychiatry 2016 Dec;16(1):16–336. doi: 10.1186/s12888-016-1048-6

34. Kiselev N. Barriers to access to outpatient mental health care for refugees and asylum seekers in Switzerland: the therapist's view. 2020;14.

35. Shannon PJ, Wieling E, Simmelink-McCleary J, Becher E. Beyond Stigma: Barriers to Discussing Mental Health in Refugee Populations. Journal of Loss and Trauma 2015 May 4;20(3). doi: 10.1080/15325024.2014.934629

36. Schick M, Morina N, Mistridis P, Schnyder U, Bryant RA, Nickerson A. Changes in Post-migration Living Difficulties Predict Treatment Outcome in Traumatized Refugees. Front Psychiatry 2018 Oct 9;9:476. doi: 10.3389/fpsyt.2018.00476

37. De Graaff AM, Cuijpers P, Twisk JWR, Kieft B, Hunaidy S, Elsawy M, Gorgis N, Bouman TK, Lommen MJJ, Acarturk C, Bryant R, Burchert S, Dawson KS, Fuhr DC, Hansen P, Jordans M, Knaevelsrud C, McDaid D, Morina N, Moergeli H, Park A-L, Roberts B, Ventevogel P, Wiedemann N, Woodward A, Sijbrandij M. Peer-provided psychological intervention for Syrian refugees: results of a randomised controlled trial on the effectiveness of Problem Management Plus. BMJ Ment Health 2023 Feb;26(1):e300637. doi: 10.1136/bmjment-2022-300637

38. Spaaij J, De Graaff AM, Akhtar A, Kiselev N, McDaid D, Moergeli H, Pfaltz MC, Schick M, Schnyder U, Bryant RA, Cuijpers P, Sijbrandij M, Morina N. The effect of a low-level psychological intervention (PM+) on post-migration living difficulties – Results from two studies in Switzerland and in the Netherlands. Comprehensive Psychiatry 2023 Nov;127:152421. doi: 10.1016/j.comppsych.2023.152421

39. Purgato M, Carswell K, Acarturk C, Au T, Akbai S, Anttila M, Baumgartner J, Bailey D, Biondi M, Bird M, Churchill R, Eskici S, Hansen LJ, Heron P, Ilkkursun Z, Kilian R, Koesters M, Lantta T, Nosè M, Ostuzzi G, Papola D, Popa M, Sijbrandij M, Tarsitani L, Tedeschi F, Turrini G, Uygun E, Välimäki MA, Wancata J, White R, Zanini E, Cuijpers P, Barbui C, Van Ommeren M. Effectiveness and cost-effectiveness of Self-Help Plus (SH+) for preventing mental disorders in refugees and asylum seekers in Europe and Turkey: study protocols for two randomised controlled trials. BMJ Open 2019 May;9(5):e030259. doi: 10.1136/bmjopen-2019-030259

40. Tol WA, Leku MR, Lakin DP, Carswell K, Augustinavicius J, Adaku A, Au TM, Brown FL, Bryant RA, Garcia-Moreno C, Musci RJ, Ventevogel P, White RG, van Ommeren M. Guided self-help to reduce psychological distress in South Sudanese female refugees in Uganda: a cluster randomised trial. The Lancet Global Health 2020 Feb;8(2):e254–e263. doi: 10.1016/S2214-109X(19)30504-2

41. Murray LK, Haroz E, Dorsey S, Kane J, Bolton PA, Pullmann MD. Understanding mechanisms of change: An unpacking study of the evidence-based common-elements treatment approach (CETA) in low and middle income countries. Behaviour Research and Therapy 2020 Jul;130:103430. doi:

10.1016/j.brat.2019.103430

42. Müller F, Schwegler C. Update Niederschwellige Kurzinterventionen für psychisch belastete Asylsuchende und Flüchtlinge. Aktuelle Beschreibung der Angebote zuhanden des BAG. Interface; 2021.

43. Tol WA, Le PD, Harrison SL, Galappatti A, Annan J, Baingana FK, Betancourt TS, Bizouerne C, Eaton J, Engels M, Hijazi Z, Horn RR, Jordans MJD, Kohrt BA, Koyiet P, Panter-Brick C, Pluess M, Rahman A, Silove D, Tomlinson M, Uribe-Restrepo JM, Ventevogel P, Weissbecker I, Ager A, Van Ommeren M. Mental health and psychosocial support in humanitarian settings: research priorities for 2021–30. The Lancet Global Health 2023 Apr;S2214109X23001286. doi: 10.1016/S2214-109X(23)00128-6

44. Ellis DM, Draheim AA, Anderson PL. Culturally adapted digital mental health interventions for ethnic/racial minorities: A systematic review and meta-analysis. Journal of Consulting and Clinical Psychology 2022 Oct;90(10):717–733. doi: 10.1037/ccp0000759

45. Karyotaki E, Miguel C, Panagiotopoulou OM, Harrer M, Seward N, Sijbrandij M, Araya R, Patel V, Cuijpers P. Digital Interventions for Common Mental Disorders in Low- and Middle-Income Countries: A Systematic Review and Meta-Analysis. Camb prisms Glob ment health 2023 Sep 15;1–28. doi: 10.1017/gmh.2023.50

46. Andersson G, Titov N. Advantages and limitations of Internet-based interventions for common mental disorders. World Psychiatry 2014 Feb;13(1):4–11. doi: 10.1002/wps.20083

47. Romer A, Rezzonico L, Della Torre L, Omlin E. Asylum Information Database, AIDA, Country Report: Switzerland. European Council on Refugees and Exiles (ECRE); 2022. Available from: https://asylumineurope.org/wp-content/uploads/2023/06/AIDA-CH_2022-Update.pdf

48. Alencar A, Kondova K, Ribbens W. The smartphone as a lifeline: an exploration of refugees' use of mobile communication technologies during their flight. Media, Culture & Society 2019;41(6):828–844. doi: 10.1177/0163443718813486

49. Maitland C, Xu Y. A Social Informatics Analysis of Refugee Mobile Phone Use: A Case Study of Za'atari Syrian Refugee Camp. TPRC 43: The 43rd Research Conference on Communication, Information and Internet Policy Paper SSRN Electronic Journal 2015;10. doi: 10.2139/ssrn.2588300

50. Andersson G, Titov N, Dear BF, Rozental A, Carlbring P. Internet-delivered psychological treatments: from innovation to implementation. World Psychiatry 2019 Feb;18(1):20–28. doi: 10.1002/wps.20610

51. Carlbring P, Andersson G, Cuijpers P, Riper H, Hedman-Lagerlöf E. Internet-based vs. face-to-face cognitive behavior therapy for psychiatric and somatic disorders: an updated systematic review and meta-analysis. Cognitive Behaviour Therapy 2018 Jan 2;47(1):1–18. doi: 10.1080/16506073.2017.1401115

52. Catarino A, Harper S, Malcolm R, Stainthorpe A, Warren G, Margoum M, Hooper J, Blackwell AD, Welchman AE. Economic evaluation of 27,540 patients with mood and anxiety disorders and the importance of waiting time and clinical effectiveness in mental healthcare. Nat Mental Health 2023 Aug 31;1(9):667–678. doi: 10.1038/s44220-023-00106-z

53. Muñoz RF, Bunge EL, Chen K, Schueller SM, Bravin JI, Shaughnessy EA, Pérez-Stable EJ. Massive Open Online Interventions: A Novel Model for Delivering Behavioral-Health Services Worldwide. Clinical Psychological Science 2016 Mar;4(2):194–205. doi: 10.1177/2167702615583840

54. Patel V, Saxena S, Lund C, Thornicroft G, Baingana F, Bolton P, Chisholm D, Collins PY, Cooper JL, Eaton J, Herrman H, Herzallah MM, Huang Y, Jordans MJD, Kleinman A, Medina-Mora ME, Morgan E, Niaz U, Omigbodun O, Prince M, Rahman A, Saraceno B, Sarkar BK, De Silva M, Singh I, Stein DJ, Sunkel C, UnÜtzer Jü. The Lancet Commission on global mental health and sustainable development. The Lancet 2018 Oct;392(10157):1553–1598. doi: 10.1016/S0140-6736(18)31612-X

55. Moshe I, Terhorst Y, Philippi P, Domhardt M, Cuijpers P, Cristea I, Pulkki-Råback L, Baumeister H, Sander LB. Digital interventions for the treatment of depression: A meta-analytic review. Psychological Bulletin 2021 Aug;147(8):749–786. doi: 10.1037/bul0000334

56. Musiat P, Johnson C, Atkinson M, Wilksch S, Wade T. Impact of guidance on intervention adherence in computerised interventions for mental health problems: a meta-analysis. Psychol Med 2022 Jan;52(2):229–240. doi: 10.1017/S0033291721004621

57. Baumeister H, Reichler L, Munzinger M, Lin J. The impact of guidance on Internet-based mental health interventions — A systematic review. Internet Interventions 2014 Oct;1(4):205–215. doi: 10.1016/j.invent.2014.08.003

58. Leung C, Pei J, Hudec K, Shams F, Munthali R, Vigo D. The Effects of Nonclinician Guidance on Effectiveness and Process Outcomes in Digital Mental Health Interventions: Systematic Review and Meta-analysis. J Med Internet Res 2022 Jun 15;24(6):e36004. doi: 10.2196/36004

59. Cuijpers P, Heim E, Abi Ramia J, Burchert S, Carswell K, Cornelisz I, Knaevelsrud C, Noun P, van Klaveren C, van't Hof E, Zoghbi E, van Ommeren M, El Chammay R. Effects of a WHO-guided digital health intervention for depression in Syrian refugees in Lebanon: A randomized controlled trial. Wickramage K, editor. PLoS Med 2022 Jun 23;19(6):e1004025. doi: 10.1371/journal.pmed.1004025

60. Cohen F, Yaeger L. Task-shifting for refugee mental health and psychosocial support: A scoping review of services in humanitarian settings through the lens of RE-AIM.

61. Healey P, Stager ML, Woodmass K, Dettlaff AJ, Vergara A, Janke R, Wells SJ. Cultural adaptations to augment health and mental health services: a systematic review. BMC Health Serv Res 2017 Dec;17(1):8. doi: 10.1186/s12913-016-1953-x

62. McCleary JS, Horn TL. Processes for culturally adapting behavioral health interventions for people with refugee backgrounds: A scoping review. American Journal of Community Psychology 2024;73(1–2):250–266. doi: 10.1002/ajcp.12709

63. Hall GCN, Ibaraki AY, Huang ER, Marti CN, Stice E. A Meta-Analysis of Cultural Adaptations of Psychological Interventions. Behavior Therapy 2016 Nov;47(6):993–1014. doi: 10.1016/j.beth.2016.09.005

64. Harper Shehadeh MH, Heim E, Chowdhary N, Maercker A. Cultural Adaptation of Minimally Guided Interventions for Common Mental Disorders: A Systematic Review and Meta-Analysis. JMIR MENTAL HEALTH 2016;13. doi: 10.2196/mental.5776

65. Spanhel K, Balci S, Feldhahn F, Bengel J, Baumeister H, Sander LB. Cultural adaptation of internet- and mobile-based interventions for mental disorders: a systematic review. npj Digit Med 2021 Aug 25;4(1):128. doi: 10.1038/s41746-021-00498-1

66. Cuijpers P, Karyotaki E, Reijnders M, Purgato M, Barbui C. Psychotherapies for depression in low- and middle-income countries: a meta-analysis. World Psychiatry 2018 Feb;17(1):90–101. doi: 10.1002/wps.20493

67. Bernal G, Sáez-Santiago E. Culturally centered psychosocial interventions. Journal Community

Psychology 2006 Mar;34(2):121–132. doi: 10.1002/jcop.20096

68. Heim E, Mewes R, Abi Ramia J, Glaesmer H, Hall B, Harper Shehadeh M, Ünlü B, Kananian S, Kohrt BA, Lechner-Meichsner F, Lotzin A, Moro MR, Radjack R, Salamanca-Sanabria A, Singla DR, Starck A, Sturm G, Tol W, Weise C, Knaevelsrud C. Reporting Cultural Adaptation in Psychological Trials – The RECAPT criteria. Clin Psychol Eur 2021 Nov 23;3(Special Issue):e6351. doi: 10.32872/cpe.6351

69. Heim E, Knaevelsrud C. Standardised research methods and documentation in cultural adaptation: The need, the potential and future steps. Clin Psychol Eur 2021 Nov 23;3(Special Issue):e5513. doi: 10.32872/cpe.5513

70. Resnicow K, Baranowski T, Ahluwalia J, Alam R. Cultural sensitivity in public health: Defined and demystified. Ethnicity and Disease 1999;9(1):10–21.

71. Rustage K, Crawshaw A, Majeed-Hajaj S, Deal A, Nellums L, Ciftci Y, Fuller SS, Goldsmith L, Friedland JS, Hargreaves S. Participatory approaches in the development of health interventions for migrants: a systematic review. BMJ Open 2021 Oct;11(10):e053678. doi: 10.1136/bmjopen-2021-053678

72. Cargo M, Mercer SL. The Value and Challenges of Participatory Research: Strengthening Its Practice. Annu Rev Public Health 2008 Apr 1;29(1):325–350. doi: 10.1146/annurev.publhealth.29.091307.083824

73. usability.gov. User-Centered Design Basics. Available from: https://www.usability.gov/what-and-why/user-centered-design.html

74. Greene MC, Jordans MJD, Kohrt BA, Ventevogel P, Kirmayer LJ, Hassan G, Chiumento A, Van Ommeren M, Tol WA. Addressing culture and context in humanitarian response: preparing desk reviews to inform mental health and psychosocial support. Confl Health 2017 Dec;11(1):21. doi: 10.1186/s13031-017-0123-z

75. Mayring P. Qualitative Inhaltsanalyse: Grundlagen und Techniken. 12th revised edition. Weinheim: Julius Beltz GmbH & Co. KG; 2015.

76. Interaction Design Foundation. Design Thinking (DT). 2024. Available from: https://www.interaction-design.org/literature/topics/design-

thinking#the_five_stages_of_design_thinking-6

77. Harper Shehadeh MJ, Abi Ramia J, Cuijpers P, El Chammay R, Heim E, Kheir W, Saeed K, van Ommeren M, van't Hof E, Watts S, Wenger A, Zoghbi E, Carswell K. Step-by-Step, an E-Mental Health Intervention for Depression: A Mixed Methods Pilot Study From Lebanon. Front Psychiatry 2020 Feb 12;10:986. doi: 10.3389/fpsyt.2019.00986

78. Mediavilla R, McGreevy KR, Felez-Nobrega M, Monistrol-Mula A, Bravo-Ortiz M-F, Bayón C, Rodríguez-Vega B, Nicaise P, Delaire A, Sijbrandij M, Witteveen AB, Purgato M, Barbui C, Tedeschi F, Melchior M, Van Der Waerden J, McDaid D, Park A-L, Kalisch R, Petri-Romão P, Underhill J, Bryant RA, Haro JM, Ayuso-Mateos JL, on behalf of the RESPOND Consortium. Effectiveness of a stepped-care programme of internet-based psychological interventions for healthcare workers with psychological distress: Study protocol for the RESPOND healthcare workers randomised controlled trial. DIGITAL HEALTH 2022 Jan;8:205520762211290. doi: 10.1177/20552076221129084

79. Spaaij J, Kiselev N, Berger C, Bryant RA, Cuijpers P, de Graaff AM, Fuhr DC, Hemmo M, McDaid D, Moergeli H, Park A-L, Pfaltz MC, Schick M, Schnyder U, Wenger A, Sijbrandij M, Morina N. Feasibility and acceptability of Problem Management Plus (PM+) among Syrian refugees and asylum seekers in Switzerland: a mixed-method pilot randomized controlled trial. European Journal of Psychotraumatology 2022 Jul 29;13(1):2002027. doi: 10.1080/20008198.2021.2002027

80. Seewer N, Skoko A, Käll A, Andersson G, Luhmann M, Berger T, Krieger T. Efficacy of an Internet-based self-help intervention with human guidance or automated messages to alleviate loneliness: a three-armed randomized controlled trial. Sci Rep 2024 Mar 19;14(1):6569. doi: 10.1038/s41598-024-57254-0

81. Berger T, Hämmerli K, Gubser N, Andersson G, Caspar F. Internet-Based Treatment of Depression: A Randomized Controlled Trial Comparing Guided with Unguided Self-Help. Cognitive Behaviour Therapy 2011 Dec;40(4):251–266. doi: 10.1080/16506073.2011.616531

82. Digital Research Creation Tool. Available from: https://www.ewi-psy.fu-berlin.de/psychologie/einrichtungen/cmhds/direct/index.html

83. Härle D. TSY® Traumasensitives Yoga. Available from: https://www.trauma-institut.eu

84. Härle D. Körperorientierte Traumatherapie: Sanfte Heilung mit traumasensitivem Yoga.

Junfermann; 2015.

85. Härle D. Yoga traumasensitiv unterrichten: Affektregulation, Selbstwirksamkeit und Körperwahrnehmung verbessern. Asanger; 2019.

86. Epping-Jordan JE, Harris R, Brown FL, Carswell K, Foley C, García-Moreno C, Kogan C, van Ommeren M. Self-Help Plus (SH+): a new WHO stress management package. World Psychiatry 2016 Oct;15(3):295–296. doi: 10.1002/wps.20355

87. World Health Organization. Doing what matters in times of stress: an illustrated guide. Geneva: World Health Organization; 2020. Available from: https://apps.who.int/iris/handle/10665/331901 [accessed Nov 2, 2021]ISBN:978-92-4-000391-0

88. TraumaHilfeZentrum Nürnberg e.V. Sonne für die Seele. Ein Selbsthilfebuch für traumatisierte Flüchtlinge. Informationen und Übungen, die helfen können traumatische Erfahrungen zu bewältigen. Nürnberg; 2017.

89. Nezu AM, Nezu CM, D'Zurilla TJ. Problem-solving therapy: A treatment manual. springer publishing company. 2012.

90. Bur OT, Krieger T, Moritz S, Klein JP, Berger T. Optimizing the context of support of web-based self-help in individuals with mild to moderate depressive symptoms: A randomized full factorial trial. Behaviour Research and Therapy 2022 May;152:104070. doi: 10.1016/j.brat.2022.104070

91. Haines S. Pain is really strange. Singing Dragon; 2015.

92. Wachter M von. Chronische Schmerzen: Selbsthilfe und Therapiebegleitung, Orientierung für Angehörige, konkrete Tipps und Fallbeispiele; mit Online-Material. Berlin Heidelberg: Springer; 2012. ISBN:978-3-642-19612-6

Appendix C: Article III

Stoeckli, R. T., Zoellner, V., Haji, F., Aebersold, M., Burchert, S., Wabiszczewicz, J., Knaevelsrud, C., Heim, E. & Berger, T. (2024). *Psychosocial support for Arabic-speaking refugees residing in Switzerland (Sui SRK app): a mixed-methods randomised controlled trial.* https://doi.org/10.2196/preprints.59905. [Manuscript submitted for publication].

This article was submitted to the *Journal of Migration and Health* on December 22, 2024, and was under consideration at the time of submission. The attached article is the same as the submitted version; no written changes have been made, except for few minor typos. To avoid disrupting the flow of reading, the tables are placed after the reference section Supplementary material submitted together with the manuscript has not been included in this dissertation and is available on request from the author.

Psychosocial support for Arabic-speaking refugees residing in Switzerland (Sui SRK app): a mixed-methods randomised controlled trial

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Abstract

Introduction: Refugees' quality of life (QOL) is significantly impacted by the challenging post-migration context. Digital mental health and psychosocial support (MHPSS) services offer scalable, culturally adaptable solutions. This study evaluates the Sui SRK app, which was co-developed with Arabic-speaking refugees in Switzerland to address barriers to mental healthcare and promote psychosocial well-being.

Methods: A mixed-methods randomised controlled trial assessed the app's impact on QOL and mental health outcomes among Arabic-speaking refugees in Switzerland. Participants were randomised (2:2:1) into an app-only (Sui), app with peer support (Sui+), or waitlist control (WL) group. Quantitative data were collected at baseline, post (8 weeks), and follow-up (16 weeks). Semi-structured interviews explored user experiences and areas for improvement.

Results: Intention-to-treat ($N = 170$) revealed no significant group-by-time interaction effects for QOL (e.g., Psychological: $F(2,134.67) = 1.85$, $p = .16$) or secondary outcomes at post-assessment. Small but significant interaction effects emerged at follow-up between active groups. Median app usage for was 11.84 minutes, with 95 successfully logging in. Participants expressed general satisfaction with the app. They reported diverse experiences with the app's technology, content, formats, peer support, and identified everyday needs and challenges.

Conclusions: The Sui SRK app was well-accepted among Arabic-speaking refugees in Switzerland. The holistic content, non-linear design, and inclusion of peer support provide a foundational step for digital psychosocial services. The lack of significant improvements in QOL and mental health outcomes, alongside engagement challenges, highlights the need for technical refinements and clearer guidance. Further research should refine the app and explore its potential across diverse refugee populations.

Keywords: Digital MHPSS; Quality of Life; Cultural Adaptation; Refugees; Arabic; Psychosocial

Introduction

The impact of displacement due to war or persecution on vulnerability to mental illness is well documented in the literature [1–3]. Adverse events before, during and after migration contribute to an increased incidence of psychopathological symptoms [4]. In addition, post-migration stressors, often referred to as "Post-Migration Living Difficulties" (PMLD), are highly prevalent among refugees. In Switzerland, these most commonly include difficulties with employment, government regulations, housing, education, finances and language [5,6]. PMLDs can also include worries about family back home, isolation or concerns about not having access to the health system [7]. PMLDs have a negative impact on mental health, either directly [8–10] or by disrupting interdependent psychosocial pillars necessary for recovery and resilience.

These pillars are outlined in the Adaptation and Development after Persecution and Trauma (ADAPT) model by Silove et al. [11] and defined as safety/security, bonds/networks, justice, roles/identity, and existential meaning. They have been described to provide a holistic view of what is needed to comprehensively support conflict-affected populations. Quality of life (QOL) is another holistic concept that links past experiences, ongoing psychosocial challenges and health. The World Health Organization (WHO) defines QOL using a multidimensional approach, categorizing it into physical, psychological, social, and environmental [12,13]. The concept includes mental health but also takes the individual's current living context into account.

QOL has been reported to be lower among refugees in low-, middle- and high-income countries compared to the general population [14–17]. Social factors have been shown to be strongly associated with health-related QOL [18–21]. Unemployment and the presence of very few family members predicted poorer QOL in a study with Iraqi refugees in Jordan [22]. Psychopathology, such as anxiety, has also been reported to predict lower QOL [22] or to be associated with lower QOL [17,23]. Stressors specific to the post-migration context further mediate the association between potentially traumatic events and QOL [24].

Given the significant vulnerability to mental health issues and associated socio-structural challenges commonly observed in post-migration contexts, it is essential to broaden the reach of

mental healthcare services to wider population of people in need [3,25]. Mental Health and Psychosocial Support (MHPSS) reflects a comprehensive approach, addressing both mental health disorders – such as trauma-related conditions – and psychosocial challenges linked to cultural and contextual factors [26,27]. Low-threshold psychosocial support, a key component of MHPSS, is designed to be accessible and inclusive, targeting diverse population with both basic and focused interventions. As outlined by the International Federation of the Red Cross (IFRC) Reference Centre for Psychosocial Support (2020), such services aim to promote positive mental health, enhance psychosocial wellbeing, and provide prevention activities. Regarding traditional mental healthcare research with Syrian refugees in Switzerland revealed several structural and sociocultural access barriers, underscoring the limitations of specialised treatments in meeting the needs of diverse populations [29].

Digital interventions, with their potential for adaptability, scalability, effectiveness, and accessibility, represent an innovative approach to supporting individuals in need, particularly those who may encounter obstacles to in-person services [30]. Studies indicate that app-supported smartphone interventions are generally effective in improving QOL [31]. Promising results were also reported in improving QOL among refugees [32], and in enhancing access to services [30]. Furthermore, the widespread use of digital devices within refugee communities indicates that technology-based interventions are viable and practical [33].

A common challenge with digital interventions is low adherence, with many users disengaging before completing the program [34]. Research shows that interventions with human support achieve higher adherence rates [35] and better outcomes [36]. Providing human support to refugees presents unique challenges, as facilitators need to speak the refugees' native languages and understand their life situation. A potential solution to this barrier is task-shifting, such as peer support, where trained non-specialists with similar backgrounds or experiences provide additional support to complement the intervention. This approach has been successfully tested in face-to-face interventions [3] and digital mental health interventions [37] with refugees and asylum seekers, although adherence still remains a challenge.

Given the low QOL and significant mental healthcare barriers encountered by numerous refugees, this study introduces the "Sui SRK app" (Selfhelp, Support, Information, Swiss Red Cross) as a digital MHPSS service designed to provide accessible, culturally sensitive psychosocial support. The objective of this study is to evaluate the app's impact on QOL and mental health outcomes among Arabic-speaking refugees in Switzerland, both with and without additional peer support. Furthermore, the study assesses the app's acceptability and explores modifications for the use in a future version. To our knowledge, no digital intervention or service has been evaluated that combines specific, country-relevant information with low-threshold psychological support. Such an approach represents not only a crucial advancement in providing accessible, culture-sensitive services tailored to the living context of refugees, but also contributes to the limited body of evidence on psychosocial support.

Materials and methods

Study design

This mixed-methods study was a parallel three-arm randomised controlled trial (RCT). Participants were randomly assigned to one of three groups: (1) Sui: app access only, (2) Sui+: app access with weekly peer support, and (3) WL: waitlist control group with delayed app access. The primary outcome was assessed at 8 weeks (post-treatment) and participants were followed up to 16 weeks. Participants were invited to join an optional qualitative telephone interview to reflect on their experience with the app.

This study was preregistered on clinicaltrials.gov (NCT05651737) and conducted in accordance with the Declaration of Helsinki. It was approved by the Cantonal Ethics Committee of Bern (CEC; ID: 2022-00607). Participants paper signed an informed consent before entering the study.

Study groups: Sui, Sui+, and waitlist

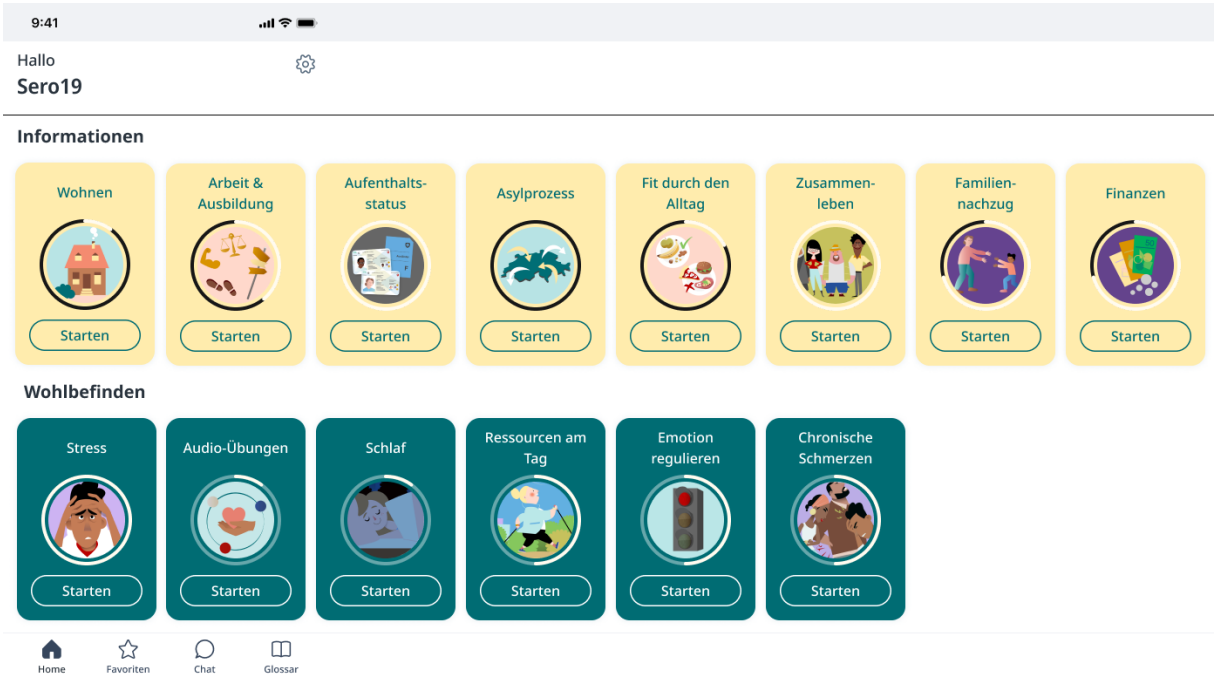
The Sui app was co-developed bottom-up in a participatory process with experts and representatives of the target group, as described in detail by Stoeckli et al. [41, preprint]. The documentation follows the cultural adaptation framework of Heim et al. [39]. The app contains four introductory general chapters, nine chapters with practical information about life in Switzerland and five chapters on psychological well-being, featuring psychoeducation, coping skills, and exercises (see

Figure 1). It offers content in various formats (text, videos, audio, illustrations) and is designed for non-linear access, as needed.

The Sui+ group received weekly personalised support messages in Arabic from a peer via in-app chat. They were written based on templates and focused on promoting well-being. Peers guided their assigned users through the app, suggested relevant exercises, and referred to chapters in the app for specific concerns, and answered questions within 48 hours. The Sui group used the app without support. Participants in both active groups received automatic push notification reminders after 5 and 10 days of inactivity. The WL received delayed access to the Sui app without support 8 weeks after randomisation.

Figure 1

Sui SRK app's two main chapters: Information: Housing, Work & Education, Residence status, Asylum process, Health promotion, Social living, Family reunification, finances; Well-being: Stress, Audio exercises, Sleep, Resources, Emotion regulation, Chronic pain



Sample size and power

The sample size was determined a priori using G*Power 3 [40] to detect a small-to-medium effect ($f = 0.15$) between the active groups and a medium effect ($f = 0.25$) between the active groups and the WL on the primary outcome (QOL) at the post-assessment. We assumed a correlation of $r = 0.5$ and power of 0.80. This required a minimum of 60 participants per active group and 30

participants for the WL, totalling 150 participants. For qualitative data collection, it was decided to interview everyone willing to participate.

Recruitment, selection of participants and procedure

Recruitment occurred between October 2022 and November 2023, using flyers and posters, snowball sampling, social media, personal networks, and visits to cantonal asylum centres with the help of an Arabic-speaking translator.

After registering online and providing signed consent, participants completed a baseline self-assessment via an emailed link. Inclusion criteria: Participants had to be 18 years or older, speak Arabic as a native or secondary language, have sufficient Arabic literacy, reside in Switzerland for 5 years or less, and have access to a smartphone and the internet. Participants were excluded if they indicated acute suicide risk (PHQ-9 suicide item) or reported a diagnosis of psychosis or bipolar disorder.

If eligible, participants were block-randomised into one of three groups (1) Sui, (2) Sui+, or (3) WL, using a 2:2:1 concealed allocation ratio. Randomisation was implemented via the data collection and management capture tool REDcap [41]. Immediate app access information was provided to participants in the active groups, with the Sui+ group receiving their first peer support message within two days. Each participant received two subsequent links to self-assessments: one after 8 weeks (post-assessment) and another after 16 weeks (follow-up). They were remunerated with a 20-franc supermarket voucher for each completed assessment up to a maximum of 60 Swiss francs.

In the post assessment (active groups), and in the follow-up assessment (WL), participants were asked if they wished to participate in the qualitative interview. Interview appointments were scheduled 2-9 weeks after participants expressed their interest. No additional incentives were offered for interview participation.

Quantitative measures

Sociodemographic variables (e.g., gender, age, nationality, and education level), along with religious affiliation and activity, chronic illness, lifetime diagnosis of bipolar affective or psychotic disorder, and recruitment source, were self-assessed in the questionnaire at baseline. At all three

timepoints other socio-demographic variables (e.g. employment status, living situation, marital status) were self-reported.

Primary outcomes

The primary outcome was QOL, measured using the 24-item WHOQOL-BREF questionnaire [12,13], with the validated Arabic version [42]. Items are categorised into four domains: physical health (7 items), psychological health (6 items), social relationships (3 items), and environment (8 items). Items for physical health contain questions about pain, energy, sleep, mobility, activities, medication, and work. Psychological health items cover positive feelings, thinking, self-esteem, body image, negative feelings, and spirituality. Social items query satisfaction with current relationships, perception of support, and sex life, with response to the last item being optional. Environment items cover questions about safety, housing, finances, services, information accessibility, natural environment, and transportation possibilities. Items are rated on a five-point Likert scale from 1-5. Scores are transformed to a 4-20 scale for each domain, with higher scores reflecting a better QOL. An overall score is not recommended by the WHO [13].

Secondary outcomes

Secondary outcomes included depression, anxiety, posttraumatic, and somatic symptoms, as well as post-migration living difficulties (PMLD) and self-stigmatization.

Depressive symptoms were measured with the 9-item Patient Health Questionnaire (PHQ) module 9 (PHQ-9, [43], validated Arabic version [44]). Anxiety symptoms were assessed with the 7-item Generalised Anxiety Disorder-7 (GAD-7, [45], validated Arabic version [44]). Posttraumatic symptoms were assessed with the Posttraumatic Stress Disorder Checklist (PCL-5) (validated Arabic [46], shortened validated 8-item version [47]). Somatic symptoms were measured with the PHQ-15 [48] (validated Arabic version [49]). PMLDs were evaluated using the PMLD-Checklist (CL) [50], adapted for Switzerland and translated to Arabic by Schick et al. (2016). Self-stigma was measured with two sections of the Self-Stigma of Mental Illness Scale Shortform (SSMIS-SF, [51]) assessing stereotype awareness and agreement with each five items (Arabic translation from another self-help app study [52]).

Further quantitative measures

The client satisfaction questionnaire (CSQ-8, [53]), which was adapted to the Sui app and translated to Arabic by the study team's translator (FH), was assessed 8 weeks after app access. App usage was measured by timestamps from each app use, providing information about the intensity of app usage during the 8-week active study phase.

Qualitative measures

For qualitative data, semi-structured telephone interviews were conducted in English, in German, or with simultaneous Arabic-German translation. Aim of the interviews was to gather feedback on user experience, suggestions for improvement, and current needs. After 12 interviews, the first guide was adapted to a shorter second version. The second version took into account the participant's app usage time and their answers to the satisfaction questionnaire (see Appendix A.1 and A.2 for interview guides). All interviews were conducted by psychology master's students.

Analyses

Quantitative Analyses

As per the intention-to-treat (ITT) principle, we included all randomised participants in the analyses. For the primary analysis, we utilised the lmer function from the lme4 package [54] in R (version 4.4.1) to conduct linear mixed models with restricted maximum likelihood estimation, evaluating changes in the primary and secondary outcome variables between the baseline and post-assessment. The fixed effects included timepoint (baseline, post), study group (Sui, Sui+, waitlist) and their interaction. The same model was used to assess the effects on the secondary outcome measures. The follow-up analyses included the third timepoint (follow-up) data excluded the WL group data, as they gained access to the app after the post-assessment.

To evaluate group differences at baseline, we used ANOVAs for continuous data and Chi-squared tests for nominal data. At post-assessment we examined differences between the active groups for satisfaction and app usage time. Where relevant assumptions for the respective tests were violated (e.g., normality), we conducted non-parametric tests such as Fisher's Exact Test, Kruskal-Wallis Test or Wilcoxon Rank-Sum Test.

Qualitative Analyses

Qualitative analyses followed Mayring's [55] summarising content analysis for its rules-based approach and allowing for the integration of quantitative elements. Interviews were inductively coded from simplified transcripts to reduce texts with equal meaning into categories. After coding four interviews, the coding team refined the categories and then continuously updated them as new codes emerged. Subsequently, all categories were clustered into main categories. All interviews were revised in the end using the final category system to check compliance. The coding team included three master's students in psychology (who also conducted the interviews) and this article's first author RS, a PhD student in clinical psychology.

Results

Sample

Participant flow of the study is displayed in Figure 2. The final sample size was 170, 68 per active group, 34 in the WL. The sample consisted of 95 males (55.9%), 74 females (43.5%), and one non-binary individual (0.6%). The age range was between 18 and 63 years, with a mean age of M = 32.88 (SD = 9.52). The most effective recruitment strategy was visits to asylum centres, accounting for 58 participants (34.1%), followed by 48 participants (28.2%) who heard about the study through friends, 35 (20.6%) through social media, 14 (8.2%) via flyers or posters, 10 (5.9%) through professional referrals, and 5 (2.9%) by other means. Participants primarily came from German-speaking (78.2%), followed by French-speaking (21.2%), and Italian-speaking (0.6%) Switzerland.

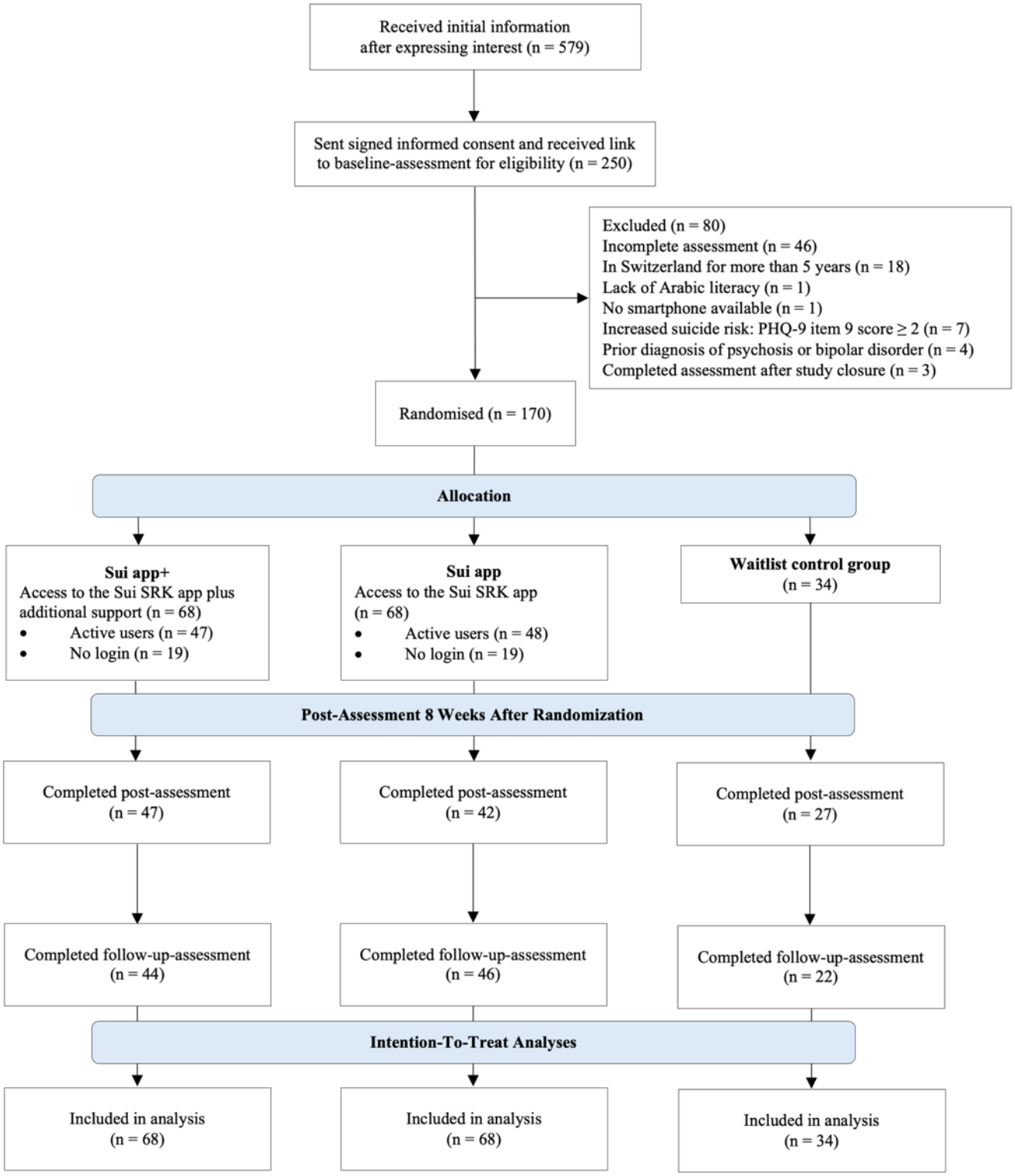
A total of 58 participants volunteered for the interviews. Of these, 11 could not be reached and 6 were solely contacted for questions about logging into the app because they had not logged in. The final sample included 41 participants (23 males, 18 females) from ten different countries with a majority from Syria (n = 27). The average age across participants was M = 36.22, SD = 9.58. Most of the interviews were conducted in Arabic with German translation, two were held in German and one in English. Duration was 50-75 minutes for the first 12 and 15-36 minutes for the remaining 29 interviews. Group distribution included 19 participants from Sui+ (7 of whom were non-responsive to support messages), 17 from Sui, and 5 from the WL. Information on individual age, app usage, gender, and study group is displayed in Appendix D.2.

Baseline comparisons

There were no between-group differences for most of the demographic characteristics at baseline Table 1, except for differences in employment. There were no baseline between-group differences on the primary or secondary outcomes, except for the psychological domain of QOL (χ^2 (2) = 8.76, p = 0.01) (for details see Appendix B).

Figure 2

Participants' study flow



Study dropout analysis

Data for the primary outcome were missing for 54 participants at post-assessment (31.8%, Sui+, $n = 47$; Sui, $n = 42$; WL, $n = 27$) and for 58 participants at follow-up (34.1%, Sui+, $n = 44$; Sui, $n = 46$; WL, $n = 22$), classifying them as "non-completers" regarding study completion. Completers were older ($M = 33.9$ $SD = 9.67$) than non-completers ($M = 30.6$ $SD = 8.85$; W = 3792, $p = .027$). A higher percentage of males dropped out (χ^2 (1) = 4.175, $p = .04$). Furthermore, there was a significant relation between residence status and completion (χ^2 (5) = 11.17, p .048) and living situation and completion (χ^2 (3) = 8.85, p .03), though pairwise comparisons revealed no significant differences (all adjusted p-values > .05).

No differences were found in psychotherapy attendance, nationality, religion, religiousness, time in Switzerland, education level, marital status, or job situation between completers and non-completers. They did not differ on the primary and most of the secondary outcomes at baseline. A significant difference was found only for the stigma awareness outcome (SSMIS-SF section 1), with completers scoring higher at baseline than non-completers (W = 3729.5, $p = 0.03$).

Effects on the primary and secondary outcomes

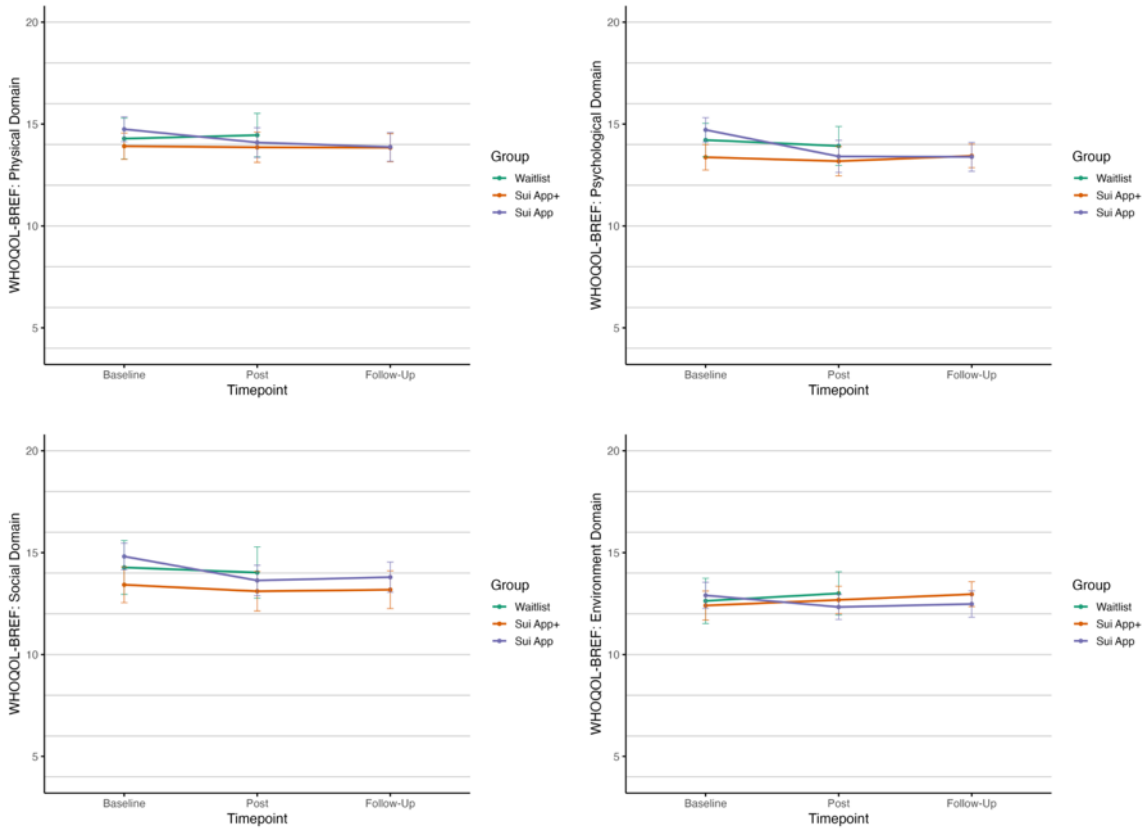
Baseline and 8-week post-assessment means for all four domains of the WHOQOL-BREF, across the two active groups (Sui+ and Sui) and the WL, are displayed in Figure 3. Since the WL gained access to the app after post-assessment, the 16-week follow-up means are not controlled and therefore not displayed.

Table 2 presents observed means for baseline, post-assessment (including estimated means), and follow-up. Effect sizes for within- and between-group differences and overall effects of the group-by-time interaction are also displayed in Table 2. No significant group-by-time interaction effects were found for any of the linear mixed models at the 8-week post-assessment for primary or secondary outcomes (p-values > 0.05; see Appendix C for the complete outcome table across all three timepoints). For the two active groups only, the linear mixed model showed a statistically significant group-by-time interaction effect on the psychological domain of QOL, $F(2,193.47) = 5.06$, $p = .01$ at 16-week follow-up with an effect size of Cohen's $d = 0.02$. Similarly, for SSMIS-SF stigma

agreement, the model yielded a significant effect at 16-week follow-up, $F(2, 192.9) = 3.50$, $p = .03$ (*Cohen's d* = 0.12).

Figure 3

Observed means of the WHOQOL-BREF questionnaire domains at baseline, post and follow-up timepoints, with 95% confidence intervals. Follow-up mean for the waitlist group is not displayed as it was not controlled



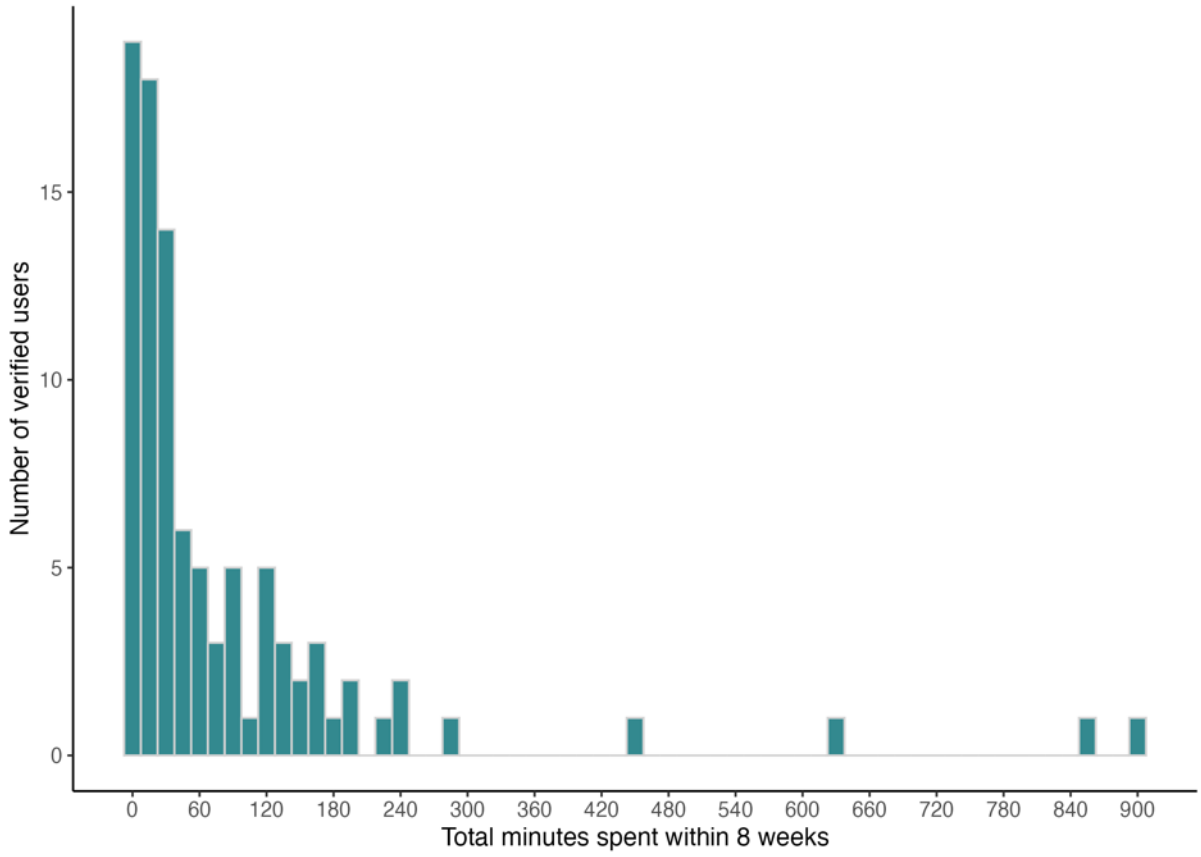
App usage

Data were unavailable for three participants (2.2%) because they deleted their accounts prior to the study end. For all 136 active group participants, the median usage time after 8 weeks was 11.84 minutes. The mean time spent in the app did not differ between the Sui+ ($M = 89.95$, $SD = 174.72$) and Sui group ($M = 32.29$, $SD = 56.22$) ($W = 2698.5$, $p = 0.09$). In the Sui+ group, 32 participants (47.1%) did respond to the peer support. A total of 23 participants (16.9%) from the active groups never logged in, and 10 participants (7.4%) had an activated status but no subsequent time stamps. In total, 95

participants (69.9%) logged in and used the app for at least one minute, indicating a successful login ("verified users"). The median usage time of verified users after 8 weeks was 34.5 minutes. Figure 4 shows the distribution of these 95 verified users. Regarding the content, out of all 136 participants from the active study groups, 47 (34.6%) accessed at least one of the six psychological chapters, 69 (50.7%) at least one of the nine information chapters, and 51 (37.5%) at least one of the introductory chapters. A chapter was considered accessed if at least one subchapter was completed. The median usage time of the 41 participants who participated in the interviews was 31.0 minutes 8 weeks after receiving access to the app.

Figure 4

Distribution of app use time of "verified users", i.e. people who have successfully logged into the Sui app (n = 95)



Participant satisfaction

The average score for satisfaction with the app (CSQ-8) at post-assessment was at $M = 2.84$ ($SD = 0.55$, $n = 46$) for the Sui+ group and at $M = 2.81$ ($SD = 0.57$, $n = 41$) for the Sui app group. On

a scale of 1-4, these scores indicate overall satisfaction with the app. The two active groups did not differ significantly regarding their satisfaction scores (W = 1002, p = .62).

Qualitative results

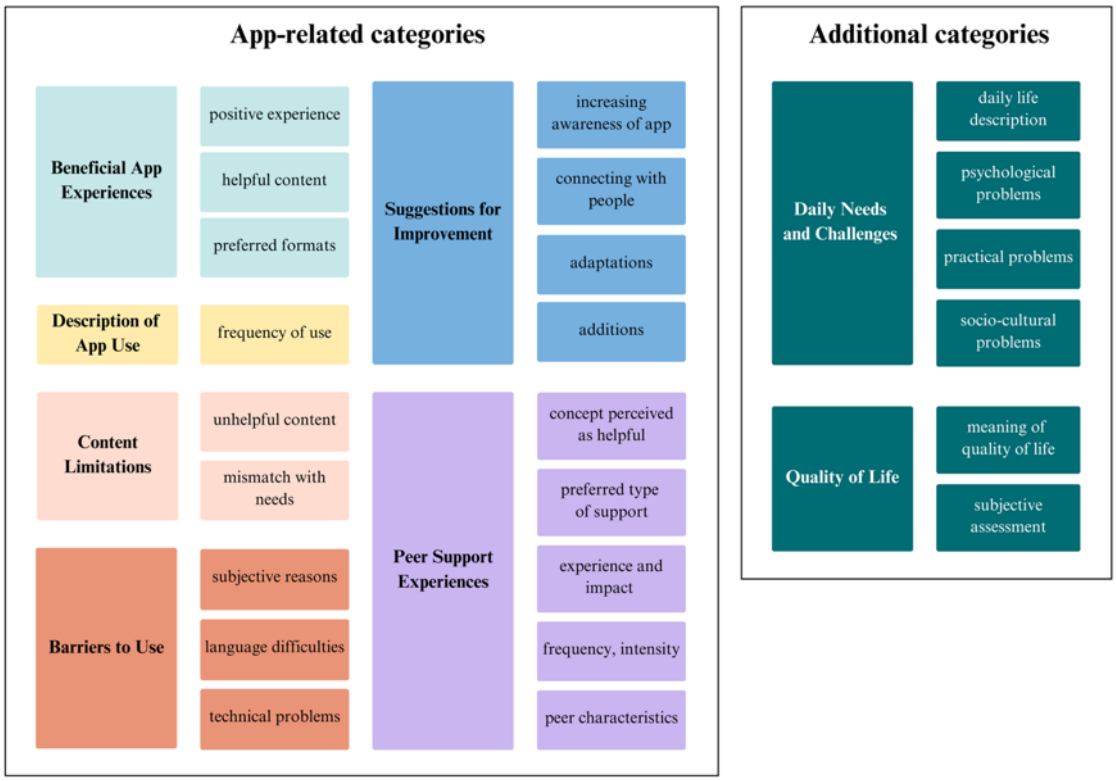
Figure 5 displays the emerged categories and corresponding subcategories. Details with descriptions, participant counts, and anchor examples are provided in Appendix D.1.

Overall, the participants appreciated the app's selection of chapters. Some preferred well-being chapters and audio exercises, while others were more interested in information chapters. Notably, the video testimonials were consistently well-received. Participants were very satisfied with peer support, and those who did not use it were largely enthusiastic about the concept. Low usage was linked to limited time, unclear app purpose, and technical issues.

Participants suggested improvements such as more personalised information, connection to people in real life (e.g., Swiss or Arabic speakers), and expanded peer and professional support. Finally, the app's content aligned well with users' daily challenges and needs.

Figure 5

Seven main categories emerged from qualitative analysis with corresponding level 1 subcategories



Discussion

This study evaluated the effectiveness and acceptability of the Sui SRK app, a culturally adapted digital psychosocial service for Arabic-speaking refugees in Switzerland. While the app aimed to improve QOL and mental health outcomes, the findings showed no statistical improvements, except for two significant interaction effects at follow-up. These results must be viewed in light of the app's design, study conduct, and user engagement. Qualitative interviews provided valuable insights into participants' reception and opportunities for further adaptation.

At the 8-week post-assessment, no significant group-by-time interactions were found in the primary outcome domains. At the 16-week follow-up, a significant interaction in the psychological domain was found with a very small effect size between the two active groups, potentially driven by the baseline difference between the study groups in this domain. No significant interactions were identified for the secondary outcomes at post-assessment. At follow-up, stigma awareness (SSMIS-SF,

section 2) showed a significant interaction with a small effect size. However, it is important to note that the control group was not included in the follow-up analyses, as they had gained access to the app in the meantime. Satisfaction with the app was good, with a mean score of 2.81 out of 4.

When interpreting the results, it is necessary to consider the app usage time across all participants (M = 11.84 minutes). This tripled if considering only the verified users that successfully logged into the app (M = 34.5 minutes). The app's flexible design, without a standardised or modular structure, likely contributed to lower engagement, but also presents an opportunity to explore valuable user data on non-linear platforms. Qualitative feedback pointed to issues with intuitive navigation and clarity of purpose. This user autonomy approach is rare in the literature and provides important insights.

A review of digital approaches improving QOL reported highly variable studies regarding their intervention design, methods, targeted outcomes, often targeting populations with elevated psychopathological symptoms, such as depression [32]. Unlike most preceding intervention studies, which typically employed a modular structure and focused on populations with predefined clinical cut-offs, our study targeted a broader, more heterogeneous population. This may have contributed to the lack of clarity of purpose and lower engagement. For instance, an linear app targeting depression in refugees [56] reported higher engagement and improvements of psychological distress [57] and depression [58], but still faced challenges in achieving expected engagement. Another fully self-guided app with a modular structure, designed to reduce posttraumatic stress symptoms in Syrian refugees in Germany, reported an average usage time of 42.5 minutes over four weeks, however failed to demonstrate effectiveness [52]. Notably, it was observed in both this study and ours that approximately one-third of participants did not progress beyond the initial onboarding module. This highlights the common challenge of low sustained engagement with digital interventions.

Surprisingly, the addition of weekly peer support did not lead to measurable improvements in QOL or symptom severity. While support through trained non-clinicians has been shown to improve mental health outcomes and engagement in digital interventions [35,59], no such benefits were observed in this study. The engagement with peer support was low, as fewer than half of the

participants in the Sui+ group actively interacted with their assigned peer and no significant differences in usage time was observed between the active groups. Qualitative feedback suggested that participants either did not see or trust the peer messages, possibly due to deactivated notifications and standard text templates (impression of a bot). Nevertheless, participants who engaged more frequently with peer support reported highly positive experiences.

Strengths of this study include the mixed-methods approach and the high participation rate in qualitative interviews, which provided rich insights. Additionally, the inclusion of culturally sensitive content, which received minimal criticism further supports the relevance and acceptance of the app. Unlike many previous studies focusing exclusively on Syrian refugees, this study included Arabic-speaking refugees from diverse countries, broadening accessibility. Language concerns about content provided in the app were not related to participants' national origin, but rather to differences in literacy and education levels. This finding adds to the growing body of research on contextual adaptation beyond traditional cultural adaptation.

According to a systematic review the WHOQOL-BREF is suitable for detecting change regardless of the time elapsed between measurements [60]. Nonetheless, the potential for such changes may be limited by a ceiling effect, as the QOL scores in our sample were not substantially lower than those observed in general populations [12]. This likely restricted the ability to detect improvements and suggests that we might not have studied a representative sample. Including only refugees with lower QOL could have increased the likelihood of observing measurable change. However, the decision to include all refugees aligned with the app's goal of supporting individuals across varying levels of need, particularly those underserved or with limited access to traditional mental health services.

The study presents several limitations that should be considered. First, the dropout of more than 30% at post and follow-up assessments may have introduced a bias, potentially limiting the generalisability of the results. Second, the reliance solely on self-reported measures, without incorporating observer ratings, may have affected the objectivity of the data. Third, the study did not examine long-term effects, which are critical for understanding the sustained impact of the app. As

highlighted by previous authors reviewing digital interventions, detecting meaningful changes in QOL might require long-term follow-up assessments [61]. Qualitative findings were limited by potential loss of meaning in translation, and the results might not be generalisable, as the sample was self-selected.

Future research should address these limitations, improve user experience through technical enhancements and clearer guidance, and increase visibility of the in-app peer support. Additionally, future analyses should employ per-protocol analyses, where only verified users are included, to account for non-start attrition. Given that the app was designed to be easily adaptable for other linguistic refugee populations, it would be valuable to test it with different groups to explore user behaviour further. Future studies should also investigate which participants benefitted most and explore factors that could enhance the effectiveness of the app for those who experienced limited benefits.

Despite its limitations, this study marks a foundational step for digital psychosocial services that actively integrate the post-migration context by embedding local information within their mental health agenda. To our knowledge, there is no existing evidence of digital psychosocial services employing a similar concept. Moreover, the lack of evaluated digital interventions for refugees, especially smartphone-based, targeting improvement in QOL as a primary outcome emphasises the novelty and importance of this research. The well-accepted content, design and the holistic concept of the app provide a valuable foundation for further development and refinement, offering potential for broader application and impact in future digital MHPSS interventions.

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CRediT Author contribution

Rilana Stöckli: Conceptualisation, Data curation, Formal analysis, Investigation, Methodology, Project administration, Software, Supervision, Visualisation, Writing – original draft.

Viktoria Zoellner: Conceptualisation, Investigation, Project administration, Supervision, Writing – review & editing

Monia Aebersold: Conceptualisation, Funding acquisition, Project administration, Supervision, Writing – review & editing

Farhad Haji: Conceptualisation, Investigation, Supervision, Writing – review & editing

Sebastian Burchert: Software, Resources, Writing – review & editing

Jessica Wabiszczewicz: Software, Resources, Writing – review & editing

Christine Knaevelsrud: Software, Resources, Writing – review & editing

Eva Heim: Conceptualisation, Writing – review & editing

Thomas Berger: Conceptualisation, Resources, Supervision, Writing – review & editing

Appendices

Appendices A.1 – D.2 attached.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used ChatGPT-4 in order to improve language and readability. After using this tool, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

References

[1] Blackmore R, Boyle JA, Fazel M, Ranasinha S, Gray KM, Fitzgerald G, et al. The prevalence of mental illness in refugees and asylum seekers: A systematic review and meta-analysis. PLoS Med 2020;17:e1003337. https://doi.org/10.1371/journal.pmed.1003337.

[2] Patanè M, Ghane S, Karyotaki E, Cuijpers P, Schoonmade L, Tarsitani L, et al. Prevalence of mental disorders in refugees and asylum seekers: a systematic review and meta-analysis. Glob Ment Health 2022;9:250–63. https://doi.org/10.1017/gmh.2022.29.

[3] Turrini G, Purgato M, Acarturk C, Anttila M, Au T, Ballette F, et al. Efficacy and acceptability of psychosocial interventions in asylum seekers and refugees: systematic review and meta-analysis. Epidemiol Psychiatr Sci 2019;28:376–88. https://doi.org/10.1017/S2045796019000027.

[4] Abubakar I, Aldridge RW, Devakumar D, Orcutt M, Burns R, Barreto ML, et al. The UCL–Lancet Commission on Migration and Health: the health of a world on the move. The Lancet 2018;392:2606–54. https://doi.org/10.1016/S0140-6736(18)32114-7.

[5] Drescher A, Kiselev N, Akhtar A, Acarturk C, Bryant RA, Ilkkursun Z, et al. Problems after flight: understanding and comparing Syrians' perspectives in the Middle East and Europe. BMC Public Health 2021;21:717. https://doi.org/10.1186/s12889-021-10498-1.

[6] Kiselev N, Pfaltz M, Schick M, Bird M, Pernille H, Sijbrandij M, et al. Problems faced by Syrian refugees and asylum seekers in Switzerland. Swiss Med Wkly 2020:150:w20381. https://doi.org/10.4414/smw.2020.20381.

[7] Aragona M, Pucci D, Mazzetti M, Geraci S. Post-migration living difficulties as a significant risk factor for PTSD in immigrants: a primary care study. Italian Journal of Public Health 2012;9. https://doi.org/10.2427/7525.

[8] Gleeson C, Frost R, Sherwood L, Shevlin M, Hyland P, Halpin R, et al. Post-migration factors and mental health outcomes in asylum-seeking and refugee populations: a systematic review. European Journal of Psychotraumatology 2020;11:1793567. https://doi.org/10.1080/20008198.2020.1793567.

[9] Hynie M. The Social Determinants of Refugee Mental Health in the Post-Migration Context: A Critical Review. Can J Psychiatry 2018;63:297–303. https://doi.org/10.1177/0706743717746666.

[10] Jannesari S, Hatch S, Prina M, Oram S. Post-migration Social–Environmental Factors Associated with Mental Health Problems Among Asylum Seekers: A Systematic Review. J Immigrant Minority Health 2020;22:1055–64. https://doi.org/10.1007/s10903-020-01025-2.

[11] Silove D. The ADAPT model: a conceptual framework for mental health and psychosocial programming in post conflict settings. Intervention 2013;11:237–48. https://doi.org/10.1097/WTF.0000000000000005.

[12] Skevington SM, Lotfy M, O'Connell KA. The World Health Organization's WHOQOL-BREF quality of life assessment: Psychometric properties and results of the international field trial. A Report from the WHOQOL Group. Qual Life Res 2004;13:299–310. https://doi.org/10.1023/B:QURE.0000018486.91360.00.

[13] WHOQOL-Group. Development of the World Health Organization WHOQOL-BREF quality of life assessment. Psychological Medicine 1998;28:551–8. https://doi.org/10.1017/S0033291798006667.

[14] Al Masri F, Müller M, Nebl J, Greupner T, Hahn A, Straka D. Quality of life among Syrian refugees in Germany: a cross-sectional pilot study. Arch Public Health 2021;79:213. https://doi.org/10.1186/s13690-021-00745-7.

[15] Gagliardi J, Brettschneider C, König H-H. Health-related quality of life of refugees: a systematic review of studies using the WHOQOL-Bref instrument in general and clinical refugee populations in the community setting. Confl Health 2021;15:44. https://doi.org/10.1186/s13031-021-00378-1.

[16] Sengoelge M, Nissen A, Solberg Ø. Post-Migration Stressors and Health-Related Quality of Life in Refugees from Syria Resettled in Sweden. IJERPH 2022;19:2509. https://doi.org/10.3390/ijerph19052509.

[17] Leiler A, Bjärtå A, Ekdahl J, Wasteson E. Mental health and quality of life among asylum seekers and refugees living in refugee housing facilities in Sweden. Soc Psychiatry Psychiatr Epidemiol 2019;54:543–51. https://doi.org/10.1007/s00127-018-1651-6.

[18] Correa-Velez I, Green A, Murray K, Schweitzer RD, Vromans L, Lenette C, et al. Social Context Matters: Predictors of Quality of Life among Recently Arrived Refugee Women-at-Risk Living in Australia. Journal of Immigrant & Refugee Studies 2020;18:498–514. https://doi.org/10.1080/15562948.2020.1734893.

[19] Haj-Younes J, Strømme EM, Igland J, Kumar B, Abildsnes E, Hasha W, et al. Changes in self-rated health and quality of life among Syrian refugees migrating to Norway: a prospective longitudinal study. Int J Equity Health 2020;19:188. https://doi.org/10.1186/s12939-020-01300-6.

[20] Schick M, Zumwald A, Knöpfli B, Nickerson A, Bryant RA, Schnyder U, et al. Challenging future, challenging past: the relationship of social integration and psychological impairment in traumatized refugees. European Journal of Psychotraumatology 2016;7:28057. https://doi.org/10.3402/ejpt.v7.28057.

[21] van der Boor CF, Amos R, Nevitt S, Dowrick C, White RG. Systematic review of factors associated with quality of life of asylum seekers and refugees in high-income countries. Conflict and Health 2020;14:14:48. https://doi.org/10.1186/s13031-020-00292-y.

[22] Al-Smadi AM, Tawalbeh LI, Gammoh OS, Ashour AF, Alshraifeen A, Gougazeh YM. Anxiety, stress, and quality of life among Iraqi refugees in Jordan: A cross sectional survey: Quality of life among refugees. Nursing & Health Sciences 2017;19:100–4. https://doi.org/10.1111/nhs.12323.

[23] Buchcik J, Kovach V, Adedeji A. Mental health outcomes and quality of life of Ukrainian refugees in Germany. Health Qual Life Outcomes 2023;21:23. https://doi.org/10.1186/s12955-023-02101-5.

[24] Dangmann C, Solberg Ø, Andersen PN. Health-related quality of life in refugee youth and the mediating role of mental distress and post-migration stressors. Qual Life Res 2021;30:2287–97. https://doi.org/10.1007/s11136-021-02811-7.

[25] Koesters M, Barbui C, Purgato M. Recent approaches to provision of mental healthcare in refugee populations. Current Opinion in Psychiatry 2018;31:368–72. https://doi.org/10.1097/YCO.0000000000000428.

[26] Weine S, Danieli Y, Silove D, Ommeren MV, Fairbank JA, Saul J. Guidelines for International Training in Mental Health and Psychosocial Interventions for Trauma Exposed Populations in Clinical and Community Settings. Psychiatry: Interpersonal and Biological Processes 2002;65:156–64. https://doi.org/10.1521/psyc.65.2.156.19936.

[27] Inter-Agency Standing Committee Task Force on Mental Health, Settings PSIE, Van Ommeren M, Wessells M. Inter-agency agreement on mental health and psychosocial support in emergency

settings. Bull World Health Organ 2007;85:822–3. https://doi.org/10.2471/BLT.07.047894.

[28] IFRC Reference Centre for Psychosocial Support. Strategic Operational Framework 2023. Copenhagen: 2020.

[29] Kiselev N. Barriers to access to outpatient mental health care for refugees and asylum seekers in Switzerland: the therapist's view. BMC Psychiatry 2020;20:20:378. https://doi.org/10.1186/s12888-020-02783-x.

[30] Ashfaq A, Esmaili S, Najjar M, Batool F, Mukatash T, Al-Ani HA, et al. Utilization of Mobile Mental Health Services among Syrian Refugees and Other Vulnerable Arab Populations—A Systematic Review. IJERPH 2020;17:1295. https://doi.org/10.3390/ijerph17041295.

[31] Linardon J, Cuijpers P, Carlbring P, Messer M, Fuller-Tyszkiewicz M. The efficacy of app-supported smartphone interventions for mental health problems: a meta-analysis of randomized controlled trials. World Psychiatry 2019;18:325–36. https://doi.org/10.1002/wps.20673.

[32] Nascimento P, Roberto MS, Poole-da-Costa MC, Lemos M, Santos AS. Digital Methods in the Promotion of Well-Being in Immigrants: A Systematic Review: Author Note. J Immigrant Minority Health 2023;25:906–15. https://doi.org/10.1007/s10903-023-01450-z.

[33] Alencar A, Kondova K, Ribbens W. The smartphone as a lifeline: an exploration of refugees' use of mobile communication technologies during their flight. Media, Culture & Society 2019;41:828–44. https://doi.org/10.1177/0163443718813486.

[34] Andersson G, Berger T. Internet approaches to psychotherapy: Empirical findings and future directions. In: Barkham M, Lutz W, Castonguay LG, editors. Bergin and Garfield's Handbook of Psychotherapy and Behavior Change, vol. 50th anniversary edition. 7th ed., John Wiley & Sons, Inc.; 2021, p. 739:762.

[35] Musiat P, Johnson C, Atkinson M, Wilksch S, Wade T. Impact of guidance on intervention adherence in computerised interventions for mental health problems: a meta-analysis. Psychol Med 2022;52:229–40. https://doi.org/10.1017/S0033291721004621.

[36] Koelen JA, Vonk A, Klein A, De Koning L, Vonk P, De Vet S, et al. Man vs. machine: A meta-analysis on the added value of human support in text-based internet treatments ("e-therapy") for mental disorders. Clinical Psychology Review 2022;96:102179.

https://doi.org/10.1016/j.cpr.2022.102179.

[37] El-Haj-Mohamad R, Nohr L, Niemeyer H, Böttche M, Knaevelsrud C. Smartphone-delivered mental health care interventions for refugees: A systematic review of the literature. Camb Prisms Glob Ment Health 2023;10:e6. https://doi.org/10.1017/gmh.2022.61.

[38] Stoeckli RT, Berger T, Aebersold M, Zoellner V, Haji F, Hunziker M, et al. Development and Cultural-Contextual Adaptation of a Low-Threshold Digital Psychosocial Service for Refugees Living in Switzerland: Sui App (JMIR Preprint) 2024. https://doi.org/10.2196/preprints.59905.

[39] Heim E, Mewes R, Abi Ramia J, Glaesmer H, Hall B, Harper Shehadeh M, et al. Reporting Cultural Adaptation in Psychological Trials – The RECAPT criteria. Clin Psychol Eur 2021;3:e6351. https://doi.org/10.32872/cpe.6351.

[40] Faul F, Erdfelder E, Lang A-G, Buchner A. G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behavior Research Methods 2007;39:175–91. https://doi.org/10.3758/BF03193146.

[41] Harris PA, Taylor R, Minor BL, Elliott V, Fernandez M, O'Neal L, et al. The REDCap consortium: Building an international community of software platform partners. Journal of Biomedical Informatics 2019;95:103208. https://doi.org/10.1016/j.jbi.2019.103208.

[42] Ohaeri JU, Awadalla AW. The reliability and validity of the short version of the WHO Quality of Life Instrument in an Arab general population. Annals of Saudi Medicine 2009;29:98–104. https://doi.org/10.4103/0256-4947.51790.

[43] Kroenke K, Spitzer RL, Williams JBW. The PHQ-9: Validity of a brief depression severity measure. J Gen Intern Med 2001;16:606–13. https://doi.org/10.1046/j.1525-1497.2001.016009606.x.

[44] Sawaya H, Atoui M, Hamadeh A, Zeinoun P, Nahas Z. Adaptation and initial validation of the Patient Health Questionnaire – 9 (PHQ-9) and the Generalized Anxiety Disorder – 7 Questionnaire (GAD-7) in an Arabic speaking Lebanese psychiatric outpatient sample. Psychiatry Research 2016;239:245–52. https://doi.org/10.1016/j.psychres.2016.03.030.

[45] Löwe B, Decker O, Müller S, Brähler E, Schellberg D, Herzog W, et al. Validation and Standardization of the Generalized Anxiety Disorder Screener (GAD-7) in the General Population. Medical Care 2008;46:266–74. https://doi.org/10.1097/MLR.0b013e318160d093.

[46] Ibrahim H, Ertl V, Catani C, Ismail AA, Neuner F. The validity of Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5) as screening instrument with Kurdish and Arab displaced populations living in the Kurdistan region of Iraq. BMC Psychiatry 2018;18:259. https://doi.org/10.1186/s12888-018-1839-z.

[47] Price M, Szafranski DD, van Stolk-Cooke K, Gros DF. Investigation of abbreviated 4 and 8 item versions of the PTSD Checklist 5. Psychiatry Research 2016;239:124–30. https://doi.org/10.1016/j.psychres.2016.03.014.

[48] Kroenke K, Spitzer RL, Williams JBW. The PHQ-15: Validity of a New Measure for Evaluating the Severity of Somatic Symptoms: Psychosomatic Medicine 2002;64:258–66. https://doi.org/10.1097/00006842-200203000-00008.

[49] AlHadi AN, AlAteeq DA, Al-Sharif E, Bawazeer HM, Alanazi H, AlShomrani AT, et al. An arabic translation, reliability, and validation of Patient Health Questionnaire in a Saudi sample. Ann Gen Psychiatry 2017;16:32. https://doi.org/10.1186/s12991-017-0155-1.

[50] Silove D, Sinnerbrink I, Field A, Manicavasagar V, Steel Z. Anxiety, depression and PTSD in asylum-seekers: Assocations with pre-migration trauma and post-migration stressors. Br J Psychiatry 1997;170:351–7. https://doi.org/10.1192/bjp.170.4.351.

[51] Corrigan PW, Michaels PJ, Vega E, Gause M, Watson AC, Rüsch N. Self-stigma of mental illness scale—short form: Reliability and validity. Psychiatry Research 2012;199:65–9. https://doi.org/10.1016/j.psychres.2012.04.009.

[52] Röhr S, Jung FU, Pabst A, Grochtdreis T, Dams J, Nagl M, et al. A Self-Help App for Syrian Refugees With Posttraumatic Stress (Sanadak): Randomized Controlled Trial. JMIR Mhealth Uhealth 2021;9:e24807. https://doi.org/10.2196/24807.

[53] Attkisson CC, Zwick R. The client satisfaction questionnaire. Psychometric properties and correlations with service utilization and psychotherapy outcome. Evaluation and Program Planning 1982;5:233–7. https://doi.org/10.1016/0149-7189(82)90074-X.

[54] Bates D, Mächler M, Bolker B, Walker S. Fitting Linear Mixed-Effects Models Using lme4. J Stat Soft 2015;67. https://doi.org/10.18637/jss.v067.i01.

[55] Mayring P. Qualitative Inhaltsanalyse: Grundlagen und Techniken. 12th revised edition.

Weinheim: Julius Beltz GmbH & Co. KG; 2015.

[56] Carswell K, Harper-Shehadeh M, Watts S, van't Hof E, Abi Ramia J, Heim E, et al. Step-by-Step: a new WHO digital mental health intervention for depression. mHealth 2018;4:34–34. https://doi.org/10.21037/mhealth.2018.08.01.

[57] Burchert S, Alkneme MS, Alsaod A, Cuijpers P, Heim E, Hessling J, et al. Effects of a self-guided digital mental health self-help intervention for Syrian refugees in Egypt: A pragmatic randomized controlled trial. PLoS Med 2024;21:e1004460. https://doi.org/10.1371/journal.pmed.1004460.

[58] Cuijpers P, Heim E, Abi Ramia J, Burchert S, Carswell K, Cornelisz I, et al. Effects of a WHO-guided digital health intervention for depression in Syrian refugees in Lebanon: A randomized controlled trial. PLoS Med 2022;19:e1004025. https://doi.org/10.1371/journal.pmed.1004025.

[59] Leung C, Pei J, Hudec K, Shams F, Munthali R, Vigo D. The Effects of Nonclinician Guidance on Effectiveness and Process Outcomes in Digital Mental Health Interventions: Systematic Review and Meta-analysis. J Med Internet Res 2022;24:e36004. https://doi.org/10.2196/36004.

[60] Skevington SM, Epton T. How will the sustainable development goals deliver changes in well-being? A systematic review and meta-analysis to investigate whether WHOQOL-BREF scores respond to change. BMJ Glob Health 2018;3:e000609. https://doi.org/10.1136/bmjgh-2017-000609.

[61] Hennemann S, Farnsteiner S, Sander L. Internet- and mobile-based aftercare and relapse prevention in mental disorders: A systematic review and recommendations for future research. Internet Interventions 2018;14:1–17. https://doi.org/10.1016/j.invent.2018.09.001.

Table 1.

Participant sample at baseline and comparisons between study groups.

Characteristics	**Sui+** (n = 68)	**Sui** (n = 68)	**Waitlist** (n = 34)	**Statistic**
Mean age, years M (SD)	33.0 (9.40)	33.4 (10.13)	31.6 (8.63)	Kruskal-Wallis χ^2 (2) = 0.63 p = .73
Age range	18-53	18-63	19-60	
Gender, *n* (%)				Fisher's exact test p = .09
Male	36 (53.0)	44 (64.7)	15 (44.1)	
Female	32 (47.1)	24 (35.3)	18 (53.0)	
Non-binary	0 (0.0)	0 (0.0)	1 (2.9)	
Residence status, *n* (%)				Fisher's exact test p = .28
B Refugee	23 (33.82)	30 (44.12)	15 (44.11)	
B / F Foreigner	9 (13.24)	5 (7.35)	7 (20.588)	
F Refugee	8 (11.76)	6 (8.82)	4 (11.76)	
N Asylum seeker	25 (36.76)	20 (29.41)	5 (14.71)	
Other	3 (4.11)	6 (8.82)	3 (8.82)	
Nationality				Fisher's exact test p = .059
Syria	51 (75.00)	38 (55.88)	21 (61.76)	
Iraq	4 (5.88)	4 (5.88)	3 (8.82)	
Egypt	0 (0.00)	2 (2.94)	4 (11.76)	
Palestine	3 (4.41)	5 (7.35)	1 (2.94)	
Other	10 (14.71)	19 (27.94)	5 (14.71)	
Religion				χ^2 (2) = 0.63, p = .73
Sunni	53 (77.94)	56 (82.35)	26 (76.47)	
Other	15 (22.06)	12 (17.65)	8 (23.53)	
Religiousness				χ^2 (4) = 4.99, p = .29
Low	29 (42.65)	21 (30.88)	11 (32.35)	
Medium	30 (44.12)	31 (45.59)	19 (55.88)	
High	9 (13.24)	16 (23.53)	4 (11.76)	
Currently in psychotherapy				Fisher's exact test p = .13
Yes	13 (19.12)	5 (7.35)	4 (11.76)	
No	55 (80.88)	63 (92.65)	30 (88.24)	
Time in Switzerland, years M (SD)	1.62 (1.36)	1.95 (1.49)	1.66 (1.9)	Kruskal-Wallis χ^2 (2) = 1.95 p = 0.38
Living situation, *n* (%)				Fisher's exact test p = .84
Federal asylum centre	11 (16.18)	6 (8.82)	4 (11.76)	
Cantonal asylum centre	23 (33.82)	23 (33.82)	11 (32.35)	
Apartment	29 (42.65)	34 (50.0)	18 (52.94)	
Shared apartment	5 (7.35)	5 (7.35)	1 (2.94)	
Highest educational level, *n* (%)				Fisher's exact test p = .55
No school	9 (13.24)	7 (10.30)	4 (11.76)	
1-12 years of school	22 (32.35)	14 (20.59)	7 (20.59)	
Maturity / Apprenticeship	11 (16.18)	16 (23.53)	10 (29.41)	
University / College	26 (38.24)	31 (45.59)	13 (38.24)	
Marital status, *n* (%)				Fisher's exact test p = .34
Single	20 (29.41)	26 (38.24)	11 (32.35)	
In a partnership	0 (0.00)	2 (2.94)	1 (2.94)	
Married	42 (61.76)	36 (52.94)	19 (55.88)	
Divorced	5 (7.35)	1 (1.47)	1 (2.94)	
Widowed	1 (1.47)	3 (4.41)	1 (2.94)	
Employment, *n* (%)				Fisher's exact test p = .01*
Full or part-time job	6 (8.82)	5 (7.35)	5 (14.71)	
Unemployed	33 (48.53)	27 (39.71)	6 (17.65)	
Househusband / Housewife	7 (10.29)	7 (10.29)	8 (23.53)	
In training / Other	22 (32.35)	29 (42.65)	13 (38.24)	

Table 2.

Observed and estimated means at baseline and post-assessment, and within- and between-group effect sizes (ITT sample) at post-assessment.

Measure	Study group	Baseline		Post (observed)		Post (estimated)		Follow-up (observed)		Baseline-post within-group effect sizes (estimated post means)	Group-by-time interaction (baseline, post)	Between-group effect sizes at post (estimated means)
		Mean (*SD*)	*n*	Mean (*SD*)	*n*	Mean (*SE*)	*n*	Mean (*SD*)	*n*	Cohen's *d* [95% CI]	F and *df*	Cohen's *d* [95% CI]
↑ WHOQOL-BREF mean, 4-20 scale range Physical Domain	Sui+	13.91 (2.67)	68	13.86 (3.07)	47	13.92 (0.34)	68	13.84 (2.85)	44	0.01 [-0.33; 0.34]	$F_{(2, 128.27)} = 0.26$ $p = .77$	Sui+ vs. WL: -0.17 [-0.58; 0.24]
	Sui	14.75 (2.52)	68	14.10 (3.01)	42	14.75 (0.34)	68	13.88 (2.91)	46	0.02 [-0.31; 0.36]		Sui+ vs. Sui: -0.20 [-0.54; 0.14]
	WL	14.29 (2.88)	34	14.46 (3.07)	27	14.29 (0.48)	34	14.78 (2.93)	22	-0.00 [-0.48; 0.47]		Sui vs. WL: 0.03 [-0.38; 0.44]
↑ WHOQOL-BREF mean, 4-20 scale range Psychological Domain	Sui+	13.37 (2.60)	68	13.18 (2.96)	47	13.17 (0.37)	68	13.44 (2.40)	44	0.01 [-0.32; 0.35]	$F_{(2, 134.67)} = 1.85$ $p = .16$	Sui+ vs. WL: -0.29 [-0.70; 0.12]
	Sui	14.72 (2.47)	68	13.41 (3.25)	42	13.66 (0.38)	68	13.39 (2.92)	46	0.07 [-0.26; 0.41]		Sui+ vs. Sui: -0.16 [-0.50; 0.18]
	WL	14.22 (2.36)	34	13.93 (2.74)	27	14.03 (0.50)	34	14.45 (2.54)	22	0.02 [-0.46; 0.49]		Sui vs. WL: -0.12 [-0.53; 0.29]
↑ WHOQOL-BREF mean, 4-20 scale range Social Relations Domain	Sui+	13.42 (3.63)	68	13.11 (4.00)	47	13.24 (0.47)	68	13.18 (3.82)	44	0.01 [-0.33; 0.34]	$F_{(2, 125.92)} = 0.86$ $p = .42$	Sui+ vs. WL: -0.18 [-0.59; 0.24]
	Sui	14.81 (2.68)	68	13.63 (3.08)	42	13.86 (0.49)	68	13.80 (3.01)	46	0.06 [-0.28; 0.40]		Sui+ vs. Sui: -0.16 [-0.50; 0.18]
	WL	14.27 (3.78)	34	14.02 (3.61)	27	13.90 (0.49)	34	14.42 (3.51)	22	0.02 [-0.45; 0.50]		Sui vs. WL: -0.01 [-0.42; 0.40]
↑ WHOQOL-BREF mean, 4-20 scale range Environment Domain	Sui+	12.40 (2.95)	68	12.68 (2.77)	47	12.60 (0.37)	68	12.96 (2.52)	44	-0.01 [-0.35; 0.32]	$F_{(2, 120.67)} = 0.56$ $p = .57$	Sui+ vs. WL: -0.05 [-0.46; 0.36]
	Sui	12.90 (2.65)	68	12.33 (2.54)	42	12.69 (0.39)	68	12.48 (2.67)	46	0.01 [-0.32; 0.35]		Sui+ vs. Sui: -0.03 [-0.37; 0.31]
	WL	12.63 (3.18)	34	13.00 (3.05)	27	12.75 (0.51)	34	13.27 (2.09)	22	-0.01 [-0.48; 0.47]		Sui vs. WL: -0.02 [-0.43; 0.39]

↓ PHQ-9 sum, 0-27 range Depressive symptoms	Sui+	8.91 (5.53)	68	9.04 (6.82)	46	9.34 (0.77)	68	9.45 (5.63)	42	-0.01 [-0.34; 0.33]	$F_{(2, 125.79)} = 0.68$ $p = .51$	Sui+ vs. WL: 0.39 [-0.02; 0.81]
	Sui	7.99 (5.16)	68	9.74 (6.68)	42	9.43 (0.80)	68	7.76 (4.64)	45	-0.03 [-0.37; 0.31]		Sui+ vs. Sui: -0.01 [-0.35; 0.32]
	WL	6.56 (4.53)	34	6.96 (5.68)	26	7.08 (1.05)	34	6.86 (6.16)	22	-0.02 [-0.49; 0.46]		Sui vs. WL: 0.37 [-0.05; 0.78]
↓ PCL-5 sum, 0-32 range 8-item version Posttraumatic stress disorder symptoms	Sui+	12.16 (7.98)	68	11.67 (9.00)	46	12.39 (1.10)	68	11.83 (8.31)	42	-0.00 [-0.34; 0.33]	$F_{(2, 121.22)} = 1.39$ $p = .25$	Sui+ vs. WL: 0.50 [0.08; 0.91]
	Sui	10.31 (7.63)	68	11.64 (9.19)	42	11.17 (1.12)	68	10.80 (7.98)	45	-0.02 [-0.36; 0.32]		Sui+ vs. Sui: 0.13 [-0.20; 0.47]
	WL	9.53 (7.99)	34	7.38 (7.34)	26	8.00 (1.50)	34	7.73 (7.67)	22	0.05 [-0.43; 0.52]		Sui vs. WL: 0.35 [-0.06; 0.77]
↓ GAD-7 sum, 0-21 range Anxiety symptoms	Sui+	6.72 (4.80)	68	7.02 (5.89)	46	7.19 (0.68)	68	7.12 (5.56)	42	-0.02 [-0.35; 0.32]	$F_{(2, 132.18)} = 2.34$ $p = .10$	Sui+ vs. WL: 0.54 [0.12; 0.96]
	Sui	5.22 (4.39)	68	7.07 (6.04)	42	6.79 (0.70)	68	5.78 (4.94)	45	-0.06 [-0.40; 0.28]		Sui+ vs. Sui: 0.07 [-0.27; 0.41]
	WL	4.88 (4.01)	34	4.08 (4.63)	26	4.24 (0.92)	34	4.32 (4.11)	22	0.04 [-0.37; 0.46]		Sui vs. WL: 0.45 [0.04; 0.87]
↓ PHQ-15 sum, 0-30 range Somatic symptoms	Sui+	8.55 (5.56)	68	9.07 (6.80)	46	9.03 (0.75)	68	10.00 (6.38)	42	-0.01 [-0.35; 0.32]	$F_{(2, 123.97)} = 1.74$ $p = .18$	Sui+ vs. WL: 0.41 [-0.00; 0.83]
	Sui	6.90 (5.19)	68	9.01 (6.54)	42	8.46 (0.77)	68	8.78 (6.40)	45	-0.05 [-0.39; 0.28]		Sui+ vs. Sui: 0.09 [-0.24; 0.43]
	WL	6.65 (4.85)	34	5.80 (5.73)	26	6.53 (1.03)	34	5.98 (4.26)	22	0.01 [-0.47; 0.48]		Sui vs. WL: 0.31 [-0.10: 0.72]
↓ SSMIS-SF 1-9 mean range Section 1: Stigma awareness	Sui+	3.94 (1.70)	68	3.60 (2.15)	46	3.52 (0.26)	68	3.63 (1.47)	41	0.04 [-0.29; 0.38]	$F_{(2, 138.49)} = 0.63$ $p = .54$	Sui+ vs. WL: 0.03 [-0.38; 0.45]
	Sui	3.54 (1.71)	68	3.67 (1.78)	42	3.53 (0.27)	68	3.70 (1.86)	46	0.00 [-0.33; 0.34]		Sui+ vs. Sui: -0.00 [-0.34; 0.33]
	WL	3.83 (1.57)	33	3.44 (1.99)	27	3.45 (0.34)	34	3.51 (1.95)	22	0.06 [-0.42; 0.53]		Sui vs. WL: 0.04 [-0.37; 0.45]
↓ SSMIS-SF 1-9 mean range Section 2: Stigma agreement	Sui+	3.72 (1.65)	68	3.00 (1.75)	46	3.00 (0.24)	68	3.47 (1.63)	42	0.07 [-0.26; 0.41]	$F_{(2, 135.13)} = 2.61$ $p = .08$	Sui+ vs. WL: -0.17 [-0.58; 0.25]
	Sui	3.21 (1.81)	68	3.44 (1.63)	42	3.29 (0.25)	68	3.38 (1.84)	45	-0.01 [-0.34; 0.33]		Sui+ vs. Sui: -0.14 [-0.48; 0.19]
	WL	3.53 (1.64)	34	3.33 (1.87)	27	3.32 (0.32)	34	3.33 (1.93)	22	0.03 [-0.45; 0.51]		Sui vs. WL: -0.02 [-0.43; 0.40]

↓ PMLD-CL 0-68 range Post-migration living difficulties	Sui+	30.09 (12.54)	68	28.56 (13.51)	46	29.08 (1.81)	68	29.23 (13.05)	43	0.01 [-0.32; 0.35]	$F_{(2, 127.30)} = 1.02$ $p = .36$	Sui+ vs. WL: 0.46 [0.04; 0.88]
	Sui	28.10 (13.58)	68	28.40 (14.33)	42	27.90 (1.86)	68	26.63 (13.12)	46	0.00 [-0.33; 0.34]		Sui+ vs. Sui: 0.08 [-0.26; 0.42]
	WL	26.21 (11.96)	34	22.52 (15.06)	27	22.41 (2.43)	34	26.68 (16.27)	22	0.08 [-0.40; 0.55]		Sui vs. WL: 0.37 [-0.04; 0.79]

Notes. WHOQOL-BREF = World Health Questionnaire Quality of Life Short Version, PHQ-9 = Depression Module of Patient Health Questionnaire, PCL-5 = Posttraumatic Stress Disorder Checklist for DSM-5, GAD-7 = Generalized Anxiety Disorder Screening, PHQ-15 = Somatic Module of Patient Health Questionnaire, SSMIS-SF = Self-Stigma of Mental Illness Scale Short Form, PMLD-CL = Post-Migration Living Difficulties Checklist. The symbol ↑ indicates that higher values mean better health, symbol ↓ indicates that lower values mean better health.

Appendix D: Article IV

Aeschlimann, A., Heim, E., Hoxha, A., Triantafyllidou, V., Killikelly, C., Haji, F., Stoeckli, R. T., Aebersold, M., & Maercker, A. (2024). Cultural adaptation of an internet-based self-help app for grieving Syrian refugees in Switzerland. *BMC Public Health*, *24*(1), 3048. https://doi.org/10.1186/s12889-024-20507-8

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Cultural adaptation of an internet-based self-help app for grieving Syrian refugees in Switzerland

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Abstract

Background Loss and grief pose significant challenges for victims of armed conflicts, such as Syrian refugees. Internet-based interventions (IBIs) present a promising solution to address this treatment gap and provide adequate support. However, research on grief, grief support, and IBIs remain largely limited to Western cultural contexts, and culturally adapted IBIs for grief are needed. Following the Reporting Cultural Adaptation in Psychological Trials (RECAPT) framework, this study aimed to develop and further adapt a culturally sensitive IBI for bereaved Syrian refugees in Switzerland.

Methods The study employed qualitative methods. Initially, formative research was conducted to create a first version of the intervention, including semi-structured interviews with 10 experts to identify necessary cultural adaptations. The preliminary version of the intervention was then presented to six potential users and three experts to gather feedback on additional cultural adaptations through two iterative feedback rounds. The first round involved semi-structured interviews using a "paper version" of the intervention, followed by a second round with a walk-through think-aloud protocol with a beta version. Data were analyzed using framework analysis.

Results The input from various key informants at different stages of development provided valuable feedback on surface and deep structure adaptation, which may enhance treatment adherence, acceptance, and motivation.

Conclusions These findings provide important insights and recommendations for the cultural adaptation of interventions and may help address the treatment gap for bereaved Syrian refugees.

Keywords Cultural adaptation, Refugees, Bereaved, RECAPT, Mobile mental health, Syrian, Self-help

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Introduction

Thirteen years into the devastating Syrian civil war, 13.8 million Syrians have been forcibly displaced, marking the highest proportion of displaced people relative to any national population worldwide [1]. As of the end of 2023, nearly 14,000 Syrian refugees have been recognized in Switzerland, making them the second largest group of recognized refugees in the country [2]. The war has caused extremely high humanitarian costs with over 16 million Syrians in need of humanitarian assistance in 2024 [3]. A central issue for victims of armed conflicts, such as Syrian refugees, is the experience of loss and grief [4]. These loss experiences, coupled with post-migration stressors, such as financial difficulties, discrimination, and being separated from one's family [5], have been shown to increase the probability of developing prolonged grief disorder (PGD; 6). Accordingly, studies indicate much higher prevalence rates of PGD in refugees compared to the general population, with a pooled prevalence rate of approximately 33.2% in refugees as opposed to estimates of 3.3–4.2% in the general population [7–9].

PGD is a newly recognized diagnostic category for excessively prolonged and intense grief reactions, now included in the latest edition of the World Health Organization's International Classification of Diseases (ICD-11; [10]). Diagnostic criteria emphasize cultural variations in grief expression, duration, and functional impairment, allowing for a diagnosis only if the grief response surpasses the intensity and duration expected within the individual's socio-cultural context [11]. This culturally sensitive approach is in line with recent research indicating that directly translating mental health constructs developed in Western, Educated, Industrialized, Rich, and Democratic (WEIRD; [12]) contexts to other socio-cultural settings can result in "category fallacy" [13]. This occurs because such translations often neglect culture- or context-specific factors that influence mental health issues.

It is well-documented that culture shapes the way mental health problems are expressed ("cultural idioms of distress"; [14]) and individuals' explanations for these issues, including their causes, course, and potential outcomes (explanatory models; e.g., [15, 16]). To account for cultural differences in the phenomenology and etiology of mental health problems, the term "cultural concepts of distress" (CCD) was introduced in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM; [17]). Grief in particular is heavily saturated with cultural influence, including differences in grief expression, mourning rituals and practices, and beliefs about death [18]. While there might be commonalities in some grief responses, normal and clinically relevant grief symptoms can vary greatly across cultures [19]. For instance, emotional outbursts in the first days or weeks after the loss are considered normal by Syrian refugees [20], while for Palestinians, negative emotional outbursts are usually concealed [21].

The significantly elevated prevalence rates of PGD among refugees underscore the urgent need for comprehensive support and intervention. However, a substantial mental health support gap for refugee communities persists [22, 23]. Bryant et al. [6], for instance, found that 43.7% of the refugee sample with probable PGD had not received any psychological assistance. Numerous barriers of both structural and socio-cultural nature have been recognized to prevent or hinder refugees from accessing mental health care services in their host countries [22, 24]. In a study with Syrian refugees in Switzerland, these included language barriers, lack of resources, lack of trust in health professionals, and a fear of stigma [24]. In addition, the cultural incongruity between Western healthcare professionals and refugees relating to differences in mental health beliefs, explanations, and practices about mental health has been found to negatively affect help-seeking behavior [24–26].

This emphasizes the importance of developing and implementing accessible mental health care for refugee populations. Internet-based interventions (IBIs) are considered a viable solution to bridging this gap [27]. This approach aligns with recent recommendations from the American Psychological Association Summit [28], which emphasize the need to scale up effective individual-level interventions to the population level by leveraging innovative delivery systems such as online platforms and mobile applications. IBIs are easily accessible, are low in delivery cost, can be used flexibly independent of time and location at a self-determined pace, and provide anonymity to users [27, 29]. Evidence provides support for the efficacy of IBIs in the treatment of mental health disorders [30–32]. A guided and scalable IBI for depression was evaluated for Syrian refugees in Lebanon with results showing a significant reduction in depression and anxiety symptoms [33]. Hence, IBIs have the potential to address many of the barriers to mental health care experienced by Syrian refugees in Switzerland and may improve access to support for those who are bereaved.

Although the results are promising, evidence for the effectiveness of IBIs for grief remains limited and largely confined to WEIRD contexts [34–36]. Given that culture significantly impacts grief reactions, it is crucial to consider these aspects when developing an IBI for bereaved refugees. Meta-analytic findings support the effectiveness and acceptability of culturally adapted psychological interventions over non-adapted ones [37, 38]. In one meta-analysis, a higher number of adapted elements in IBIs was associated with higher effect sizes [39], and culturally adapting interventions also appears to increase

adherence [40]. However, no culturally adapted IBI for bereaved individuals has been developed so far [41].

Cultural adaptation can be conceptually divided into surface and deep structure adaptation [42]. Surface structure adaptation relates to matching materials and treatment delivery to observable characteristics of the target group (e.g., language and illustrations). In the context of IBIs, this includes adaptation of user-interfaces and software functions to the intended users (e.g., 43). In contrast, deep structure adaptation considers social, cultural, environmental, and psychological factors that influence health behavior [42]. The latter includes considering a population's CCD, which encompass idioms of distress and explanatory models [17, 44]. One way to conceptualize this distinction is to think of deep structure as addressing the "what" and "why" of an intervention, while surface structure pertains to the "how" of its delivery. However, this is a simplification, and the separation is not always clear-cut.

Criticizing the lack of standardized criteria for documenting cultural adaptations in clinical trials, Heim et al. [45] proposed The Reporting Cultural Adaptation in Psychological Trials (RECAPT) criteria, which incorporate the dimension of deep and surface structure adaptation and can be used as a guideline to plan the cultural adaptation process of an intervention, as well as providing a template for documenting adaptations. This can be implemented for both top-down approaches, where an existing intervention is adapted, and bottom-up interventions, which are newly developed interventions within a specific cultural context [45].

To the best of our knowledge, no culturally adapted IBI for grieving Syrian refugees has been developed so far. Hence, the aim of the current project was the bottom-up development and cultural adaptation of such an IBI for future integration as a supplementary module into the "Sui app", a digital psychosocial support app for refugees developed by the Swiss Red Cross [46]. Following the framework for cultural adaptation of scalable psychological interventions proposed by Heim and Kohrt [44] and the RECAPT-Criteria [45], this project encompasses three cultural adaptation phases:

(i) The formative research phase aimed to gather information on context, target symptoms, and specific needs of Syrian refugees in Switzerland, as well as on aspects of the planned IBI, such as possible contents and structure, informing the development of the first version of the IBI.
(ii) The first cultural adaptation phase aimed to evaluate, adapt, and complement a first version of the IBI in terms of relevance, cultural acceptability, and comprehensibility of intervention contents regarding grief-related CCD, community needs, treatment components, structure and illustrations.
(iii) The second cultural adaptation phase aimed to evaluate and adapt a beta version of the IBI regarding cultural acceptability, relevance and comprehensibility.

Methods

Design

As recommended in the RECAPT guidelines [45], the Consolidated Criteria for Reporting Qualitative research (COREQ) were followed to ensure transparency and research quality (see Additional File 3). The formative research commenced with a literature review as per Heim and colleagues [45] suggestions. A scoping review, which explored the scope and nature of culturally sensitive interventions addressing grief, was published recently [41]. Results of the literature review were supplemented with qualitative information gathered through three rounds of semi-structured, in-depth key informant interviews (KII) with potential users and experts in the accompaniment of grieving Syrian refugees. This qualitative design was employed for a thorough understanding of the participants' individual experiences [47] and because it is ideal for acquiring detailed information on a specific topic within a target group from a different cultural background [20]. Based on findings from the literature review, the first key informant interviews with potential users (KIIU1) and experts (KIIE1), a first version of the IBI-content was developed. In the following two stages of interviews with potential users and experts (KIIUE2 and KIIUE3), the IBI was evaluated and further adapted in an iterative manner. An overview of the final version of the IBI content is available in Additional File 5 (see Fig. 1 for an overview of all chapters).

As the three stages slightly differ regarding sample and recruitment as well as data collection, they will be described in individual subchapters. Methods and results from KIIU1 will not be detailed further, as these are published elsewhere [20]. The ethics proposals for KIIE1 and KIIUE2/KIIUE3 were accepted by the ethics committee of the Faculty of Arts and Social Sciences at the University of Zurich (UZH) in March 2022 and March 2023, respectively.

KIIE1

Sample and recruitment

Potential participants were recruited via purposive and snowball sampling [48] through e-mail or via phone call, and provided with initial information about the project. Participants had to be mental health experts, religious leaders, or interpreters working with or counseling Syrian refugees with PGD in Switzerland. In addition to

Fig. 1 Overview of the chapters of the IBI in German and Arabic

that, potential participants had to be at least 18 years old and fluent in German. Individuals who met the inclusion criteria were given detailed information about the study, the opportunity to ask any additional questions, and were provided with two consent forms: one for study participation and another for the audio recording of the interviews. Interested participants then scheduled interview appointments. Interpreters received compensation at their standard hourly rate of 90 CHF, while other KI did not receive compensation due to limited financial resources. Sample size was estimated based on results of a systematic review by Hennink and Kaiser [49] which showed that data saturation in in-depth interview studies is normally reached between 9 and 17 interviews. Two potential participants dropped out before their interview appointment due to personal reasons. In total, $n=10$ key informants were included. Details on participant characteristics can be found in Additional File 4.

Data collection

Data was collected between May and September 2022. Roles and background of the research team members for all KII can be found in Additional File 1. The interviewer and participants had not met previously. Interview sessions were conducted either in person at the Psychological Department of the UZH or via video conference on a secure platform. Participants were provided with both written and oral information about the study, and written informed consent was obtained. Interviews were held in German, audio-recorded, and subsequently transcribed using f4 audio transcription software version 8.1.1 [50]. Two participants had a follow-up interview, as the subject of interest was initially not fully captured as intended. The interviews lasted from 62 min to 111 min.

The interviews were composed of a brief demographic questionnaire and a semi-structured interview guide featuring open-ended questions. The interview guide was developed in an iterative process following the guidelines by Fylan [51] and Kallio and colleagues [52], with the content being informed by the RECAPT criteria and further background literature. The first part of the guide included questions about the CCD concerning Syrian refugees' grief, while the second part involved questions about the development, intended content and structure of the future IBI (see Additional File 2). Two pilot interviews were conducted to assess and refine the initial interview guide.

KIIUE2

Based on the results from KIIE1, a first version of the IBI content was developed. This initial version was drafted on paper and included the texts (excluding vignettes and texts for audio-exercises) and the first sketches of illustrations. The texts were originally written in German, adapted to simple German, and then translated to Arabic. During the development of this first version, a desk review was conducted to gather additional information not previously covered by the scoping review or KIIE1 on various topics, including positive psychology and mindfulness in Arabic-speaking populations, internet-based interventions for grief, and psychological interventions for grief. KIIUE2 focuses on the evaluation and adaptation of this first version.

Sample and recruitment

Two groups of participants were recruited. Experts had to meet the same inclusion criteria as in KIIE1, while potential users needed to be Syrian and at least 18 years old. Experts were recruited via e-mail and phone from

the previous phase of the formative research. Interpreters were compensated at their standard hourly rate of 90 CHF, while other experts did not receive compensation due to limited financial resources. Potential users were recruited by the interpreter affiliated with the Swiss Red Cross (SRC) and were compensated with a supermarket voucher worth 150 CHF (including travel expenses). Those meeting the inclusion criteria received detailed study information, had the chance to ask questions, and were provided with two informed consent forms: one for study participation and one for audio recording. Interested participants then scheduled interview appointments. The aim was to include at least three experts and six potential users. No potential participants dropped out. In total, $n=9$ key informants participated, including three experts and six potential users. Details on participant characteristics can be found in Additional File 4.

Data collection

Data was collected between March and April 2023. Individual interviews were conducted in German with the experts either in person at the Department of Psychology at the UZH or online on a secure platform. In each interview with potential users, which were conducted at the premises of the SRC in Bern, two participants, one or two interviewers (with one person aiding with timekeeping), and a Syrian interpreter were present. The decision to have two participants interviewed at once, i.e. to combine focus groups and single key informant interviews, was made based on previous positive experiences with this format within the research group and resource limitations [53]. The interpreter translated between German and Arabic. The interviewer and participants had not previously met. However, the interpreter partially knew potential users. At the beginning of the interviews, the study was explained, and the informed consent was signed. Interviews were audio-recorded and transcribed in German using f4 audio transcription software version 8.3 [54]. The interviews with potential users included three main interviews and three follow-up interviews, during which additional feedback was gathered about the IBI contents that due to time constraints could not be discussed in the main interviews. Interviews lasted from 60 to 150 min.

The interview materials consisted of a demographic questionnaire and the semi-structured interview. Participants read selected chapters (the first, third, and fifth) of the IBI and were then asked to give feedback on specific content, which was displayed in a PowerPoint presentation (in Arabic and German). This approach was chosen due to time constraints, focusing on the most critical aspects, while chapters like resource activation, already used in similar interventions, were omitted. The interview guide was developed following guidelines by Kallio et al. [52] and based on background literature, the RECAPT criteria, the results of KIIE1 and the first version of the IBI. Requested feedback focused on the cultural relevance and appropriateness of IBI content, as well as suggestions for adapting less comprehensible, irrelevant, and potentially inappropriate IBI content and appearance (see Additional File 2). Two pilot interviews were conducted to assess and refine the initial interview guide.

KIIUE3

Incorporating the results from KIIUE2, a beta-version of the app was developed in German and Arabic, which included all texts, vignettes, interactive exercises, audios, videos and illustrations. The beta-version contained two Arabic versions of the text and audio-exercises, one for female and one for male users (due to Arabic verbs being conjugated depending on the gender of the addressed person). KIIUE3 focuses on the evaluation and adaptation of this beta-version of the IBI (see Fig. 2 for a screenshot of the home screen).

Sample and recruitment

The same two groups were recruited as for KIIUE2. Additional inclusion criteria were that participants were required to possess a smartphone with internet access and that they could read and write in either Arabic or German. Participants of both groups were recruited from previous project phases or via the interpreter of the SRC through e-mail and telephone. Those meeting the inclusion criteria received more comprehensive study details and were provided with informed consent for study participation. Interested participants then scheduled interview appointments. Interpreters received compensation at their standard hourly rate of 90 CHF, while other experts did not receive compensation due to limited financial resources. As a compensation for their participation, potential users received a supermarket voucher worth 150 CHF (including travel expenses). The aim was to include at least three experts and six potential users. No potential participants dropped out. In total, $n=9$ key informants, including three experts and six potential users were included. Details on participant characteristics can be found in Additional File 4.

Data collection

Data was collected between June and July 2023 in person at the Department of Psychology of the UZH for the experts and at the premises of the SRC in Bern for the potential users. In the interviews with the experts, one interviewer was present, while with the potential users, the interpreter was present like in KIIUE2. In the beginning, study procedures were explained, and the informed consent was signed. Interviews were audio-recorded,

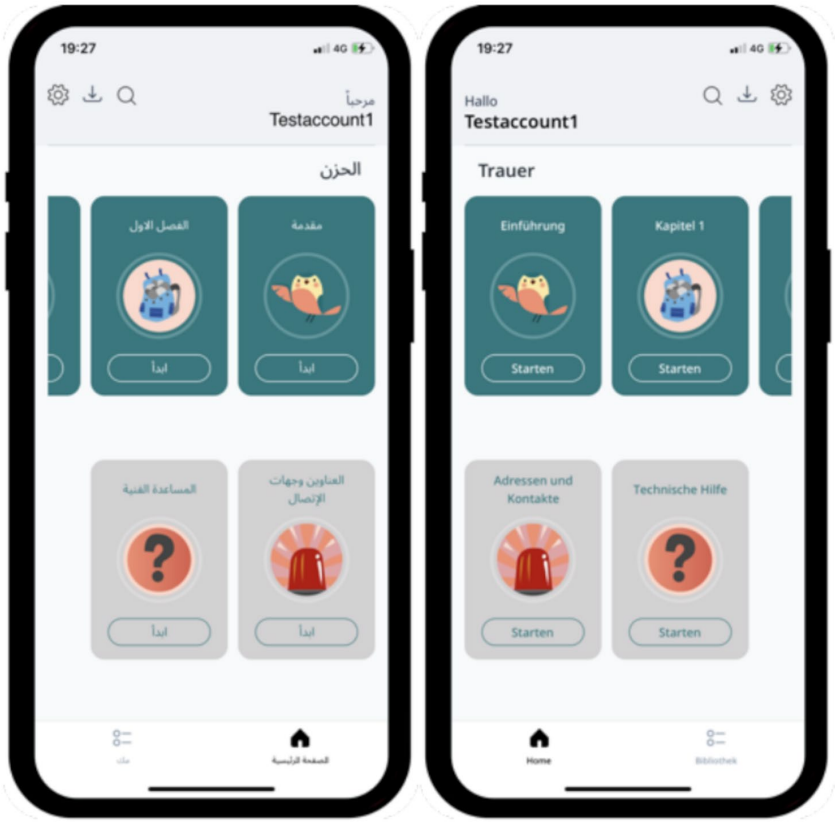

Fig. 2 Screenshots of the IBI in Arabic and German

partly video-recorded for the think aloud walkthrough (see below) and transcribed in German using f4 audio transcription software version 8.3 [54]. No follow-up interviews were conducted. The interviews lasted from 120 min to 150 min.

After filling out a demographic questionnaire, the IBI was set up on the participant's smartphone. Following this, the so-called think aloud walkthrough method was used. During this, insights into users' cognitive processes were gathered as participants were instructed to vocalize their thoughts and feelings while testing the app [55]. Participants had 30 min to test the app on their own and 30 min in which they were instructed to test certain selected features. Following this, a semi-structured interview was conducted. The interview guide was developed following guidelines by Kallio et al. [52] and based on background literature, the RECAPT criteria and the results of the two previous KII rounds. Requested feedback focused on the cultural relevance and appropriateness of the IBI regarding design and illustrations, videos and interactive parts, content and topics, functions, as well as suggestions for adapting less comprehensible, potentially irrelevant, and inappropriate IBI content and appearance (see Additional File 2). Two pilot interviews were conducted to assess and refine the initial interview guide.

Data analysis

The KI interviews of all phases were analyzed employing the framework analysis method, a structured and adaptable procedure for examining qualitative data, systematically managing large data sets and analyzing data covering similar topics [56]. This method produces highly structured outputs of summarized data (framework matrix), with themes emerging through comparisons conducted within and between individual interviews [56]. In all stages of the cultural adaptation process, the analysis started with a deductive approach based on the RECAPT criteria [45], as the aim was to produce clear suggestions for adaptations based on the components suggested in RECAPT. During coding, this approach was combined with an inductive approach to include new aspects brought up by the individual KI experiences. Deductive codes were developed in the MAXQDA 2022

software [57]. Each interview transcript underwent independent parallel coding by two coders, ensuring consistency and increasing the reliability of the analysis [58]. Coding was followed by subsequent discussions among the coders and a third researcher to achieve consensus on conflicting codes and addressing any uncertainties that arose during the coding process. To efficiently meet the project timeline, we initially performed rapid qualitative analyses (RQA; [59, 60]) for KIIUE2 and KIIUE3 to prepare for the decision-making meetings. This pragmatic approach enabled us to quickly evaluate feedback for implementation. Although RQA might sacrifice some scientific rigor compared to full qualitative analysis, it provided timely insights necessary for swift decision-making. Ultimately, we conducted full framework analyses for all three rounds to ensure no critical themes were overlooked.

Decision-making meetings

Two decision-making meetings led by the first author were held each, after KIIUE2 and KIIUE3 respectively, to assess the outcomes of the KI interviews, determine the feasibility of the proposed adaptations and explore subsequent actions. First, the research team members involved in data collection and analysis discussed the feedback received, shared their opinions on potential adaptations, and occasionally offered additional suggestions. Following this, a second meeting was held between the first author and two experienced researchers and psychotherapists in the field to discuss decisions particularly related to interventions and exercises. Please refer to Additional File 1 for information on the background and roles of the research team members. The final decisions were a combination of participants' input, and considerations related to time and financial resources.

Monitoring and documentation of the adaptation procedure

The RECAPT monitoring sheet was employed to document every adaptation made. As the present project is the first to employ the monitoring sheet for a bottom-up development, several alterations were made. The most notable being the division into two sheets: one for the development of the first version of the IBI after KIIE1 and a second one for the adaptations made to this version following KIIUE2 and KIIUE3. Detailed reasoning for the adaptations made, including supporting literature from the desk review and the specific rationale behind each change, are documented in the appended RECAPT table (Additional File 1).[1]

[1] For brevity, only the part of the table related to Chap. 1 is included in Additional File 1. The full documentation can be requested from the first author.

Results

The following section highlights a selected subset of results to maintain clarity and conciseness. If no results are mentioned for a subject from a KII round, it is implied that no particularly noteworthy adaptations were made. The results are structured around the four main components of the RECAPT criteria: (1) Community needs, stigma and context, (2) Cultural concepts of distress, (3) Treatment components, and (4) Treatment delivery.

Community needs, stigma, and context

Various considerations related to community needs, stigma, and context were identified as critical for the adaptation and inclusion in the IBI. These encompass the refugee experience, heterogeneity/diversity, rituals, types of losses, "what matters most", religion, and stigma.

In KIIE1, several post-migratory stressors were mentioned in relation to the refugee experience. These included being far away from the family and the graves of the deceased due to war, which entailed worry about the family left behind and feelings of guilt towards them ($n=9$), problems directly related to the asylum situation including financial problems, living in an asylum center, not being able to work or mobility restrictions ($n=7$), problems with integration like language learning or finding work ($n=6$), social isolation ($n=5$) and distrust/data privacy concerns (e.g., mistrust towards healthcare professionals and government institutions; $n=4$). Adaptations were made based on these results by incorporating them into contextually relevant treatment rationales and goals. For example, treatment goals included having more energy to focus on integration and future perspectives. The context was also considered in psychoeducational parts, acknowledging that certain factors can impede the capacity to perform rituals. Additionally, suggestions for behavioral activation, social activities, or rituals were adapted to be accessible and feasible within the constraints of the refugee context. This included options like free activities or opting for phone calls instead of in-person meetings. Further adaptations targeted feelings of guilt, such as not being able to visit graves or not being present when a loved one died. Cognitive restructuring and self-compassion techniques were employed to address these feelings. Finally, there was a strong emphasis on being transparent about data privacy and clearly communicating what the app can and cannot provide.

The heterogeneity/diversity within Syrians was mentioned as an important factor to consider by all ($n=9$) participants in KIIE1 (e.g., "You could say that Syria is a mosaic country, a patchwork country.", D3). It was mentioned that the grief and needs of bereaved Syrians for the app were highly individual and influenced by the diversity of religion (e.g., Muslim, Christian, Aramean Marronite, Jewish, Druz), education level, gender, ethnicity (e.g.,

Arab, Kurdish, Armenian) and type of loss present in the Syrian community. As a consequence, heterogeneity has been addressed in psychoeducation about grief reactions and emphasizing the fact that grief is highly individual. Furthermore, the wording of the app was kept as open as possible meaning that a focus on one subgroup (e.g., in religion) rather than another was avoided, and open formulations were used to provide space for heterogenous needs. Moreover, users have been provided with the option of adding their own entry to list-exercises. To cater to different educational levels, simple language was used (see Sect. Treatment delivery3.4). In KIIUE2 and KIIUE3, it was observed that suggestions for adapting rituals and social activities varied, with participants expressing conflicting opinions. These divergent views were seen as a reflection of the target group's diversity, leading to the decision to include all suggestions to adequately cater to these heterogeneous preferences and perspectives.

In KIIE1, rituals were noted by most participants ($n=8$), i.e., the most important rituals to Syrians ($n=7$) and challenges/possibilities to performing rituals in Switzerland ($n=5$). Important rituals were often connected to religion and included visiting the grave, praying, or speaking about positive memories of the deceased. Regarding rituals in Switzerland, the importance of suggesting to users to find space for grief in their everyday life and providing alternatives to certain rituals was outlined, with suggestions including creating an alternative to a tombstone such as an altar. Adaptations made based on these findings were emphasizing space for grief as a session topic, including exercises that reflect or adapt certain aspects of known grief rituals in the Syrian community (e.g., the "tree of legacy" exercise permitting to reflect on positive memories of the deceased, the "memory wall" exercise providing a sort of digital altar, or "choosing and planning a ritual").

Furthermore, psychoeducation about rituals was included, and culturally relevant examples of rituals were featured in exercises and psychoeducation. In KIIUE2, the included rituals were considered clear and culturally appropriate by all participants ($n=9$). However, it was suggested that in the exercise "choosing and planning a ritual", two additions should be made to the list of suggested rituals: Donating money and doing good deeds in the name of the deceased (e.g., "Really the donation, that here is not mentioned, it's actually very well-known. That you donate something for the person, build something, do something, yes.", U6). Furthermore, the suggestion "Have conversations with the deceased person in a beautiful setting, such as in nature" was criticized ($n=4$) as this was seen as "crazy" and frightening ("For us, it's like a mistake. One does not speak with the deceased.", P1). No adaptations were made to this last suggestion in line with the decision to include all suggestions for rituals without removal, as mentioned in the previous paragraph.

Regarding types of losses, two main themes emerged in KIIE1: ambiguous loss ($n=4$) and implications of different types of losses ($n=5$), such as losing the support of the deceased person (e.g., "They feel weaker than before because they received support from someone who is no longer there, such as a father, an older son, a husband, or a wife.", D1) or losing a role (e.g., being a parent). The implications of different types of losses were included with the topic of secondary losses, which includes several examples in psychoeducation and contains an exercise focused on reflecting and adjusting to secondary losses. Although considered important, the topic of ambiguous loss was not included at this stage of the project due to lack of resources, as it comprises several aspects that require different interventions or different framing of the interventions (e.g., concerning rituals). At a later stage, the app will be adapted for ambiguous loss, thus offering the users to choose either an option for ambiguous loss or loss due to death at start.

Concerning "what matters most", family ($n=10$) and work/education ($n=7$) were mentioned as most important in KIIE1. To increase motivation, both topics were incorporated in different parts of the IBI, for instance in the treatment rationale (see 3.3) or in the rationale for different exercises (e.g., positive impact on social relationships and family when practicing self-compassion). Furthermore, the topics were included in psychoeducational parts, acknowledging for instance the impact of grief on work performance or social connections. See Sect. Cultural concepts of distress for further inclusion of family/social relationships.

Religion emerged as a highly relevant topic in KIIE1 with all ($n=10$) participants mentioning the importance of religion as a resource in grief. Religion was included as a resource throughout the app (e.g., including prayer as suggestion in various exercises) and including religious counseling services in the "external resources and addresses" chapter. In KIIUE2 ($n=5$) and KIIUE3 ($n=4$), increasing the amount of religious content was advised. As a consequence, several Quran and Bible verses were included throughout psychoeducational parts of the app.

Mental health stigma (e.g., fear of speaking about/showing mental health problems, being labeled as crazy) within the Syrian community was mentioned by most participants in KIIE1 ($n=8$). Although the anonymity of the IBI was seen as a potential solution to this, the importance of addressing stigmatizing beliefs in the app was underlined. Hence, normalizing and validating different grief reactions with psychoeducational texts and testimonials of affected individuals speaking about their experience was a main focus of the app.

Cultural concepts of distress

Several culturally relevant symptoms, metaphors and phrases, as well as cultural explanations emerged as relevant for inclusion or adaptation in the IBI.

As a result of KIIE1, the most commonly mentioned symptoms were emotion-related symptoms such as sadness/depressed mood ($n=5$) and guilt ($n=3$); cognitive symptoms including preoccupation ($n=3$) and denial/being stuck in the past ($n=3$); behavioral symptoms like withdrawal ($n=5$); and somatic symptoms such as sleep problems ($n=5$) and physical pain ($n=4$). Symptoms were included as examples in psychoeducational parts of the IBI about grief reactions. On the other hand, the most common symptoms partly guided the choice of treatment components (e.g., behavioral activation for depressed mood or cognitive restructuring for preoccupation and guilt). Furthermore, symptoms were included in an exercise, where users select their own symptoms from a list (see Fig. 3). In KIIUE2, the included examples of symptoms were considered clear and culturally appropriate by all ($n=9$) participants, with several suggestions made for additional symptoms to be included (e.g., shock, self-harm, remorse, apathy, forgetting to eat and drink).

Two types of metaphors were identified in KIIE1, one concerning grief and the other grief-related coping. Metaphors for grief can be broadly categorized into body-related metaphors ($n=4$) related to eyes, heart, pain and heaviness (e.g., "Grief is like a backpack, that we carry with us"; S2); and community-related metaphors ($n=3$) highlighting how the deceased is a missing link in their community (e.g., "The loss, that is in cultural circles, the family is a center, a navel. And we describe it like this with the navel, and if the navel is open, then the entire relationship with myself and my surroundings, with my family, almost the entire tribe, is not quite in order.", P2), while metaphors for coping were mostly religious ($n=6$; e.g., "God gave him as a gift, and God has taken him back, but life goes on."; D2). Metaphors were included in psychoeducation about grief reactions and about secondary losses. Furthermore, an exercise asking users to describe their own grief reaction as a metaphor was added to promote engagement and self-reflection. Finally, the metaphor of heaviness and grief as a backpack was included in the description of the goal of the IBI and treatment goals. In KIIUE2 all participants ($n=9$) deemed the included metaphors good and culturally appropriate, while suggestions were made to add a missing metaphor ("broken back") and slightly adjust the wording of other metaphors for better comprehension.

In KIIE1, cultural explanations for grief and loss mainly related to religion ($n=8$) and the community ($n=3$), as well. Religious explanations were more fatalistic, suggesting that loss is divinely ordained and should be accepted as a test from God and in some cases, as a new beginning and an opportunity for growth. Meanwhile, community-based explanations emphasized the significant role of the community as a vital resource, highlighting that communal grieving alleviates the intensity of grief (e.g., "Grieving in our community is actually a collective experience. […] It is said that grief is shared and thus lessened, meaning it becomes lighter.", D3). Cultural explanations influenced various adaptations throughout the app, such as

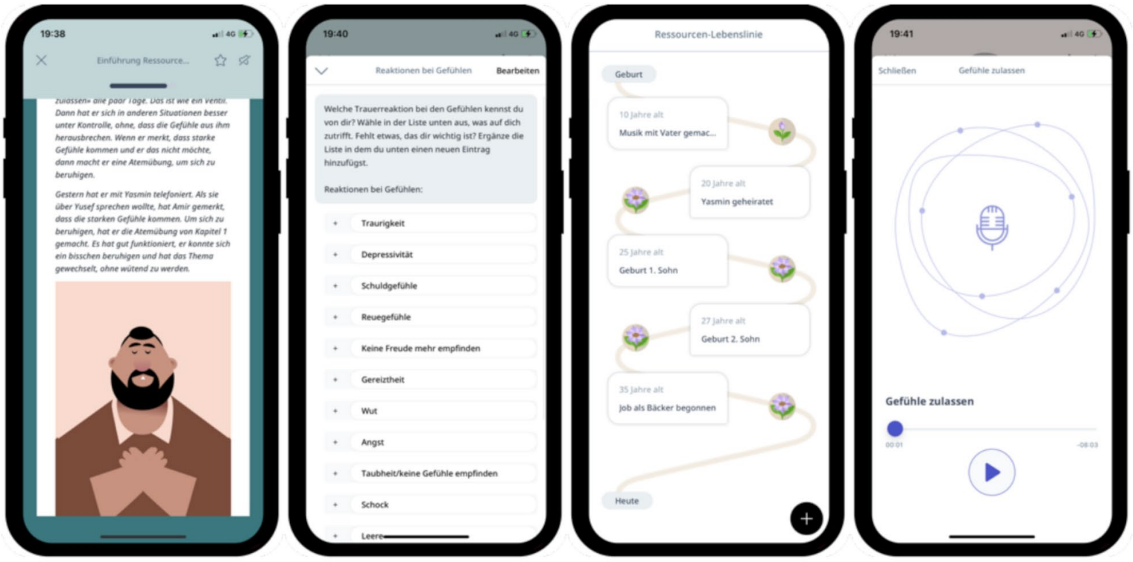

Fig. 3 Examples of Intervention Components
Note. (1) Vignette; (2) List exercise; (3) Interactive exercise (Resource-Lifeline); (4) Mindfulness audio-exercise

incorporating religion and community as resources for grieving, emphasizing the importance of strengthening social relationships to alleviate grief as a session topic. Features like the "memory wall" exercise foster communal grieving, while psychoeducational sections address secondary losses and highlight the significance of social connections.

Treatment components

Results concerning treatment components are organized into two sections, one addressing the treatment goal and treatment rationale, and the other detailing the content, i.e. interventions, exercises, and supplementary resources.

Regarding the treatment goal of the app, findings from KIIE1 indicated that both loss- and restoration- oriented components according to the dual process model of grief [61] should be included ($n=7$), with most participants ($n=6$) favoring moving from loss- to restoration-orientation throughout the app, ending on a focus on the now and future. Regarding loss-oriented components, it was mentioned that speaking about and finding a space for grief ($n=4$), accepting and integrating the loss ($n=6$) and continuing bonds ($n=9$) were important. The latter included the importance of positive memories and rituals to feel close to the deceased ($n=7$) and adapting the relationship with the deceased in balance with restoration orientation ($n=6$). Concerning restoration-orientation, the importance of fostering joy ($n=4$), encouraging future perspectives and becoming active ($n=4$), focusing on the present and future by distracting oneself and focusing on family/education/work ($n=6$) were noted.

Concerning the treatment rationale provided to the users, suggestions from KIIE1 emphasized the relevance of the app to break out of the isolation of grief, finding strength for integration and future perspectives, and being there for family ($n=2$). These findings influenced the choice of chapter topics (see Additional File 5) and specific exercises (e.g., tree of legacy or words to the deceased to adapt relationship), as well as the ratio of loss- and restoration-oriented components and the order in which they are presented. The treatment rationale is introduced to the user explaining that the app will deal both with the pain of grief and with giving them more strength and energy to focus on their goals related to family/work/education in the present and future. The first chapter includes an exercise called "goal setting", which prompts users to set a goal for themselves. The instructions to this exercise contain examples for treatment goals which are in line with the findings related to the treatment rationale (e.g., be there for family, improve concentration for language learning, goals for future). In KIIUE2 the examples received positive feedback from all ($n=9$) participants and were considered clear and culturally appropriate ($n=6$). Suggestions were made to add additional goals and to change the order to match the importance of certain goals in Syrian culture (e.g., family first, then future goals, etc.), both of which were implemented.

Topics related to content, which were suggested for inclusion in the app in KIEE1, were additional resources for points of contact outside the app ($n=8$) and interventions and exercises. The latter included psychoeducation and normalizing ($n=7$), cognitive restructuring for guilt and dysfunctional cognitions ($n=2$), resource and behavioral activation, ($n=9$) as well as mindfulness, relaxation and body-related exercises ($n=3$). For resource and behavioral activation, multiple culturally appropriate resources and activities were listed (e.g., religion, social activities, physical activity, cooking). Based on these findings, a strong focus was set on psychoeducation and normalizing in the first chapter as a topic, resource and behavioral activation (including culturally relevant examples/suggestions) in the second chapter, and a partial focus on cognitive restructuring in chapter four. Mindfulness, relaxation and body-related exercises were used throughout the app. In KIIUE2 feedback was provided on specific exercises. Positive reactions were expressed towards the following exercises: "Sitting with difficult emotions and breathing exercise" (good exercise, $n=5$), "Tree of legacy" (good and clear exercise, $n=9$), "Pinboard/memory wall" (good and meaningful exercise, $n=8$), "Pick a legacy" (culturally relevant examples of legacies, $n=9$), "Visualizing your future" (meaningful and clear, $n=7$), "Reflecting difficult dates and how to cope with them" (good examples, $n=7$; relevant topic, $n=6$), "Looking back on goals and reflecting what was learnt in app" (good and helpful, $n=8$).

However, several critical reactions were voiced towards three exercises in particular. In response to the exercise "Sitting with difficult emotions and breathing exercise", it was noted that some emotions should not be allowed ($n=2$; "We practically destroyed the country because we allowed our feelings", U5) and that the exercise was not considered helpful against sadness ($n=2$). Since users expressed that knowing the exercise was conducted in a controlled setting would increase their comfort, the introduction was adjusted to acknowledge their fear of experiencing emotions, clarify the exercise's context, reassure them that they could stop if uncomfortable, and further explain its proven benefits. The audio-exercise "Imaginary conversation with the deceased" prompted negative reactions from six participants. The idea of having a conversation with a deceased person sparked fear, incomprehension and rejection of the exercise with participants mentioning that this would be seen as "crazy" or as speaking to the devil (e.g., "A conversation is unthinkable. If this should ever happen […] it would simply be

a conversation with the devil.", U5). The exercise was renamed to "Words to the Deceased" to avoid implying a two-way conversation and an introduction was added to clarify its purpose and address religious concerns. Additionally, a disclaimer was included to warn about the emotional challenges, with frequent reminders that users can stop anytime, and the wording was adjusted to refer to an "image" or "memory" of the deceased to ensure user comfort and understanding. Finally, the two variations of the exercise "Visualizing your future" caused confusion. One version, which involved imagining speeches at one's 80th birthday party, was considered unrealistic and participants suggested changing the age ($n=7$). The other version, which entailed imagining one's ideal day in the future and writing about it in a letter to the deceased, was deemed unclear about its future focus, who was writing to whom, and what they were imagining ($n=3$). To address this, the description was adjusted to specify the time frame and include a clarifying picture. Additionally, introductions were added to explain that one version focuses on the near future and the other on the distant future. This adjustment aimed to help refugees, who may find it difficult to think about the future due to uncertainties, feel less intimidated by using a path/journey metaphor.

In KIIUE3, the overall content and exercises received generally positive feedback, being described as relaxing, simple, helpful, and positive. Self-compassion exercises were rated particularly well ($n=6$). The "Words to Deceased" exercise elicited both hesitation ($n=7$) and positive feedback, with some participants finding it fitting and helpful ($n=7$). However, unclear instructions, especially regarding the aim and purpose of several exercises ("Resource-Lifeline", "Memory wall" "Select your own grief reactions" "Finding a metaphor for your grief") combined with technical issues (see 3.4), caused confusion. In reaction to these results, the aim and purpose of the exercises in question were explained in more detail. Furthermore, in the case of the "Resource-Lifeline" and the "Memory wall", screenshots displaying an exemplary version of how to complete the exercise (with examples from the vignette protagonists) were included to clarify the instructions (see Fig. 3 for screenshot of the Resource-Lifeline). The exercise "Words to the deceased" was not removed or adapted as participants mentioned not being able to accurately judge the exercise without listening to it in full length.

Treatment delivery

Results concerning treatment delivery can be divided into audiovisual content, vignettes, language and technical features/design.

Audiovisual content comprises input on videos, audios, and illustrations. In KIIE1, the inclusion of videos was suggested by seven participants, with specific suggestions for testimonial videos of example cases ($n=2$). This was implemented in chapter one by including short videos of a Syrian man and woman speaking about their own experience regarding grief symptoms and impact of these symptoms on their life. The feedback in KIIUE3 was positive from all participants, with participants finding the videos touching, impressed by the courage and openness of the individuals, representative of their own experiences, and feeling understood despite the sad content ("I am impressed by how courageously they can simply talk about their grief.", U4). Despite only one participant suggesting audio-exercises in KIIE1, several audio-exercises recorded in Syrian dialect with a female speaker were included throughout the app due to their proven effectiveness in other studies for enhancing user engagement and providing mindfulness exercises. In KIIUE3, the feedback on audio-exercises was notably positive, with participants praising the pleasant voice of the speaker ($n=6$) and finding the instructions comprehensible ($n=7$).

The illustrations employed in the app were partly previously developed for the Sui app in close collaboration with the target group (see description here: [46]), with several newly developed illustrations created for the present app. To ensure consistency and maintain the visual integrity of the original content, significant alterations to the style or the depiction of characters were not possible, as it was essential to match the established aesthetic of the Sui app. In KIIUE2, the illustrations were highly praised by all participants for being appropriate, explanatory, and accurate. However, some illustrations were deemed unclear, and suggested adaptations were implemented. Overall, in KIIUE3, the illustrations received positive feedback by all participants for being helpful for understanding, including religion, having well-done facial expressions, and featuring nice colors. Nonetheless, some participants raised a critical point about the lack of diversity in religious representation, noting that Syrian society includes various religions and ethnicities, and not all women wear headscarves ($n=2$) ("It could simply become a problem because Syrian society does not consist only of women with headscarves, it does not represent other religions and ethnicities", U3), and not all men have beards ($n=2$). To address this feedback, the male vignette character in question was depicted with a mustache instead of a beard. Due to resource limitations, a new female vignette character without a headscarf could not be added, and the existing female character's headscarf could not be removed entirely to maintain consistency with the Sui app, so she was shown without it only when indoors or with family, as is customary (see Fig. 4).

Vignette stories were introduced throughout the app for consistency with the Sui app, featuring the exemplary

Fig. 4 Adaptation of illustrations according to feedback
Note. (1) Depiction of Yasmin with headscarf and Yusef with beard. (2) Adapted version of the illustration after feedback

Fig. 5 Fictional vignette characters Amir and Yasmin

narrative of two fictional protagonists, Yasmin and Amir, both Syrian refugees coping with grief (see Fig. 5). Amir's father Yusef passed away due to illness, and now Amir and Yasmin are learning to cope with their grief. Amir lives in Switzerland as a refugee, while Yasmin and their children remain in a refugee camp in Lebanon. These stories aim to incorporate various aspects relevant to the target group (e.g., symptoms, post-migratory living difficulties, religion as a resource), as presented in Sects. Community needs, stigma, and context and Cultural concepts of distress. They are designed to illustrate how individuals might navigate the app and engage with different exercises (as detailed in Sect. Treatment components). The intent is to potentially provide motivation, encouragement, and role models, thereby making the content more engaging and relatable. In KIIUE3, all participants gave overwhelmingly positive feedback on the vignette stories, finding them interesting, motivating, realistic, and well-written, and felt they could identify with the narratives ("The story of Amir and his wife, and how they dealt with things, gave [me] motivation to keep going.", U3).

Regarding language, the importance of the app being in Syrian (spoken) dialect ($n=4$) was mentioned in KIIE1 and different suggestions on the tone and characteristics of the language were made ($n=10$). The latter included using simple language, with a motivating, benevolent and non-directive tone. These findings resulted in the use of a form of simple Levantine Arabic (see description of adaptation process: [46]), while aiming to use a non-directive tone (framing exercises as suggestions) and incorporating ample positive feedback for motivation and encouragement (e.g., congratulating users on taking the first step in the app). In KIIUE2, multiple translation errors were identified ($n=3$) and subsequently corrected. In KIIUE3, the language was found to be clear and comprehensible ($n=8$).

Although the general design ($n=2$) and navigation ($n=8$) of the app were praised in KIIUE3, technical issues and user-friendliness were considered the biggest problem. As this was a beta-version of the app, technical errors (e.g., instruction of exercise displayed in English instead of Arabic, no sound for videos, etc.) were experienced by nearly all participants ($n=8$). Furthermore, some confusion about the navigation (e.g., skipping an exercise, closing a chapter, etc.) was observed for most participants ($n=7$). Finally, difficulties in the technical navigation of the "Resource-Lifeline" ($n=7$) and the "Memory wall" ($n=6$) exercise in particular arose for a majority of participants. This may partly be because of the instructions being displayed in English. Technical issues were resolved when possible. To assist users struggling with navigation, two measures were implemented. Navigation points were made explicit in the text, such as instructing users to click the "next" button to proceed. Additionally, a "Technical Help" session was created, providing detailed explanations and screenshots of the app's features. Adaptations made to assist with specific exercises have been detailed in Sect. Treatment components.

Discussion

This paper presents results from the bottom-up cultural adaptation of an IBI for bereaved Syrian refugees. The aim of this study was to collect feedback from different stakeholders throughout the iterative adaptation process regarding the dimensions of the RECAPT criteria, thus informing the decisions on the development of the IBI. To this end, three rounds of semi-structured interviews were held with a broad range of key informants, including usability testing with a beta-version in KIIUE3. Results provided valuable feedback regarding (1) Community needs, stigma, and context, (2) Cultural concepts of distress, (3) Treatment components, and (4) Treatment delivery.

Given that a bottom-up approach was employed, the majority of the adaptations were derived from the results of KIIE1. Notably, most decisions for the initial version of the IBI were influenced by components 1) and 2), while results from KIIUE2 predominantly guided adaptations related to component 3). Additionally, findings from KIIUE3 primarily led to adaptations concerning component 4). This underscores the importance of conducting multiple iterative rounds of feedback interviews using various methods (e.g., usability testing for KIIUE3 to detect technical problems) and involving diverse stakeholders as recommended by Heim and colleagues [45], as different relevant data emerged that would have been otherwise overlooked.

In line with previous findings on Syrian refugees [24, 62], mental health stigma, such as the fear of being perceived as "crazy," was identified as a significant barrier to treatment by many stakeholders. Participants found that the IBI format effectively addressed this barrier by providing anonymity. However, self-stigma, where individuals internalize stigmatizing beliefs [63], was also highlighted, emphasizing the need for psychoeducation. This aligns with prior research recommending psychoeducation to counteract stigma among Syrian refugees [62, 64]. To address self-stigma, the IBI incorporates a strong focus on psychoeducation, normalization, including video testimonials, and vignette stories. Participants particularly appreciated the video testimonials, illustrations, and vignettes, noting they could identify with them. This approach mirrors that of Nickerson and colleagues [65], who found that integrating videos and case examples in their IBI reduced self-stigma and increased help-seeking behavior. Therefore, it is reasonable to speculate that these components may help reduce stigma in future users of the IBI.

As mentioned, the IBI format was deemed suitable, aligning with previous research indicating high technology use among Syrians [43]. However, participants in KIIUE3 reported significant technical issues and navigation challenges. While some issues may have arisen from the early prototype stage, they could also reflect the technical literacy challenges noted by Burchert and colleagues [43]. Despite widespread mobile technology use among Syrian refugees, familiarity often centers on specific applications like communication tools, which underscores the importance of intuitive interfaces for accessibility and ease of use [43]. To address these challenges, navigation points were made explicit and a "Technical Help" session with detailed explanations and screenshots of the app's features was created.

A further barrier identified in this study is concerns about data privacy and mistrust in healthcare providers and government institutions, influenced by the political climate in Syria and experiences as refugees, consistent with previous research [66–68]. These studies suggest the need for refugees to feel they are in a secure environment. To address this, we aimed for transparency about the capabilities and limitations of the IBI. Interestingly, some participants expressed that certain emotions should not be allowed as they could be potentially dangerous in response to the "Sitting with difficult emotions and breathing exercise". However, many indicated they would feel more comfortable knowing the exercise was in a controlled and safe setting. This suggests that concerns about emotional expression and data privacy may both stem from mistrust and an increased need for security and transparency.

Regarding the treatment goal of the app, the dual process model of grief [61] effectively reflected participants' suggestions and proved valuable in conceptualizing the treatment goals. This model incorporates both

loss-oriented and restoration-oriented elements, which were recommended for inclusion. Stroebe and Schut assert that the model's flexibility makes it widely applicable across various cultural groups, allowing for different emphases on its two components. Interestingly, this study found that the target group placed a stronger emphasis on restoration orientation, specifically focusing on future perspectives and new beginnings. This aligns with previous research on coping strategies among Syrian refugees [62] and specifically with Arabic-speaking refugees dealing with bereavement [69]. The strong focus on moving forward and future-oriented thinking may also be linked to religious beliefs, as participants mentioned viewing death as God's will, which necessitates facing loss with acceptance and patience according to Islamic teachings [70].

One prominent theme related to future orientation was the focus on family and community, frequently mentioned as what "matters most" in the IBI. This emphasis surfaced in connection with the treatment goals and rationale, such as the importance of being there for family. Including "what matters most" in a culture in interventions is strongly recommended to enhance motivation and reduce mental health stigma [45, 71]. Consequently, the treatment goals and rationales in the present IBI were primarily formulated to benefit the community or family rather than the individual alone. Additionally, the importance of family and community emerged in metaphors, cultural explanations, and as a significant resource for coping with bereavement. Grief was described as an experience that profoundly affects the community through secondary losses but is also managed collectively, highlighting the crucial role of social relationships in coping. This observation aligns with previous research on mourning in collectivistic cultures, which underscores the communal nature of grieving in non-Western cultures, including the Syrian community [72]. In a study on prolonged grief disorder in Arabic-speaking populations, lower perceived social support was linked to greater symptom severity, underscoring the importance of social support in the grieving process [73]. In this context, the symptom of withdrawal noted in the present study may be particularly problematic for the target group, as it removes a crucial coping mechanism. Social isolation, exacerbated by the refugee experience, further intensifies this issue. Therefore, interventions for bereaved Syrian refugees must prioritize social relationships as a key component.

Similarly, the topic of religion emerged frequently throughout this study, appearing in metaphors, cultural explanations, comments on illustrations, in connection to rituals, and as a vital resource for dealing with bereavement. This aligns with previous research indicating that religion is a major source of support for Arabic-speaking refugees in bereavement [69]. Although religion is known to aid in coping with bereavement by facilitating meaning-making, it is rarely included in bereavement interventions, despite its relevance for culturally sensitive approaches [41, 74, 75]. To incorporate religious perspectives in this study, religious leaders were recruited as key informants. Efforts were made to include religious elements without focusing on any single religious subgroup.

Many rituals identified as relevant were connected to religion. Wojtkowiak and colleagues [76] suggest that incorporating rituals into grief therapy can enhance its effectiveness and cultural sensitivity. This is particularly significant for refugee communities, where the inability to perform traditional rituals may intensify grief symptoms [69, 76, 77]. Consequently, the study included various rituals and provided ways to adapt known rituals to the Swiss context or create new ones.

According to Wojtkowiak et al. [76], rituals in grief interventions can facilitate the expression of emotions and the creation of bonds with the deceased and other mourners, addressing ambivalent or problematic relationships. The topic of continuing bonds, the ongoing inner relationship the bereaved maintain with the deceased [78], emerged as important in interviews, particularly in connection to rituals and the exercise "Words to the Deceased". Continuing bonds can involve behaviors such as telling stories about the deceased, looking at old photos, viewing the deceased as a role model, dreaming about the deceased, or engaging in direct communication with the deceased [79]. However, the idea of speaking with the deceased caused strong reactions, including fear and rejection, among participants. Cultural and religious beliefs significantly shape continuing bonds [70]. In this study, participants indicated that speaking to the deceased and them responding was viewed as speaking to the devil, whereas seeing and speaking to the deceased in dreams was considered normal. This aligns with literature on continuing bonds in Islam, which explains that the dead can hear but cannot reply, and dreaming about the deceased is common [70, 80]. It is crucial to be mindful of such differences when applying common grief intervention techniques based on continuing bonds, such as imaginal dialogues, to diverse cultural groups. The present IBI aimed to reframe the exercise to clarify its purpose and allow users to complete it in a way that felt comfortable for them.

Finally, the diversity of the Syrian population in terms of religion, age, education levels, and other factors was frequently highlighted as a crucial consideration for addressing the needs of the target group in the IBI. While it is challenging to accommodate such varied needs without becoming impractical or overly resource-intensive, it remains a pertinent consideration. For instance, Heim and colleagues [53] found that insufficient attention to

diversity within a cultural group, particularly age differences, contributed to the challenges in their RCT with an IBI for Albanian immigrants in Switzerland. To address these diverse needs, the present study aimed to recruit a heterogeneous stakeholder group and to incorporate a wide range of options and perspectives into the IBI. However, future evaluations are necessary to determine the success of this approach.

This study has several limitations that should be acknowledged. Firstly, we were unable to present the entire content of the IBI in KIIUE2 and KIIUE3 due to resource constraints. Consequently, participant feedback is limited to the parts of the intervention they experienced and may be biased by the research team's selection. In a future pilot Randomized Controlled Trial (RCT), participants will have the opportunity to test the entire app, which will allow for more comprehensive feedback. Additionally, although our sample size was small, it is consistent with qualitative research norms. According to Hennink and Kaiser [49], data saturation is typically reached between nine and 17 interviews, supporting the adequacy of our sample. We conducted three rounds of interviews, with a large part of participants being unique in each round, which ensured a range of perspectives. Despite the small sample size, we believe sufficient data saturation was achieved, though generalizability may still be limited. Moreover, despite efforts to recruit participants from diverse cultural and religious backgrounds, the sample may not fully capture the extensive cultural, ethnic, and religious diversity present in Syria. As a result, while participants generally found the discussed elements—such as the rituals—to be clear and culturally appropriate, these perspectives may not reflect the experiences of all cultural or religious groups. This limitation affects the generalizability of the findings across Syria's diverse population. Another limitation is the necessity of translation, which may have disrupted the natural flow of conversation and the spontaneity of participant responses. The need for translation inevitably resulted in some cultural nuances and idiomatic expressions being lost, posing a risk of information loss. Ideally, the research would be conducted entirely in the participants' mother tongue to fully capture the depth of their responses [81]. Additionally, the recruitment of potential users through the interpreter, who knew them beforehand, may have introduced social desirability bias, as participants might have modified their responses to be viewed more favorably. Nonetheless, the interpreter, being a member of the target group, helped foster trust and had a deeper understanding of community challenges, which in turn ensured more cultural sensitivity. Furthermore, potential power imbalances between researchers and participants could also have influenced the responses, which is acknowledged as a limitation in the interpretation of the findings.

Conclusions

The present study offers several implications for both research and clinical practice. By reporting on the development of the first culturally adapted IBI for grief, it adds to the scarce body of research investigating grief in non-WEIRD populations [41]. Few studies in cultural adaptation research have transparently reported the adaptations made and the decisions leading to them, ensuring their replicability [64, 82]. This study adds to the body of sufficiently documented cultural adaptation processes, which are needed to improve the overall quality of evidence regarding the cultural adaptation of psychological interventions [45]. Notably, this study is the first to apply the RECAPT framework using a bottom-up approach, potentially serving as a model for future projects employing the same approach. However, it is important to recognize that when culturally adapting an intervention bottom-up, it is not possible to determine if certain adaptations are unique to the specific culture (i.e., cultural adaptations) or if they are general factors for grief support applicable to other cultural groups. This underscores the need for future research to evaluate whether the feedback genuinely reflects cultural specificity and whether the adaptations would be applicable to other contexts. Additionally, by thoroughly and transparently documenting the adaptation process, this study may provide valuable information that can be leveraged by future researchers, whether they are targeting similar groups or focusing on bereaved individuals, thus reducing the need to start from scratch. Apart from providing insights for future research developing culturally sensitive interventions for similar target groups, it may also offer useful perspectives to clinical practitioners when working with bereaved Syrian refugees. In light of the substantial treatment gap for refugees, the findings from this study have contributed to the development of the culturally adapted IBI, which may offer crucial support to bereaved Syrians in need. Given its scalability, the app is well-suited for cultural adaptation to other refugee groups or contexts, potentially addressing similar support gaps. This would be an interesting avenue for future research. Additionally, future studies are necessary to evaluate the acceptability, feasibility, and effectiveness of the culturally adapted IBI.

Supplementary Information

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Additional File 1: RECAPT criteria

Additional File 2: Semi-structured Interview Guides: KIIE1, KIIEU2 and KIIEU3

Additional File 3: COREQ Checklist

Additional File 4: Participant characteristics

Additional File 5: Description of the app outline and content

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Author contributions
AA, EH, and CK conceived the study. AA designed the work. AA, AH, VT, and FH acquired the data, with analysis by AA, AH, and VT. Data interpretation was performed by AA, EH, AH, VT, CK, FH, RS, and MA. AA, AH, and VT drafted the manuscript, which was substantively revised by AA, EH, CK, FH, RS, MA, and AM. All authors read and approved the final manuscript.

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Data availability
The datasets generated and analyzed in this study contain sensitive clinical information that could potentially identify participants and are therefore not publicly available. However, the framework matrices with summarized data, which support the study's findings, can be obtained from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
The ethics proposals for KIIE1 and KIIUE2/KIIUE3 were accepted by the ethics committee of the Faculty of Arts and Social Sciences at the University of Zurich.

Consent for publication
Not applicable to the present study as the human faces used are animation/cartoon.

Competing interests
The authors declare no competing interests.

Declaration of generative AI and AI-assisted technologies in the writing process
During the preparation of this work the author(s) used ChatGPT in order to improve the grammar and avoid spelling mistakes. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

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References

1. UNHCR, Global Trends. Forced displacement in 2023. Copenhagen, Denmark: United Nations High Commissioner for Refugees; 2024 [cited 2024 Jul 20]. https://www.unhcr.org/global-trends-report-2023
2. Staatssekretariat für Migration. Asylstatistik 2023. Wabern, Switzerland: Staatssekretariat für Migration; 2024.
3. UN Office for the Coordination of Humanitarian Affairs. Syrian Arab Republic: 2024 Humanitarian Needs Overview. UN Office for the Coordination of Humanitarian Affairs; 2023 [cited 2024 Jul 20]. https://reliefweb.int/report/syrian-arab-republic/syrian-arab-republic-2024-humanitarian-needs-overview-december-2023
4. Hassan G, Ventevogel P, Jefee-Bahloul H, Barkil-Oteo A, Kirmayer LJ. Mental health and psychosocial wellbeing of syrians affected by armed conflict. Epidemiol Psychiatr Sci. 2016;25(2):129–41.
5. Alfadhli K, Drury J. A typology of secondary stressors among refugees of Conflict in the Middle East: the case of Syrian refugees in Jordan. PLoS Curr. 2018;10. ecurrents.dis.4bd3e6437bff47b33ddb9f73cb72f3d8.
6. Bryant RA, Edwards B, Creamer M, O'Donnell M, Forbes D, Felmingham KL, et al. A population study of prolonged grief in refugees. Epidemiol Psychiatr Sci. 2020;29:e44.
7. Kokou-Kpolou CK, Moukouta CS, Masson J, Bernoussi A, Cénat JM, Bacqué MF. Correlates of grief-related disorders and mental health outcomes among adult refugees exposed to trauma and bereavement: a systematic review and future research directions. J Affect Disord. 2020;267:171–84.
8. Lechner-Meichsner F, Comtesse H, Olk M. Prevalence, comorbidities, and factors associated with prolonged grief disorder, posttraumatic stress disorder and complex posttraumatic stress disorder in refugees: a systematic review. Confl Health. 2024;18(1):32.
9. Rosner R, Comtesse H, Vogel A, Doering BK. Prevalence of prolonged grief disorder. J Affect Disord. 2021;287:301–7.
10. World Health Organization. International classification of diseases for mortality and morbidity statistics (11th revision). Geneva: World Health Organization. 2018 [cited 2020 Aug 6]. https://icd.who.int/browse11/l-m/en#/http://id.who.int/icd/entity/1183832314
11. Killikelly C, Maercker A. Prolonged grief disorder for ICD-11: the primacy of clinical utility and international applicability. Eur J Psychotraumatology. 2018;8(sup6):1476441.
12. Henrich J, Heine SJ, Norenzayan A. The weirdest people in the world? Behav Brain Sci. 2010;33(2–3):61–83.
13. Kleinman AM. Depression, somatization and the new cross-cultural psychiatry. Soc Sci Med 1967. 1977;11(1):3–9.
14. Nichter M. Idioms of distress: Alternatives in the expression of psychosocial distress: a case study from South India. Cult Med Psychiatry. 1981;5(4):379–408.
15. Kirmayer LJ, Bhugra D. Culture and Mental Illness: Social Context and Explanatory Models. In: Psychiatric Diagnosis. John Wiley & Sons, Ltd; 2009 [cited 2024 Jul 22];29–40. https://onlinelibrary.wiley.com/doi/abs/10.1002/9780470743485.ch3
16. Shala M, Morina N, Salis Gross C, Maercker A, Heim E. A point in the heart: concepts of emotional distress among albanian-speaking immigrants in Switzerland. Cult Med Psychiatry. 2020;44(1):1–34.
17. American Psychiatric Association. Diagnostic and statistical manual of mental disorders. 5th ed. American Psychiatric Publishing; 2013.
18. Rosenblatt PC. Grief across cultures: a review and research agenda. Handbook of bereavement research and practice: advances in theory and intervention. Washington, DC, US: American Psychological Association; 2008;207–22.
19. Hilberdink CE, Ghainder K, Dubanchet A, Hinton D, Djelantik AAAMJ, Hall BJ, et al. Bereavement issues and prolonged grief disorder: a global perspective. Camb Prisms Glob Ment Health. 2023;10:e32.
20. Killikelly C, Ramp M, Maercker A. Prolonged grief disorder in refugees from Syria: qualitative analysis of culturally relevant symptoms and implications for ICD-11. Ment Health Relig Cult. 2021;24(1):62–79.
21. Flicker SM, Ayoub HJS, Guynn MJ. Emotional display rules in Palestine: Ingroup/outgroup membership, status of interaction partner and gender. Int J Psychol. 2019;54(1):33–41.
22. Fuhr DC, Acarturk C, McGrath M, Ilkkursun Z, Sondorp E, Sijbrandij M, et al. Treatment gap and mental health service use among Syrian refugees in Sultanbeyli, Istanbul: a cross-sectional survey. Epidemiol Psychiatr Sci. 2020;29:e70.
23. Satinsky E, Fuhr DC, Woodward A, Sondorp E, Roberts B. Mental health care utilisation and access among refugees and asylum seekers in Europe: a systematic review. Health Policy. 2019;123(9):851–63.
24. Kiselev N, Pfaltz M, Haas F, Schick M, Kappen M, Sijbrandij M, et al. Structural and socio-cultural barriers to accessing mental healthcare among Syrian refugees and asylum seekers in Switzerland. Eur J Psychotraumatology. 2020;11(1):1717825.
25. Bhugra D. Cultural identities and cultural congruency: a new model for evaluating mental distress in immigrants. Acta Psychiatr Scand. 2005;111(2):84–93.
26. Smid GE, Groen S, de la Rie SM, Kooper S, Boelen PA. Toward Cultural Assessment of grief and grief-related psychopathology. Psychiatr Serv. 2018;69(10):1050–2.

27. Schröder J, Berger T, Westermann S, Klein JP, Moritz S. Internet interventions for depression: new developments. Dialogues Clin Neurosci. 2016;18(2):203–12.
28. Dodge KA, Prinstein MJ, Evans AC, Ahuvia IL, Alvarez K, Beidas RS et al. Population mental health science: Guiding principles and initial agenda. Am Psychol. 2024 Jun 3 [cited 2024 Jul 22]; https://search.ebscohost.com/login.aspx?direct=true&db=pdh&AN=2024-88444-001&site=ehost-live
29. Berger M, Wagner TH, Baker LC. Internet use and stigmatized illness. Soc Sci Med. 2005;61(8):1821–7.
30. Firth J, Torous J, Nicholas J, Carney R, Rosenbaum S, Sarris J. Can smartphone mental health interventions reduce symptoms of anxiety? A meta-analysis of randomized controlled trials. J Affect Disord. 2017;218:15–22.
31. Kuester A, Niemeyer H, Knaevelsrud C. Internet-based interventions for posttraumatic stress: a meta-analysis of randomized controlled trials. Clin Psychol Rev. 2016;43:1–16.
32. Sloan DM, Gallagher MW, Feinstein BA, Lee DJ, Pruneau GM. Efficacy of Telehealth treatments for posttraumatic stress-related symptoms: a Meta-analysis. Cogn Behav Ther. 2011;40(2):111–25.
33. Cuijpers P, Heim E, Ramia JA, Burchert S, Carswell K, Cornelisz I, et al. Effects of a WHO-guided digital health intervention for depression in Syrian refugees in Lebanon: a randomized controlled trial. PLOS Med. 2022;19(6):e1004025.
34. Brodbeck J, Berger T, Biesold N, Rockstroh F, Znoj HJ. Evaluation of a guided internet-based self-help intervention for older adults after spousal bereavement or separation/divorce: a randomised controlled trial. J Affect Disord. 2019;252:440–9.
35. Eisma MC, Boelen PA, van den Bout J, Stroebe W, Schut HAW, Lancee J, et al. Internet-based exposure and behavioral activation for complicated grief and rumination: a Randomized Controlled Trial. Behav Ther. 2015;46(6):729–48.
36. Wagner B, Rosenberg N, Hofmann L, Maass U. Web-Based Bereavement Care: A Systematic Review and Meta-Analysis. Front Psychiatry. 2020 Jun 24 [cited 2024 Jul 22];11. https://www.frontiersin.org/journals/psychiatry/articles/https://doi.org/10.3389/fpsyt.2020.00525/full
37. Arundell LL, Barnett P, Buckman JEJ, Saunders R, Pilling S. The effectiveness of adapted psychological interventions for people from ethnic minority groups: a systematic review and conceptual typology. Clin Psychol Rev. 2021;88:102063.
38. Hall GCN, Ibaraki AY, Huang ER, Marti CN, Stice E. A Meta-analysis of Cultural adaptations of psychological interventions. Behav Ther. 2016;47(6):993–1014.
39. Harper Shehadeh M, Heim E, Chowdhary N, Maercker A, Albanese E. Cultural Adaptation of minimally guided interventions for Common Mental disorders: a systematic review and Meta-analysis. JMIR Ment Health. 2016;3(3):e5776.
40. Naeem F, Phiri P, Rathod S, Ayub M. Cultural adaptation of cognitive–behavioural therapy. BJPsych Adv. 2019;25(6):387–95.
41. Aeschlimann A, Heim E, Killikelly C, Arafa M, Maercker A. Culturally sensitive grief treatment and support: a scoping review. SSM - Ment Health. 2024;5:100325.
42. Resnicow K, Baranowski T, Ahluwalia JS, Braithwaite RL. Cultural Sensitivity in Public Health: defined and demystified. Ethn Dis. 1999;9(1):10–21.
43. Burchert S, Alkneme MS, Bird M, Carswell K, Cuijpers P, Hansen P et al. User-Centered App Adaptation of a Low-Intensity E-Mental Health Intervention for Syrian Refugees. Front Psychiatry. 2019 Jan 25 [cited 2024 Jul 22];9. https://www.frontiersin.org/journals/psychiatry/articles/https://doi.org/10.3389/fpsyt.2018.00663/full
44. Heim E, Kohrt BA. Cultural Adaptation of Scalable Psychological interventions. Clin Psychol Eur. 2019;1(4):1–22.
45. Heim E, Mewes R, Abi Ramia J, Glaesmer H, Hall B, Harper Shehadeh M, et al. Reporting Cultural Adaptation in psychological trials – the RECAPT criteria. Clin Psychol Eur. 2021;3(Spec Issue):e6351.
46. Stoeckli R, Berger T, Aebersold M, Zoellner V, Haji F, Hunziker M et al. Development and Cultural-Contextual Adaptation of a Low-Threshold Digital Psychosocial Service for Refugees Living in Switzerland: Sui App. 2024 [cited 2024 Jul 22]. https://preprints.jmir.org/preprint/59905
47. Roller MR, Lavrakas PJ. Applied qualitative Research Design: a total quality Framework Approach. Guilford; 2015. p. 417.
48. Palinkas LA, Horwitz SM, Green CA, Wisdom JP, Duan N, Hoagwood K. Purposeful sampling for Qualitative Data Collection and Analysis in mixed method implementation research. Adm Policy Ment Health Ment Health Serv Res. 2015;42(5):533–44.
49. Hennink M, Kaiser BN. Sample sizes for saturation in qualitative research: a systematic review of empirical tests. Soc Sci Med. 2022;292:114523.
50. Dr D. & Pehl GmbH. F4transkript. Dr. Dresing & Pehl GmbH; 2022. https://www.audiotranskription.de/en/f4
51. Fylan F. Semi-structured interviewing. In: Miles J, Gilbert P, editors. A Handbook of Research Methods for Clinical and Health Psychology. Oxford University Press; 2005 [cited 2024 Jul 22]. p. 0. https://doi.org/10.1093/med:psych/9780198527565.003.0006
52. Kallio H, Pietilä AM, Johnson M, Kangasniemi M. Systematic methodological review: developing a framework for a qualitative semi-structured interview guide. J Adv Nurs. 2016;72(12):2954–65.
53. Heim E, Ademi B, Dacaj A, Hosny N, Burchert S, Pashoja AC, et al. Why did our trial not work out? A qualitative analysis. Clin Psychol Eur. 2024;6(2):1–13.
54. Dr D. & Pehl GmbH. F4transkript. Dr. Dresing & Pehl GmbH; 2023. https://www.audiotranskription.de/en/f4
55. Riihiaho S. Usability Testing. In: The Wiley Handbook of Human Computer Interaction. John Wiley & Sons, Ltd; 2018 [cited 2024 Jul 22];255–75. https://onlinelibrary.wiley.com/doi/abs/10.1002/9781118976005.ch14
56. Gale NK, Heath G, Cameron E, Rashid S, Redwood S. Using the framework method for the analysis of qualitative data in multi-disciplinary health research. BMC Med Res Methodol. 2013;13(1):117.
57. Software VERBI. MAXQADA 2022 [computer software]. Berlin, Germany: VERBI Software; 2022. https://www.maxqda.com
58. MacPhail C, Khoza N, Abler L, Ranganathan M. Process guidelines for establishing Intercoder Reliability in qualitative studies. Qual Res. 2016;16(2):198–212.
59. Gale RC, Wu J, Erhardt T, Bounthavong M, Reardon CM, Damschroder LJ, et al. Comparison of rapid vs in-depth qualitative analytic methods from a process evaluation of academic detailing in the Veterans Health Administration. Implement Sci. 2019;14(1):11.
60. Lewinski AA, Crowley MJ, Miller C, Bosworth HB, Jackson GL, Steinhauser K, et al. Applied Rapid Qualitative Analysis to develop a contextually appropriate intervention and increase the likelihood of Uptake. Med Care. 2021;59:S242.
61. Stroebe M, Schut H. The dual process model of coping with bereavement: rationale and description. Death Stud. 1999;23(3):197–224.
62. Renner A, Hoffmann R, Nagl M, Roehr S, Jung F, Grochtdreis T, et al. Syrian refugees in Germany: perspectives on mental health and coping strategies. J Psychosom Res. 2020;129:109906.
63. Rüsch N, Angermeyer MC, Corrigan PW. Mental illness stigma: concepts, consequences, and initiatives to reduce stigma. Eur Psychiatry. 2005;20(8):529–39.
64. Böttche M, Kampisiou C, Stammel N, El-Haj-Mohamad R, Heeke C, Burchert S, et al. From Formative Research to Cultural Adaptation of a face-to-face and internet-based cognitive-behavioural intervention for arabic-speaking refugees in Germany. Clin Psychol Eur. 2021;3(Spec Issue):e4623.
65. Nickerson A, Byrow Y, Pajak R, McMahon T, Bryant RA, Christensen H, et al. Tell your story': a randomized controlled trial of an online intervention to reduce mental health stigma and increase help-seeking in refugee men with posttraumatic stress. Psychol Med. 2020;50(5):781–92.
66. Byrow Y, Pajak R, Specker P, Nickerson A. Perceptions of mental health and perceived barriers to mental health help-seeking amongst refugees: a systematic review. Clin Psychol Rev. 2020;75:101812.
67. Çöl M, Akın-Sarı B, Mut ANU, Çelik K, Aykut NB, Dinç LE et al. A qualitative research on mental health and psychosocial issues impacting Syrian refugee women in Turkey. 2022 [cited 2024 Jul 24]. https://www.researchsquare.com/article/rs-2233366/v1
68. Kerbage H, Marranconi F, Chamoun Y, Brunet A, Richa S, Zaman S. Mental Health Services for Syrian refugees in Lebanon: perceptions and experiences of professionals and refugees. Qual Health Res. 2020;30(6):849–64.
69. Lechner-Meichsner F, Comtesse H. Beliefs About Causes and Cures of Prolonged Grief Disorder Among Arab and Sub-Saharan African Refugees. Front Psychiatry. 2022 Apr 5 [cited 2024 Aug 16];13. https://www.frontiersin.org/journals/psychiatry/articles/https://doi.org/10.3389/fpsyt.2022.852714/full
70. Suhail K, Jamil N, Oyebode J, Ajmal MA. Continuing bonds in Bereaved Pakistani muslims: effects of Culture and Religion. Death Stud. 2011;35(1):22–41.
71. Kohrt BA, Turner EL, Rai S, Bhardwaj A, Sikkema KJ, Adelekun A, et al. Reducing mental illness stigma in healthcare settings: Proof of concept for a social contact intervention to address what matters most for primary care providers. Soc Sci Med. 2020;250:112852.
72. Dennis MK. Collecting grief: indigenous peoples, deaths by police and a global pandemic. Qual Soc Work. 2021;20(1–2):149–55.
73. Specht F, Vöhringer M, Knaevelsrud C, Wagner B, Stammel N, Böttche M. Prolonged grief disorder in Arabic-speaking treatment-seeking populations: Relationship with socio-demographic aspects, loss- and trauma-related characteristics, and mental health support. Front Psychiatry. 2022 Sep 15 [cited

2024 Aug 15];13. https://www.frontiersin.org/journals/psychiatry/articles/https://doi.org/10.3389/fpsyt.2022.933848/full
74. Kokou-Kpolou CK, Park S, Lenferink LIM, Iorfa SK, Fernández-Alcántara M, Derivois D, et al. Prolonged grief and depression: a latent class analysis. Psychiatry Res. 2021;299:113864.
75. Schaal S, Jacob N, Dusingizemungu JP, Elbert T. Rates and risks for prolonged grief disorder in a sample of orphaned and widowed genocide survivors. BMC Psychiatry. 2010;10(1):55.
76. Wojtkowiak J, Lind J, Smid GE. Ritual in Therapy for Prolonged Grief: A Scoping Review of Ritual Elements in Evidence-Informed Grief Interventions. Front Psychiatry. 2021 [cited 2022 Apr 25];11. https://www.frontiersin.org/article/https://doi.org/10.3389/fpsyt.2020.623835
77. Hinton DE, Peou S, Joshi S, Nickerson A, Simon NM. Normal grief and complicated bereavement among traumatized Cambodian refugees: Cultural Context and the Central Role of dreams of the Dead. Cult Med Psychiatry. 2013;37(3):427–64.
78. Stroebe M, Schut H. To continue or relinquish bonds: a review of consequences for the Bereaved. Death Stud. 2005;29(6):477–94.
79. Root BL, Exline JJ. The role of Continuing Bonds in coping with grief: overview and future directions. Death Stud. 2014;38(1):1–8.
80. Klass D, Goss R. The politics of grief and continuing bonds with the Dead: the cases of Maoist China and Wahhabi Islam. Death Stud. 2003;27(9):787–811.
81. Fryer CE. An Approach to Conducting Cross-Language Qualitative Research with People from Multiple Language Groups. In: Liamputtong P, editor. Handbook of Research Methods in Health Social Sciences. Singapore: Springer; 2019 [cited 2024 Jul 23];1653–74. https://doi.org/10.1007/978-981-10-5251-4_38
82. Shala M, Morina N, Burchert S, Cerga-Pashoja A, Knaevelsrud C, Maercker A, et al. Cultural adaptation of *hap-pas-Hapi*, an internet and mobile-based intervention for the treatment of psychological distress among Albanian migrants in Switzerland and Germany. Internet Interv. 2020;21:100339.

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Erklärung zur Dissertation

Hiermit bestätige ich, dass ich die Dissertation (Titel):

im Fach Klinische Psychologie und Psychotherapie

unter der Leitung von Prof. Dr. Thomas Berger

ohne unerlaubte Hilfe ausgeführt und an keiner anderen Universität zur Erlangung eines akademischen Grades eingereicht habe.

Datum Unterschrift