

Co-Designing Health Interventions With Refugee Communities – A Scoping Review.

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Abstract

Background

As of June 2020, there were more than 79.5 million people displaced from their homes globally. Despite significantly different lived experiences, health literacy is poor within most displaced communities, contributing to low awareness and uptake of healthcare services and poor health outcomes as a result. Co-designing health interventions with communities is not a new concept however it is experiencing a significant increase in interest and support within the global health movement and areas of health equity in particular. This scoping review examines the current literature and gaps related to co-designing health interventions with refugees in order to increase health literacy; provide health services; and/or build quantitative data on health needs specific to refugee communities.

Methods

The following three questions were drafted and incorporated into a PICO framework.

1. What literature exists surrounding co-designing health interventions with refugee populations?
2. What effect (if any) do existing co-designed health interventions have on health outcomes (as defined above) within refugee populations?
3. What gaps persist in co-designing health interventions with refugee communities?

Key search terms were developed aiming to locate academic literature located within a Venn diagram of three categories: health, refugees and co-design.

Results

Combined searches uncovered a total of 1,804 articles following removal of duplications. 1,750 articles were excluded following screening of title and abstract leaving a shortlist of 54 articles. Only 10 of these articles met PICO criteria and nine of these focused exclusively on co-designing health interventions with refugee populations applied qualitative techniques. Only one article addressed all three health outcomes listed in the inclusion criteria above and half the articles did not discuss intervention outcomes or include any form of process evaluation.

Conclusions

This scoping review presents an opportunity to explore the intersection of collaborative design and health innovation with refugee communities. To ensure health interventions improve health outcomes, communities directly affected by displacement must be supported to authentically participate in, and where possible lead, efforts to co-design within this context. Future research efforts should expand to focus on evaluating the outcomes of ethical, meaningful and representative collaboration.

Background

As of June 2020, there were more than 79.5 million people displaced from their homes globally [1]. Despite significantly different lived experiences, access to healthcare services is poor and specific healthcare needs go unmet for most of this population [2]. Health literacy is variable and dependent upon pre-transit socioeconomic status, education background, geographic proximity to healthcare and social welfare services, as well as the overall quality of the healthcare system within one's origin country, more generally [3]. Health literacy, defined in this instance as "a person's ability to access, understand and apply health information"[4], is poor within most displaced communities, contributing to low awareness and uptake of healthcare services and to poor health outcomes as a result [5]. Due to the range of security and economic barriers that are present within most refugee settings, both emergency and resettled, data on the specific needs of different refugee populations is scant [6]. This has a deleterious effect on funding and policy and contributes to the cycle of poverty experienced by most of the world's displaced communities [6].

To ensure health interventions improve health outcomes, communities directly affected by displacement must be supported to authentically participate in, and where possible lead, efforts to co-design health interventions within this context [7]. Co-designing with communities is not a new concept however it is experiencing a significant increase in interest and support within the global health movement and areas of health equity in particular. This is due in part to the rise in human-centered design processes often associated with digital platform development, and products that equate substantial end-user input with increased acceptability and uptake and ideally, profits.

Human-centered design is an approach marked by three stages (Inspiration, Ideation and Implementation) which diverge and converge repeatedly. These stages are practically applied through concrete steps (Empathize, Define, Ideate, Prototype and Test) in a process called "design thinking" [8]. In this review, design thinking studies were considered based on Altman, Huang and Breland's (2018) criteria that the studies "1) described user/needs assessment, 2) involved iterative prototyping/testing of the intervention with user feedback, and 3) tested the intervention with target users" [9]. Authentic co-design means end-user communities (i.e. the beneficiaries of a health or social intervention) are engaged with and listened to and their advice or feedback is acted upon and visible in the final product or program developed. Importantly, co-design can help to increase user acceptance and ownership of intended interventions [9] [10].

The terms co-design, co-production and co-creation are often used interchangeably and inconsistently. This scoping review considers co-design the act of defining a problem and designing its potential solution with the intended beneficiaries. Co-production involves developing and delivering that solution to its intended audience and co-creation is the process of working with all stakeholders to achieve this end goal. Whilst community based participatory research (CBPR) sits within the co-design stage (i.e. understanding, empathizing and defining the problem or barrier in need of addressing) many CBPR projects outline

health problems well but do not move on to actually co-designing or co-producing potential solutions. As this scoping exercise is focused on health interventions specifically, only CBPR or participatory action research (PAR) that included a continuation on to either co-design, co-produce or co-create a solution (i.e. a health intervention) with and for refugees were included in the final review of articles.

Human-centered design within the health and humanitarian context is a rapidly evolving field of both academia and policy application. As with many other areas that cross the implementation science or translational research space, the most relevant discourse in this area currently can mainly be found within grey literature. Similarly, because recent systematic reviews on the health of displaced communities continue to demonstrate a dearth of literature describing any kind of human-centered design approach, a scoping review was determined more feasible and useful than a systematic review. Within the context of this scoping review, the term “refugee” is being used as an all-encompassing descriptor that includes people with legal refugee status, as well as people seeking asylum, undocumented immigrants (or workers) and people generally considered displaced or stateless, regardless of the temporality or formal recognition of their circumstance. Refugee settings could be either emergency or humanitarian-based or within a resettled country.

Objectives

The aims of this scoping review were to:

1. Examine the current literature on co-designing health interventions with refugee populations that aim to address health outcomes in any of the following ways:
 - Increasing health literacy of refugees;
 - Providing refugees with health services; and/or
 - Building quantitative data on health needs of refugees.
2. Determine what gaps persist in the literature surrounding co-designing health interventions with refugee communities.

Methods

Clinical questions

The following three questions were drafted and incorporated into a PICO framework (see Table 1).

1. What literature exists surrounding co-designing health interventions with refugee populations?
2. What effect (if any) do existing co-designed health interventions have on health outcomes (as defined above) within refugee populations?
3. What gaps persist in co-designing health interventions with refugee communities?

Search terms

Next, key search terms were developed aiming to locate academic literature located within a Venn diagram of three categories: health, refugees and co-design. Broader terms required adaptation in certain databases in order to bring up any articles once search commenced. Final search terms were as follows:

Health: Health; Healthcare; Health care; Health outcome; Primary care; Medic*; patient

Refugee: Refugee; Asylum; Asylum seek*; Displaced; Undocumented; Vulnerable; Migrant; Migrat*; Illegal; alien

Co-Design: Design thinking; Design science; Design approach; User cent* design; user led design; Human cent* design; human led design; Person cent* design; person led design; Patient cent* design; Patient led design; Co-design; Codesign; co-creat*; cocreat*; co-produc*; coproduc*; co-construct*; coconstruct*; co-develop*; codevelop*

The broader definition of health presented some difficulty as to what constitutes a direct health intervention or a health outcome. Whilst recognizing the importance of social determinants of health (e.g. housing, employment, education or social inclusion), this was deemed outside the scope of this review and articles that focused on these were excluded. . In cases where a specific community group is mentioned without reference to refugee status but that these groups are known to have a history of refugee or undocumented experience in that country (e.g. Somali, Hmong, LatinX communities in the United States) they were included. However if the article mentioned that participants or co-designers were from minority groups but did not specifically refer to refugees, asylum seekers or undocumented workers they were excluded. This is the case in which community partners were grouped as “black minority ethnic”. The decision to separate these groups in no way implies that non-refugee, migrant or minority communities have better health outcomes, access or experiences or warrant less consideration.

Databases

The following electronic databases were used to identify relevant published literature:

- Ovid
- Medline including Medline in-process and other non-indexed citations via Ovid

- PsychINFO via Ovid
- EMBASE via Ovid
- All EBM Reviews, incorporating:
 - Cochrane Database of Systematic Reviews
 - ACP Journal Club
 - Database of Abstracts of Reviews of Effects
 - Cochrane Central Register of Controlled Trials
 - Cochrane Methodology Register
 - Health Technology Assessment
 - NHS Economic Evaluation Database
- CINAHL
- Global Health (CABI)
- Google and Google Scholar
- SCOPUS
- Web of Science

OpenGrey, Informit and Proquest Health and Medical Collection were excluded from the original plan as they brought up millions of articles without the capacity to sort through those which met criteria. Google and Google Scholar were searched and the first 25 per cent demonstrated some relevance (i.e. met at least two of the three topics in the Venn diagram). Due to the cumbersome nature of using Google's search platform (it re-searches when moving to each new page and only allows the user to view and save 20 items at a time), it became too time consuming to save all findings (n = 1,516). The first 420 articles were selected as those beyond this time began to show less and less relevance to any of the topics being explored (see Figure 1).

Bibliographies of relevant and related studies were also searched and manually added if not already in the final search count. To identify ongoing trials, we searched the International Clinical Trials Registry Platform Search Portal (<http://apps.who.int/trialsearch/>), which provides access to a central database containing the trial registration data sets provided by 16 different international registries. The search strategy was limited to English but not to year of publication or study type. Only academic articles were considered as the grey literature surrounding these topics is too vast to include in a scoping review and the goal was to explore evidence-based, peer-reviewed literature.

The original key terms search was run in March 2020. An additional search was run to capture any new articles published between April 2020 and January 2021 using the same methods and search terms and applying a narrative synthesis to reviewed articles.

Screening of search results

Endnote X8 was used to manage search results. As this is a scoping review, the first author (RB) assessed selection criteria. A second reviewer (JB) verified abstraction results, as needed. A full text of the article was retrieved for further assessment if the information given suggested that the study met the selection criteria or if there was any doubt regarding eligibility of the article based on the information given in the title and abstract. In some cases, there were more than one article describing the same study and reporting different outcomes [11] [12].

Risk of bias

Methodological quality of the included studies was assessed by first author (RB) and this assessment was reviewed and confirmed by one other author (JB) using the Critical Appraisals Skills Programme (CASP) risk of bias checklist for qualitative studies [13]. Due to the heterogeneous, and mostly qualitative, nature of the results, a quantitative synthesis or meta-analysis was not appropriate. Instead, the authors undertook a descriptive synthesis using narrative summary and tabulation. Subgroup analysis was planned according to PICO inclusion criteria, demography, location, research type and goal of intervention however sample sizes and results available did not allow for interrogation or analysis of intervention outcomes.

Data extraction

Table 2 outlines general information collected for each study (title, authors, reference/source, country, year of publication, setting), along with health outcomes (as per clinical questions posed), sample size (if listed), study quality, relevant themes, contributions to the field of study, lessons learned and gaps remaining within the existing literature.

Results

The combined searches uncovered a total of 1,804 articles following removal of duplications. 1,750 articles were excluded following screening of title and abstract leaving a shortlist of 54 articles (see Fig. 1). Shortlisted articles were excluded after being read in full if they did not discuss a refugee co-designed health intervention addressing or related to at least one of the clinical questions above (i.e. improving health literacy of refugees, directly increasing health access for refugees, or facilitating the quantification of health need via population-based data collection), as was the case for a number of scoping articles and systematic reviews. Articles that were theoretical explorations of related topics such as those that discussed collaborating with refugees without specifically co-designing (as per description above) with them, were similarly excluded. Interventions that did not directly relate to health interventions or solutions (e.g. shelter, music) did not meet the PICO criteria, nor did those that did not directly benefit refugee communities such as eLearning modules for

pharmacy staff and were subsequently excluded. Finally, several articles discussed promising health interventions, however the co-designers worked for refugee organizations (e.g. therapists, case managers, healthcare workers) and were not necessarily refugees themselves. Unless the article specifically noted that staff members (or at least some of them) had a lived experience of being a refugee, they were also excluded. Articles were also excluded if multiple attempts to access the full text failed. Conference proceedings and dissertations (e.g. Masters or PhD) were not included.

As only CBPR or PAR articles that also discussed co-designing an actual or potential community health intervention with and for refugees were deemed acceptable, 45 shortlisted articles were subsequently excluded (see Fig. 1) for failing to meet this inclusion criteria. This left 10 articles for final review (see Table 2). The 10 remaining articles were primarily qualitative though a number discussed the design and implementation of a quantitative survey [12, 14–16] and one article also undertook biological specimen collection [15]. All research took place in high income countries which is unsurprising given the difficulty and often dangerous aspects of undertaking research in both emergency and longer term refugee settings [17] [17]. Shortlisted research articles that did take place in refugee camps [18, 19] were excluded if co-designers were only listed as health and humanitarian professionals and it was unclear if they had a lived experience as a refugee also. As mentioned, a second search was run for articles published between April 2020 and January 2021 and results are included in the PRISMA diagram (Fig. 1).

What literature exists surrounding co-designing health interventions with refugee populations?

Nine of the 10 articles that focused exclusively on co-designing health interventions with refugee populations all applied qualitative techniques. Different methods of CBPR and PAR were utilized to develop a health intervention that increased health literacy [12, 15, 20–23], provided (or improved) health access [15, 24] or built upon existing health data related to the partner community [14, 20]. Projects included plays on autism [20]; digital storytelling about diabetes [12]; in-language talking books on dementia [21]; guidelines for health professionals working with refugees [23] and community education or support programs [22, 24] amongst others.

All researchers made a conscious effort to avoid tokenistic engagement [12, 20, 21] and worked to reduce community distrust through sincere and frequent engagement, utilizing health researchers, workers and representatives from similar refugee backgrounds as those within the projects' focus [16, 23]. Only three of the 10 articles stated that the aim of the health outcome was pre-determined by end user community members based on self-identified need or the project was driven by the community members themselves [14, 15, 20]. In the case of Ramaliu et al.'s community participation project, specific research techniques were not discussed directly, nor was data gathered or analyzed [24]. Though some authors did undertake community surveys [14], quantitative data was not extensively analyzed or explored beyond reporting on basic demographics except in two instances [21, 22]. All articles were assessed to be of moderate to high quality, based on the CASP checklist [13]. Studies that used robust qualitative methods built their findings around mixed methodologies such as in-depth interviews, quantitative surveys and focus groups [12, 14–16, 21] or provided opportunities for repeat feedback or longitudinal data collection [22, 23].

What effect (if any) do existing co-designed health interventions have on health outcomes (as defined above) within refugee populations?

Only Morrison et al.'s CBPR partnership with the Montagnard community in North Carolina addressed all three health outcomes listed in the inclusion criteria above [15]. Formea's CBPR work on diabetes with Somali, Cambodian and LatinX communities in Minnesota addressed two out of the three [11] and the remaining articles each addressed one of these health outcomes. Eight of the 10 articles focused on addressing health literacy either directly through development of health education materials, classes or awareness raising campaigns [11, 20]. Evidence suggests that health conditions-specific awareness increased in relation to autism [20], dementia [21], diabetes [12], women's health [22], hypertension [15] and mental health [24]. In the case of O'Reilly-de Brún et al, community capacity and sense of rebalancing power is also reported to have increased as a direct outcome of the health intervention co-design process [23].

... [Being a peer researcher with my community,] I feel ... very powerful and ... when I listened to [MSUs'] views it gave me more energy ... I feel that I have done a good job for [my community]... I'm hopeful, that [what happens] will be good for the community and the problems they are facing. [23]

Two articles addressed health access either via a health fair [15] or establishing a refugee health service [24]. Community co-design efforts also led to research opportunities with local universities that contributed to the development of professional expertise and healthcare service provision, specifically health screenings and development of education materials [15]. Four articles addressed data gaps unique to the partnering refugee community and the need to improve on the granularity of information on self-identified community health needs via disease-specific surveys [11, 16] or more generalized health and behavior surveys [14, 15]. Co-design efforts helped improve the cultural safety of community surveys assessing health literacy and awareness [21]. Implementation plans were changed to increase their accessibility and acceptability and leading to increased response rates and sample sizes [11, 16]. Finally, Berthold's research ensured community health workers were trained to facilitate mobile-enabled health data collection across six Cambodian-American communities [14, 23].

What gaps persist in co-designing health interventions with refugee communities?

Half the articles did not discuss intervention outcomes or include any form of process evaluation [11, 12, 15, 16, 24]. Effect was yet to be measured in one article since the intervention had not been implemented by time of publication [11]. Effect was measured extensively by Aabe et al. against the socio-ecological model [25], taking into consideration impact within the micro (individual and group), meso (organizational) and macro (societal) levels [20]. Similarly, Goeman and O'Reilly-de Brún undertook extensive evaluations using multiple techniques including qualitative analysis of focus group discussion, surveys and community trainer/participant self-reflection [21, 23]. Finally, Berthold et al.'s CBPR efforts were robustly measured by training and supervision logs surrounding data collection, community engagement, study and sampling procedures and survey implementation [14].

Discussion

This scoping review presents an opportunity to explore the intersection of collaborative design and health innovation with refugee communities. Finding only 10 eligible articles from a broad set of search terms that initially yielded almost 1,800 potential results demonstrates a significant gap in the literature. Given that this particular topic sits within the centre of a Venn diagram of other well-researched areas including refugee health, community co-design and public health interventions, it was surprising that there were not more peer-reviewed, academic articles within this space.

The majority of articles focused on only one of the health outcomes listed in the inclusion criteria (i.e. increasing health literacy of refugees, providing refugees with health services, or building quantitative data on health needs of refugees) and only one article attempted to address all three. In seeking to determine the remaining gaps related to this literature search, half the articles failed to evaluate the health intervention, the co-design process, or both. Those that did evaluate offered robust methodologies though almost all were qualitative and none were generalisable in nature. Overall, the failure to offer quality effect measurement of either the co-design process or health intervention makes it difficult to expand the evidence around what does and does not work within the co-design and humanitarian health space. A key observation is the important role co-design plays in rebalancing power dynamics between community members and non-community researchers and how this impacted the research team and the end users of the health intervention being developed at the individual, organizational and societal level [23].

Unsurprisingly, the involvement of community researchers seemed to have the positive effect of making recruitment and data collection easier. This was integral in Wong's study, which originally experienced a low recruitment rate for its hypertension survey until community researchers advocated the coupling of recruitment with direct services such as assisting participants with employment forms and resumes, facilitating transport, participating in community events, running education classes and serving as advisors or speakers at community workshops [16].

There is a growing body of grey literature focused on this topic that should not be overlooked [3, 5, 26]. Though, in some cases, grey literature may lack in rigor, it makes up for it in innovation and accessibility, from both a dissemination perspective (i.e., reaching more people) but also from an engagement perspective (i.e., being made understandable and accessible to non-academic audiences). This is important as this work focuses on communities, as well as non-government organizations and support services who are, by circumstance, unlikely to be able to engage academically at least during the peak of their refugee experience. A number of articles excluded did report on research undertaken in active humanitarian settings or for refugee communities, however if they did discuss co-design it was in the context of developing solutions with health or social welfare organizations and did not explicitly state if they were working with end user communities (i.e. refugees) themselves [18, 27–30]. This is unsurprising, given the lack of capacity and potential increased vulnerability many people may experience as newly arrived refugees. The average length of exile is between 5–14 years [31] however, so more established or integrated community members may benefit from being involved in action-based research and bring a sense of agency as well as a depth and breadth of experience needed to make that research more meaningful and impactful for the intended beneficiaries (i.e. other refugees). Future research should be undertaken with the community end-users, where possible and these partnerships should be explicitly outlined when referring to co-design methodologies.

Limitations

This review was limited to English language and academic articles and the heterogeneous nature of the review meant no meta-analysis could be undertaken. The review did, exclude articles in which participatory research was the intervention due to the limited generalizability or impact qualitative research of this kind can have at the population level (i.e. for those not involved in the research activities directly). These articles were not of direct relevance to this research effort but likely led to important lessons through the process of community engagement for those seeking to undertake authentic co-design within refugee settings.

Strengths

This review is the first of its kind in assessing evidence-based literature that intersects the co-design of health interventions for and with refugee communities. The complexity of the refugee experience creates opportunities for exploitation and tokenism and there is an immediate need to understand how to work with communities based on their own perceptions of vulnerability, resilience, self-identified need and access to power [17]. Understanding what has and has not worked in the space offers an opportunity to develop best practices that ensure refugees are the central and lead decision makers in care meant for them. This is a strength of this paper, particularly at a time where the refugee crisis is at a global high and the world is in the midst of a pandemic.

Conclusion

This review aimed to determine what role, if any, co-design can have on increasing health literacy or access to services within refugee communities as well as building population-level data surrounding their specific health needs. It also sought to determine what gaps persist in the evidence-based, academic literature surrounding refugee community co-design. Based on the findings, future research efforts should expand to focus on evaluating the outcomes of ethical, meaningful and representative collaboration. This will help build the evidence, and consequently the support novel health interventions' effectiveness as well as the process of working and being led by end user communities to achieve these goals. This would also assist to build the evidence base of using authentic community co-design with refugee communities, which is a rapidly growing area of practice and research termed "equity-centered community design" [32]. Strengthening the rigor of this type of research with communities that experience higher risks of vulnerabilities, such as refugees, would also contribute to its utilization within acute refugee settings (either camp-based or urban), where appropriate. The rate of human displacement grows daily and with it the risk to public health and safety on a global scale. This paper offers useful and immediately applicable guidance surrounding best practices when working with refugees to co-design health interventions that are not only appropriate but also acceptable and accessible to their wider communities.

Declarations

Ethics approval and consent to participate

This research did not involve human participants, human material, or human data and was therefore not subject to a Human Ethics Review Committee, nor did it require participant consent. All methods were carried out in accordance with relevant guidelines and regulations related to rapid and/or scoping reviews.

Consent for publication

All authors consent to publication. There are no identifying images or other personal or clinical details of participants present in this manuscript.

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Availability of data and materials

All data generated or analysed during this study are included in this published article.

Competing interests

None of the authors have competing interests as defined by BMC, or other interests that might be perceived to influence the results and/or discussion reported in this paper. All of the material is owned by the authors and/or no permissions are required.

Authors' contributions

RB drafted and reworked the manuscript based on edits and advice provided throughout by JW and JB. All authors read and approved the final manuscript.

References

1. UNHCR. Refugee Population Statistics Database 2020 [Available from: <https://www.unhcr.org/refugee-statistics/>].
2. WHO. Report on the health of refugees and migrants in the WHO European Regions: no public health with refugee and migrant health. 2018.
3. Partnership MaRWsH. Enhancing health literacy in the settlement of migrant and refugee women. 2018.
4. AIHW. Australia's Health: 4.3 Health Literacy. 2018.
5. HIC/VRHN. Working Together to Improve Health Literacy of Women from Refugee Backgrounds. 2017.
6. Blanchet K, & Roberts, B.. An evidence review of research on health interventions in humanitarian crises.; 2015.
7. Holeman I, Kane D. Human-centered design for global health equity. *Inf Technol Dev.* 2019;26(3):477–505.
8. d.school S. Get Started with Design Thinking Process. 2016
9. Altman M, Huang TTK, Breland JY. Design Thinking in Health Care. *Prev Chronic Dis.* 2018;15:E117.
10. Government Q. Human Centred Design Toolkit. 2018.
11. Formea CM, Mohamed AA, Hassan A, Osman A, Weis JA, Sia IG, et al. Lessons learned: cultural and linguistic enhancement of surveys through community-based participatory research. *Prog Community Health Partnersh.* 2014;8(3):331–6.
12. Njeru JW, Patten CA, Hanza MM, Brockman TA, Ridgeway JL, Weis JA, et al. Stories for change: development of a diabetes digital storytelling intervention for refugees and immigrants to minnesota using qualitative methods. *BMC Public Health.* 2015;15:1311.
13. CASP. Critical Appraisals Skills Programme Qualitative Checklist 2018 [Available from: https://casp-uk.net/wp-content/uploads/2018/03/CASP-Qualitative-Checklist-2018_fillable_form.pdf].
14. Berthold SM, Kong S, Kuoch T, Schilling EA, An R, Blatz M, et al. Combating Health Disparities in Cambodian American Communities: A CBPR Approach to Building Community Capacity. *Progress in Community Health Partnerships-Research Education and Action.* 2017;11(2):109–18.
15. Morrison SD, Sudha S, Young A, Dharod J, Nie YB, Siu HW, et al. When Community Calls, We Collaborate! Community-Based Participatory Research With the Multilanguage Montagnard Refugee Community. *Progress in Community Health Partnerships.* 2018;12(2):179–86.
16. Wong C, Mouanoutoua V, Chen M-J. Engaging community in the quality of hypertension care project with Hmong Americans. *Journal of cultural diversity.* 2008;15(1):30–6.
17. Blanchet K, Ramesh A, Frison S, Warren E, Hossain M, Smith J, et al. Evidence on public health interventions in humanitarian crises. *Lancet.* 2017;390(10109):2287–96.
18. Rutta E, Williams H, Mwansasu A, Mung'ong'o F, Burke H, Gongo R, et al. Refugee perceptions of the quality of healthcare: findings from a participatory assessment in Ngara, Tanzania. *Disasters.* 2005;29(4):291–309.
19. Burchert S, Alkneime 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. *Frontiers in Psychiatry.* 2019;9.
20. Aabe NO, Fox F, Rai D, Redwood S. Inside, outside and in-between: The process and impact of co-producing knowledge about autism in a UK Somali community. *Health Expectations.* 2019;22(4):752–60.

21. Goeman D, Michael J, King J, Luu H, Emmanuel C, Koch S. Partnering with consumers to develop and evaluate a Vietnamese Dementia Talking-Book to support low health literacy: a qualitative study incorporating codesign and participatory action research. *BMJ open*. 2016;6(9):e011451.
22. Mulcahy ER, Buchheit C, Max E, Hawley SR, James AS. Collaborative health education for Somali Bantu refugee women in Kansas City. *BMC Research Notes*. 2019;12(1):616.
23. O'Reilly-de Brun M, de Brun T, Okonkwo E, Bonsenge-Bokanga J-S, Silva MMDA, Ogbemor F, et al. Using Participatory Learning & Action research to access and engage with 'hard to reach' migrants in primary healthcare research. *Bmc Health Services Research*. 2016;16.
24. Ramaliu A, Thurston WE. Identifying best practices of community participation in providing services to refugee survivors of torture: a case description. *Journal of immigrant health*. 2003;5(4):165–72.
25. Bronfenbrenner U. Ecological systems theory In: R V, editor. *Annals of Child Development*. 6: Jessica Kingsley; 1989. p. 187–249.
26. Irk L. *Co-designing with Refugees: Addressing Challenges to Healthcare Access*: Purdue University; 2018.
27. Baldi V, Ribeiro A, editors. *Conceptualization of a mobile application aimed at refugees in Portugal*. 2018 13th Iberian Conference on Information Systems and Technologies (CISTI); 2018: IEEE.
28. Furajjat G, Kleinert E, Simmenroth A, Mueller F. Implementing a digital communication assistance tool to collect the medical history of refugee patients: DICTUM Friedland - an action-oriented mixed methods study protocol. *Bmc Health Services Research*. 2019;19.
29. Gardner PM. *Lessons in Failing Well: Building Hyper-Migration—a postcolonial, digital, feminist game with refugee youth in Toronto*. 2016.
30. Ramadurai KW, Bhatia SK. Disruptive technologies and innovations in humanitarian aid and disaster relief: an integrative approach. *Reimagining Innovation in Humanitarian Medicine*: Springer; 2019. p. 75–91.
31. Devictor X. Blogs WB, editor. *Development for Peace 2019*. [11 April 2020]. Available from: <https://blogs.worldbank.org/dev4peace/2019-update-how-long-do-refugees-stay-exile-find-out-beware-averages#:~:text=As%20of%20end%2D2018%2C%20the,between%204%20and%2014%20years>.
32. *Field Guide: Equity-Centered Community Design*. Missouri 2020. Available from: <https://www.creativereactionlab.com/store/p/field-guide-equity-centered-community-design>.

Tables

Table 1 Selection criteria in PICO table (please list in Methods section)

	Participants (P)	Intervention (I)	Comparison (C)	Outcomes (O)	Study type	Limits
Inclusion criteria	Refugee populations which include: refugees and asylum seekers (resettled, urban and/or camp settings), people who have been forcibly displaced (for any reason) from their homeland regardless of the pathway in which they migrated (e.g. legal refugee, undocumented worker etc.)	Health interventions that have been co-designed, co-created, co-produced or co-developed with refugee populations (as per participant description).	N/A	Increasing health literacy Connecting to and/or providing health services Building quantitative or population-based data on health needs	All study designs	English only Peer reviewed journal articles
Exclusion criteria	Migrants who were not forcibly displaced (for any reason) from homeland e.g. economic migrants	Conceptual articles about collaborating with refugees for health that do not include a specific intervention Studies aimed at addressing social determinants of health (e.g., housing, employment, education or social inclusion)	N/A	N/A	N/A	Languages other than English Grey literature

Table 2 Study Design and Characteristics (please list in Results section or Appendix)

Author, Year	Location	Study Design	Study Quality (CASP Checklist)	Community involvement	Intervention sample size	Intervention: Increasing health literacy	Intervention: Providing health access	Inte Buil qua
Aabe, N. et al, 2019	Bristol, UK	CBPR	High	Project conceived by (former) refugee, research design, execution and analysis co-produced with academic partner	n = 15	Increasing awareness and support for Somali families who have a child with autism	N/A	N/A
Berthold, S. et al, 2017	California, Connecticut, Massachusetts, Minnesota, Oregon and Pennsylvania, USA	CBPR	High	Project initiated by refugee-led organisations (NCAHI and KHA), partnered with university	Capacity development n = 8 Survey n = 371	N/A	N/A	Gatl six (acrc tech
Formea, C. et al, 2014	Minnesota, USA	CBPR	High	Established community-academic partnership (RHCP) adapted and translated diabetes survey for health literacy and local relevance	Working group for health literacy survey n = 6 Adaptation of survey into Somali n = 3	Diabetes survey adapted to improve for health literacy and relevance within local Somali, Cambodian and LatinX community (Somali translation framed lessons learned from the process in this particular paper).	N/A	Dial rele corr

Goeman, D. et al, 2016	Victoria, Australia	Co-design and PAR	High	Community collaborated with district nursing service to design, develop and appraise talking book on dementia for Vietnamese speakers	Focus group n = 59 Evaluation n = 22	Bilingual talking book on dementia in Vietnamese and English	N/A	N/A
Morrison, S. et al, 2018	North Carolina, USA	CBPR	Moderate, quantitative findings not analysed by time of report	Proposal initiated by health professional from within the Montagnard community, academic partnership developed to examine problem and co-design solution around detecting and treating early hypertension	Terminology working group n = 5 Focus group n = 14 Biological specimen collection n = 127 Behavioural data collection n = 131	Health literacy brochures	Health fairs	Biol beh.

Mulcahy, E. R. et al, 2019	Kansas, USA	Community-based collaborative action research (CBCAR)	High	Refugee community-resettlement agency health education partnership	Health education classes and focus groups n = 11	42 small group sessions held three times a week for 12 months on health and wellbeing for Somali Bantu women	N/A	N/A
Njeru, J.W. et al., 2015	Minnesota, USA	CBPR	High	Established community-academic partnership (RHCP) determined need for CBPR and digital storytelling intervention on diabetes for local Somali and LatinX community	Survey n = 78 Focus group discussion n = 37 Digital storytelling = 8	Digital storytelling (short films)	N/A	N/A

O'Reilly-de Brún, M. et al, 2016	Galway, Ireland	Participatory Learning and Action (PLA)	Moderate, minimal qualitative findings discussed in relation to effect/ impact of guidelines	Multiple refugee/ migrant community-research-health provider partnership	PLA training n = 7 PLA research n = 51	Guidelines for cross-cultural communications for health providers around supporting refugee and migrant communities	N/A	N/A
Ramaliu, A. et al, 2003	Alberta, Canada	Participatory community analysis and collaborative design	Moderate, sample size and outcomes of health interventions not documented	Volunteers, Calgary Ref Cross, Calgary Catholic Immigrant Society (CCIS) and refugee community members collaborated to develop Survivors of Torture (SOT) Program	Not documented	N/A	Establish organised and competent services, readily available to provide physical and mental health treatment to survivors of torture	N/A
Wong, C. et al, 2008	California, USA	Community-sensitive research method (CSRМ)	High	Collaboration between academic and Hmong community leaders to develop study design, produce survey instrument and implement survey within Hmong community	In-depth interviews n = 10 Focus group discussion n = 12 Survey n = 205	N/A	N/A	"Qu. surv

Figures

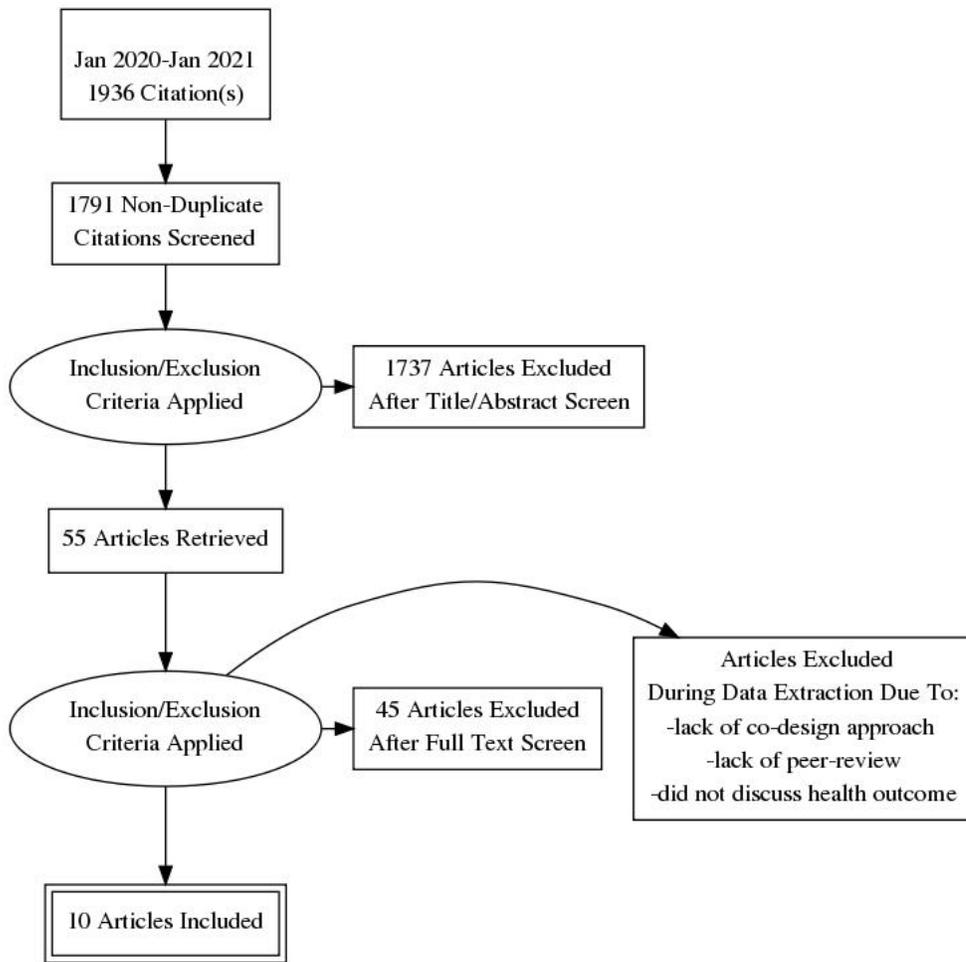


Figure 1

PRISMA Flow Diagram (please list in Results section)