



Review Article

What factors are associated with food security among recently arrived refugees resettling in high-income countries? A scoping review

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Abstract

Objective: Refugees are vulnerable to food insecurity (FI). This is attributable to a combination of inequitable social determinants and cultural differences. In 2019, 92% of refugee resettlement (host country provides residency/citizenship) occurred in high-income countries, but little is known about the factors impacting their food security status in this setting. The review's objective was to therefore thematically identify factors affecting food security among refugees resettling in high-income countries.

Design: This review was based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews. Between May–July 2020 and February 2021, peer-reviewed studies focused on FI, and published in English from 2000–2020, were searched on Medline, CINAHL, Scopus, Informit, PsychArticles, Proquest and EmBase.

Setting: Only studies set in high-income countries were included.

Participants: Fifty percent or more of study participants had to be refugees who had resettled within 5 years.

Results: Twenty studies from six high-income countries were included. Culturally based food practices and priorities, confidence in navigating local foodways and transport, level of community connections and capabilities in local language and food preparation were key themes associated with food security.

Conclusions: Utilising the four themes of culture, confidence, community and capabilities, there is an opportunity to improve the cultural sensitivity of measurement tools, develop understanding of how community-based resources (such as social capital) can be leveraged as food security buffers and modify existing food security initiatives to better serve refugee needs.

Keywords
Food insecurity
Refugees
Resettlement
High income countries
Review

The term food security is defined by the Committee on World Food Security as existing 'when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy lifestyle'⁽¹⁾. The concept is further extrapolated by the FAO widely used six dimensions of food security (see Fig. 1)⁽²⁾. It is clear that food security encompasses a complex and individualised network of equitable food access, safety, quality and culture-based preferences and can be experienced at the

national, household or individual level. It is by understanding this network of interrelated variables that define food security, that the complexity of its inverse, food insecurity (FI), can be appreciated. FI is recognised as a global public health issue. Estimates indicate that 690 million people, nearly 9% of the global population, are food insecure⁽³⁾. Current trends project that this figure will surpass 840 million by 2030⁽³⁾. In high-income countries, FI is associated with many factors, including being a single parent, having children under 18 years old, having low educational attainment,

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Fig. 1 The FAO Dimensions of Food Security*. *Adapted from Ashby S, Kleve S, McKechnie R, Palermo C. Measurement of the dimensions of food insecurity in developed countries: a systematic literature review. *Public Health Nutrition*. 2016;19(16):2887-96; HLPE. HLPE Report 15: Food security and nutrition: building a global narrative towards 2030. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security [Internet]. 2020 [cited 2021 February 3]; Rome: HLPE; Available from: <http://www.fao.org/3/ca9731en/ca9731en.pdf>

renting a house, having low socioeconomic status, receiving social assistance payments or being a member of a racial or ethnic minority^(4,5). As members of a racial or ethnic minority, refugees are vulnerable to FI. A refugee is defined as a person who has a well-founded fear of persecution in their home country and, as such, is unwilling or unable to safely return to it⁽⁶⁾. Unlike many migrant groups, refugees often also have low socio-economic status and live in rental or government-supported accommodation, further increasing their association with FI risk factors^(7,8).

For many refugees, their experience with FI begins before their resettlement in their final host country (which provides residency/citizenship). Around 85% of refugees move from their country of birth (COB) to a low- to middle-income transition country where they await resettlement⁽⁹⁾. The median stay in transition countries is 5 years⁽¹⁰⁾. Often, accommodation is deficient and food is rationed or scarce⁽¹¹⁻¹³⁾. The transition country experience has been reported to cause issues such as exclusion, discrimination and FI and affect physical and mental health^(14,15). Mental conditions including loneliness, grief, gloom and psychological and distress physical conditions, such as malnutrition and anaemia, among children and women can be developed or exacerbated as result of the time in transition⁽¹⁵⁻¹⁸⁾. From transition, some refugees are offered an opportunity to move to a resettlement country.

The top ten resettlement countries in 2018⁽⁹⁾, in terms of refugee intake, were all high-income countries⁽¹⁹⁾. These countries took 92% of the 81 337 resettled refugees in 2018⁽⁹⁾. Resettlement puts enormous pressure on policy-makers and service providers in high-income countries to accommodate their growing refugee populations and provide necessities such as housing, education and food⁽²⁰⁾. Understanding the resettlement challenges of refugee populations in high-income countries is an important step in building evidence-based resettlement capacity. As refugees are known to be vulnerable to FI, one critical resettlement challenge is understanding how refugee food security can be procured and protected.

Food security involves a sufficient, safe and nutritious diet⁽¹⁾. A nutritious diet is known to support physical and mental health⁽²¹⁾. Considering the nutritional issues faced by refugees in transition countries and their health on arrival in high-income countries⁽¹¹⁻¹³⁾, the benefits of a nutritious diet become even more critical for this population. Associations have been reported between refugee FI in high-income countries and reduced intake of fruit, vegetables, red meat and milk products, and consequently low intakes of Fe, K, Ca, vitamins B₁, B₁₂ and other micronutrients⁽²²⁻²⁵⁾. This has been shown to detrimentally affect the quality and diversity of the migrant, including the refugee, diet⁽²²⁻²⁵⁾. Consequences of these dietary deficiencies

Table 1 Framework for scoping review*

Step	Arksey and O'Malley Framework	Levac Colquhoun and O'Brien Enhancements
1	Identify research question	Link purpose and research question
2	Identify relevant studies	Feasibility to be balanced with scope and comprehensiveness of process
3	Select studies	Iterative team approach used to select studies and extract data
4	Chart data	Numerical summary and thematic analysis to be included
5	Gather, summarise and report results	Identify implications of review findings
6	Consultation (optional)	Include consultation as methodology component

*Adapted from: Peters MDJ, Godfrey CM, Khalil H (2015). Guidance for conducting systematic scoping reviews. *Int J Evid Based Healthc* 13, 141–146.

can include malnutrition, undernutrition and micronutrient deficiencies^(22,24,25).

A 2020 systematic review reported the prevalence of household FI among refugees settling in high-income countries to be between 40% and 71%, depending on the measurement tool used and participant ethnicity⁽²⁶⁾. This is significantly higher than within the host country populations⁽²⁶⁾. Some studies set in high-income countries indicate the prevalence of refugee FI is highest in the first 2 years of resettlement^(13,27–29). Prevalence then slowly reduces, and approximately 10 years after arrival, the risk of FI is equivalent to that of the host population⁽²⁷⁾. However, for some refugee sub-populations, the persistence of chronic barriers in the resettlement environment, including lack of host language proficiency, unemployment and poverty, has been associated with chronic vulnerability to FI^(14,24,28,30–32).

Review rationale and objective

Refugees are highly vulnerable to FI. Understanding the population's food security needs is a vital part of successful resettlement. Over 90% of the world's refugees are resettled in high-income countries⁽⁹⁾, yet there is a paucity of data providing insight into refugee FI in this environment. The objective of this review was to scope the current literature to identify themes, locate evidence gaps and develop a pathway for future investigation of FI amongst recently arrived refugees settling in high-income countries.

Prior to commencement of this review, a preliminary search for existing reviews on refugee FI was conducted on MEDLINE and Scopus. A 2017⁽³³⁾ and a 2020⁽²⁶⁾ systematic reviews were located. Unlike the located reviews, the current review's focus is on multiple high-income countries and recently arrived refugees and is therefore substantially different from the existing reviews.

Method

The framework developed by Arksey and O'Malley, with enhancements by Levac et al, was used for the development of this review (see Table 1)^(34,35). The process outlined in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping

Reviews checklist was also followed⁽³⁶⁾. Review objectives, inclusion criteria, methods and draft charting table were developed as parts of the protocol⁽³⁶⁾. Eligibility criteria: The eligibility criteria stated that 50% or more of study participants must be legally documented refugees who had recently arrived in their resettlement country. In this review, the term 'refugees' did not include asylum seekers or 'immigrants', due to differences in the groups' rights, entitlements and resettlement trajectories. Based on the literature, 'recently arrived' was defined as having been in the resettlement country for 2 years or less^(13,27–29). Participants could have been from any COB. The review's core concept was FI; therefore, studies focussed on household FI, food security, scarcity of food, food stress or dietary transition issues were included. Only original, peer-reviewed, published studies set in high-income countries, using the World Bank definition⁽¹⁹⁾, were included.

Search strategy: The search was conducted between May and July 2020. A search update was conducted in February 2021. Search terms included papers disseminated between 2000 and 2020 but excluded those not published in English. A three-step search strategy was employed⁽³⁷⁾. An initial search was conducted on MEDLINE and Scopus. Retrieved paper titles and abstracts were analysed for keywords and index terms. These were then used to develop the search plan. The second search used that plan to search MEDLINE, CINAHL, Scopus, Informit and EmBase. ProQuest and PsychArticles were added to the database list in February 2021, as they were then searched. Suitable databases were selected in consultation with a research librarian. All are well recognised in the aggregation of peer-reviewed health, nutrition and sociological literature. The search plan was iteratively updated as additional keywords and search terms were discovered. In the third search stage, the reference list of retrieved articles was searched.

Study selection: Duplicate papers were removed. Retrieved papers and abstracts were then screened against the eligibility criteria by the primary author. If further information was required, the authors of queried studies were contacted directly. Action regarding queried studies was discussed and agreed within the research team of four researchers. Study selection details are outlined in Fig. 2.

Data charting and synthesis: The selected studies were charted using the protocol data charting table^(36,37).

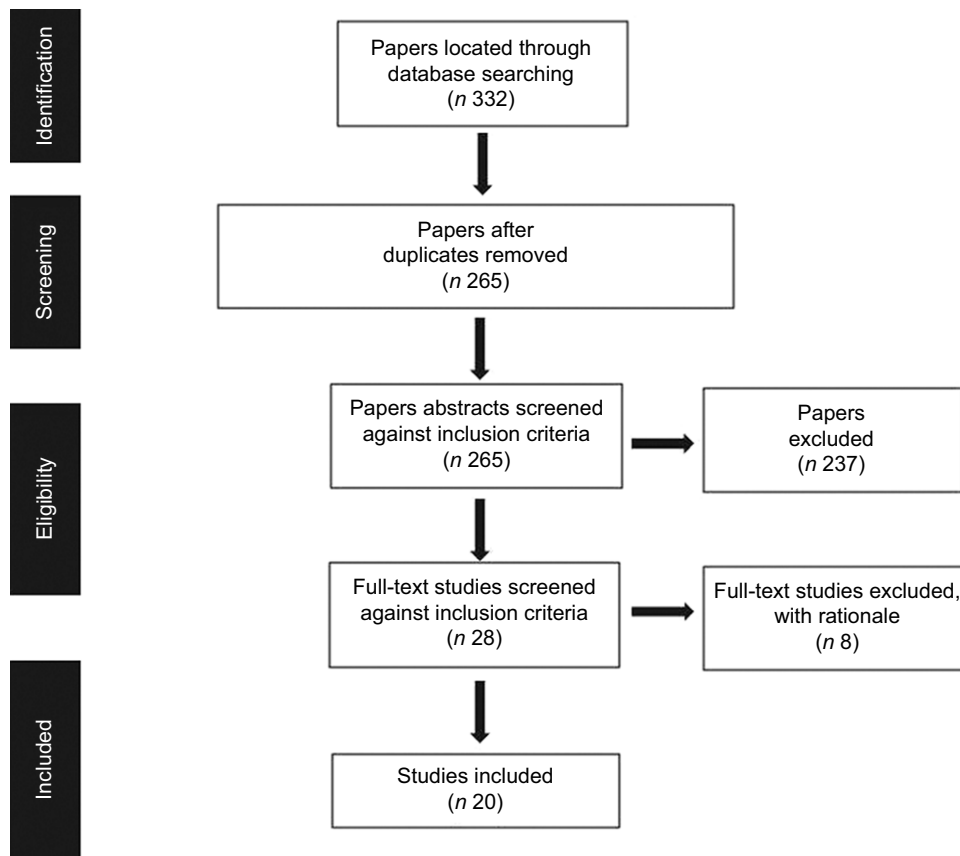


Fig. 2 Study Selection Flow Chart Using the PRISMA Diagram for Scoping Review Process

Extracted data included author, year, participant characteristics, study design and method and reported issues regarding refugee FI. Using charting, frequency of issues was noted across studies. Issues were then grouped under themes and critically appraised by the team.

Results

A total of 332 papers were located. After screening, sixty seven were determined to be duplicates, leaving 265 papers. Of these, 237 did not meet the inclusion criteria. The remaining twenty-eight studies were reviewed. Authors were contacted if clarification was required. Subsequent to the procedure, a further eight were excluded. Four studies were excluded as the refugee resettlement timeframe was unknown or greater than 5 years, one had a sample of less than 50% refugees, one was a review, one was not a primary study and one did not focus on the review's core concepts. In all, twenty studies satisfied the eligibility criteria (see Fig. 2).

Study characteristics

Six different high-income countries were represented (Table 2). Seven of the twenty studies used a multi-country COB sample. Sub-Saharan Africans refugees were the focus

of six studies, while Afghani refugees were the focus of three.

Nineteen studies were cross-sectional. Most used semi-structured group or individual interviews. Specific measures of FI included the Canadian Community Health Survey FI module^(30,32,45), an FFQ⁽³¹⁾, a dietary recall⁽⁴⁰⁾ and modified versions of the United States Department of Agriculture's Household Food Security Survey Module (HFSSM) or food security scale^(13,27,29,30,38,43) and the Radimer-Cornell instrument^(24,29,31). In total, twelve studies used an adaptation of an existing FI tool. A charted summary of the studies can be seen in Table 3 (studies are identified by the first one or two letters of the country name).

The literature indicated that factors such as income and access to transport affect food security among the general population, including refugees^(13,40,48,49). However, it also indicated that there are food security issues particularly related to refugees. These interconnected themes, such as culture, work in, around and across all of the FAO food security dimensions. The factors and themes work interdependently to influence and affect the dimensions. The FAO dimensions were therefore not the most appropriate way to capture the interconnected nature of the emergent themes, as reflected in Fig. 3, nor frame the presentation of results.

Table 2 Characteristics of included studies (*n* 20)

Receiving country	Refugee country/region of birth	Number of studies <i>n</i> (%)	
USA ^(13,24,28,29,31,38,39)	Multi-country sample = 2 Sub-Saharan Africa = 3 Afghanistan = 1 Sudan = 1	7	35 %
Australia ^(14,40–43)	Multi-country sample = 1 Sub-Saharan Africa = 3 Afghanistan = 1	5	25 %
Canada ^(12,27,32,44,45)	Multi-country sample = 3 Latin-American = 1 Syria = 1	5	25 %
Switzerland ⁽³⁰⁾	Afghanistan = 1	1	5 %
United Kingdom ⁽⁴⁶⁾	Multi-country sample = 1	1	5 %
Norway ⁽⁴⁷⁾	Multi-country sample = 1	1	5 %

In Fig. 3, the four themes are encircled by temporal economic conditions including housing stability, income level, the cost of food and employment status as these are pivotal dimensions of FI with change in any of them influencing some, or all, of the factors comprising each of the themes. Housing and income are widely recognised as the bedrock of food security resilience as they impact a household's individual and collective resilience resources^(32,50,51). For refugees, these factors are particularly important. A 2013 study of refugee resettlement in Australia found that, on average, refugees relocated three times in the first year⁽⁵²⁾. Housing instability can reduce familiarity with the local food environment, navigation of transport and development of community connections⁽⁵³⁾.

Theme 1: Cultural food connections and practices in the new environment

The literature suggests three interrelated ways that culture influences refugee FI. They are the culturally based food priorities and practices of the particular sub-population, the level of access to culturally familiar foodways and foods and the level and pattern of dietary acculturation^(13,14,28,38–40,43,44,47).

Culturally based food priorities, practices, preferences and nutrition beliefs were reported to influence food choices, budgets and household FI^(13,14,29,40,42,44,54). Study U4 reported that, culturally, a Somali complete meal contains meat⁽³¹⁾. It was therefore a food budget priority for many to purchase meat. The study found that a household's intake levels of meat were reflected in the level of FI, and participants who reported eating meat daily were more likely to be FI⁽³¹⁾. While prioritising meat is not unique to Somali culture, this finding indicated that cultural preferences related to food priorities can affect FI. It also suggested that these preferences may impact diet quality, as it was presence of meat, not necessarily the meat quality, that was the cultural priority. Similarly, U5 reported higher consumption of freshly killed meat in FI Sudanese households, indicating a link between FI and food priorities in some cultures⁽²⁴⁾.

Previous culturally influenced patterns and traditions related to food preparation and consumption may also be influenced by new food environments, impairing the food preparer's ability to prepare nutritious and safe food⁽⁴⁴⁾. Studies A1, A5, C4, C5 and N1 all reported that

religious beliefs and food-related proscriptions can impact refugee FI by reducing availability and access^(12,14,40,45,47). The challenge of accessing halal food was captured in a quote from a Syrian refugee in study C5, '... I have to read the ingredients and this is a challenge. I don't buy anything that I don't know or if it has gelatine or preservatives'⁽¹²⁾. Study C3 reported that Muslim participants paid a premium for halal foods, detrimentally impacting food budgets⁽⁴⁴⁾. Cultural and religious differences in how and when FI was disclosed may also have hindered the ability to buffer negative shocks when FI was experienced⁽⁴²⁾. It was suggested that culture may play a significant role in the lived experiences and reporting of FI. Even when FI was disclosed and help sought, cultural or religious issues could be an issue when seeking to address FI. Studies A5, C3 and C5 indicated that halal food was often not available from food banks, rendering the banks unsuitable for Muslim refugees^(12,14,44).

The level of access to culturally familiar foods and foodways may also impact FI by altering access to traditional staples and disrupting traditional dietary patterns⁽⁴⁴⁾. In new food environments, individuals lack norms for guidance regarding food choices, COB beliefs regarding nutrition may not accurately translate to the new setting and knowledge of local foods, particularly fruits and vegetables, may be limited⁽⁴⁷⁾. Studies N1 and C1 found that locally available foods were unfamiliar, packaged or stored differently to COB, or did not taste the same as foods from refugees' COBs^(32,47). Studies A1, A2, C3, C5 and U1 reported that for some recognised foods, the taste and quality were deemed inferior to COB fresh foods^(12,29,40,41,44). Study A2 found that 96 % of its African participants (*n* 139) had difficulty locating traditional foods, such as camel milk and maize grain, during resettlement⁽⁴¹⁾. As a result, they had to adapt recipes, using available ingredients to replace the traditional. Access to familiar foods and foodways was found to be particularly relevant during early resettlement, the most critical FI timeframe, when culturally and religiously appropriate foods can be the most difficult to access⁽⁴⁴⁾.

Dietary acculturation may improve access to food, but adverse acculturation patterns may negatively affect nutrition^(29,39,45,47,55). Studies A1, A2 and N1 suggest that negative 'forced' acculturation patterns, due to reduced food access, may increase intake of nutritionally inferior foods^(40,41,47).

Table 3 Charting of literature examining food insecurity issues among recently arrived refugees settling in high-income countries*

Code	Author and year	Population	Study focus	Design and method	Refugee food insecurity issues identified
Australia					
A1	Burns ⁽⁴⁰⁾ 2000	<i>n</i> 33. Refugees from Somali (30 women and 3 men)	Food and nutrition issues of Somali refugees	Cross-sectional Mixed methods Group interviews, followed by individual interviews and nutritional analysis of seven women	<ul style="list-style-type: none"> • Reduced access to halal food • Difficulties finding affordable traditional, familiar foods • Local foods considered not fresh/altered taste Unfamiliar with some local foods • Reluctant to access food emergency services • Changes in HH responsibility for food preparation • Changes in social network • Increased intake of oil and soft drinks due to low price • Impact of historical factors • Difficulty in locating traditional staple foods • Nutritional implications of substituting nutritionally inferior local foods for traditional foods • 'Forced' acculturation through high prohibitive cost of some culturally desired foods • Taste of some familiar foods perceived as poor • Lack of access to transport • HH financial issues including priorities, budgeting skills, sending money home, late welfare payments • Cultural difference in how/when FI disclosed • FI increases complexity of resettlement process • Poor language proficiency • Lack of social network for emotional and material support
A2	Renzaho and Burns ⁽⁴¹⁾ 2006	<i>n</i> 139 HH Sub-Saharan migrants and 54 % were refugees	Food habits of migrants and refugees settling in Victoria	Cross-sectional Mixed methods Face-to-face interviews	<ul style="list-style-type: none"> • 'Forced' acculturation through high prohibitive cost of some culturally desired foods • Taste of some familiar foods perceived as poor • Lack of access to transport • HH financial issues including priorities, budgeting skills, sending money home, late welfare payments • Cultural difference in how/when FI disclosed • FI increases complexity of resettlement process • Poor language proficiency • Lack of social network for emotional and material support
A3	Gallegos, Ellies and Wright ⁽⁴²⁾ 2008	<i>n</i> 51 Refugees from 14 cultural backgrounds	Prevalence and issues related to FI among refugees in Perth	Cross-sectional Quantitative Questionnaire	<ul style="list-style-type: none"> • 'Forced' acculturation through high prohibitive cost of some culturally desired foods • Taste of some familiar foods perceived as poor • Lack of access to transport • HH financial issues including priorities, budgeting skills, sending money home, late welfare payments • Cultural difference in how/when FI disclosed • FI increases complexity of resettlement process • Poor language proficiency • Lack of social network for emotional and material support
A4	Gichunge et al ⁽⁴³⁾ 2015	<i>n</i> 71 HH (383 people). Refugees from Burundi, Congo, Rwanda	Relationship between FI, social support and vegetable intake among African refugees in Queensland	Cross-sectional Quantitative USDA 18-item Food Security Module and food frequency questionnaire	<ul style="list-style-type: none"> • 'Forced' acculturation through high prohibitive cost of some culturally desired foods • Taste of some familiar foods perceived as poor • Lack of access to transport • HH financial issues including priorities, budgeting skills, sending money home, late welfare payments • Cultural difference in how/when FI disclosed • FI increases complexity of resettlement process • Poor language proficiency • Lack of social network for emotional and material support
A5	Kavian et al ⁽¹⁴⁾ 2020	<i>N</i> 10. Female refugees from Afghanistan	Food access challenges for Afghan women refugees settling in Adelaide	Cross-sectional Qualitative Semi-structured face-to-face interviews	<ul style="list-style-type: none"> • Health and other issues related to transition country • Navigating new food environment • Unfamiliar food culture • Challenges accessing halal food • Finding culturally appropriate and desired food
Canada					
C1	Vahabi et al ⁽³²⁾ 2010	<i>n</i> 70 Refugees from Latin America, resettling in Canada for less than 5 years	Food insecurity issues among Latino American refugees settling in Toronto	Cross-sectional Quantitative Self-completed survey	<ul style="list-style-type: none"> • Food banks lacked perishables regularly used • Canned goods at food banks unfamiliar
C2	Girard and Sercia ⁽²⁷⁾ 2013	<i>n</i> 506 Recently resettled immigrants and refugees	Social and nutritional issues related to food insecurity among immigrants settling in Montreal	Cross-sectional Quantitative Questionnaire including 4 items related to FI	<ul style="list-style-type: none"> • Determining FI prevalence can be impeded by cultural bias or shame • Low level of education impacts access • Marked decline in some nutrient-dense foods, such as fruit and fish



Table 3 Continued

Code	Author and year	Population	Study focus	Design and method	Refugee food insecurity issues identified
C3	Moffat, Mohammed and Newbold ⁽⁴⁴⁾ 2017	<i>n</i> 24. Multi-country sample of immigrants (50 % refugees) <i>n</i> 22. refugee service providers	Interaction between food insecurity and culture among immigrants living in Hamilton, Ontario	Cross-sectional Qualitative Immigrant perspectives captured through focus groups. Individual interviews with service providers.	<ul style="list-style-type: none"> • Poor access to culturally specific foodways/food • Incongruence between refugee and service provider perspectives • Concerns about safety of local foods • Local food taste and unfamiliarity • Difficulties in sourcing halal and related trust issues • Different storage and packaging of foods • Language barrier • Poor label reading literacy • Loss of FI cultural mechanisms • Food banks rarely used • Absence of social capital
C4	Lane, Nisbet and Vatanparast ⁽⁴⁵⁾ 2019	<i>n</i> 300. Immigrant and refugee children aged 3–13 years <i>n</i> 23 service providers	Using data from the Healthy Immigrant Children study to investigate FI and nutritional risk	Cross sectional Mixed-methods Self-completed food security and 24-h dietary recall questionnaire Interviews with newcomers and service providers	<ul style="list-style-type: none"> • Financial priorities competing with food purchase including prescription medication and transport loans • Very few accessed food banks
C5	Vatanparast et al ⁽¹²⁾	<i>n</i> 54. Syrian refugees settling in Canada since 2015. <i>n</i> 15. Refugee settlement and support agency providers.	An exploration of food security issues among Syrian refugees resettling in Canada.	Cross-sectional Qualitative Face-to-face semi-structured interviews with refugees. Face-to-face or telephone semi-structured interviews with service providers.	<ul style="list-style-type: none"> • High cost of accessing Arabic/Syrian food • Financial priorities competing with food budget, including transport and household fixed bills • Transport issues, related to language barriers, cost and geographic location, impact food access • Neighbourhood location affecting access and availability of food • Difficulties related to language, transport and income negatively impacting access to halal food • Social networks assist in navigation of food systems and halal food location and choice and development of food quality and value perceptions • Food security management remains gendered with women carrying the majority of the burden • Food banks accessed but limited halal options and food waste an issue
USA U1	Hadley and Sellen ⁽²⁹⁾ 2006	<i>n</i> 33 Liberian refugees settling the USA less than 5 years	Food security and child hunger among Liberians resettling in USA	Cross-sectional Qualitative Face-to-face interviews	<ul style="list-style-type: none"> • 'Chemicals' in locally available food • Preference for in-home family meals • Primary shopper unfamiliar with shopping environment • Low income • Difficulties with local language

Table 3 *Continued*

Code	Author and year	Population	Study focus	Design and method	Refugee food insecurity issues identified
U2	Hadley, Zodiates and Sellen ⁽²⁸⁾ 2007	<i>n</i> 101 Refugees from Liberia with a child under 5 years. Settled in the US for less than 4 years.	Prevalence and severity of FI of Liberian refugees recently settling in the USA	Cross-sectional Mixed methods Participant observation and structured in-depth interviews at baseline and 6-month follow-up	<ul style="list-style-type: none"> • Language difficulties • Difficulty navigating shopping environment • Poor budgeting skills • HH finance allocations (e.g. bills and family obligations) • Low income and education • Low dietary acculturation • Unemployment
U3	Hadley, Patil and Nahayo ⁽³⁸⁾ 2010	<i>n</i> 281 Refugees from various COBs, 64 % female. Staff from resettlement agency (<i>n</i> 39)	Prevalence and correlates of FI in recently resettled refugees in Midwestern USA	Cross-sectional Quantitative Questionnaire administered in face-to-face interviews	<ul style="list-style-type: none"> • Food environment challenges including unfamiliar foods and unknown shop locations • Lack of knowledge in how to cook American foods • Difficulties finding desired foods
U4	Dharod, Croom and Sady ⁽³¹⁾ 2013	<i>n</i> 195. Refugee mothers from Somalia	Relationship between FI, dietary intake and body weight among Somali women settling in USA	Cross-sectional Quantitative Survey administered in interview process. Height and weight measured and recorded by interviewer	<ul style="list-style-type: none"> • Cultural food traditions may outrank nutrition priorities and negatively impact meal choices and food security.
U5	Anderson et al ⁽²⁴⁾ 2014	<i>n</i> 49 Refugees from Sudan settling in Atlanta	To test if HH FI is reduced by social support, increased income and attitudes to traditional foods	Cross-sectional Quantitative 10 item survey administered by trained Sudanese interviewers during interview sessions	<ul style="list-style-type: none"> • Cultural food priorities may impact food budgeting • FI response and coping mechanisms may be culturally based
U6	Nunnery et al ⁽¹³⁾ 2015	<i>n</i> 33 Refugee Liberian caregivers	To examine FI and budgeting practices among Liberian caregivers settling in the USA	Cross-sectional Mixed methods Semi-structured face-to-face interviews	<ul style="list-style-type: none"> • Unstable pre-settlement experiences • Socio-cultural differences in receiving country • Difficulty navigating grocery stores • Unfamiliar food choices compromises food management and budgeting practices • Length of stay does not always reduce FI • Budgeting not just income can be a key factor in some sub-groups
U7	McElrone et al ⁽³⁹⁾ 2019	<i>n</i> 18 Female refugees from Burundi and Congo	To understand the FI barriers and facilitators among Burundian and Congolese refugees settling in the USA.	Cross-sectional Qualitative Semi-structured face-to-face interviews	<ul style="list-style-type: none"> • Low level of dietary acculturation • Poor language proficiency • Unfamiliar with local cooking methods/equipment • Unfamiliar with preparing local ingredients/dishes • Difficulties using local currency • Access to private transportation • Level of social support • Challenges using public transport • Limited access to food gardening space • Limited access to culturally appropriate foods

Table 3 *Continued*

Code	Author and year	Population	Study focus	Design and method	Refugee food insecurity issues identified
Switzerland S1	Khakpour et al ⁽³⁰⁾ 2017	<i>n</i> 25. Afghani refugees living in Swiss refugee camp.	Impact of socio-economic and cultural factors on refugee FI.	Cross-sectional. Mixed methods Face-to-face interviews. Questionnaire	<ul style="list-style-type: none"> • Cultural differences • Lack of social connection and interaction • Language difficulties • Financial struggles • Lack of access to culturally appropriate food • Lack of knowledge in utilisation of local food
United Kingdom UK1	Sellen, Tedstone and Frize ⁽⁴⁶⁾ 2002	<i>n</i> 30. Refugees from various COB, with children under 5 years of age, settling in the UK less than 2 years.	Prevalence and issues related to FI among recently arrived refugees settling in the UK.	Cross-sectional. Mixed methods Face-to-face interviews. Questionnaire	<ul style="list-style-type: none"> • High cost of fresh foods • Lack of access to quality fresh produce • Lack of prep time due to work commitments • Easy access to fast food and snacks • Lack of access to garden
Norway N1	Terragni et al ⁽⁴⁷⁾ 2014	<i>n</i> 21. Refugees from various COB.	Early-phase food habits and dietary acculturation.	Cross-sectional. Qualitative Face-to-face interviews.	<ul style="list-style-type: none"> • Challenging to be in 'first wave' of refugees • Access to transport improves food access • Will frequent ethnic shops even if distant from home • Lunch affected by Western foodways: no commensality, often cold, lunchboxes unfamiliar • Distrust of labelling and shops in regard to halal • Halal limits food choice and restricted diet short-term • Lack of confidence in new food culture lead to poorer diets • Food prices are a barrier to access • Rapid changes to diet as a result of new foods and foodways • Challenges reproducing social norms and culinary codes in new environment

HH, households; FI, food insecurity; ME, Middle East; USDA, United States Department of Agriculture; COB, countries of birth.

*Studies are grouped by country and ranked in ascending order in terms of publication year. The coding represented the first letter (or initials for the UK), followed by the number in which they appear in the table. This code is then used to refer to the studies throughout the discussion.

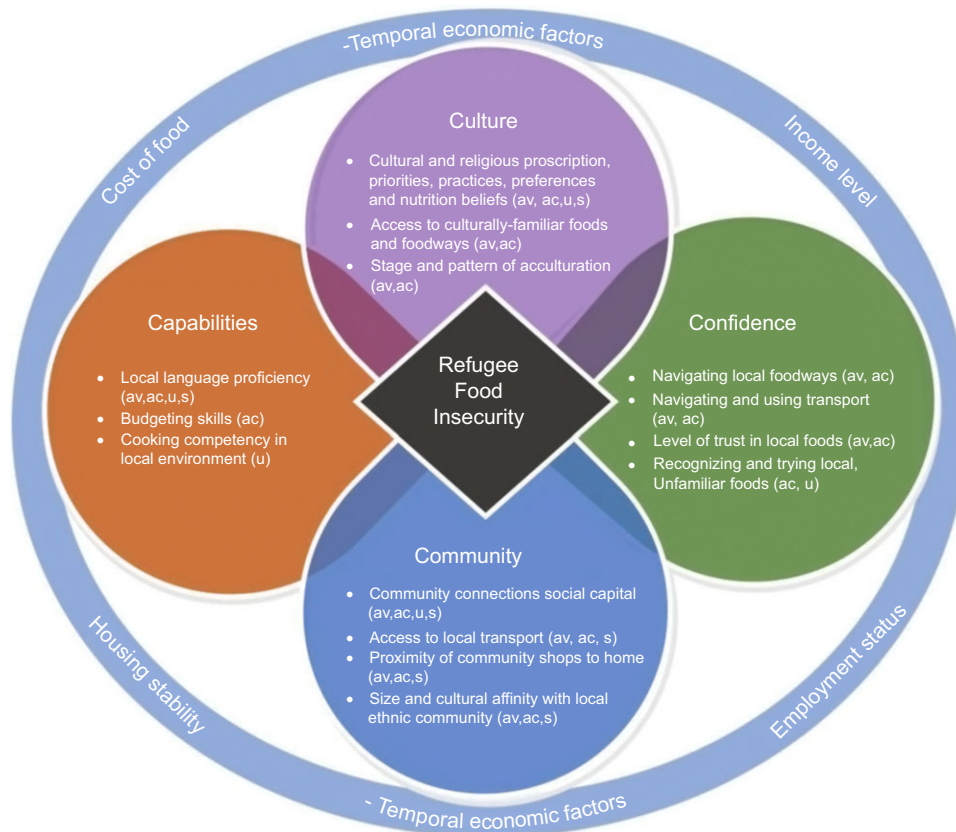
The literature indicates that acculturation factors in high-income countries, including lifestyle changes, working arrangements, lunchboxes and dinner as the main daily meal alters dietary acculturation patterns and, depending on the pattern, affects FI⁽⁴⁷⁾.

Theme 2: Confidence in navigating new environments and foods

Confidence in navigating transport systems and local foodways and the safety of local foods may increase food access, availability and utilisation. Studies A3, C3, N1, U6 and U7 revealed that private or public transport access can improve food shopping options and the availability

of affordable, desired foods for refugees^(13,39,42,44,47). The connection between transport and food access is depicted by a quote from a Burundian participant in Study U7, 'We didn't know how to take the bus anywhere, so we had to walk to the grocery store to get some food'⁽³⁹⁾.

The level of confidence or trust in the safety of local foods also affects perceived food availability. Study C3 found concerns about the health and safety of local foods⁽⁴⁴⁾. Studies A5, C5 and N1 also found that trust was a concern, even when recognisable foods were available^(12,14,47). Participants perceived local food, even fresh food, to be full of harmful chemicals. The trust issue extended to religious proscriptions⁽⁴⁷⁾. A5 and N1 found that participants did not trust halal labelling in



FAO Food insecurity Pillars Affected, abbreviated in figure as; av = availability, ac = access, u = utilization, s=stability.

Fig. 3 (colour online) Issues Affecting Refugee Food Insecurity: Emergent Themes

mainstream shops, opting to pay premium prices at ethnic shops, more trusted sources^(14,47). A Study A5 participant said, 'I still cannot trust foods here that they are halal. I have heard that if they have a code it means that it is not halal'⁽¹⁴⁾. Similarly, one Study N1 Somali refugee said, 'when you arrive here, and you know that a lot of things are not halal, then you become suspicious'⁽⁴⁷⁾.

Theme 3: Community connections, social capital and ethnicity

The ethnicity of the local community, community connections and social capital may improve access to culturally appropriate foods and buffer negative food security shocks. Established ethnic precincts are characterised by large numbers of immigrants of the same ethnicity, which results in the establishment of more culturally familiar foods and foodways⁽⁵⁶⁾. The literature suggests that living within established ethnic precincts may improve food availability. Studies U3 and N1 suggest that it is harder for the first ethnic wave of migrants during resettlement, as familiar foodways are not established and access to traditional foods is limited^(38,47). For subsequent waves, help from previous arrivals facilitates resettlement.³⁸ Study U3 found that Bhutanian refugees reported spending upwards of \$600 per month on food and never having food shortages⁽³⁸⁾. However, Burundi refugees on the same income reported going up to four days

with no food. There was an established community of more than 300 Bhutanians in the city, but no Burundis. The authors argued that ready availability of culturally appropriate Bhutanian food reduced pressure on budgeting⁽³⁸⁾.

Studies A1, A4, C3, C5, U7 and S1 found that community connections and developing social capital, a measure of trust, reciprocity and social network⁽⁵⁷⁾, may assist by offering food security safety nets^(12,30,39,40,43,44). In their COB or transition country, many refugee sub-populations established habits and traditions which mitigated FI, including daily shopping, food gardens, familiar foodways, social capital and sharing food with extended family^(12,44).

One Study A5 Afghani participant said, 'In Pakistan if we ran out of a food, we will ask our neighbours [. . .] here in Australia that is not possible.'⁽¹⁴⁾ During early resettlement, traditional FI coping mechanisms may be absent or compromised, but living within ethnically aligned communities and developing connections and social capital can quickly build these coping mechanisms^(24,44).

Theme 4: Capabilities in the host language, food preparation and money handling

Most studies reported that individual capabilities, such as local language proficiency, cooking competency within the local environment and budgeting skills, may impact FI. Studies A4, C3, C5, U1, U2, U7 and S1 found that poor



language skills are associated with the occurrence and severity of refugee FI, by impairing the ability to find familiar foods, navigate local foodways and restricting access to transport^(12,28–30,39,43,44). Transport improves access to affordable or culturally desirable foods, yet without language proficiency navigating barriers such as bus timetables and driving licenses is challenging^(47,58–61). Local language proficiency may improve foodway navigation as refugees can ask for assistance, read signs and labels and ask for help^(28,31). Studies A5 and N1 reported that language can also increase understanding of local food cultures and cooking practices by improving familiarity with local food use, new recipes, cooking methods, food safety and understanding cooking appliance instructions^(14,47).

Studies A1, C3, N1, UK1, S1, U3 and U7 reported that cooking capabilities within local environments, changes in cooking responsibilities, reductions in time available for food preparation and cooking and storage facilities can all impair food utilisation^(30,38–40,44,46,47).

Further, study S1 indicated that lack of knowledge in food utilisation was a primary FI challenge⁽³⁰⁾. U7 study's discussion highlighted this issue with a quote from a Burundian refugee, 'In Africa, I used to cook on charcoal or sometimes firewood, but in the US the stove was new to me . . . when we forgot how to use it we would stop eating'⁽³⁹⁾.

The differences in the foodways and currencies of high-income countries and countries of birth require new budgeting and money-handling capabilities. Foodways include food acquisition, gardening practices, food preparation and mealtimes⁽⁶²⁾. Studies A3, C4, C5, U2, U5 and S1 found that a lack of such skills can impair food access^(12,24,28,42,45). In the shopping environments of high-income countries, budgeting skills may need to accommodate changes in shopping frequency and location, saving and bulk and discount buying^(28,40). A1 found that poor budgeting skills and increased access to foods such as sugar, sugar-sweetened beverages and oils lead to an increase in the purchase and intake of such⁽⁴⁰⁾. The intake of relatively more expensive foods, such as COB fruits and vegetables, was reduced. A3 reported that budgeting issues were a common reason for refugees running out of food⁽⁴²⁾. Similarly, U6 found that FI participants spent more on food than their food secure counterparts, indicating that budgeting was a key skill in managing FI⁽¹³⁾.

Discussion

This review's themes capture an interconnected network of factors that affect the food security status of refugees settling in high-income countries. However, underlying and influencing all of the factors are foundational food security issues that require discussion. The first of these is the socio-economic circumstances of refugees settling in high-income countries. A key determinant of FI is low income⁽⁶³⁾. In the USA, immigrants, including refugees, are twice as likely

to live in households within the poorest income decile, falling below the national poverty threshold⁽⁶⁴⁾. Providing pathways to higher socio-economic brackets is particularly critical for food security status, as studies have shown that food budgets, including those of refugees, are considered to be a flexible household expense which can be adjusted to accommodate fixed costs, such as utilities^(12,28,42). Without addressing the social determinants of health which would prevent refugees independently growing their income, including language barriers and employment opportunities, chronic FI will ensue. While many resettlement countries do seek to address the social determinants affecting refugees, the direct link between the inequities and chronic FI required discussion, as addressing the themes highlighted in the review without addressing these determinants compromises outcomes.

The second foundational issue is ensuring that refugee FI is regularly and effectively measured and monitored in high-income countries. Canada and USA regularly use the HFSSM to measure population FI⁽⁶⁵⁾, but it is not tailored to refugees, so measurements among this population may not be accurate⁽¹³⁾. Effectively measuring and monitoring refugee FI would allow the scale and scope of the issue, and the effectiveness of initiatives, to be evaluated. The measurement tool adapted for and used in eight of the twenty studies reviewed was the HFSSM. This provided comparable measures across the studies. Adopting this approach may prove an excellent practice for those researching refugee FI in high-income countries as it may assist equitable cross-country comparison with refugee sub-populations.

The HFSSM is widely used to measure FI in high-income countries, but it has been validated among very few immigrant groups. The confluence of culture, language and food behaviours, evident in this review's themes, means that tools like the HFSSM must be validated for language, as well as conceptual equivalency, if they are to accurately measure refugee FI.

Only then can the tools be used as sensitive and specific measures of a culturally complex issue like FI^(66,67). Ensuring conceptual equivalency may allow culturally specific conceptualisation of food security to be understood and measured within the existing tools' adapted framework. A 2015 study developed and validated a conceptually equivalent Chinese version of the HFSSM^(66,67). Concepts such as 'balanced meals' were translated to convey a similar meaning within the Chinese cultural framework. Similarly, a Farsi version⁽⁶⁸⁾ and a Spanish version for children have been developed⁽⁶⁹⁾. It would be beneficial for high-income countries to use this same process to develop conceptually equivalent versions for their refugee populations, particularly the fastest growing populations requiring resettlement, Syrian and South Sudanese⁽⁹⁾. The tailored tools could be shared with other high-income resettlement countries and used to monitor FI over time. The culturally adapted tools may also be used for rapid assessment during early caseworker or



healthcare interactions to determine FI status on arrival and during early resettlement, particularly among emerging populations, who may not enjoy the food security benefits of living in an ethnic enclave⁽⁴³⁾.

Culture was identified as a central theme. This is unsurprising as food traditions are deeply ingrained behaviours important in maintaining family and community networks and acting as cultural anchors for displaced persons^(44,70–74). Capturing this, anthropologist Elaine Power coined the term 'cultural FI', defined as a lack of availability and access to culturally appropriate food items⁽⁷⁵⁾. The cultural aspects of FI impact all migrant groups, not only refugees. However, differing pre-settlement experiences, social determinants of health and degrees of agency exist between refugees and other migrant groups⁽¹³⁾. These fundamental differences may be why there appears to be a stronger connection between refugees, culture and FI, than exists with other migrants. Recognising this inequity, refugee research, policies or programmes which can effectively encompass the cultural aspects of FI and also promote the agency of refugees may result in more equitable, sustainable solutions^(76,77). Refugee food gardens are one option which show promise^(43,78–80). A review of urban gardens in America's Midwest found that refugee gardeners exercised agency in farming practices, garden management and planting choices. Karen, Chin and Kachin refugees grew a dietary staple, roselle (*Hibiscus sabdariffa*), as it was unavailable in the local food system⁽⁷⁸⁾. To acquire the seeds, some drove to refugee communities in distant cities. Whilst promising, the research regarding refugee food gardens is disparate. Further exploration is required, specifically to understand how initiatives, such as refugee food gardens, can be designed to address all of the FAO food security dimensions and, importantly, how they can be scaled in high-income countries to become viable, sustainable solutions.

The reviewed studies identified social capital as a grassroots mechanism used to mitigate FI^(12,30,39,40,43,44). Arising from this is the question of what role bridging *v.* bonding social capital plays for refugees in high-income countries, where bonding social capital is that which is developed within the ethnic community and bridging is between the host and ethnic communities⁽⁵⁷⁾. Further, is it cultural dimensions or the size of the ethnic community which determines the type of social capital that is most effective for sustaining food security? Could digital platforms be used to expedite the development of social capital? Syrian refugees settling in Saskatoon Canada reported using Facebook and WhatsApp to facilitate access to culturally appropriate and affordable foods⁽¹²⁾. How did the refugees locate this resource? Could this idea be transferred to other cultures? Further research is required. Increased understanding of how bridging and bonding social capital and refugee FI intersect in high-income countries could inform programme and policy design that enables the development of social capital to buffer food security shocks.

In seeking to untangle the complexity of refugee FI, this review isolated themes for discussion. In reality, the themes are part of an interdependent network of variables that are vulnerable to multiple temporal factors. It is important to research the isolated variables, such as social capital, but for recognising their interdependence, it is vital to design and evaluate initiatives, utilising the identified themes, so that their effectiveness can be evaluated in situ. Considering high-income countries already have existing food security strategies and initiatives in place, how could the factors underpinning culture, confidence, capabilities and community be used to improve these existing strategies, so that they are effective for refugees? The literature suggests that existing strategies in high-income countries, such as food banks, in their current form are not effective for refugees due to the food not being culturally or religiously appropriate, transport barriers, work scheduling affecting access or refugees feeling uncomfortable using the services^(12,32,44). The Food Bank of Delaware used research data to improve availability and access by piloting a social entrepreneurship venture connected to their food bank⁽⁸¹⁾. The model was based on Amish salvage markets and is similar to the community supermarket model⁽⁸²⁾. Groceries were purchased from a salvage good distributor and then sold at or slightly above cost. The store was staffed by volunteers or current food bank staff. Any profit made went back into the food bank to purchase new stock or was used to facilitate their overall mission to eliminate hunger. For food banks located near refugee ethnic enclaves, could this community supermarket model be adapted to pay heed to – the local community's cultural needs, whilst being considerate of the confidence and capability levels of the local refugee community? Participatory design or co creation could be employed to exercise the agency of the refugee community and optimise outcomes^(77,83,84). Certainly more research regarding refugee food security needs is critical. However, there is an opportunity to assess the existing infrastructure in high-income countries and operationalise the existing knowledge regarding refugee FI, in order to determine if iterative innovative design can better serve refugee food security needs within these current structures.

Refugees are a vulnerable population, cross-cultural research poses complex difficulties and FI is a sensitive issue, all of which makes researching refugee FI in high-income countries a challenging task. This was clearly evident throughout the reviewed studies. There were similarities in some studies which reported 'lively and vibrant' discussions or provided valuable cultural and contextual insight. These studies adopted a nutritional *and* anthropological approach, not a purely nutrition science approach. In an issue where culture is a central theme, this reflexive nutritional anthropology approach to design was more fruitful than the nutrition science based studies, as it provided greater cultural insight. To enhance this perspective,



it may be beneficial for cultural insiders to be part of research teams to ensure subtle cultural nuances are not lost in translation. Further recognising the potential cultural sensitivity of FI, mixed methods design may assist in triangulating qualitative findings. This could include measures such as gathering ethnic shop sales data or using tools such as culturally sensitive diet diaries.

Limitations

A strength of this review was that it included studies from six different high-income countries and numerous sub-populations and was therefore able to synthesise findings from different settings and cultures. However, a limitation was that the majority of included studies were qualitative and cross-sectional in design. Causal factors were therefore unable to be identified. Additionally, the vital importance of cultural and conceptual nuance in relation to food security could limit the generalisability of the research findings across multiple refugee sub-populations.

Conclusion

This review identified four key themes regarding food security for refugees resettling in high-income countries. These included cultural preferences and proscriptions, individual capabilities and confidence in navigating new environments and the level of community support and ethnic affinity. The identification of these interrelated themes presents three key opportunities for policymakers and researchers. One is using these themes to adapt existing FI measurement tools, such as the HFSSM, so that they are culturally sensitive and conceptually equivalent. This would enable FI to be more effectively measured, monitored and compared, within and across high-income countries. This shared knowledge that may assist in the co-creation of solutions⁽⁸⁴⁾. The second is to use the findings to further build understanding of how bottom-up capacity can be developed within communities through bridging and bonding social capital and the increased agency of refugees. Identifying effective bottom-up strategies may be an economically and culturally sound option to build food security buffers. The third opportunity is to consider how food security initiatives already established in high-income environments may be modified to be more culturally sensitive, recognise the capacity and confidence levels of refugee populations and build community connections within local refugee groups. These opportunities allow high-income countries to better develop, evaluate and modify programmes, which effectively meet the food security needs of their refugee populations.

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Supplementary material

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