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A mixed methods systematic review of studies examining the relationship between housing and health for people from refugee and asylum seeking backgrounds

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A mixed methods systematic review of studies examining the relationship between housing and health for people from refugee and asylum-seeking backgrounds

ABSTRACT

Housing is an important social determinant of health and a key element of refugee integration into countries of resettlement. However, the way in which housing may affect mental and physical health for refugees and asylum seekers has not been systematically examined. This systematic review aimed to explore the effects of housing on health and wellbeing for this population, in order to identify key pathways for public health interventions. The review was undertaken following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) and Social Care Institute for Excellence (SCIE) guidelines. We identified publications through a search of Medline, PsychInfo, Scopus, Web of Science, Embase, CINAHL, Cochrane Library, Google, ProQuest, OpenGrey, MedNar and WHOLIS. Eligibility criteria included: publication in English between 1997 and 2017, with findings pertaining to the relationship between housing and health for refugees and/or asylum seekers. Out of 2371 items, 25 papers were included with a further five identified through reference lists. Eleven of the papers explored housing and health for those refugees and asylum seekers living within refugee camps, with 19 focusing on countries of resettlement. All studies identified housing issues for refugees and asylum seekers, with physical housing conditions particularly poor in refugee camps, and issues of affordability, suitability, insecure tenure and mobility as well as difficulties securing housing also highlighted in countries of resettlement. Consistent relationships were found between physical aspects of housing and physical and mental health, with other aspects of housing such as safety and overcrowding linked to mental health. There were a number of methodological issues with most of the studies, making it difficult to specify precise pathways. However, improvements to housing quality particularly in refugee camps, and targeted housing interventions more generally for refugees and asylum seekers would likely have an important public health benefit.

Keywords: housing; accommodation; refugee; asylum seeker; health and wellbeing; social determinants of health; integration

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INTRODUCTION

People with refugee and asylum-seeking backgrounds represent some of the most marginalised and vulnerable groups in the world (Fazel et al., 2005; Fozdar & Hartley, 2014; Hollifield et al., 2002; Taylor, 2004). They face a range of risk factors for health and wellbeing, including experiences of trauma, dislocation, and violence, with associated loss of family and community support (e.g., see (Phillips, 2006; Silove & Ekblad, 2002)). When building a new life, either temporarily within a refugee camp or longer term within countries of resettlement, there are several factors that are important for successful health outcomes, including housing.

Secure housing is an important social determinant of health (Marmot, 2005) and a marker of successful integration for refugees and asylum seekers (Ager & Strang, 2004, 2008). However, there is evidence of a range of housing difficulties faced by refugees and asylum seekers (Bakker et al., 2016; Beer & Foley, 2003; Carter et al., 2009; Forrest et al., 2012; Phillips, 2006; Rose, 2001). While there is a growing body of research on the link between housing and health more generally, there is no current review of the impact of housing on the health of people from refugee and asylum seeking backgrounds (Forrest et al., 2012; Fozdar & Hartley, 2014). As such, this paper provides a systematic review of the literature concerning the relationship between housing and health and wellbeing for refugees and asylum seekers. It aims to synthesise the available evidence on the link between housing and health for refugees and asylum seekers, and to identify both research gaps and potential pathways for public health interventions.

Background:

Adequate housing is enshrined as a human right (OHCHR, 2018), with 'adequate' meaning more than just a physical shelter but "to have a home, a place which protects privacy, contributes to physical and psychological wellbeing and supports the development and social integration of its inhabitants" ((Bonnefoy et al., 2003) (pp 413)). Housing is also a key social determinant of health (that is, the set of conditions in which people are born and live, and which shape daily life (World Health Organization, 2017)), with a

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growing body of research linking housing to overall health and wellbeing (Baker et al., 2014; Bonnefoy, 2007; Braubach, 2011; Braubach et al., 2011; Evans et al., 2003; Gibson et al., 2011; Howden-Chapman, 2002; Shaw, 2004; Thomson et al., 2009). This evidence suggests that housing can influence all aspects of health and wellbeing to the extent that it is suitable, affordable, and offers secure tenure, and encompasses physical features of the housing itself as well as social and symbolic aspects such as a sense of safety, discrimination, identity and ontological security.

Housing can affect health and wellbeing through a range of pathways. For example, housing conditions such as mould, damp and unsafe water may directly influence health conditions (e.g., asthma or diarrheal illnesses), overcrowding can contribute to the spread of communicable diseases, housing difficulties can cause stress and anxiety, unaffordable housing costs can limit money available for health promoting resources, and housing issues can negatively affect access to other resources such as employment and education that are themselves social determinants of health (Acevedo-Garcia, 2000; Dunn, 2000; Evans et al., 2003; Howden-Chapman, 2002; Rosenberg et al., 1997; Shaw, 2004; Wanyeki et al., 2006). These effects are likely to be both direct and indirect (Howden-Chapman, 2002) and bi-directional where poor health, together with other social factors such as education, ethnicity, and socio-economic status, significantly impact on one's ability to secure appropriate housing (Baker et al., 2014; Mallett et al., 2011).

It is important to acknowledge that there are likely differences in the experiences of housing for refugees and asylum seekers, and these two groups of people are heterogeneous. Asylum seekers are defined as people who are outside their country of origin and seeking formal protection, but have not had their claims to refugee status assessed, while refugees are defined as people who meet the criteria for refugee status as defined by either the United Nations High Commissioner for Refugees (UNHCR), or particular criteria outlined by specific countries (UNHCR, 2017). Within the terms "asylum seeker" and "refugee", there remains large amounts of variability, and thus it is acknowledged that these terms are potentially problematic in subsuming complex and diverse identities and lived experiences into single categories.

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In relation to housing and accommodation specifically, people with refugee or asylum-seeking backgrounds will likely have differing experiences based on both their status in relation to their refugee claims, as well as the country they are currently residing in. Most obviously, refugees living in middle or high income resettlement countries such as Australia, New Zealand, Canada, the United States (US) or the United Kingdom (UK) will live in the community and be required to access private or public accommodation as per the practices and structures in that country (although some countries, such as Australia, do provide temporary accommodation to newly arrived refugees for a short period of time). On the other hand, asylum seekers living in resettlement countries will be subject to a range of different practices depending on the country. For example, in countries such as Australia and the UK, deterrence-related policies are adopted such that access to support services and publicly funded housing is restricted in order to reduce the perceived attractiveness of those destinations for asylum seekers (Bakker et al., 2016). In these instances, asylum seekers may have to access private housing while having their ability to work or receive welfare restricted. Correspondingly, the experiences of housing and accommodation in resettlement countries are likely to differ broadly based upon the status of a person as either a refugee or asylum seeker.

For refugees and asylum seekers living in resettlement countries, current research indicates that new arrivals face a range of barriers to accessing suitable housing or accommodation (Forrest et al., 2012; Phillips, 2006; Refugee Council of Australia, 2013; Rose, 2001). Specifically, research from Australia and the UK has highlighted challenges to accessing private rental accommodation including availability, lack of references, and affordability, with other forms of accommodation often out of reach (Bakker et al., 2016; Beer & Foley, 2003; Forrest et al., 2012; Phillips, 2006; Rose, 2001; Ziersch et al., 2017c). Similarly, research has found evidence of discrimination towards refugees and asylum seekers in resettlement countries, further impacting the ability to access housing (Forrest et al., 2012). Other issues identified in the literature include overcrowding, language barriers, and unfamiliarity with housing stock and locations (Forrest et al., 2012; Fozdar & Hartley, 2013). The studies reviewed below provide further evidence of these challenges. Housing difficulties have also been linked to other areas of refugee integration or resettlement. For example, Phillimore and Goodson's (2008) summary of several studies they conducted with respect to

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refugee integration found that housing affected a range of other areas of integration including undertaking education and forming social connections.

Large numbers of refugees or asylum seekers (an estimated four million people in 2015, (UNHCR, 2016)) live in refugee camps in (usually) low to middle-income countries, and are thus faced with a very different set of housing conditions. Such conditions may include little protection and inadequate infrastructure such as water and proper sewerage (Alnsour & Meaton, 2014; Rueff & Viaro, 2009). Previous research with both refugees and children of refugees living in refugee camps has found that lack of housing or shelter is experienced as a significant traumatic event (Sabin et al., 2003).

While these issues surrounding the housing situation for refugees and asylum seekers are well known, and there is emerging evidence of the impacts on health, this has not been systematically examined. As such, this paper aimed to provide a comprehensive systematic review of the literature concerning the relationship between housing and health and wellbeing for people with refugee or asylum seeker backgrounds, including all study designs, and across the range of housing outcomes (that is, resettlement in a developed or developing country, or refugee camp). In addition, the paper aimed to identify gaps in the literature and potential public health interventions.

METHODS

Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) was drawn upon in the collection and analysis of articles, as well as qualitative data synthesis and analysis processes from the Social Care Institute for Excellence (SCIE) Systematic Research Review Guidelines (Moher et al., 2009; Rutter et al., 2010). Specific details are provided below.

Inclusion Criteria

All empirical studies written in English from peer-reviewed and grey literature (e.g., research dissertations or reports) from 1997 to 2017 which reported on findings concerning the relationship between health and

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housing in relation to refugee and/or asylum seeker populations were included. Studies that focused on migrants only were excluded, as were studies that referred to "migrants" or "immigrants" but did not provide sufficient information to ascertain whether any participants had refugee or asylum-seeking backgrounds. Studies which included refugees or asylum seekers amongst other populations (such as children of refugees or other migrants) but did not disaggregate the data (e.g., (Sabin et al., 2003; Toscani et al., 2007)) were also excluded, as were those looking only at internally displaced populations. All study designs were included, encompassing both qualitative, quantitative and mixed-methods designs.

Health and wellbeing were defined broadly for the purposes of the search, following the multi-dimensional definition provided by the World Health Organization (World Health Organization, 1948), and encompassing physical, mental and behavioural domains. At times, for readability, the term 'health' is used in place of 'health and wellbeing' in the paper. In line with the pathways noted by Gibson and colleagues (2011), housing was also broadly defined, and included any aspects of housing and accommodation, including quality of the physical structure, overcrowding or number of people per room, access to accommodation or residential mobility, and internal characteristics such as heating and cooling. While the neighbourhood where housing is located has been highlighted as potentially impacting on health, in order to be included in the review, papers needed to also specifically highlight housing itself.

Search Strategy and Data Extraction

Medline, PsychInfo, Scopus, Web of Science, Embase, CINAHL, and Cochrane Library were all searched for peer-reviewed literature. Grey literature searches were also conducted using Google (searching site: .edu or .gov and filetype: .pdf), ProQuest, OpenGrey, MedNar and WHOLIS. In addition, reference lists of articles that were included in a full-text review were hand-searched for additional relevant articles. Article searches were conducted in English only. The full search protocol can be found in Table 1.

The initial search returned 2,371 results that were considered for inclusion, with an additional five publications identified through the reference lists of included papers. All titles and abstracts were screened

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independently by the two authors. As the study includes diverse designs, and since the quality of the articles found was taken to represent the state of the current literature (see (Campbell et al., 2011)), no initial screening for article quality was conducted. However, discussions of quality and bias are provided below in the results section. Furthermore, due to the diverse designs and aims of the quantitative studies, no meta-analysis was performed.

The first author extracted important characteristics of the studies using a predesigned table. This information included: country where the research was conducted, study aims and design, number and characteristics of participants, health and housing measures, and results pertaining to housing and health (see Appendix 1). This information was cross-checked by the second author.

RESULTS

From the 2,371 results generated from the search and reference list check, 30 publications that met the inclusion criteria were identified (see Figure 1 for full search results and flow chart for selection). Full texts were obtained for all articles. The main reasons for excluding articles were consideration of internally displaced populations or migrants rather than asylum seekers or refugees, and not exploring the relationship between housing and health, but rather focusing on these two as separate areas of concern.

Description of the studies

Details of each of the 30 studies can be found in Appendix 1. Table 2 breaks down the studies by qualitative and quantitative designs. Twenty-six of the documents were peer reviewed papers, with three reports that did not appear to be peer reviewed (Al-Madi et al., 2003; Khawaja & Tiltnes, 2002; Ziersch et al., 2017b) and one (Loehr, 2016) was an unpublished thesis.

Thirteen of the papers were qualitative only and 13 were quantitative only. A further four publications were mixed methods (Al-Madi et al., 2003; Carter et al., 2009; Fozdar, 2009; Ziersch et al., 2017b). Two of these were categorised as quantitative (Al-Madi et al., 2003; Carter et al., 2009) and one qualitative (Fozdar, 2009), as in each case the emphasis of reporting was clearly on one form of data. The report by

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Ziersch et al. (2017c) included a focus on both qualitative and quantitative data, however this was categorised as quantitative for the purposes of this review as much of the qualitative material was separately published in another included paper.

Eleven of the papers were based in refugee camps with the remaining 19 in countries of resettlement. Table 2 indicates two key periods of publication for articles in the area – from 2002-2006 and 2012-2017. While there was a spread of studies across regions, the majority of the studies in refugee camps were in the Middle East (all quantitative), with a further four in Africa. Studies in resettlement countries were spread more broadly.

Most of the papers involved refugees as the informant group (with Akinyemi et al. (2012) also including a non-refugee comparison group), with three including both refugees and service providers (Loehr, 2016; Shedlin et al., 2014; Ziersch et al., 2017b) and Fennelly (2006) only including service providers (Table 2/Appendix 1). Most papers included data on adults, with five also including data on children (typically defined as under either 16 or 18 years of age within the papers) and one study only considered children (Deveci, 2012). No studies focussed only on asylum seekers, although eight papers in resettlement countries included asylum seekers in the sample (Deveci, 2012; Palmer, 2006; Palmer & Ward, 2007; Papadopoulos et al., 2004; Song et al., 2015; Warfa et al., 2006; Ziersch et al., 2017b; Ziersch et al., 2017c). The studies varied markedly in their sample size, ranging from 4 to over 4000, with larger sample sizes in the quantitative studies (Table 2/Appendix 1).

Fourteen papers had a focus on both mental and physical health, 14 on mental health and two focused only on physical health (Table 2/Appendix 1).

The aims of the studies varied widely. Four of the 11 studies undertaken in refugee camps had an explicit aim to consider the impact of housing, living conditions and/or the built environment on health and wellbeing (Al-Khatib et al., 2005; Al Khatib & Tabakhna, 2006; Habib et al., 2006; 2002; Zabaneh et al., 2008). A further two studies focused on housing and living conditions (Al-Madi et al., 2003; Khawaja &

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Tiltnes) more generally with health considered as part of this, and five focused on health, with housing as an emergent theme (Akinyemi et al., 2016; Akinyemi et al., 2012; Carta et al., 2013; Feyera et al., 2015; Habib et al., 2014).

In the 19 papers from resettlement countries, only one study (with 2 publications, (Ziersch et al., 2017b; Ziersch et al., 2017c) was explicitly designed to explore the links between housing and health. Three studies focused on housing experiences within resettlement countries with health as an emergent theme (Carter et al., 2009; Fozdar & Hartley, 2014; Loehr, 2016), and 11 had a health focus with a link to housing as an emergent or secondary theme (Fozdar, 2009; Miller et al., 2002; Muennig et al., 2015; Palmer, 2006; Palmer & Ward, 2007; Papadopoulos et al., 2004; Shedlin et al., 2014; Song et al., 2015; Sonne et al., 2016; Warfa et al., 2006; Whitsett & Sherman, 2017). An additional three looked broadly at resettlement experiences and the link between housing and health emerged in qualitative discussions (Deveci, 2012; Fennelly, 2006; Hashimoto-Govindasamy & Rose, 2011).

Ten of the 16 papers that used quantitative methods were conducted in refugee camps and so reflect these contexts in relation to sampling populations living in close proximity. Ten of the qualitative papers were interview or focus group based, however, three papers included other qualitative methods, namely photovoice (Fozdar & Hartley, 2014; Ziersch et al., 2017b) and case studies (Deveci, 2012; Ziersch et al., 2017b). Further discussion of the studies in relation to quality and risk of bias is undertaken further below.

Findings in relation to housing and health

Below, we provide a description of the key findings in relation to housing and health from all included studies, separated broadly by housing situation (i.e. refugee camps and resettlement countries).

Studies concerning experiences in refugee camps

Of the 11 studies that explored refugee camp experiences, seven focused on the experiences of Palestinian refugees, in Palestine (Al-Khatib et al., 2005; Al Khatib & Tabakhna, 2006), Lebanon (Al-Madi et al., 2003;

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Habib et al., 2006; Habib et al., 2014; Zabaneh et al., 2008) and Jordan (Khawaja & Tiltnes, 2002). These studies found poor conditions in the camps, including high levels of over-crowding (such as an average number of children per bedroom of 3.56 and 38% of families having two or more children per bed (Al-Khatib et al., 2005) in addition to poor housing conditions (such as poor ventilation, no windows and therefore no natural light, the presence of damp and mould, leaking roofs, infestations from vermin such as cockroaches or rats, and unreliable piped water and sewage systems). The other four studies were of refugee camps in Africa; of Somali refugees in Ethiopia (Feyera et al., 2015), Malian refugees in Burkina Faso (Carta et al., 2013), and largely Liberian refugees in Nigeria (Akinyemi et al., 2016; Akinyemi et al., 2012). These African studies did not focus on housing conditions in detail and noted more general assessments of housing problems. For example, Carta et al. (2013) found that 92% of 408 participants in the Burkina Faso camp rated their housing as poor.

Associations between housing and physical health

Six papers reported on the relationship between housing conditions and physical or general health in refugee camps. In Palestine, Al-Khatib et al (2005) found that 97% of the women in their study agreed that housing conditions affected health and wellbeing, 77% linked humidity and ventilation to physical health outcomes, and 97% felt that crowding increases the spread of disease. There were higher rates of several self-reported physical health conditions for married women living in housing that they perceived as unhealthy. Al-Khatib & Tabakhna (2006) found links between housing factors and respiratory illnesses, with crowding associated with the common cold, cough, tonsillitis and ear infections as well as links with housing conditions such as damp, mould and lack of ventilation. In Lebanon, Habib et al. (2014) found a significant relationship between the two elements of housing they considered, crowding and water leakage, and the likelihood of reporting multiple health problems. Habib et al. (2006) found households with five or more housing condition problems were more likely to report an illness (almost exclusively relating to physical health) of a household member than those with less problems. There were no significant associations with their indexes of infrastructure or service issues, and individual housing conditions such as heating, humidity and pest infestation were not significantly associated with specific

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illnesses. Al-Madi et al. (2003) found that those living in a home with poor indoor quality (cold, heat, damp, ventilation) were more than twice as likely to report general health as poor or very poor. Interestingly, they found an inverse relationship between crowding and health, with those in the poorest health living with the most space per person. Zabenah et al. (2008) found a similar inverse relationship between overcrowding and chronic disease when measured by number of people per room but not size of area per person. Zabenah et al. (2008) did not find any link between chronic disease and heating, external ventilation or mould and dampness.

Associations between housing and mental health

Seven papers explored associations between housing and mental health – three of these were in Africa and the other three were in the Middle East. Carta et al. (2013) found self-rated poor housing ratings in 88% of people who met the diagnostic criteria for Post-traumatic Stress Disorder (PTSD), and 73% of people who scored above the cut-off for psychological distress on the K6. Current poor housing was positively associated with PTSD but not psychological distress after controlling for other variables. Feyera et al. (2015) found a link between a reported lack of housing or shelter and the presence of depressive symptomatology. In Nigeria, Akinyemi et al. (2012) found a moderate but non-significant relationship between the number of rooms in a house and overall mental health, and in the qualitative study, Akinyemi et al. (2016) participants reported housing problems as affecting mental health and quality of life. Al-Khatib, Arafat and Musmar (2005) found a relationship between housing conditions and stress and feelings of safety amongst their sample of women living in a refugee camp in Palestine, however, no measure of effect size or significance testing was performed. Al-Madi et al. (2003) found a link between poor indoor environment and psychological distress for both men and women, and an inverse link between crowding and psychological distress. Khawaja and Tiltnes (2002) likewise report a link between poor indoor environment and psychological distress for women but not for men. However, significance testing was not reported for these findings in either of these two studies. Despite describing focus group discussions

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linking crowding to a range of poorer social and health outcomes, Khawaja and Tiltnes (2002) report finding no relationship between levels of crowding and psychological distress for either men or women.

Studies conducted in resettlement countries

Within resettlement countries, the key emerging issues relating to housing were *affordability*, *insecure tenure and mobility*, *discrimination and difficulties securing housing, overcrowding* and *housing quality or condition*. These are discussed in turn below.

In relation to affordability, eight studies suggested that refugees typically lived in cheaper and smaller housing than was average in the specific resettlement country (Carter et al., 2009; Fennelly, 2006; Hashimoto-Govindasamy & Rose, 2011; Miller et al., 2002; Palmer, 2006; Palmer & Ward, 2007; Papadopoulos et al., 2004; Warfa et al., 2006), while six papers (Carter et al., 2009; Fennelly, 2006; Fozdar & Hartley, 2014; Loehr, 2016; Ziersch et al., 2017b; Ziersch et al., 2017c), reported affordability as a key barrier to accessing housing. Interestingly, Carter et al. (2009) found that affordability increased over the three year period of their longitudinal study, with access to social housing largely making the cost of housing more affordable for refugee communities. However, this may be related to the smaller town in which refugees were resettled (Winnipeg, Canada) and is not likely to be reflective of larger cities.

Seven papers (Carter et al., 2009; Fennelly, 2006; Fozdar & Hartley, 2014; Palmer, 2006; Warfa et al., 2006; Ziersch et al., 2017b; Ziersch et al., 2017c) found that refugee or asylum seeker populations were highly mobile in their search for housing, as a result of searching for better quality housing, and general issues with the insecurity of their housing tenure (e.g. short term leases).

There were also issues in securing housing in the first place, particularly in relation to discrimination. Eight papers (Fennelly, 2006; Fozdar & Hartley, 2014; Hashimoto-Govindasamy & Rose, 2011; Loehr, 2016; Shedlin et al., 2014; Ziersch et al., 2017b; Ziersch et al., 2017c; Warfa et al., 2006) found that discrimination was an issue in accessing housing. Hashimoto-Govindasamy (2011) and Loehr (2016) highlighted that discrimination impacted on large families, which were perceived as being poor, having too many children,

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and likely to damage properties. Fozdar and Hartley (2014) found discrimination to be a particular issue in accessing housing for Muslim refugees in Australia, while Shedlin et al. (2014) highlighted housing discrimination experienced by Colombian refugees in Ecuador, and Warfa et al. (2006) highlighted housing discrimination for Somali refugees in London. Finally, Ziersch et al. (2017b) found that 5% of their sample experienced discrimination in securing housing. Other issues in relation to securing housing found included lack of local references, difficulties navigating the private rental market, and access to public housing (Fennelly, 2006; Fozdar & Hartley, 2014; Miller et al., 2002; Ziersch et al. (2017b,c).

Eight papers (Carter et al., 2009; Fennelly, 2006; Loehr, 2016; Muennig et al., 2015; Palmer & Ward, 2007; Papadopoulos et al., 2004; Ziersch et al., 2017b; Ziersch et al., 2017c) found that overcrowding was an issue, particularly when people had to share houses with strangers or with extended family members whose health needs may vary. In addition to overcrowding, Ziersch et al. (2017b, c) highlighted other issues in relation to the condition of housing in terms of aspects such as presence of mould and damp (and a lack of heating and cooling), and other issues during tenancy such as difficulties getting things repaired, problems communicating in English and legal aspects of their tenancy agreements.

Associations between housing and physical health in resettlement countries

Eight papers (Carter et al., 2009; Fennelly, 2006; Fozdar & Hartley, 2014; Macintyre et al., 2003; Muennig et al., 2015; Papadopoulos et al., 2004; Ziersch et al., 2017b; Ziersch et al., 2017c) reported relationships concerning housing and physical health. Within these studies, generally consistent relationships emerged concerning housing in resettlement countries and effects on physical health through pathways such as housing quality, instability, and overcrowding. For example, Carter, Polevychok and Osborne's (2009) study found that 29% of their sample felt that their housing (specifically quality and satisfaction) contributed to health problems in their first year of resettlement in Canada, while Papadopoulos et al. (2004) found that 37% of their sample attributed ill-health in part to housing problems (broadly defined as overcrowding, lack of space and lack of privacy) in the UK. Over 80% of participants in Ziersch et al. (2017b)'s study perceived

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that housing had an impact on their health and wellbeing and there was a positive association between housing satisfaction and SF-8 physical health scores.

In several papers from Australia (Fozdar & Hartley, 2014; Loehr, 2016; Ziersch et al., 2017b; Ziersch et al., 2017c), participants perceived a negative relationship between the quality of their housing upon arrival in Australia and their health outcomes, particularly in relation to poor housing conditions, such as cold and damp and size and layout, that were seen as exacerbating existing health conditions such as asthma. Research by Fennelly (2006) with service-providers found perceptions that instability in housing led to difficulties managing physical health needs such as tuberculosis in the US, while overcrowding in particular was linked to the spread of infectious diseases. On the other hand, one study (Muennig et al., 2015) found that the number of habitants per room did not predict health (measured by the EQ5D5L), but low levels of crowding predicted positive oral health.

Associations between housing and mental health in resettlement countries

While some papers examined associations between housing and physical health, as noted above, most papers in resettlement countries focussed on mental health (Carter et al., 2009; Deveci, 2012; Fozdar, 2009; Fozdar & Hartley, 2014; Hashimoto-Govindasamy & Rose, 2011; Loehr, 2016; Miller et al., 2002; Palmer, 2006; Palmer & Ward, 2007; Song et al., 2015; Whitsett & Sherman, 2017; Ziersch et al., 2017b; Ziersch et al., 2017c). These papers indicated links between housing and mental health relating to the elements highlighted above such as housing condition, insecure tenure and mobility, discrimination and accessing housing; overcrowding and a sense of safety and social connections.

In terms of general mental health outcomes, in an Australian study, Ziersch et al. (2017b) found a positive association between housing satisfaction and SF-8 mental health scores. In the US, Song et al. (2014) found that unstable housing was related to severely impaired global functioning and Whitsett & Sherman (2017) found that stable and uncrowded housing was a key variable associated with improved mental health outcomes in terms of depression, anxiety and trauma symptoms amongst their sample of refugees

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undergoing treatment for mental health issues. However, in contrast, a study conducted in Denmark by Sonne et al. (2016) found no relationship between dwelling rating and changes in similar symptom scores for their sample of mental health programme users.

Poor housing conditions and insecure tenure were highlighted as impacting on mental health. In the UK, Palmer & Ward (2007) found that inappropriate housing or homelessness was cited as a key reason for poor mental health outcomes. Palmer (2006), Loehr (2016) and Ziersch et al. (2017c) also found that housing quality and access to housing were linked by participants to negative mental health concerns such as stress and anxiety, and Warfa et al.'s (2006) study found that poor housing conditions (such as damp and mould) led to high rates of mobility which in turn increased negative mental health outcomes. High housing mobility and insecure tenure were also highlighted by Ziersch et al. (2017c) as sources of stress and anxiety.

Challenges in accessing housing were also associated with negative mental health outcomes. In Australia, Fozdar and Hartley (2014) and Ziersch et al. (2017b,c) found that difficulties securing housing led to stress in their participants. Fozdar (2009), Hashimoto-Govindasamy and Rose (2011), Shedlin et al., (2014) Carter et al. (2009), Loehr (2016) and Ziersch et al. (2017b,c) all found that reported discrimination from rental agents and others when trying to find housing was linked by participants to negative mental health outcomes and exacerbated stress.

Overcrowding was also highlighted as negatively affecting mental health. In the US, Miller et al. (2002)'s participants reported on the loss of identity and autonomy related to overcrowding, particularly when it involved living with extended family unwillingly. Deveci (2012) similarly found that living in a shared house led to risk taking and therefore unhealthy behaviours for young refugees in the UK, and in Australia, Ziersch et al. (2017b,c) found that needing to live in shared housing due to housing costs exacerbated mental health issues. Meunnig et al. (2015) found amongst refugees from Myanmar living on the Thai/Myanmar border that a lower number of people per room was significantly related to improved children's social development, but that it was not significantly related to adult's quality of life.

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Issues in relation to safety and social connections were also highlighted. Papadopoulos et al. (2004) found that insecure housing particularly influenced women's mental health due to safety concerns, and Ziersch et al. (2017c) also highlighted the impact that feelings of safety both within housing and broader neighbourhood had on mental health, as well as social ties with neighbours.

Reflections on quality

Issues of quality were considered with reference to the CASP checklists (Critical Appraisal Skills Programme, 2017). In addition to quality reflections, we also considered issues of comparability between studies given the diversity of research designs and aims in the included papers – for example, in relation to the measures used, sampling, analysis and ethical concerns. Overall, there were a number of issues that make definitive statements about the link between housing and health more difficult to make.

There was a range of issues with the measures used in the studies. A broad range of health measures were used in the studies (Appendix 1), making comparisons between studies and outcomes particularly difficult. The health conditions measured in studies were also self-assessed rather than directly measured. Housing measures were generally less rigorous than health with a broad array of indicators such as the type of housing and building materials, number of rooms, connection to sewerage or piped water systems as well as presence of pests, ventilation, light, water leakage, and dust. Some studies where housing was not the key focus used very simple housing measures. Responses to housing measures were sometimes provided by researcher observation, but largely by respondent self-report.

Sampling in the refugee camp quantitative studies was largely multi-stage cluster or stratified approaches where buildings or floors of buildings were identified within camps and then households sampled within these; however, in most of the studies, women were over-represented as the respondents for the household with only one study (Feyera et al, 2015) using a genuinely random selection method. For the six quantitative papers conducted in resettlement countries, all used sampling that introduced potential bias and other limitations – such as patients referred to one clinic (Song et al., 2015; Sonne et al., 2016; Whitsett

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& Sherman, 2017), a convenience sample of children at two schools in Thailand (Muennig et al., 2015) and through organisational networks, advertisements and snowball sampling (Carter & Osborne, 2009; Ziersch et al., 2017b; Ziersch et al., 2017c). The majority of the qualitative studies relied upon convenience samples, with some studies recruiting from only one or two services (e.g., Miller, 2002; Palmer & Ward, 2007; Palmer, 2006). In addition, as the main focus of most qualitative studies was not on the relationship between housing and health, this link was generally not explored in a systematic way in data collection, with most findings emerging in broader discussions. All of these factors limit the generalisability and representativeness of the findings.

All but one of the studies were correlational, and as such, the causality of the health problems seen in this body of research is difficult to determine. In terms of analysis, a number of the quantitative papers only employed univariate analysis and so did not control for other potentially important variables, with the remainder using logistic or linear regression (Appendix 2). There was limited analysis of sub-groups within the samples – for example disaggregation by gender or visa type (only Khawaja & Tiltnes, 2002, and Al-Mahdi et al (2003) did so, disaggregating by gender). Some qualitative studies described some type of thematic or framework analysis with clearly outlined analytic procedures (Loehr, 2016; Miller et al., 2002; Palmer & Ward, 2007; Warfa et al., 2006; Ziersch et al., 2017c). However, in other cases, the precise analytical approach was either not specified or only broadly described.

Ethical issues were not extensively discussed in the papers. Some papers made no mention of ethical considerations at all, while others only noted that ethics clearance had been obtained, and two said that ethics clearance was not required for their studies (Muennig et al., 2015; Zabaneh et al., 2008). Some studies provided more details, however, this was largely confined to further describing informed consent procedures; with the exception of Fozdar and Hartley (2014) and Ziersch et al. (2017b), who provided a comprehensive discussion of the ethical considerations of their study. This general lack of discussion of ethical considerations is of particular concern for those studies conducted in refugee camps with very high reported responses rate (e.g. 95% in Khawaja & Tiltnes, 2002; 96% in Al-Madi et al., 2003; 98% in Carta et al., 2013; 100% in Al-Khatib & Tabakhna). The majority of this data was collected face-to-face, and while

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there may have been particular reasons for these high response rates, potential issues about perceived coercion or compromised anonymity were not discussed.

In terms of potential bias, funding sources were not noted by all of the studies, but for those that did there was no evidence of potential conflict of interest in this funding, which was largely philanthropic funds or government sources not from the country where the study was being conducted (except Carter et al. (2009), who did receive some funding from the Canadian government). Some studies did not state funding sources but stated that there was no conflict of interest (Carta et al., 2013; Feyera et al., 2015).

Taken together, the issues raised about study quality to a large extent reflect the wide range of challenges of conducting studies with refugees and asylum seekers, both in refugee camps and countries of resettlement where there are extensive ethical considerations, sampling frames are often not available, access to participants can be difficult and measures vary in their cultural appropriateness.

DISCUSSION

Overall, the review found significant housing issues experienced by refugees in both refugee camps and resettlement countries. These issues were associated with worse mental and physical health outcomes, supporting a broad literature highlighting housing as an important social determinant of health (Baker et al., 2014; Bonnefoy, 2007; Braubach, 2011; Braubach et al., 2011; Evans et al., 2003; Gibson et al., 2011; Howden-Chapman, 2002; Shaw, 2004; Thomson et al., 2009). In particular, the physical condition (e.g., mould or damp) of housing was associated with physical health, especially in refugee camps where housing was generally in poor condition. In resettlement countries where the majority of studies were qualitative there was less focus on housing condition, but difficulties securing housing and generic problems with housing quality, affordability, and overcrowding as well as high mobility were associated with poorer health outcomes in particular in relation to mental health. However, many of the studies were not expressly designed to examine the link between housing and health, and compromised study quality and difficulties

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in comparing studies in widely different contexts using a variety of health and housing measures makes it more difficult to specify the key pathways between housing and health for this population. A more comprehensive targeted research programme to examine these potential pathways would assist in developing appropriate interventions. Nevertheless, the research reviewed suggests a number of avenues for public health interventions to improve wellbeing for refugees and asylum seekers. These findings are discussed further below.

Findings in relation to housing and health and wellbeing

In relation to refugee camps, largely located in the Middle East, our review identified significant issues with physical housing conditions and surrounding amenities and infrastructure. All but one (Zabaneh et al., 2008) of the studies in refugee camps that examined elements of physical housing conditions found a negative link with physical health outcomes, and in some instances mental health outcomes. This supports a strong body of research highlighting such links more generally (Evans et al., 2003), and this was the strongest finding of the review. Overcrowding was also highlighted as an issue and was significantly associated with physical health in two of the studies (Al-Khatib et al., 2005; Habib et al., 2014). However, two of the studies (Al-Madi et al., 2003; Zabaneh et al., 2008) found an inverse relationship between crowding and health outcomes, which may relate to different measures of crowding used. Zabenah et al. (2008) and Khawaja & Tiltnes (2002) also postulate that cohabiting with multiple others may lead to social support. Further consideration of the way that higher density living can provide both benefits and drawbacks would be a useful addition to the research evidence. The review also suggests that there may be a tipping point for the cumulative impact of housing issues on health, with one of the studies finding that having five or more problems was significantly associated with poor physical health outcomes but individual housing issues were not (Habib et al., 2006).

Fewer refugee camp studies examined mental health outcomes, but those that did found a link between elements of housing (e.g., a lack of housing at some point or poor quality housing) and psychological distress in particular. Khawaja & Tiltnes (2002) only found a relationship between poor indoor

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environment and psychological distress for women, which they suggest may relate to greater time spent within the house. This issue of potential 'exposure' to housing conditions is another important aspect for future research to examine. The relationship with crowding was varied. For example, Khawaja & Tiltnes (2002) did not find a relationship between crowding and mental health and Akinyemi et al. (2012) did not find a link between number of rooms in the house (though without including the number of people in the household) and mental health. Al-Madi et al. (2003) found an inverse relationship between crowding and psychological distress, again highlighting the complex relationship between co-habitation and health and wellbeing.

In resettlement countries, key elements of housing associated with health were housing quality, affordability, mobility, discrimination and overcrowding, reflecting issues noted in broader research without a health focus (Beer & Foley, 2003; Flatau et al., 2014; Flatau et al., 2015; Forrest et al., 2012; Phillimore & Goodson, 2008; Rose, 2001). The majority of studies concerning housing and health for refugees and asylum seekers in resettlement countries were qualitative and did not specifically aim to examine the link between housing and health. Nevertheless, emerging findings from these studies note perceived connections between housing quality, overcrowding and instability and physical health (e.g., particularly by exacerbating conditions such as asthma and the spread of infectious diseases), while inappropriate or unstable housing was linked to worse mental health outcomes through stress and concerns about safety. In addition, difficulties accessing housing (Fozdar & Hartley, 2014) and discrimination in the private rental housing market were also linked to stress and negative mental health outcomes (Carter et al., 2009; Fozdar, 2009; Hashimoto-Govindasamy & Rose, 2011; Loehr, 2016; Shedlin et al., 2014; Ziersch et al, 2017b; Ziersch et al, 2017c). Two studies considered the role of housing for people undergoing treatment for mental health issues, with one study (Whitsett & Sherman, 2017) finding it a key variable determining people's response to therapy, but the other finding no significant link (Sonne et al., 2016). Most of the resettlement country studies were located in the UK, USA, Canada and Australia, though there was one each from Ecuador, Thailand and Denmark. While general housing difficulties with consequences for health and wellbeing were highlighted across the studies, varied measures and

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methodological approaches used in these studies made specific country comparisons difficult. However, it is likely that specific country immigration, welfare and resettlement policies will influence experiences for refugees.

While broader research has highlighted housing difficulties as affecting health, these issues may be particularly distressing for refugees and asylum seekers given prior exposure to trauma and dislocation. Moreover, housing is linked to other elements of resettlement such as employment and social connections (Ager & Strang, 2004, 2008; Phillimore & Goodson, 2008), which are themselves social determinants of health. There was some evidence in this review of how housing issues can have compounding impacts on refugee and asylum seeker health and wellbeing (e.g. Fozdar, 2009; Fozdar & Hartley, 2014; Hashimoto-Govindasamy & Rose, 2011; Palmer & Ward, 2007; Ziersch et al., 2017c), although most of these studies are cross sectional and qualitative and therefore are limited in providing causal evidence. As such, studies that explicitly aim to explore these housing issues and their impacts on health in this population, in concert with other aspects of resettlement, are warranted.

Only two papers specifically considered the experiences of asylum seekers (Ziersch et al, 2017b; Ziersch et al, 2017c). While asylum seekers were included in several other studies, the findings were not differentiated by visa status. Ziersch et al. (2017 b, c) found that asylum seekers in particular had difficulties navigating the housing market due to conditions of their visas (such as reduced access to services and benefits) and difficulties signing longer-term leases. Further research in this area is urgently required to inform policy development in resettlement countries in terms of the support services offered to various groups of refugees and asylum seekers in relation to housing and other social determinants of health. Likewise, the vast majority of papers did not disaggregate their findings by demographic characteristics such as age, gender, or ethnicity/cultural background, and only one study explicitly explored housing and health for children (Deveci, 2012), finding that feelings of safety were critical for wellbeing. All of these demographic factors are likely to affect both housing experiences (e.g. overcrowding with larger families, discrimination in securing housing, cultural meanings of housing, and safety) as well the impacts of these experiences on health and wellbeing. Further research which specifically explores differences by

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demographics are needed to further understand this social determinant of health for refugees and asylum seekers.

Methodological considerations

While this synthesis of findings suggests a link between housing and health, there are methodological issues which make providing a clear overview of the relationship between housing and health for this population difficult, and some gaps in the research evidence exist as already indicated above. In particular, there was a broad array of mental and physical health measures used, and a dearth of validated and culturally appropriate health measures for use with refugees and asylum seekers makes comparisons across contexts difficult. Similarly, there were no consistent housing measures used. In general, there is a pressing need for better research tools to explore health and social determinants such as housing more generally for refugee and asylum seeker populations.

Synthesising findings was also hampered by the fact that many of the studies were small-scale and contextually specific, which limits the generalisability. All but one were cross-sectional, limiting causal determinations, although previous literature with broader populations suggests a bi-directional relationship between housing and health (Baker et al., 2014; Howden-Chapman, 2002). A particular concern across studies included in the review related to sampling and the potential for bias. For example, in refugee camps, comprehensive sampling frames were available, but while households were often sampled randomly or systematically from these frames, individuals within them were not, leading to biased samples (e.g., with an overrepresentation of female participants). Convenience samples were typically used in studies conducted in resettlement countries, particularly those with qualitative designs, again potentially leading to skewed results.

However, it is acknowledged that given the mobile and changing nature of refugee populations across the globe, it is difficult to access appropriate sampling frames from which to draw representative samples. This is compounded by the fact that refugees and asylum seeker populations are also typically difficult to access,

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and ethical and appropriate research designs and tools are challenging to implement (Ellis et al., 2007; Hugman et al., 2011; Ziersch et al., 2017a). In relation to these challenges, some of the authors acknowledged the limitations of their research, citing logistical difficulties of conducting research with refugee populations, many of whom are highly mobile, and for whom cross-cultural and trauma informed research methods are required.

Moreover, conducting research with people who have experienced a range of traumatic events associated with refugee or asylum seeker status raises considerable ethical challenges. Of concern in the review is that in general, the papers did not describe ethical considerations in detail (and sometimes not at all), nor discuss methodological approaches to dealing with those considerations. As highlighted above, the studies in refugee camps also noted very high response rates. While these high rates may relate to other research factors, coupled with a lack of discussion of ethics this raises concerns about participant recruitment and the potential for coercion given power differentials.

Implications for policy and practice

Despite the overall quality concerns and methodological challenges, the review does provide some evidence of the impact of housing on health, indicating a range of potential pathways through which housing may lead to positive or negative health outcomes for refugees and asylum seekers. While most of the papers did not explicitly test pathways through which housing affected health, some of these did emerge across the papers. Housing conditions - particularly in refugee camps - were linked to a number of physical health conditions including both communicable and non-communicable diseases where, for example, damp and mould were seen to exacerbate respiratory conditions or overcrowding to facilitate the spread of disease. Housing pathways identified as affecting mental health included housing conditions and general issues with appropriateness, such as overcrowding and a lack of privacy causing stress and negatively impacting health. Insecure tenure, mobility, and difficulties securing housing as well as issues of affordability also increased stress and pressure on families. Finally, pathways through which housing

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affected health were also intertwined with other aspects of integration such as greater difficulties building social connections, exposure to discrimination and issues securing employment.

In terms of specific public health interventions that respond to these findings, the WHO suggests 8 key goals for housing that supports health and wellbeing - sound construction, provision of safety and security, adequate size, basic services such as clean water and sanitation, affordability, access to services and amenities, reasonable security of tenure, and provision of protection from climate changes (Braubach, 2011) - which point to some key elements of consideration. In particular, this review suggests that improving the physical condition of housing and access to basic services in refugee camps would likely have a positive effect on health (Evans et al., 2003), while in resettlement countries interventions to improve housing access, affordability and suitability more generally would similarly lead to benefits. In resettlement countries, interventions could include increasing welfare entitlements, increased access to public housing to improve affordability and security of tenure, anti-discrimination education for landlords and tenants to improve access, and enforced minimum housing standards (Beer & Foley, 2003; Forrest et al., 2012; Fozdar & Hartley, 2013; Ziersch et al., 2017c). In a review of systematic reviews of housing interventions and health, Gibson et al. (2011) also found clear evidence for improving internal housing conditions through warmth and energy efficiency interventions. However, these reviews did not focus on outcomes for refugees and asylum seekers and any such interventions would need to be evaluated specifically with these populations. In one of the papers reviewed (Palmer, 2006), a recommendation was also for the better integration of services to support refugee housing alongside other elements of settlement such as employment. This further highlights the importance of considering the impact of the refugee experience on the link between housing and health, and the interrelatedness of housing with other elements of integration (Ager & Strang, 2004, 2008) and the importance of a holistic approach to refugee resettlement policy and practice.

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Limitations

This review itself, however, is not without limitations. In particular, our inclusion criteria were limited to English language articles, and this presents a source of bias, particularly given the subject area. A further limitation lies in the definition of housing used – we adopted a wide definition, but this led to inclusion of studies with quite limited housing focus, including some which only included single-item measures related to housing such as number of people per room. Other qualitative studies were included if housing arose as a theme, but again, this was sometimes tangential to the focus of the research. However, given the small body of literature currently available, these studies provide further insight into potential pathways between housing and health for refugees, which could be further explored in future research. Similarly, our review did not include papers that focused only on neighbourhood or area-level issues (without reference to housing), as this was outside the scope of the focus on housing as defined by the WHO. However, given the potential for location to also impact health, particularly through elements of safety which was seen in some papers in this review, attention should also be paid to neighbourhood elements in future research. Finally, although not a specific limitation of the review methodology, due to the diversity of methodologies in papers we were not able to draw conclusions about the impact of location (e.g., country of resettlement or location of camp) on the relationship between housing and health. More research is required in this area.

CONCLUSION

Housing has been identified as a key social determinant in a range of previous research, and our review indicates that this is also the case for refugees and asylum seekers. Housing – whether in resettlement countries or refugee camps – was typically found across studies to impact on mental and physical health and wellbeing in terms of housing condition and quality, availability, overcrowding, discrimination, tenure security and mobility, and safety. However, there is an urgent need for more detailed research in this area, given that housing can affect not only health for refugees and asylum seekers, but also interact with other elements such as employment and education to impact integration more generally. As such, further

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evidence concerning intersectoral pathways and targeted housing interventions will likely lead to comprehensive improvements in health and wellbeing for refugees and asylum seekers.

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REFERENCES

Acevedo-Garcia, D. (2000). Residential segregation and the epidemiology of infectious diseases. *Social Science & Medicine,* 51, 1143-1161.

Ager, A., & Strang, A. (2004). *Indicators of integration*: Home Office, Research, Development and Statistics Directorate.

Ager, A., & Strang, A. (2008). Understanding integration: A conceptual framework. *Journal of Refugee Studies,* 21, 166-191.

Akinyemi, O.O., Owoaje, E., & Cadmus, E. (2016). In their own words: Mental health and quality of life of West African refugees in Nigeria. *Journal of International Migration and Integration,* 17, 273-287.

Akinyemi, O.O., Owoaje, E.T., Ige, O.K., & Popoola, O.A. (2012). Comparative study of mental health and quality of life in long term refugees and host populations in Oru-Ijebu, Southwest Nigeria. *BMC Research Notes,* 5, 394.

Al-Khatib, I.A., Arafat, R.N., & Musmar, M. (2005). Housing environment and women's health in a Palestinian refugee camp. *International Journal of Environmental Health Research,* 15, 181-191.

Al-Madi, Bashour, Blome-Jacobsen, Deeb, Khalidi, Khawaja, et al. (2003). Difficult past, uncertain future: Living conditions among Palestinian refugees in camps and gatherings in Lebanon. In O.F.E. Ugland (Ed.), Fafo report 409. Beirut.

Al Khatib, I., & Tabakhna, H. (2006). Housing conditions and health in Jalazone Refugee Camp in Palestine. *Eastern Mediterranean Health Journal,* 12, 144-152.

Alnsour, J., & Meaton, J. (2014). Housing conditions in Palestinian refugee camps, Jordan. *Cities,* 36, 65-73.

Baker, E., Mason, K., Bentley, R., & Mallett, S. (2014). Exploring the bi-directional relationship between health and housing in Australia. *Urban Policy and Research,* 32, 71-84.

Bakker, L., Cheung, S.Y., & Phillimore, J. (2016). The Asylum-Integration Paradox: Comparing Asylum Support Systems and Refugee Integration in The Netherlands and the UK. *International Migration,* 54, 118-132.

Beer, A., & Foley, P. (2003). Housing need and provision for recently arrived refugees in Australia. Australian Housing and Urban Research Institute Melbourne.

Bonnefoy, X. (2007). Inadequate housing and health: an overview. *International Journal of Environment and Pollution,* 30, 411-429.

Bonnefoy, X., Braubach, M., Moissonnier, B., Monolbaev, K., & Röbbel, N. (2003). Housing and health in Europe: preliminary results of a pan-European study. *American Journal of Public Health,* 93, 1559-1563.

Braubach, M. (2011). Key challenges of housing and health from WHO perspective. *International Journal of Public Health,* 56, 579-580.

Braubach, M., Jacobs, D.E., & Ormandy, D. (2011). Environmental burden of disease associated with inadequate housing: A method guide to the quantification of health impacts of selected housing risks in the WHO European Region Copenhagen World Health Organization.

Campbell, R., Pound, P., Morgan, M., Daker-White, G., Britten, N., Pill, R., et al. (2011). Evaluating meta-ethnography: systematic analysis and synthesis of qualitative research. *Health Technology Assessment,* 15, 1-164.

Carta, M.G., Oumar, F.W., Moro, M.F., Moro, D., Preti, A., Mereu, A., et al. (2013). Trauma- and stressor related disorders in the tuareg refugees of a cAMP in burkina faso. *Clinical Practice and Epidemiology in Mental Health,* 9, 189.

Carter, T., & Osborne, J. (2009). Housing and Neighbourhood Challenges of Refugee Resettlement in Declining Inner City Neighbourhoods: A Winnipeg Case Study. *Journal of Immigrant and Refugee Studies,* 7, 308-327

Carter, T., Polevychok, C., & Osborne, J. (2009). The role of housing and neighbourhood in the re-settlement process: a case study of refugee households in Winnipeg. *The Canadian Geographer/Le Géographe Canadien,* 53, 305-322.

Critical Appraisal Skills Programme. (2017). Making sense of evidence.

ACCEPTED MANUSCRIPT

Deveci, Y. (2012). Trying to understand: promoting the psychosocial well-being of separated refugee children. *Journal of Social Work Practice,* 26, 367-383.

Dunn, J.R. (2000). Housing and Health Inequalities: Review and Prospects for Research. *Housing Studies,* 15, 341-366.

Ellis, B., Kia-Keating, M., Yusuf, S., Lincoln, A., & Nur, A. (2007). Ethical research in refugee communities and the use of community participatory methods. *Transcult Psychiatry,* 44, 459-481.

Evans, G.W., Wells, N.M., & Moch, A. (2003). Housing and mental health: A review of the evidence and a methodological and conceptual critique. *Journal of Social Issues,* 59, 475-500.

Fazel, M., Wheeler, J., & Danesh, J. (2005). Prevalence of serious mental disorder in 7000 refugees resettled in western countries: a systematic review. *The Lancet,* 365, 1309-1314.

Fennelly, K. (2006). Listening to the experts: provider recommendations on the health needs of immigrants and refugees. *Journal of Cultural Diversity,* 13, 190.

Feyera, F., Mihretie, G., Bedaso, A., Gedle, D., & Kumera, G. (2015). Prevalence of depression and associated factors among Somali refugee at Melkadida camp, Southeast Ethiopia: a cross-sectional study. *BMC Psychiatry,* 15, 171.

Flatau, P., Colic-Peisker, V., Bauskis, A., Maginn, P., & Buergelt, P. (2014). Refugees, housing and neighbourhoods in Australia. *Australian Housing and Urban Research Institute (AHURI) Final Report*, 1-120.

Flatau, P., Smith, J., Carson, G., Miller, J., Burvill, A., & Brand, R. (2015). The housing and homelessness journeys of refugees in Australia. *Melbourne: Australian Housing and Urban Research Institute*.

Forrest, J., Hermes, K., Johnston, R., & Poulsen, M. (2012). The Housing Resettlement Experience of Refugee Immigrants to Australia. *Journal of Refugee Studies,* 26, 187-206.

Fozdar, F. (2009). 'The Golden Country': Ex-Yugoslav and African Refugee Experiences of Settlement and Depression. *Journal of Ethnic and Migration Studies,* 35, 1335-1352.

Fozdar, F., & Hartley, L. (2013). Refugee Resettlement in Australia: What We Know and Need to Know. *Refugee Survey Quarterly,* 32, 23-51.

Fozdar, F., & Hartley, L. (2014). Housing and the creation of home for refugees in Western Australia. *Housing, theory and society,* 31, 148-173.

Gibson, M., Petticrew, M., Bambra, C., Sowden, A.J., Wright, K.E., & Whitehead, M. (2011). Housing and health inequalities: A synthesis of systematic reviews of interventions aimed at different pathways linking housing and health. *Health & Place,* 17, 175-184.

Habib, R., Basma, S., & Yeretzian, J. (2006). Harboring illnesses: On the association between disease and living conditions in a Palestinian refugee camp in Lebanon. *International Journal of Environmental Health Research,* 16, 99-111.

Habib, R., Hojeij, S., Elzein, K., Chaaban, J., & Seyfert, K. (2014). Associations between life conditions and multi-morbidity in marginalized populations: the case of Palestinian refugees. *The European Journal of Public Health,* 24, 727-733.

Hashimoto-Govindasamy, L., & Rose, V. (2011). An ethnographic process evaluation of a community support program with Sudanese refugee women in western Sydney. *Health Promotion Journal of Australia,* 22, 107-112.

Hollifield, M., Warner, T.D., Lian, N., Krakow, B., Jenkins, J.H., Kesler, J., et al. (2002). Measuring trauma and health status in refugees: a critical review. *JAMA,* 288, 611-621.

Howden-Chapman, P. (2002). Housing and inequalities in health. *Journal of Epidemiology and Community Health,* 56, 645-646.

Hugman, R., Pittaway, E., & Bartolomei, L. (2011). When 'do no harm' is not enough: the ethics of research with refugees and other vulnerable groups. *Br J Soc Work,* 41, 1271-1287.

Khawaja, M., & Tiltnes, A.A. (2002). On the Margins: Migration and Living Conditions of Palestinian Camp Refugees in Jordan. Fafo report 357. Oslo: FAFO.

Loehr, N. (2016). At Home in the Market: Risk, Acculturation and Sector Integration in the Private Rental Tenancies of Humanitarian Migrants. Flinders University.

Macintyre, S., Ellaway, A., Hiscock, R., Kearns, A., Der, G., & McKay, L. (2003). What features of the home and the area might help to explain observed relationships between housing tenure and health? Evidence from the west of Scotland. *Health & Place,* 9, 207-218.

ACCEPTED MANUSCRIPT

Mallett, S., Bentley, R., Baker, E., Mason, K., Keys, D., Kolar, V., et al. (2011). Precarious housing and health inequalities: what are the links? Summary Report. Melbourne, Australia: VicHealth.

Marmot, M. (2005). Social determinants of health inequalities. *The Lancet,* 365, 1099-1104.

Miller, K.E., Worthington, G.J., Muzurovic, J., Tipping, S., & Goldman, A. (2002). Bosnian refugees and the stressors of exile: a narrative study. *American Journal of Orthopsychiatry,* 72, 341.

Moher, D., Liberati, A., Tetzlaff, J., & Altman, D.G. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Ann Intern Med.,* 151, 264-269.

Muennig, P., Boulmier-Darden, P., Khouzam, N., Zhu, W., & Hancock, P. (2015). Predictors of health among refugee adults from Myanmar and the development of their children. *Journal of Immigrant and Minority Health,* 17, 1385-1390.

OHCHR. (2018). Article 11.1 of the International covenant on economic, social and cultural rights.

Palmer, D. (2006). Imperfect prescription: mental health perceptions, experiences and challenges faced by the Somali community in the London Borough of Camden and service responses to them. *Primary Care Mental Health,* 4, 45-56.

Palmer, D., & Ward, K. (2007). 'Lost': listening to the voices and mental health needs of forced migrants in London. *Medicine, Conflict and Survival,* 23, 198-212.

Papadopoulos, I., Lees, S., Lay, M., & Gebrehiwot, A. (2004). Ethiopian refugees in the UK: migration, adaptation and settlement experiences and their relevance to health. *Ethnicity & health,* 9, 55-73.

Phillimore, J., & Goodson, L. (2008). Making a place in the global city: The relevance of indicators of integration. *Journal of Refugee Studies,* 21, 305-325.

Phillips, D. (2006). Moving towards integration: the housing of asylum seekers and refugees in Britain. *Housing Studies,* 21, 539-553.

Refugee Council of Australia. (2013). Housing issues for refugees and asylum seekers in Australia: A literature review Refugee Council of Australia.

Rose, D. (2001). The housing situation of refugees in Montreal three years after arrival: the case of asylum seekers who obtained permanent residence. *Journal of International Migration and Integration,* 2, 493-529.

Rosenberg, T., Kendall, O., Blanchard, J., Martel, S., Wakelin, C., & Fast, M. (1997). Shigellosis on Indian reserves in Manitoba, Canada: its relationship to crowded housing, lack of running water, and inadequate sewage disposal. *American Journal of Public Health,* 87, 1547-1551.

Rueff, H., & Viaro, A. (2009). Palestinian Refugee Camps: From Shelter to Habitat. *Refugee Survey Quarterly,* 28, 339-359.

Rutter, D., Francis, J., Coren, E., & Fisher, M. (2010). SCIE systematic research reviews: guidelines (2nd edition). London: Social Care Institute for Excellence.

Sabin, M., Lopes Cardozo, B., Nackerud, L., Kaiser, R., & Varese, L. (2003). Factors associated with poor mental health among guatemalan refugees living in mexico 20 years after civil conflict. *JAMA,* 290, 635-642.

Shaw, M. (2004). Housing and Public Health. *Annual Review of Public Health,* 25, 397-418.

Shedlin, M.G., Decena, C.U., Noboa, H., & Betancourt, Ó. (2014). Sending-country violence and receiving-country discrimination: Effects on the health of Colombian refugees in Ecuador. *Journal of Immigrant and Minority Health,* 16, 119-124.

Silove, D., & Ekblad, S. (2002). How well do refugees adapt after resettlement in Western countries? *Acta Psychiatrica Scandinavica,* 106, 401-402.

Song, S.J., Kaplan, C., Tol, W.A., Subica, A., & de Jong, J. (2015). Psychological distress in torture survivors: pre-and post-migration risk factors in a US sample. *Social Psychiatry and Psychiatric Epidemiology,* 50, 549-560.

Sonne, C., Carlsson, J., Bech, P., Vindbjerg, E., Mortensen, E.L., & Elklit, A. (2016). Psychosocial predictors of treatment outcome for trauma-affected refugees. *European Journal of Psychotraumatology,* 7, 30907.

Taylor, J. (2004). Refugees and social exclusion: What the literature says. *Migration Action,* XXVI, 16–31

Thomson, H., Thomas, S., Sellstrom, E., & Petticrew, M. (2009). The Health Impacts of Housing Improvement: A Systematic Review of Intervention Studies From 1887 to 2007. *American Journal of Public Health,* 99, S681-S692.

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Toscani, L., DeRoo, L.A., Eytan, A., Gex-Fabry, M., Avramovski, V., Loutan, L., et al. (2007). Health status of returnees to Kosovo: do living conditions during asylum make a difference? *Public Health,* 121, 34-44.

UNHCR. (2016). Global trends in forced displacement in 2015. UNHCR.

UNHCR. (2017). What is a refugee? .

Wanyeki, I., Olson, S., Brassard, P., Menzies, D., Ross, N., Behr, M., et al. (2006). Dwellings, crowding, and tuberculosis in Montreal. *Social Science & Medicine,* 63, 501-511.

Warfa, N., Bhui, K., Craig, T., Curtis, S., Mohamud, S., Stansfeld, S., et al. (2006). Post-migration geographical mobility, mental health and health service utilisation among Somali refugees in the UK: a qualitative study. *Health & Place,* 12, 503-515.

Whitsett, D., & Sherman, M.F. (2017). Do resettlement variables predict psychiatric treatment outcomes in a sample of asylum-seeking survivors of torture? *International Journal of Social Psychiatry,* 63, 674-685.

World Health Organization. (1948).

World Health Organization. (2017). Social determinants of health.

Zabaneh, J.E., Watt, G.C.M., & O’Donnell, C.A. (2008). Living and health conditions of Palestinian refugees in an unofficial camp in the Lebanon: a cross-sectional survey. *Journal of Epidemiology and Community Health,* 62, 91.

Ziersch, A., Due, C., Arthurson, K., & Loehr, N. (2017a). Conducting Ethical Research with People from Asylum Seeker and Refugee Backgrounds. In P. Liamputtong (Ed.), *Handbook of Research Methods in Health Social Sciences* pp. 1-19). Singapore: Springer Singapore.

Ziersch, A., Due, C., Walsh, M., & Arthurson, K. (2017b). Belonging begins at home: Housing, social inclusion and health and wellbeing for people from refugee and asylum seeking backgrounds. Adelaide: Flinders Press.

Ziersch, A., Walsh, M., Due, C., & Duivesteyn, E. (2017c). Exploring the Relationship between Housing and Health for Refugees and Asylum Seekers in South Australia: A Qualitative Study. *International Journal of Environmental Research and Public Health,* 14, 1036.

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A mixed methods systematic review of studies examining the relationship between housing and health for people from refugee and asylum-seeking backgrounds

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Table 1: Search terms

Refugees	**Housing**	**Health**
refugee*	hous*	Health
"asylum seeker*"	Accommodation	Wellbeing
Migrant	"living condition*"	"mental health"
Immigrant		"mental illness"
		"well being"
		illness
		depress*
		anxiety
		anxious
		PTSD
		"post-traumatic stress disorder"
		"post-traumatic stress"
		stress

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Table 2: Overview of Included Studies

	Quantitative (N =16)	Qualitative (N =14)	Total N=30
Housing Situation			
Refugee camp	10	1	11
Resettlement country	6	13	19
Year of Publication			
1997-2001	0	0	0
2002-2006	5	5	10
2007-2011	2	3	5
2012-2017	9	6	15
Region of Study			
Australia	1	4	5
United Kingdom	0	5	5
United States and Canada	3	3	6
Europe	1	0	1
Africa	3	1	4
The Middle East	7	0	7
South America	0	1	1
South East Asia	1	0	1
Informant Group			
Refugees/asylum seekers	15	11	26
Service providers	0	1	1
Refugees/asylum seekers and service providers	1	2	3
Sample Size			
Under 10	0	2	2
11-50	0	5	5
51-100	0	5	5
101-200	4	0	6
201-300	2	0	2
301-500	3	0	3
500+	7	0	7
Outcome focus			
Mental health	5	9	14
Physical health	2	0	2
Mental and physical health	9	5	14

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Appendix 1: Detailed description of studies in the review

Authors	Year	Country	Aims	Study design	Sampling	Outcome focus / measures/analysis*	Main findings*
REFUGEE CAMPS							
Akinyemi, Owoaje, Ige, Popoola	2012	Nigeria	To provide community-based comparative assessment data on the mental health status and its interaction with the quality of life and community quality of life of refugees compared to a non-refugee population living in the same area	Quantitative: Cross-sectional comparative survey	444 adult refugees and 527 non-refugees. Cluster sampling – residential blocks in unofficial refugee camp randomly selected, all respondents in each block interviewed	Mental health Health measured with MINI, WHOQOL-BREF and CQoL. Housing measured as whether housing had one room or two or more rooms (not accounting for household size). Main focus was on comparison of mental health and QOL between refuge and non-refugee West Africans. Housing only included as a control variable in logistic regression.	• Number of rooms in house was not significantly associated with mental health for refugees
Akinyemi, Owoaje & Cadmus	2016	Nigeria	To provide explorative data on the mental health and quality of life of West African refugees living in Nigeria	Qualitative: focus groups	32 adult refugees participating in 4 focus groups, purposively sampled by refugee status, gender and age – overall population pool not described	Mental health Discussions considered factors affecting mental health and quality of life. Thematic framework analysis using NVivo.	• The physical environment including housing emerged in discussions as an element of life affecting mental health and quality of life

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Authors	Year	Country	Aims	Study design	Sampling	Outcome focus / measures/analysis*	Main findings*
Al-Khatib & Tabakhna	2006	Palestine	To investigate housing conditions and their impact on health, in particular respiratory symptoms and diseases	Quantitative: cross-sectional survey	Data on adult and child refugees in 200 households in a refugee camp. Random household selection, then household 'head' or other interviewed (non-random) households, 1259 individuals	Physical health (self-reported respiratory symptoms and illnesses). Self-reported household crowding, dampness, leakage, mould and ventilation, and presence of smokers in household Chi square test of significance between household and health variables.	• Number of household members associated with common cold (p=.001) and cough (p=.001) but not tonsillitis or ear infection. • Maximum number of persons using 1 bedroom associated with common cold (p=<.000), cough (p=<.000), tonsillitis (p=<.000) and ear infection (p=<.000) • Presence of damp associated with common cold (p=<.000), cough (p=<.000), tonsillitis (p=<.000), ear infection (p=.006) • Presence of leakage associated with common cold (p=<.000), cough (p=<.000), tonsillitis (p=<.013), ear infection (p=.001) • Presence of mould associated with common cold (p=<.000), cough (p=<.000), tonsillitis (p=<.000) and ear infection (p=<.000) • Lack of ventilation associated with common cold (p=<.000), cough (p=<.000), tonsillitis (p=<.000) but not ear infection. • Overcrowding and housing conditions not associated with influenza or asthma. • Only 2% felt housing conditions

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Authors	Year	Country	Aims	Study design	Sampling	Outcome focus / measures/analysis*	Main findings*
							caused the respiratory symptoms and diseases.
Al-Khatib, Arafat & Musmar	2005	Palestine	To investigate women's perception of the effect of housing environment on their health and wellbeing and the relationship between housing and women's physical, mental health and wellbeing	Quantitative: cross sectional survey	150 adult female refugees. Sampling described as 'systematic' but specific method not specified	Mental health and physical health Health measured as stress and self-report back and neck, chronic disease and teeth problems. Housing measured as perception of housing as healthy or unhealthy. Univariate chi square test.	• 33% reported housing as 'unhealthy' • 97% agreed that housing conditions affected health and wellbeing • 77% linked humidity and ventilation issues to physical health outcomes. • 97% reported link between humidity and health • Higher rates of several self-reported physical health conditions for married women in housing perceived as unhealthy • 97% thought crowding increases the spread of disease and 19.7% thought it led to a lack of privacy.
Al-Madi et al 2003	2003	Lebanon	To describe current living conditions in Palestinian refugee camps and gatherings.	Quantitative: cross sectional survey	Random households selected then head of household, all ever married women and a randomly selected individual 15+year some individuals randomly selected.	Mental and physical health Health measured through Hopkins Symptom Checklist, self-report general health, checklist of chronic physical or psychological illness and whether due to war-related event, self-report functional impairment.	• For women, 41% in a home with very poor indoor environment reported psychological distress of 5+ symptoms, compared to 17% with very good environment. For men, the contrast was 34% and 19% respectively. • More than twice as many people living in very poor indoor conditions

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Authors	Year	Country	Aims	Study design	Sampling	Outcome focus / measures/analysis*	Main findings*
					Sample included 4042 women, 4894 youth, 2306 children and 3687 randomly selected individuals.	Housing indoor environment measured by 4-point scale of humidity and damp cold and difficult to heat; uncomfortably hot in summer; poorly ventilated. Frequencies reported, no significance testing.	as those in very good indoor conditions reported general health to be poor or very poor. • Household crowding inversely associated with general health and psychological distress.
Carta, Oumar, Moro, Moro, Preti, Mereu & Bhugra	2013	Burkina Faso	To explore risk of trauma and stressor-related disorders and associated burden of psychological distress	Quantitative: cross-sectional survey	408 refugees aged 16+ years, randomly sampled from refugee camp register.	Mental health Health measured with Short Screening Scale for DSM-IV PTSD and K6. Housing problem measured as ‘current poor housing’ and as an indicator of trauma. Examined housing problems as a potential contributor to PTSD using multivariate logistic regression.	• Current ‘poor housing’ was positively associated with PTSD (OR=3.88; CI=1.29-11.62) but not K6.
Feyera, Mihretie Bedaso, Gedle & Kumera	2015	Ethiopia	To identify the prevalence and determinants of depression among refugees	Quantitative: cross-sectional survey	847 adult refugees from Somalia. Multistage probability sampling.	Mental health Health measured by Patient Health Questionnaire-9. Housing measured as a self-	• Lack of housing or shelter was significantly associated with depression (OR=1.5; 95% CI=1.05, 2.07)

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Authors	Year	Country	Aims	Study design	Sampling	Outcome focus / measures/analysis*	Main findings*
						reported lack of housing as an example of a traumatic event. Bivariate and multivariate logistic regression.	
Habib, Basma, Yeretzian	2006	Lebanon	To examine the association between the domestic built environment and the presence of illness among household members	Quantitative cross-sectional survey	Data on refugee residents of 860 households in a refugee camp. Two-stage probability sampling stated but no details given.	Mental and physical health Health measured with reported illnesses using the WHO-ICD 10 Classification (and if at least one household member reported at least one illness). Housing conditions measured by the Housing Conditions index (including presence of vermin, ventilation, humidity and heating). Also included an Infrastructure and Service index (eg. drinking water, sewage, rubbish disposal) and Household Crowding index (ratio of number of people in household to number of rooms excluding kitchens, bathrooms, unclosed balconies and garages)	• Households with 5-7 housing condition problems were more likely to report an illness (OR=1.53, 95% CI=1.02, 2.29) compared to those with 4 or less, as were those with 8-15 problems (OR=2.08, 95% CI=1.40, 3.11). • Specific housing conditions such as heating, humidity, ventilation and pest infestation were not associated with specific illnesses such as circulatory and/or respiratory illnesses. • Infrastructure and Services index and Household Crowding index were not associated with illness.

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Authors	Year	Country	Aims	Study design	Sampling	Outcome focus / measures/analysis*	Main findings*
						Explicitly considered links between housing and health using chi square tests and logistic regression.	
Habib, Hojeij, Elzein, Chaaban, Seyfert	2014	Lebanon	To examine the relationship between socioeconomic deprivation and multi-morbidity among Palestinian refugees	Quantitative: cross-sectional survey	2501 adult refugees in 12 refugee camps and 20 informal 'gatherings'. Multistage cluster sample	Mental and physical health Multiple-morbidity was measured by 0, 1, 2 or 3+ poor health outcomes (including mental health problems using mental health inventory, chronic and acute illness and disability). Housing as an element of socioeconomic deprivation (measured by crowding and whether there was water leakage in the home). Main focus was on socioeconomic deprivation and multi-morbidity using multinominal logistic regression	• Homes with crowding were more likely to report two poor health outcomes (OR=1.21, CI=1.04, 1.41) and three poor health outcomes (OR=1.27, CI=1.02-1.57) than those with no crowding. • Those living in households with water leakage were nearly twice as likely to have three or more health problems (OR=1.88, CI=1.45, 2.44) than those without leakage.
Khawaja & Tiltnes, 2002	2002	Jordan	To examine the living conditions of camp refugees in Jordan	Quantitative: cross-sectional Household	2509 households. Adults [and children if include 15-17 year old ever married girls].	Mental and physical health Health measured with HSCL-25, self-reported general health, self-report chronic	• For women poor indoor environment linked to mental distress – 54% in poor home had 4 or more distress symptoms compared to 32% with a good

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Authors	Year	Country	Aims	Study design	Sampling	Outcome focus / measures/analysis*	Main findings*
				survey, individual survey (one randomly selected adult from each household) and all ever-married women aged 15 and over) 13 focus groups in two camps but no data reported about link with health	Stratified probability sample.	illness, self-report physical impairment. Housing measured as a composite measure of physical construction, crowding, basic infrastructure amenities Indoor environment indicator – humid and damp, cold and difficult to heat, hot in summer, poorly ventilated. Frequencies reported, no statistical testing noted.	indoor environment. For men association is reported as 'weak' • No association between crowding and mental health.
Zabaneh, Watt & O'Donnell	2008	Lebanon	To determine living conditions and self-reported health of Palestinian refugee families with particular reference to housing conditions on the health of children and chronic disease	Quantitative: cross sectional survey	97 households, data on 437 adult and child refugee residents in an unofficial refugee camp. Stratified random sample	Physical health Health measured by self-report of a number of physical health issues. Housing (size of rooms and presence of windows, mould and dampness, crowding, external ventilation, presence of heating, access to water and kitchen and toilet facilities).	• Individuals with a chronic disease were less likely to live in crowded housing when using the LIPRII definition (OR=0.61, CI=0.40, 0.92) but not using the WHO definition (0.67, CI=0.41, 1.10). • Other housing characteristics were not associated with chronic disease.

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Authors	Year	Country	Aims	Study design	Sampling	Outcome focus / measures/analysis*	Main findings*
						Link between housing and health explicitly assessed with chi square, Mann-Whitney and Kurskall-Wallis univariate tests.	
RESETTLEMENT COUNTRIES							
Carter, Poleyvchok and Osborne	2009	Canada	To examine the changing housing experience of recently arrived refugees over a three-year period	Quantitative: Longitudinal mixed method – with quantitative focus	275 adult refugees in 75 households initially recruited through snowball sampling, followed up twice	Mental and physical health Survey questions on housing experiences including tenure, cost, size, mobility and satisfaction as well as trajectory over time. No health measure, but self-reported impact of housing on health problems. Descriptive survey, items not included in paper.	• 29% indicated that housing “contributed to health problems” in year one, dropping to 10% in year three.
Deveci	2012	UK	To consider how practitioners can meet the needs of separated children	Qualitative: Case Studies	Convenience sample of 4 child refugees – clients of practitioner	Mental health Experiences of children who have been separated from their parents	• Briefly outlines problems with share housing for children separated from their parents, particularly in relation to stress.

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Authors	Year	Country	Aims	Study design	Sampling	Outcome focus / measures/analysis*	Main findings*
						Analysis not described.	
Fennelly	2006	US	To better understand the needs of immigrants and refugees and how they are affected by poverty and post-immigration stressors	Qualitative: Interviews	62 service providers – convenience sample	Mental health and physical health Interview questions designed to understand needs for refugees, and how poverty impacts health Analysis using NUD*IST. Specific method not described.	• Housing identified as primary need for clients. • Overcrowding and living with acquaintances were linked to poor diet and the spread of infectious disease; unstable housing was linked to anxiety due to feelings of lack of safety. • Housing was perceived to affect other areas of integration, including education and access to social services.
Fozdar	2009	Australia	To explore refugee perceptions of settlement concerns and their relation to mental-health issues	Qualitative: Mixed methods with qualitative (interview) focus	"Over 100" adult refugees (survey) 50 adult refugees (interviews), snowball sampling	Mental health Interview questions exploring understandings of mental health, broad settlement experiences and links to mental health Inductive thematic analysis.	• Practical settlement difficulties (including housing) linked to depression • Discrimination in housing linked to negative mental health outcomes
Fozdar and Hartley	2014	US	To explore housing experiences of recent arrivals, and how they perceive their housing experiences	Qualitative: Photovoice and interviews	76 adult refugees, sampling not described 3 service provider focus groups –	Mental and physical health Interviews explored how refugees perceive housing experiences	• Poor housing conditions negatively linked to mental and physical health

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Authors	Year	Country	Aims	Study design	Sampling	Outcome focus / measures/analysis*	Main findings*
					precise number of participants not identified.	Semiotic analysis of images. Analysis using NVivo for interviews and focus groups. Specific method not described.	
Hashimoto-Govindasamy and Rose	2011	Australia	To explore Sudanese refugee women's perceptions of the [broad resettlement] program and ongoing resettlement needs for future service development.	Qualitative: Interviews	Convenience sample of 12 Refugees adult clients of in program	Mental health Interviews explored post-migration socio-cultural factors and their impact on mental health Inductive framework analysis.	• Housing was identified as an important post-settlement factor, which affects mental health, with discrimination in housing identified as a key stressor.
Loehr	2016	Australia	To explore what refugees are seeking in the rental market; how systemic, market and cultural demands compete with refugees' housing goals, and; opportunities and challenges for adaptation and partnerships for improving outcomes	Qualitative: Interviews	22 adult humanitarian migrants; 22 community leaders and service providers; 11 real estate agents; 10 lessors Purposive and snowball sampling	Mental health (stressors) Interview questions focussed on: 1) Inclusion, exclusion and equity in the private rental sector, 2) Cross-sector integration in private rental housing provision, and 3) The provision of private rental housing to large families and households. Interpretive phenomenological analysis	• Housing effects on physical and mental health through a range of issues, including overcrowding, mobility and discrimination. • Crowded living conditions negatively affected health for some family members, especially the elderly. • Residential mobility led to stress (related to terms of tenancies provided to refugees upon arrival in Australia) • Large families more at risk of housing discrimination in the housing market, which impacts on health and wellbeing

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Authors	Year	Country	Aims	Study design	Sampling	Outcome focus / measures/analysis*	Main findings*
Miller, Worthington, Muzarovic, Tipping & Goldman	2002	US	To examine the stressors associated with the experience of exile among a sample of Bosnian refugees living in Chicago	Qualitative: Interviews	Convenience sample of 28 refugee adults clients in program	Mental health (stressors) Health was measured with Refugee Distress and Coping Interview (RDCI) and other open-ended questions not specified. Housing an emergent theme. Narrative analysis	• Housing was the most common stressor identified. Issues were mostly to do with cost/poverty leading to overcrowding and feeling inadequate as a parent
Muennig, Boulmier-Darde, Khouzam, Zhu & Hancock	2014	Thailand	To understand the health needs of refugee populations in Karen State and to identify strategies to identify and target at-risk populations with health and education interventions.	Quantitative cross sectional	Secondary analysis of data from 122 refugees (66 children and 56 parents). Convenience sample from two preschools	Mental and physical health Health measured through Quality of life EuroQuol (EQ5D-5L) and Ages and Stages Questionnaire. Housing variable was number of people per room. Housing included in logistic regression.	• Significant and weak relationships between ratio of people/room with dentition [OR=1.08, 95% CI: 1.01,1.67] and social skills [12 points; 95% CI: 1,23] among children but not quality of life, or other developmental measures of communication, gross and fine motor skills and problem solving
Palmer	2006	UK	To explore understanding and perceptions of mental health & stressors related to mental health for Somali refugees	Mixed methods. Quantitative data is only used for context, classified as qualitative:	Convenience sample of 7 adult Somali refugees recruited through a refugee centre	Mental health Interviews focussed on understanding and perceptions of mental health and stressors related to mental health	• Majority of participants were living in insecure housing. • Housing affected mental health. In particular, mobility and lack of secure housing led to stress and anxiety.

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Authors	**Year**	**Country**	**Aims**	**Study design**	**Sampling**	**Outcome focus / measures/analysis***	**Main findings***
				Interviews		Framework analysis.	
Palmer & Ward	2007	UK	To explore understandings and perceived source of mental health issues – e.g., social difficulties, and to redress "imbalance" in literature by presenting perspective of refugees.	Qualitative: interviews	Convenience sample of 21 refuge adults – through refugee centre in London	Mental health Interviews considered participants'' understandings of mental health Framework analysis.	• Housing identified as main social issue influencing mental health. • Other issues include immigration stressors, employment, referrals, access and waiting time.
Papadopoulos, Lees, Lay and Gebrehiwot	2004	UK	To explore the migration history of Ethiopian refugees and asylum seekers, their experiences adapting to UK culture, their beliefs and practices in relation to health and their perceptions and experiences of the UK health and social care system.	Qualitative: interviews	106 refugee adults recruited through snowballs sampling	Mental and physical health Interviews explored understandings of health, help seeking, and general resettlement experiences. Analysis briefly described but no specific method used.	• The majority of the participants lived in public/social housing and in houses with one room only. Most not satisfied. Lack of privacy, issues with sharing kitchen etc., lack of safety and women especially afraid. • Housing problems identified as cause of ill health
Shedlin	2014	Ecuador	To gather descriptive data on the characteristics of recent refugees moving from Colombia into Ecuador and how the conflict, displacement and a new environment affected	Qualitative: interviews	96 adult refugees and 33 service providers. Recruited through snowballs	Mental and physical health Interviews covered factors impacting health and wellbeing for Colombian refugees in Ecuador Analysis briefly described	• Highlights discrimination and insecurity in housing & their negative impact on mental health

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Authors	Year	Country	Aims	Study design	Sampling	Outcome focus / measures/analysis*	Main findings*
			their health vulnerabilities and risk behaviors.			but no specific method used.	
Song, Kaplan, Toi, Subica, de Jong	2014	US	To examine exposure to pre-migration torture and determine which pre-and-post migration variables most strongly associated with psychological distress and global functioning.	Quantitative: Cross-sectional survey	Convenience sample of 278 adult refugees recruited through a primary health care clinic	Mental and physical health Health measured with Posttraumatic Stress Disorder Scale, Hopkins symptom checklist, and Global assessment of functioning. Housing reported as 'stable' or 'unstable' Housing included as a post-migration risk factor in logistic regression.	• Severely impaired global functioning was significantly associated with unstable housing (OR=2.21, CI=1.08-4.53) and but not PTSD, depression or anxiety
Sonne, Carlsson, Bech, Vindbjerg, Lykeke Mortensen & Elkilt	2016	Denmark	To examine psychosocial potential predictors of treatment outcomes in a population of trauma-affected refugees	Quantitative: Survey at two time points.	195 adult refugees enrolled in a mental health treatment program	Mental health Health measured with the Harvard Trauma Questionnaire, Hopkins Symptom Check List-25, and Hamilton Depression and Anxiety Scales. Housing measured by 5 point likert rating scale – points not specified. Housing included in multiple	• Housing rating was not significantly associated with pre-to-post changes in HTQ, HSCL-25, HAM-D and HAM-A scores

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Authors	Year	Country	Aims	Study design	Sampling	Outcome focus / measures/analysis*	Main findings*
						regression with health measures.	
Warfa	2006	UK	To explore from Somali perspectives the meaning of geographical mobility, how much of an issue geographical mobility was, and how this may relate to mental health status and health service use	Qualitative: focus groups	34 adult refugees purposively sampled from professional networks and local communities.	Mental health Focus groups explored the relationship between residential mobility and mental health Framework analysis.	• High levels of residential mobility were linked to negative mental health outcomes (stress, distress, worry and anxiety)
Whitsett & Sherman	2017	USA	To examine whether resettlement variables predict outcomes of mental health a naturalistic mental health intervention for a sample of asylum-seeking torture survivors	Quantitative: Interview/survey at two time points	105 refugee survivors of torture attending a mental health clinic	Mental health Health measured with Harvard Trauma Questionnaire & Hopkins Symptom Checklist), at initial and subsequent assessment/s. Housing identified as stable and uncrowded vs not. Housing included in a multiple regression model.	• Stable, uncrowded housing negatively associated with final depression scores (β=-.217) • Stable, uncrowded housing associated with final anxiety scores (β=-.199) • Stable, uncrowded housing associated with final trauma symptoms (β=-.234)
Ziersch, Due & Walsh	2017	Australia	To investigate the link between housing and self-reported health and wellbeing for refugees	Qualitative: Interviews	50 adult refugees and asylum seekers purposively	Mental and physical health Interviews explored the relationship between	• The extent to which housing was secure, appropriate and affordable was linked to mental and physical health outcomes

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Authors	Year	Country	Aims	Study design	Sampling	Outcome focus / measures/analysis*	Main findings*
			and asylum seekers		sampled from a broader survey of refugees and asylum seekers	multiple aspects of housing and mental and physical health and wellbeing. Thematic analysis using NVivo	• Asylum seekers in particular reported greater housing difficulties and acute impacts on mental health specifically
Ziersch, Due, Walsh & Arthurson	2017	Australia	To investigate the link between housing and health and wellbeing for refugees and asylum seekers.	Mixed method: Cross sectional survey Interviews and photo-voice Quantitative focused here (Ziersch, Due & Walsh reports in more detail on qualitative).	423 adult refugees and asylum seekers recruited through community organisations, community networks and snowball sampling Interviews with asylum seekers and refugees (N=50 in-depth, N=11 Photovoice) and service providers (N=15)	Mental and physical health In the survey health was measured with the SF-8 self-report health measure. Housing was examined with a range of questions but in relation to health was measured as the extent to which people were satisfied with their current house and the extent to which people felt housing affected their health Interview schedule included questions about housing issues and impacts on health and wellbeing Analysis used frequencies and t-tests.	• Over 80% of participants felt that housing had an impact on their health and wellbeing to some extent • Housing satisfaction was associated with physical ($p=.034$) and mental health ($p=.003$) summary scores • Service providers highlighted housing as a key settlement issue that impacted on health and wellbeing • Participants took photos of elements of housing that affected their health and wellbeing including housing condition, crowding and access to outside spaces

* in relation to the associations between housing and health

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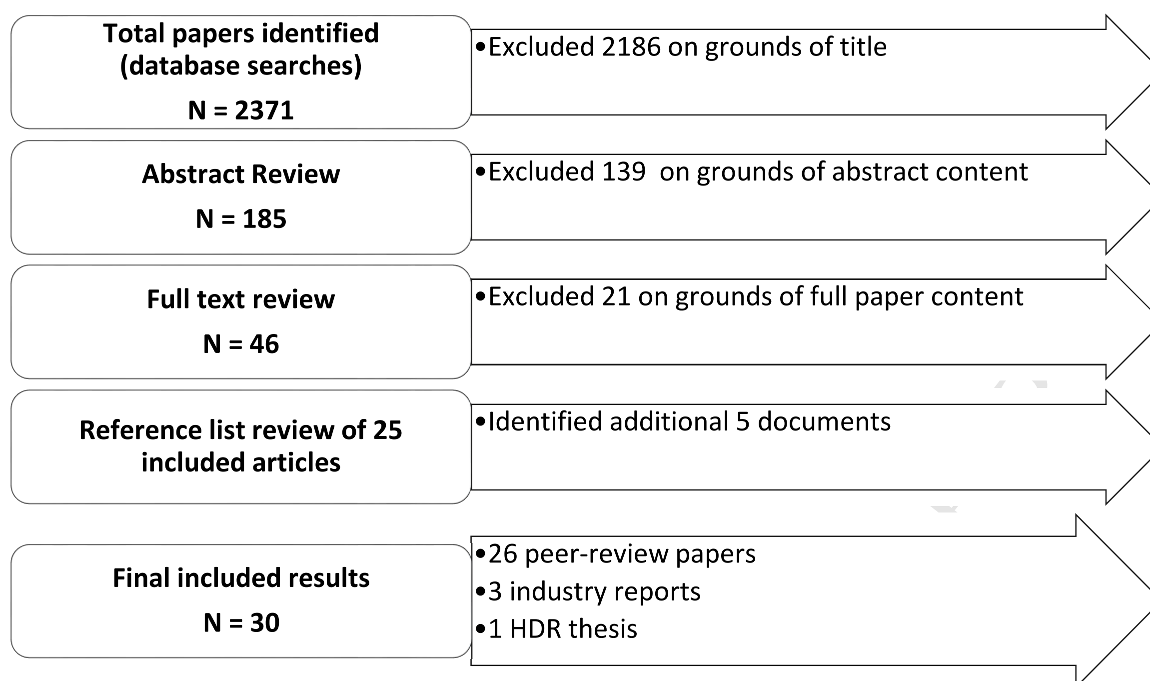

Figure 1: Flow chart of paper selection

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Research highlights:

- Synthesis of studies on housing and health link for refugees and asylum seekers
- Limited research in either refugee camps or resettlement countries
- Evidence of the health impacts of housing problems, particularly in refugee camps
- Methodological limitations identified in the evidence base
- A range of potential public health interventions, but requires specific evaluation

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