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Interventions aimed at reducing poverty for primary prevention of mental illness: A scoping review

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“Poverty is not an accident. Like slavery and apartheid, it is man-made and can be removed by the actions of human beings.”

— Nelson Mandela, Former President of South Africa

1. Introduction

According to the World Bank, 767 million people (or 10.7% of the world's population) are living below the international poverty line of \$1.90 per person per day (The World Bank Group, 2016). However, the impact of poverty on the health and well-being of individuals, families and communities is not limited to these extreme cases. Research has shown that both absolute and relative deprivation matter when it comes to health outcomes (Marmot, 2005). Even in high income countries like the United States, nearly 1 in 4 children grow up in poverty (Semega, Fontenot, & Kollar, 2017). The large disparities in socio-economic status present in the United States and other developed nations result in reduced opportunity for social participation and profoundly affect individuals' ability to lead healthy lives (OECD, 2018).

The World Health Organization (WHO) notes that disadvantage due to poverty often begins in the prenatal period and accumulates across the lifespan (World Health Organization, 2014). As depicted in the WHO's framework for tackling inequities (Fig. 1), many factors can compound inequities in physical and mental health, including unfavorable social, economic and environmental circumstances, inter-related with gender and culture. In the research community, there is widespread recognition that the social determinants of mental health (what Marmot terms the “causes of the causes”) lie in macro-level or population-level contextual factors, such as the inequitable way in which resources are distributed, influencing the circumstances in which

individuals live and grow (Marmot, 2005). However, most initiatives aiming to promote mental health act at the level of the individual, with far fewer policies and interventions taking those important contextual factors into account (Enns et al., 2016). Even among interventions that adopt a population-based approach to improving mental health, the focus is rarely on directly addressing the underlying issues (such as poverty), but rather on alleviating the sequelae or symptoms of that issue (such as teaching individuals living in poverty how to cope with daily stresses) (Van Ryzin, Fishbein, & Biglan, 2018). While helping individuals learn to respond more adaptively to their circumstances is a laudable goal, these endeavors are often woefully inadequate in the absence of meaningful efforts to improve the material circumstances in which they live.

Mental illness is costly to both individuals and societies (Whiteford et al., 2013). While some efforts to apply a population-based approach to prevention of mental illness show promise (Van Ryzin et al., 2018), there is a paucity of research examining whether policies, programs or interventions designed to directly alleviate poverty can reduce the incidence or prevalence of mental disorders. A higher-level public health approach using population-based strategies that focus on modifiable risk factors (i.e., an approach supporting the primary prevention of mental illness) is desperately needed to improve the well-being of disadvantaged populations and inform the development of future initiatives.

In recent years, several key position papers, including the WHO's comprehensive Mental Health Action Plan for 2013–2020 (World Health Organization, 2013) and the WHO's report on the Social Determinants of Mental Health (World Health Organization, 2014) have called for an increased focus on prevention and greater attention to the social and economic context that influences mental health. This

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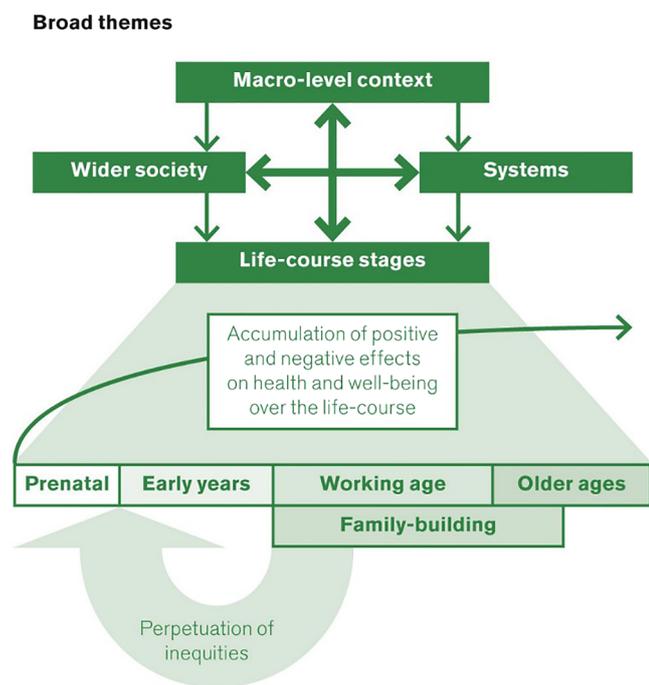


Fig. 1. A life course approach to tackling inequalities in health. Used with permission from the World Health Organization (World Health Organization, 2014).

call builds on previous work, including the WHO's Commission of Social Determinants of Health (World Health Organization, 2008), the Marmot Review in England (Marmot, 2010), and pioneering WHO reports on mental health promotion and prevention of mental disorders in 2004 (World Health Organization, 2004a, 2004b), which emphasizes the close relationship between the social gradient of economic circumstance and mental health (Allen, Balfour, Bell, & Marmot, 2014). A number of plausible mechanisms for this relationship have been proposed, including poverty's impact on family relationships (Evans & Kim, 2013), the toxic effects of stress on the brain (Blair & Raver, 2016), adverse social environments (Evans, 2004), and increased exposure to physical stressors, like noise and poor quality housing (Coley, Lynch, & Kull, 2015; Jones-Rounds, Evans, & Braubach, 2014; Liddell & Guiney, 2015).

Public interest in the issue of economic inequality has been growing, and was arguably accelerated following the sub-prime loan crisis in the United States in 2007, and subsequent bank failures and global recession in 2009 (Roubini, 2009). Mass protests like the Occupy Wall Street movement in the United States (Gautney, 2011) and the *Mouvement des gilets jaunes* in France (Goodman, 2019) have placed increasing pressure on governments to respond to the needs of "the 99%", while economic populism has fueled similar movements across the political spectrum. In some cases, the link between economic disadvantage and mental health has been highlighted in the media (for example, there was widespread

Table 1
Inclusion and exclusion criteria for the scoping review.

Inclusion criteria	Exclusion criteria
<ul style="list-style-type: none"> Articles written in English language published between 2014 and 2018 (i.e., after publication of the WHO report in 2013) Primary research studies or review articles describing specific outcomes Interventions focusing on reducing poverty as a means to promote mental health or prevent mental illness in the general population Peer-reviewed 	<ul style="list-style-type: none"> Studies of interventions aimed at individuals already diagnosed with a mental illness Studies taking place in low- or middle-income countries Interventions seeking to promote mental health through means other than poverty reduction (e.g., through physical activity or other types of therapies) Interventions that did not describe one of their aims as promoting mental health or preventing mental illness Books and book chapters, book reviews, theses and dissertations, opinion papers, commentaries and narrative reviews

attention on rising suicide rates and addiction among poor white men in the United States) (C.K., 2018). However, it is not clear whether researchers and policy-makers have conceptualized interventions aimed at improving the material life circumstances of those living in poverty as mental health interventions.

Thus, the objective of this scoping review was to examine whether the academic literature reflects the influence of these calls to action in the domain of mental health, as evidenced by *research examining whether interventions working to alleviate poverty bring about changes in mental health*. While we acknowledge that each of the social determinants of health can profoundly impact mental well-being and that these determinants are inextricably interwoven, we focused our review on the issue of *poverty as a primary determinant of mental health*.

2. Methods

Scoping reviews are useful for examining a topic in which the authors wish to systematically map and describe the literature to identify key concepts, themes or research gaps. Unlike systematic reviews or meta-analyses, scoping reviews maintain broad parameters for the kinds and quality of studies that are included (Arksey & O'Malley, 2005). Nonetheless, scoping review methodology is rigorous and appropriate for examining the extent, range and nature of research activity in a particular field, while encompassing both empirical and conceptual research. In our scoping review, we followed a protocol designed for conducting scoping studies of literature reviews (Schultz et al., 2018), adapting and broadening this approach to scope both the primary and the review literature.

2.1. Research question

Our research question was shaped through discussion among members of an interdisciplinary team engaged in primary prevention research: "What peer-reviewed literature is available over the last five years that describes interventions aimed at reducing poverty to promote mental health or prevent mental illness in the general population of high-income countries?" We defined the 'general population' as individuals who had not been included in an intervention on the basis of diagnosed mental health problems or other chronic illnesses.

2.2. Relevant studies

We conducted a search of the following electronic databases: Scopus, PubMed, PsycINFO, and the Cochrane Library. Led by a health sciences librarian and content experts on our research team, we developed a search strategy using concepts and keywords to describe mental health and poverty/low income interventions. An example of our search strategy is presented in Appendix 1, and the inclusion and exclusion criteria for our search are listed in Table 1. We focused on high-income countries in this review by excluding research articles examining interventions in low- and middle-income countries (LMIC); in preliminary searches, we found that mental health is very rarely

measured as an outcome in studies from LMIC since interventions tend to focus on immediate life-sustaining needs of populations living in extreme poverty, such as adequate food supply. Our search results were imported into EndNote reference management software, and duplicates were removed.

2.3. Study selection

We used a two-stage study screening process. In Stage 1, a single reviewer screened the titles and abstracts of the results, applying the pre-defined inclusion and exclusion criteria. Articles that were clearly ineligible were removed at this stage. In Stage 2, the titles and abstracts of all articles with the potential for meeting the inclusion criteria were distributed to two independent reviewers. Where insufficient information was available in the title/abstract to assess eligibility for inclusion, we viewed the full text of the articles. Any discrepancies in our decision-making were resolved through discussion with the larger team.

2.4. Charting the data

We developed a data extraction tool based on Arksey and O'Malley's seminal paper on scoping review methodology (Arksey & O'Malley, 2005) and a previous scoping review on mental health promotion interventions (Enns et al., 2016). Using this tool, we extracted the aim of each study, a description of intervention(s) studied, the target population, the intervention setting, and the mental health outcomes measured. We synthesized our findings, noting in particular where there were commonalities and differences in intervention approaches.

3. Results

Our search yielded a total of 4198 articles (PRISMA flowchart in Fig. 2). After removing 765 duplicates, title and abstract screening eliminated another 3393 articles, leaving 40 articles for full-text screening. As we became more familiar with the poverty literature, three prominent themes emerged among articles we selected for further screening: multi-level (i.e., individual-, community-, and institutional-level) interventions acting directly to alleviate poverty; safety net programs, including welfare or social security programs; and housing interventions, which sought to improve housing conditions for homeless populations or families living in low-income areas. As emphasized by Arksey & O'Malley in their scoping study framework (Arksey & O'Malley, 2005) and by Daudt et al. in their follow-up methodological paper (Daudt, van Mossel, & Scott, 2013), consultation among an inter-professional group of authors can enhance the results of scoping studies. Given that we hadn't originally set out to examine housing strategies or welfare programs, but that they were clearly being discussed in relation to the concept of poverty's effect on mental health, our team agreed that we would develop and implement a second targeted literature search strategy to ensure we had satisfactorily captured the literature on these two themes (Appendix 1). The second search yielded an additional 146 articles. We then conducted full-text screening of the 40 articles from the initial search and 20 of the 146 articles from the second search that passed abstract/title screening (60 articles total were screened in Stage 2). Among these, a total of 10 articles met the inclusion criteria for the scoping review (Figure 2). A summary of the article findings is presented in Table 2.

3.1. Multi-level poverty interventions

We identified two articles describing multi-level interventions. Wahlbeck et al. reviewed studies aiming to mitigate the effects of poverty on mental health (Wahlbeck, Cresswell-Smith, Haaramo, & Parkkonen, 2017), while Yoshikawa et al. examined the mechanisms by which poverty impacts mental, emotional and behavioral health in

order to better inform the design of prevention strategies for people living in poverty (Yoshikawa, Aber, & Beardslee, 2012). Both reviews recognize poverty as a central but complex social determinant of mental health heavily correlated with other risk factors, and discuss how poverty impacts mental health at multiple levels of society to bring about negative outcomes. They highlight how poverty may influence individual factors, such as the quality of a child's nutritional intake; may act at the community level, where it may affect social connectedness and relationships among family members and peers; and it may play a role at the institutional level, including by influencing the availability of quality child care and education, parental work opportunities and neighborhood safety factors. They conclude that multi-level strategies supporting mental health in different contexts (not only in the health-care system) are needed to mitigate the harmful effects of poverty.

Wahlbeck et al. (2017) describe a five-level framework of interventions striving to address poverty-related health inequities, including (i) interventions for specific age groups across the life course; (ii) household and workplace interventions; (iii) community- or neighborhood-level interventions; (iv) interventions ensuring access to health and social services, childcare and education; and (v) social policies and governance structures. This framework is based on evidence from a UNICEF study describing how social, economic and environmental conditions shape inequities in children's outcomes (Bell, Donkin, & Marmot, 2013). Wahlbeck et al. (2017) emphasize the importance of understanding the underlying causes of poor health and social outcomes across multiple sectors – improving people's living conditions, including their mental health, requires that these social and structural determinants be addressed. Yoshikawa et al. (2012) highlight government policies and programs that aim to reduce poverty by the most direct means possible, including cash transfers, income supplements and in-kind supports, provision of which are often contingent on certain behaviors. Both reviews cite extensive literature documenting minimal to moderate impacts of these multi-level interventions in reducing poverty, but in most cases, the effects on mental health are described broadly, lacking details on the effect size or the specific outcomes measured.

3.2. Safety net programs

Two of the articles we identified were literature reviews examining the effect of safety net programs (i.e., programs providing people living in poverty with income or in-kind material support) on mental health. Poverty and its sequelae, including food insecurity, unstable or inadequate housing, and a lack of social and emotional resources, were recognized as contributing to poor mental health outcomes in both articles. Snowden (2014) reviewed broad and historical social policies and protection programs that aimed to prevent mental health disorders (Snowden, 2014), focusing on African American populations in the United States. He posits that policies providing cash payments to individuals and families living in poverty are a realistic option for government-level action against poverty, and demonstrates that these payments have the potential to increase the upward economic mobility of low-income populations and decrease symptoms of depression and anxiety. Gibson et al. (2017) reviewed a specific type of intervention called welfare-to-work programs, which provide the means for welfare recipients to improve their employability through training and work placements, with the ultimate aim of increasing participants' employment and income (Gibson et al., 2017). They found that welfare-to-work programs were only minimally successful in changing employment and poverty, and the effects on mental health (e.g., self-reported parental and child depression) were negligible.

3.3. Housing interventions

Our review found that housing interventions are increasingly being used to provide greater residential stability for homeless or high-

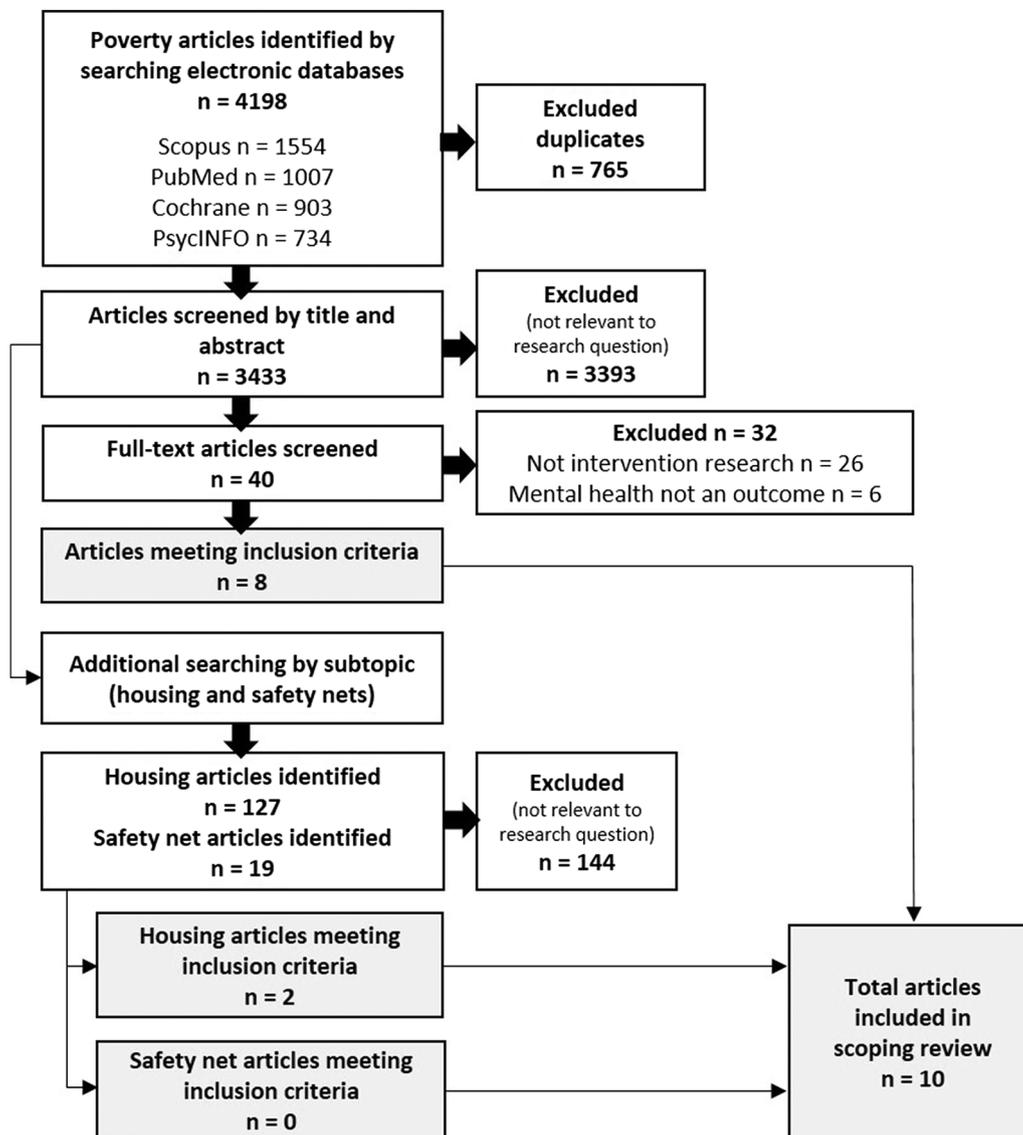


Fig. 2. PRISMA flow diagram describing the results of the literature searches and the articles included in the scoping review.

mobility populations as a way of improving their mental well-being and other health and social outcomes. Our search captured six diverse articles that describe housing strategies aimed at low-income populations. Bassuk et al. (2014) reviewed interventions that transitioned homeless families into stable residences (Bassuk, DeCandia, Tsertsvadze, & Richard, 2014), while Coren et al. (2016) reviewed programs supporting street-connected children and youth (Coren et al., 2016); both discussed how these interventions have the potential to improve symptoms of mental disorders like depression, and reduce externalizing behaviors and substance use. However, neither review drew a firm conclusion on the effectiveness of the strategies because the interventions and outcomes were highly variable across studies and the quality of reporting was generally assessed as low.

Another pair of comprehensive reviews (Liddell & Guiney, 2015; Thomson, Thomas, Sellstrom, & Petticrew, 2013) examined whether physical improvements to housing had any bearing on the mental health of the occupants; physical housing improvements included upgrades to heating systems and insulation, modernization of the structure of the home, and hazard reduction (e.g., electrical upgrades). Here too, methodologies across studies were heterogeneous and quantitative syntheses were not always feasible, but several of the studies used common measures of mental health and well-being such as the Short

Form-36 (SF-36) health survey (American Psychological Association, 2019), which includes a mental health domain, and the Hospital Anxiety and Depression Score (HADS) (Stern, 2014). The results suggest that improvements to housing were associated with better mental health survey scores, decreased absences from work or school due to illness, and stronger social relationships.

The last two studies we reviewed were controlled trials of housing mobility initiatives (Byck et al., 2015; Kessler et al., 2014). These are interventions in which families living in impoverished urban neighborhoods are relocated to higher-income areas in the same city. The prevalence of mental disorders among adolescents in these families was assessed before and after the move. Mental health disorders or symptoms were measured using the Diagnostic Interview Schedule for Children (a structured interview instrument) (Shaffer, Fisher, Lucas, Dulcan, & Schwab-Stone, 2000), the Child Behavior Checklist (a parent-administered questionnaire) (Achenbach & Rescorla, 2000), and/or the Composite International Diagnostic Interview (a psychiatric diagnostic evaluation) (Robins, Wing, & Wittchen, 1988). These studies found that the moves were associated with poorer mental health outcomes among adolescents, including elevated rates of depression and conduct disorder, particularly among boys, suggesting that many factors other than neighborhood income (including family dynamics, social networks, and

Table 2
Interventions aiming to promote mental health in the general population by reducing poverty.

Author	Type of article	Population and setting	Goal of the intervention (s)	Details of the intervention (s)	Mental health outcomes measured
Wahlbeck et al. (2017)	Review (articles from 1986–2016, although the majority were published 2010–2016)	Global population (no geographical restrictions), all ages, any setting	Mitigate the effects of poverty on mental health	<p>Identified five levels of interventions:</p> <ul style="list-style-type: none"> - Life course (from parenting programs to school programs to interventions for older adults) - Household and workplace (e.g., housing and job search supports, work placements) - Community (low barrier health programs, interventions tackling social and digital exclusion) - Services (access to health and social supports, financial counselling) - Policy (strategies for housing, healthcare, labor, youth, debt relief) 	Mental health promotion referred to quite broadly, not measured using specific scales or scores.
Yoshikawa et al. (2012)	Review (articles from 1989–2012)	Mainly focused in USA, all ages, any setting	Promote child mental health	<p>Identified different types of interventions that directly reduce poverty:</p> <ul style="list-style-type: none"> - Childhood allowances and tax credits - Conditional cash transfers and income supplements - Adult human capital interventions to increase parental education and employment - Natural experiments - Early childhood interventions - In-kind support policies 	Some studies measure externalizing behaviors or psychiatric disorders. Generally take a broad view of mental health promotion and do not use specific scales or scores.
Snowden (2014)	Review (articles from 2003–2014)	Mainly focused on African-American children and adults, any ages, any setting	Improve mental health through simple policy tools or broader social protections	<ul style="list-style-type: none"> - Reviewed three studies of unconditional or conditional cash transfers to low-income families. Broader social programs discussed included new job creation, the Home Owners Loan Corporation, the Food Stamp program, and social security programs. 	Symptoms of depression and anxiety, externalizing behaviors, and suicides.
Gibson et al. (2017)	Systematic review (articles from 1994–2011)	Lone parents (some specifically teen parents) and their children (any ages) living in USA, UK and Canada	Improve employment and income levels	<p>WtW interventions encourage participants to take up employment, increase their economic activity, or improve their employability through training or work placements. Participants may receive earnings supplements (top-ups), childcare or healthcare subsidies; they may also be subject to earning disregards or sanctions (cessation of benefits).</p> <p>Housing strategies include:</p> <ul style="list-style-type: none"> - Housing First - rapid rehousing - Section 8 Housing Choice vouchers (assistance with rental housing payments) - housing subsidies - emergency shelters - transitional housing - permanent supportive housing 	Measures of maternal and child mental health, e.g., symptoms of depression.
Bassuk et al. (2014)	Systematic review (articles from 2007–2013)	Families experiencing homelessness in USA	End family homelessness	<p>Housing strategies include:</p> <ul style="list-style-type: none"> - Housing First - rapid rehousing - Section 8 Housing Choice vouchers (assistance with rental housing payments) - housing subsidies - emergency shelters - transitional housing - permanent supportive housing 	Measures of parental mental health and trauma, substance use, and children's emotional state.
Coren et al. (2016)	Systematic review (articles from 1994–2015)	Children and youth (up to age 24) living and working on the streets, mainly in USA but one in North Korea	Promote self-esteem and mental health	<ul style="list-style-type: none"> - Therapy-based services, shelter and drop-in services, other therapeutic/health interventions 	Symptoms of depression, self-esteem, externalizing and internalizing behaviors, substance use, and psychiatric diagnoses.

(continued on next page)

Table 2 (continued)

Author	Type of article	Population and setting	Goal of the intervention (s)	Details of the intervention (s)	Mental health outcomes measured
Thomson et al. (2013)	Systematic review (published data from 1936–2011)	Global population (mainly UK and USA, but also some from Europe and Central + South America), any ages, any setting	Promote physical and mental health by improving the physical fabric of housing	Physical improvements to the fabric of housing may include hazard reduction, modernization, warmth improvements, rehousing or retrofitting, and rehousing from slums.	Mental component score from the SF-36, and GHQ (general health questionnaire) caseness. Measures of mood, emotionality, dissatisfaction, potency, and pessimism.
Liddell & Guiney (2014)	Review (articles from 2005–2013)	Adults and children (mainly in USA and UK), any ages, any setting	Promote physical and mental health by improving energy efficiency of housing	Physical improvements to heating systems and insulation in housing	Measures of depression, anxiety, vitality, social function, and happiness.
Kessler et al. (2014)	Randomized controlled trial	Children and adolescents living in large American cities	Improve mental health by moving to higher-income neighborhood	The Moving to Opportunity intervention is a housing mobility initiative wherein families living in low-income neighborhoods are relocated to higher-income neighborhoods	Mood/anxiety disorders, disruptive behavior disorders, and bipolar disorder.
Byck et al. (2015)	Controlled trial	Adolescents (age 13–18) living in a city in Alabama	Improve mental health by moving to higher-income neighborhood	A housing mobility initiative wherein families living in low-income neighborhoods are relocated to higher-income neighborhoods	Diagnostic Interview Schedule for Children, the CHLD Behavior Checklist and the Youth Self-Report, substance use and other risk-taking behaviors.

parental mental health) are likely important determinants of adolescent mental health. However, other work on the Moving to Opportunity intervention highlighted children's age as an important modifier of outcomes, demonstrating that in families with children aged 13 and under who moved to a higher income neighborhood, children's college attendance rates and their earnings as adults were significantly improved, whereas long-term outcomes for children who were over the age of 13 when their families moved were, if anything, significantly worse (likely due to disruption effects) (Chetty, Hendren, & Katz, 2016).

4. Discussion

In this scoping review, we searched the literature for interventions that aimed to prevent mental illness or improve mental health through poverty reduction strategies. Despite widespread recognition that having insufficient resources is a long-standing “cause of the causes” of mental health disorders, the existence of a robust body of literature detailing the strength of this relationship, theoretical models that identify mechanisms of action to explain the relationship, and the existence of a wide range of potential interventions to meaningfully alleviate poverty, fewer than 1% of the ~4000 articles captured in our initial search examined poverty reduction as a prevention strategy for mental illness. Of the articles that focused on poverty and mental health, only one-third discussed possible interventions. The WHO's 2013 Mental Health Action Plan called for strategies to prevent mental disorders; it seems that to date, the relatively small amount of scholarly attention paid to poverty, prevention and mental health has focused primarily on describing the problem, rather than identifying and testing solutions.

The intervention research captured in our scoping study demonstrated that the measurement of mental health outcomes (where reported) was variable across settings and studies, and there was little evidence that researchers in this area are moving towards consensus in how to evaluate the success of programs in which an important outcome is to improve mental health and/or prevent mental illness by reducing poverty. We argue that in addition to identifying well-validated and psychometrically sound measures that reflect both symptoms of mental illness and dimensions of mental wellness, including quality of life, the field needs to move towards rigorously and systematically assessing *function*. It is essential that we seek to understand to what extent and under what circumstances interventions that reduce poverty increase the ability of individuals to engage and participate meaningfully in various roles and activities. In this respect, we have found the Capability Approach, articulated by Amartya Sen (Sen, 1990, 1992) to be useful. Sen's framework acknowledges that “individuals differ in their capabilities to convert commodities (e.g., housing, income supplements, food vouchers) into valued functionings (e.g., having a safe home, feeling financially secure, being well-nourished)”. For example, as Clark (2006) points out, an individual with a physical impairment may require more resources (e.g., wheelchairs, ramps, lifts, etc.) to be able to independently mobilize than an individual without this impairment. Similarly, a family that lives in a neighborhood where average rental costs are \$1000 per month will require additional resources to efficiently convert a \$600 housing supplement into safe housing (Clark, 2006). Thus, measurement of the impact of population-level interventions needs to focus not only on the resource inputs (e.g., funds) and desired outcomes (e.g., safe housing), but on the many factors that may constrain the functioning sets and therefore the capabilities of individuals attempting to utilize those resources. A social determinants of mental health approach that considers the context in which individuals experiencing poverty live and work results in a higher likelihood that preventative actions and interventions achieve their goal.

The complex, interwoven nature of poverty, social determinants and mental health demanded an iterative and questioning scoping review

approach. It is clear from the studies we found that there are many distinct pathways through which poverty may impact mental health. Much of the research we identified was fragmented, narrowly focused (e.g., housing) or conceptualized poverty as a short-term and temporary state of affairs (e.g., safety net programs). However, we were encouraged by the emergence of a category of multi-level intervention studies. Sen's argument that "relative deprivation in the space of incomes can yield absolute deprivation in the space of capabilities" (Sen, 1992) demonstrates the need to focus on economic resources as a *necessary* but not a *sufficient* condition of full engagement and participation in society. Multi-level interventions, working directly at the individual, community and institutional levels to alleviate poverty, seemed to us to be the only way to adequately address the social determinants of mental health linked inextricably to it.

Several other research elements would help to advance this field of study: More prospective, collaborative research and greater expertise in modeling complex relationships would aid in further delineating or analyzing the interactions between the mechanisms. Appropriate and detailed indexing of studies looking at poverty and mental health would ensure that others make the important link between the two. We highlight a need for partnerships between researchers, policy makers and individuals, families and communities living in poverty to develop the theoretical models that will support the finding of effective prevention strategies that address the impact of poverty on mental illness. Transformative participatory action approaches may provide more community- and person-centered strategies that can then be rigorously tested. There is also an overwhelming imperative to invest in prevention research for mental health that examines interventions over an appropriate time-frame and does not expect programs to demonstrate their full value within the first few years of their implementation. Indeed, if the effects of poverty compound over the lifespan, we might not expect to see the full benefit of an intervention for 15–20 years after implementation, and so continued long-term evaluation will be important to provide evidence of effective mental health promotion strategies.

4.1. Strengths and limitations

Strengths of this scoping review include the use of an established and systematic methodology to tackle a complex research question, which included iterative steps to minimize omissions. The breadth of bibliographic screening we conducted is also a strength of the review. Limitations of our approach include our choice to look only at peer-reviewed published literature and not the grey literature. The concepts of mental health promotion and primary prevention of mental health disorders are multifaceted and convoluted, and we found it a challenge to design a search strategy that captured the kind of intervention research we sought. Thus, we limited the search to academic literature in this review, where the database search tools are highly customizable and we were able to search comprehensively in a systematic way. We acknowledge that the kind of interventions we were targeting with our search strategy are often costly and complex to implement, and so we would not necessarily have expected to find many studies (aside from literature reviews) published so soon after the release of the WHO Action Plan for Mental Health. The fact that we excluded studies from LMICs to focus exclusively on high-income nations might also be viewed as a limitation, as our findings might not be globally applicable; however, we made the choice to narrow the search strategy to high-income countries because the relationship between poverty and mental health in LMICs has not been studied as extensively and is marked by a different pattern of associations (Lund et al., 2010). Our decision to focus our search terms on mental health means that we may have missed relevant research describing interventions to alleviate poverty that do not explicitly identify mental health as an outcome. However, this omission of mental health as an outcome illustrates what we

believe to be a central point of our argument; if mental health is not considered as a potential outcome, the true impact of these interventions is likely to be underestimated. The inclusion of relevant MeSH search terms for mental health when describing and indexing research on the social determinants of health will help those aiming to improve mental health before the point of a diagnosed mental illness to make this link.

Finally, our decision to focus this review on the five years since the WHO call to action constrains our findings. We selected this time frame because we believe that the WHO report represents a watershed moment, and that this report arose out of an emerging consensus among experts on the need to take preventive action and to promote mental health at a population level. We acknowledge that the research agenda is often driven by country-level needs and regional priorities, and in no small part by what governments are willing to fund. In this regard, our timing was uniquely challenging; in the years since the WHO call to action was published, there has not been widespread political commitment to supporting policies and programs focused on alleviating poverty. However, there are reasons to be hopeful. In 2015, the leaders of 193 governments committed to eliminating poverty (Goal 1) and reducing inequality (Goal 10) under the United Nations 2030 Agenda for Sustainable Development (United Nations, 2019). In 2017, Development Finance International (DFI) and Oxfam produced the first index to measure the commitment of governments to reduce the gap between the rich and the poor (Lawson & Martin, 2018). They consolidated these results and published a global ranking of countries that had taken steps to reduce this gap as a way to hold countries accountable. The authors found that presently South Korea, Namibia and Uruguay are taking strong steps to reduce inequality. We recognize that the impact of poverty interventions on mental health outcomes could take many years to come to fruition. Our decision to focus this review on the five years since the WHO call to action means that we may have missed relevant research falling outside of these years, or research that is currently in progress. However, we hope this review might serve both as a call to researchers to initiate evaluations that extend over the long term and to publish their study protocols so that they might stimulate further work in this field, and as a baseline for future research. In this way, should this search be repeated in several years' time, a more comprehensive set of findings might emerge.

5. Conclusions

Mental health is integral to human health and well-being, and is fundamentally shaped by the social, economic and physical environments in which people live. Poverty is inextricably linked to mental health and mental illness at multiple levels, and contributes to higher risk of many adverse health and social outcomes. Interventions that focus on poverty reduction, housing and economic safety nets are intended to promote mental health and prevent mental illness, but must consider the context in which individuals and families live and aim to improve their capacity to meaningfully participate in and contribute to their communities. Strategies to promote mental health and prevent mental illness should then take a holistic, multi-level approach to addressing the structural disadvantages faced by various populations through both universal and targeted interventions. Although we acknowledge the many challenges in bringing about change of this scale, including the high costs, great complexity, and politically charged issues that arise during the development and implementation of poverty-reduction strategies, the detrimental impacts of poverty underscore the importance of prioritizing these areas. Thus far, there is little evidence in the peer-reviewed literature that researchers have heeded the WHO's call for this type of research and are working in a coordinated way towards implementing and evaluating interventions to prevent mental illness through poverty reduction.

List of abbreviations

DFI	Development Finance International
LMIC	Low- and Middle-Income Countries
MeSH	Medical Subject Headings
WHO	World Health Organization

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Author contributions

We confirm that the manuscript has been read and approved by all named authors and that there are no other persons who satisfied the criteria for authorship but are not listed. We further confirm that the order of authors listed in the manuscript has been approved by all of us.

Intellectual property

We confirm that we have given due consideration to the protection of intellectual property associated with this work and that there are no impediments to publication, including the timing of publication, with respect to intellectual property. In so doing we confirm that we have followed the regulations of our institutions concerning intellectual property.

Ethics

Our scoping review followed established methodology, but ethics approval and participant consent were not required. None of the participants of individual studies are identified in this manuscript.

Declaration of Competing Interest

We wish to confirm that there are no known conflicts of interest associated with this publication.

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Supplementary materials

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Appendix 1

Search strategy examples for mental health scoping review

Author note regarding specific search terms: In the initial search, we deliberately omitted the search terms ‘mental illness/mental disorders’ because we determined through extensive testing that the majority of the literature retrieved did not address our research question. Most of the articles captured using ‘mental illness/mental disorders’ related to populations who were diagnosed with or being treated for mental illness, whereas our focus was on mental health promotion and primary prevention of mental illness in the general population. In the targeted searches, however, the use of specific search terms for housing and safety nets resulted in a much narrower search and a smaller

number of results (see below). Here we did include ‘mental illness/mental disorders’, because we wanted to be sure we hadn’t missed any articles in these sub-areas, while the otherwise narrow search ensured that screening would still be feasible.

Initial search

Poverty & mental health promotion (search run Nov 17, 2017)

Example from PubMed (additional database search strategies available upon request)

("Income"[Mesh] OR "Socioeconomic Factors"[Mesh] OR "Poverty"[Mesh] OR "Social Class"[Mesh]) AND ((promot* or program* or initiative* or intervene* or educat* or support or strategy*) OR "Mental health services"[Mesh]) AND ("Mental health"[Mesh] AND ("Resilience, Psychological"[Mesh] OR "Adaptation, Psychological"[Mesh])) Filters: Publication date from 2012/01/01 to 2018/12/31; English

Second targeted search

Housing subset (search run April 3, 2018)

Example from PubMed (additional database search strategies available upon request)

("Income"[Mesh] OR "Socioeconomic Factors"[Mesh] OR "Poverty"[Mesh] OR "Social Class"[Mesh]) AND ((transient AND (home* OR hous* OR residen*)) OR (homelessness or homeless or "precarious housing" or "residential mobility" or "living on the street" or housing) OR "Homeless Persons"[Mesh] OR "Housing"[Mesh] OR "Transients and Migrants"[Mesh] OR "Residence Characteristics"[Mesh] OR "Population Dynamics"[Mesh]) AND (((("Mental Disorders"[Mesh] OR "Anxiety"[Mesh] OR "Depression"[Mesh] OR "Stress, Psychological"[Mesh]) AND "Preventive Health Services"[Mesh]) OR ("Mental Health"[Mesh] AND ("Adaptation, Psychological"[Mesh] OR "Resilience, Psychological"[Mesh]))) Filters: Publication date from 2012/01/01 to 2018/12/31; English

Safety net subset (search run April 5, 2018)

Example from PubMed (additional database search strategies available upon request)

("Income"[Mesh] OR "Socioeconomic Factors"[Mesh] OR "Poverty"[Mesh] OR "Social Class"[Mesh]) AND ("Social Welfare"[Mesh] OR "cash transfer" OR "income assistance" OR "basic income" OR "minimum wage" OR "living wage" OR "income support") AND (((("Mental Disorders"[Mesh] OR "Anxiety"[Mesh] OR "Depression"[Mesh] OR "Stress, Psychological"[Mesh]) AND "Preventive Health Services"[Mesh]) OR ("Mental Health"[Mesh] AND ("Adaptation, Psychological"[Mesh] OR "Resilience, Psychological"[Mesh]))) Filters: Publication date from 2012/01/01 to 2018/12/31; English

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