Prevalence of mental disorders among people who are homeless: An umbrella review

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Abstract

Background: Homelessness is a major problem that critically impacts the mental health and well-being of the affected individuals. This umbrella review aimed to evaluate the current evidence on the prevalence of mental disorders among homeless people from evidence-based systematic reviews and meta-analyses.

Methods: We followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines and Joanna Briggs Institute (JBI) methodology for umbrella reviews. We searched 12 major databases and additional sources to identify systematically conducted reviews and meta-analyses reporting the prevalence of mental disorders among homeless populations.

Results: We evaluated 1,277 citations and found 15 reviews meeting our criteria. Most studies were conducted among high-income countries with samples from different age groups. Studies reported high prevalence rates of depressive and anxiety disorders, schizophrenia spectrum and psychotic disorders, substance use disorders, suicidal behavior, bipolar and mood disorders, neurocognitive disorders and other mental disorders among homeless people. Moreover, studies also reported a high burden of co-occurring mental and physical health problems among the homeless experiencing mental disorders.

Conclusion: This umbrella review synthesized the current evidence on the epidemiological burden of mental disorders in homelessness. This evidence necessitates advanced research to explore psychosocial and epidemiological correlates and adopt multipronged interventions to prevent, identify and treat mental disorders among homeless populations.

Keywords

Mental disorders, psychiatric disorders, mental health, mental health services, homeless, homelessness, systematic review, meta-analysis, umbrella review, evidence-based mental health

Introduction

Homelessness is a growing population health concern worldwide (Omerov et al., 2020). In the United States, a total of 552,830 people experienced homelessness on a single night in 2018 (Henry et al., 2018). In the same year, nearly 320,000 people in the United Kingdom were recorded as homeless (Shelter England, 2018). Moreover, around 235,000 individuals were homeless during 2016 in Canada (Gaetz et al., 2016). In the twentieth century, homeless people were typically older men, whereas homelessness in recent years has been observed among females and youth of different racial and ethnic groups (Jones, 2016). This evidence provides an overall scenario of homelessness in the high-income nations; however, evidence on the severity of homelessness is scarce from low- and middle-income countries (LMICs). Socioeconomic factors associated with homelessness including rapid urbanization and industrialization, high poverty, income inequality, unemployment, maldistribution of resources between rural and urban areas, migration, and lack of access to affordable housing are prevalence in LMICs, which suggest the magnitude of homelessness is likely to be higher in those contexts (Speak, 2019). This global burden of homelessness has critical implications for health policymaking and practice. In homelessness, the rate of mortality is nearly eight times higher than the average for

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men and 12 times higher for women, with an average age for death at 52 years (Aldridge et al.,2019, 2018). This can be attributable to the fact that homeless individuals experience enormous health inequalities and have a higher prevalence of various medical conditions (Omerov et al., 2020). This burden increases among aging people who are homeless. They often experience multiple health problems, which become worse in the presence of a lack of access to health care services, poor social ties and continued effects of other social determinants of health (Omerov et al., 2020). In most cases, such problems are not prevented or diagnoses at earlier stages resulting in increased use of acute care services and higher cost to the health systems (Omerov et al., 2020; Rosenheck & Seibyl, 1998).

Addressing homelessness is essential for the overall health and well-being of a population. This agenda is part of the United Nations 2030 Agenda for Sustainable Development (United Nations, 2015). The action plans to alleviate homelessness include reducing poverty and ensuring health and well-being. In addition to addressing residential challenges and physical health problems, it is necessary to improve the mental health of people who are homeless (Altena et al., 2010; Dickey, 2000). Psychosocial stressors like impaired interpersonal relationships, lack of hope, loneliness and poor social capital affect the mental health and well-being during homelessness (Omerov et al., 2020). Another challenge is the deinstitutionalization of mental illness in many countries like the United States, which resulted in a reduced number of beds in indoor psychiatric facilities without strengthening community shelters and models of care (Yohanna, 2013). In addition, LMICs generally have lesser organizational capacities to provide mental health services, both in the institutional and community settings (Daund et al., 2018). Such challenges may have brought many people with severe mental illness to the temporary shelters and streets, thus increasing both the burden of mental disorders and homelessness within a given geographic region. From a population health perspective, homeless people, irrespective of a previous psychiatric diagnosis, are likely to live in disadvantaged conditions that make them vulnerable to mental disorders and remain undiagnosed as well as untreated in most cases (Patten, 2017; Yim et al., 2015).

To address the pre-existing mental disorders and promote positive mental health and resilience, it is essential to understand the epidemiological burden of mental disorders among homeless individuals. In this regard, observational studies may provide insights about the spatial and temporal distribution of mental disorders in homelessness. Moreover, systematic reviews or meta-analysis of observational studies can address the sampling errors of individual studies and provide a less-biased estimate of the burden of health conditions of interest. Given that more than 11 systematic reviews or meta-analyses are published in a day (Bastian et al., 2010), it is essential to synthesize the evidence from existing reviews. Such reviews of the reviews, also known as umbrella reviews, have shown advantages over meta-analyses due to their bird's eye view of evidence (Ioannidis, 2009). Furthermore, umbrella reviews are increasingly used for clinical risk prediction and evidence-based actions through synthesizing prior knowledge on several mental disorders (Fullana et al., 2019). There is a lack of an umbrella review that can provide global evidence on the prevalence of mental disorders in homelessness, which may inform future research, policymaking and practice. This umbrella review acknowledged this knowledge gap and synthesized the current evidence on the prevalence of mental disorders among people who are homeless.

Materials and methods

Search strategy of the review

This umbrella review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Liberati et al., 2009) and the Joanna Briggs Institute (JBI) methodology for umbrella reviews (Aromataris et al., 2015). We searched MEDLINE, Embase, PubMed, PsycINFO, CINAHL, Health Policy Reference Center, ERIC, Health Source (Nursing/Academic Edition), Environment Complete, Child Development & Adolescent Studies, Academic Search Ultimate and the Cochrane Library using specific keywords (please see Table 1). For each database, the titles, abstracts, subject headings and general keywords were searched with no language or time restrictions. Moreover, we searched the citations used as references of the primarily screened articles and citing articles from Google Scholar using the 'cited by' function. All databases and additional sources were searched from their inception to October 15, 2019, and the entire search process was repeated on December 21, 2019, for the last time. All the citations were compiled using RefWorks software and uploaded to Rayyan cloud-based citations management system for systematic evaluation.

Inclusion and exclusion criteria

In this umbrella review, we included reviews that systematically evaluated and reported the prevalence of mental disorders among people who are homeless. In addition, studies reporting other quantitative measures of disease burden (e.g. odds ratio (OR) or relative risk (RR) expressing the epidemiological burden of a disorder) were also considered in the absence of a prevalence value. To specify mental disorders, we adopted the classifications of mental disorders in the *International Classification of Diseases (ICD) 10th revision* (World Health Organization [WHO], 2016), or the *Diagnostic and Statistical Manual of Mental*

Table 1. Search strategy for this umbrella review.

Search query	Keywords (searched within titles, abstracts, subject headings like MeSH and general keywords)
1	prevalence OR incidence OR epidemiology OR frequency OR cases OR odds OR risks OR status OR 'risk factors' OR 'protective factors' OR 'associated factors' OR correlates OR predictors OR distribution OR determinants
2	'mental disorders' OR 'mental illness' OR 'common mental disorders' OR 'mental health' OR 'mental health services' OR 'psychological' OR 'psychiatric' OR 'psychosocial' OR 'psychosomatic' OR 'emotional' OR 'psychiatric disorders' OR 'psychiatric illness' OR 'obsessive compulsive' OR 'dementia' OR 'depression' OR 'depressive disorders' OR 'suicide' OR 'suicidal behavior' OR 'self-harm' OR 'schizophrenia' OR 'bipolar disorder' OR 'mood disorder' OR 'affective disorders' OR 'anxiety' OR 'substance abuse' OR 'substance use' OR 'alcohol' OR 'addiction' OR 'addictive disorders' OR 'panic' OR 'posttraumatic' OR 'post-traumatic' OR 'PTSD' OR 'dissociative disorders' OR 'personality disorders' OR 'Neurodevelopmental disorders' OR 'intellectual disabilities' OR 'communication disorders' OR 'autism spectrum disorder' OR 'attention deficit hyperactivity disorder' OR Schizophrenia OR 'psychotic disorders' OR 'Motor disorders' OR Catatonia OR 'somatic symptom' OR 'somatic disorders' OR 'eating disorders' OR 'sleep-wake disorders' OR parasomnia OR 'sexual dysfunction' OR 'gender dysphoria' OR 'conduct disorders' OR 'neurocognitive disorders' OR 'paraphilic disorders' OR 'unspecified mental disorders' OR 'Alzheimer's'
3	systematic review OR meta-analysis OR meta-regression OR pooled effect OR pooled estimate
4	Homeless OR homelessness OR unsheltered
Complete query	1 AND 2 AND 3 AND 4

Disorders (5th ed.; *DSM-5*; American Psychiatric Association, 2013). In addition, we acknowledged the historical evolution of the definitions and conceptual constructs within mental disorders. Therefore, we included reviews reporting mental disorders which are consistent with the earlier versions of ICD or *DSM* and have an equivalent diagnosis classified under the current versions of these guidelines. Moreover, there are several definitions of homelessness in different contexts, which may include some individuals while excluding others within the scope of respective definitions (Byrne & Culhane, 2015; US Health and Human Services, 2020). For example, in the United States, two major definitions are used by federal agencies to identify the homeless population and provide social care. While both definitions agree on most criteria, individuals living in motels or staying with others lacking a regular accommodation are considered homeless by the educational program definition, whereas those individuals are not eligible as homeless as per the Housing and Urban Development (HUD) definition (US Health and Human Services, 2020). Such definitions may have provided different estimations of study samples and the magnitude of different health problems in those samples. This review acknowledged such differences and considered any definition of homelessness in the eligible reviews and respective primary studies, which allowed this review to remain inclusive to diverse operational definitions that may have been used in different contexts over time.

Furthermore, articles were recruited if they fulfilled all the inclusion criteria and excluded if they did not meet any of the exclusion criteria as listed in Table 2. In this umbrella review, two authors independently evaluated the citations according to the pre-specified criteria. Any conflicts arising in the screening process were resolved at the end of the independent screening through discussion in the presence of a third author.

Data extraction and synthesis

A data extraction tool was developed adopting the JBI data extraction tool for systematic reviews and research synthesis (Munn et al., 2014). Two authors used this tool and independently extracted data on the following domains: the objectives and types of each review, year of publication, names of databases searched in respective reviews, the timeframe of searching databases, sample size, location of the primary studies, demographic characteristics of the participants, recruitment strategy and key findings on the prevalence of mental disorders among homeless people. Furthermore, a narrative synthesis of the research findings was conducted considering high heterogeneity in terms of operational definitions of homelessness as well as mental disorders, methodological approaches and instruments within the primary studies and reviews. The synthesized findings on the prevalence rates (percentage, proportion, OR, RR, or other quantitative measures) with specific or range estimations within 95% confidence interval (CI) were reported from the respective reviews.

Evaluation of the methodological quality

To evaluate the methodological quality of the reviews, we used the JBI critical appraisal checklist for systematic reviews and research synthesis checklist (Aromataris et al., 2015). Two reviewers independently evaluated each of the included reviews. At the end of the primary evaluation, two

Table 2. Eligibility criteria for this review.

Inclusion criteria	Exclusion criteria
1. Systematically conducted narrative, qualitative, scoping, or quantitative (meta-analytic) literature reviews	1. Articles which were not systematically conducted reviews (e.g. unstructured reviews without a plausible methodology, primary studies, opinions, commentaries, letters, or editorials were excluded from this review)
2. Articles reported prevalence (or other quantitative measures like incidence, cases with denominators, odds, or relative risks etc.) of mental disorders as specified within current or earlier versions of ICD or DSM	2. Articles which did not specifically report the prevalence (or other quantitative measures) of mental disorders only were excluded (e.g. articles reporting mental disorders within general health outcomes were excluded)
3. Articles that primarily focused on the homeless people, irrespective of definitions of homelessness in those studies	3. Articles reported primary studies conducted in general population or mixed population groups without a focus on homeless people (e.g. mental disorders among participants including some homeless individuals were excluded, unless they reported the prevalence among homeless individuals as an identifiable group)
4. Published as peer-reviewed journal articles	4. Articles, dissertations, theses, policy papers, or institutional reports were excluded if they were not published as peer-reviewed articles in journals
5. Full texts were available in the English language	5. Articles were excluded if the full texts were not available in the English language

ICD: International Classification of Diseases; DSM: Diagnostic and Statistical Manual of Mental Disorders.

reviewers discussed the evaluation findings, reached a consensus for all the items, and finalized the overall quality ratings. The checklist consists of 10 items, and each item could receive 1 point. Therefore, the overall quality score of a review could range from 0 to 10. In this umbrella review, articles receiving 0–4, 5–7 and 8–10 were categorized as the low, medium and high-quality studies, respectively.

Results

We found 723 citations from searching 12 databases and 554 citations from additional sources, totaling 1,277 citations (please see Figure 1). After eliminating 429 duplicates, we evaluated the titles and abstracts of the remaining 848 citations as per the pre-specified criteria for this review. At the end of this stage, we removed 826 citations due to non-compliance with our criteria and evaluated full texts of the remaining 22 citations. Seven articles were excluded at this stage, and we retained 15 articles in this review (Ayano, Tesfaw, & Shumet, 2019; Ayano, Tsegay, et al., 2019; Bassuk et al., 2015; Burra et al., 2009; Depp et al., 2015; Duke & Searby, 2019; Embleton et al., 2013; Ennis et al., 2015; Fazel et al., 2008; Folsom & Jeste, 2002; Hodgson et al., 2013; Parks et al., 2007; Schreiter et al., 2017; Smartt et al., 2019; Spence et al., 2004). The included articles consisted of seven meta-analytic reviews (Ayano, Tesfaw, & Shumet, 2019; Ayano, Tsegay, et al., 2019; Bassuk et al., 2015; Depp et al., 2015; Embleton et al., 2013; Fazel et al., 2008; Schreiter et al., 2017) and eight non-quantitative reviews (Burra et al., 2009; Duke & Searby, 2019; Ennis et al., 2015; Folsom & Jeste, 2002; Hodgson et al., 2013; Parks et al., 2007; Smartt et al.,

2019; Spence et al., 2004). The summary findings of the included reviews are provided in Table 3.

Characteristics of the included reviews

Most reviews ($n = 10$) included primary studies from multiple countries without specific geographic or economic focus, whereas three reviews emphasized on high-income countries (Bassuk et al., 2015; Fazel et al., 2008; Schreiter et al., 2017) and two reviews included studies from LMICs or resource-constrained contexts (Embleton et al., 2013; Smartt et al., 2019). Among reviews without a contextual focus, most primary studies were in the United States, Germany, Canada, the United Kingdom, Australia and other developed countries with fewer studies from LMICs (Ayano, Tesfaw, & Shumet, 2019; Ayano, Tsegay, et al., 2019; Burra et al., 2009; Depp et al., 2015; Folsom & Jeste, 2002). Moreover, the earliest review was published in 2002, and a total of five reviews were published before 2010 (Burra et al., 2009; Fazel et al., 2008; Folsom & Jeste, 2002; Parks et al., 2007; Spence et al., 2004), whereas most ($n = 10$) reviews were published after 2010. Furthermore, the median number of databases searched in the respective reviews was three, with a range from two to 16. The number of primary studies included in the respective reviews ranged from 10 to 50. In addition, the evaluation of the methodological quality (please see Supplemental file) found seven reviews with medium quality (Embleton et al., 2013; Ennis et al., 2015; Folsom & Jeste, 2002; Hodgson et al., 2013; Parks et al., 2007; Schreiter et al., 2017; Spence et al., 2004) and eight reviews with high methodological quality (Ayano, Tesfaw, & Shumet, 2019; Ayano, Tsegay, et al., 2019; Bassuk et al., 2015; Burra et al., 2009; Depp
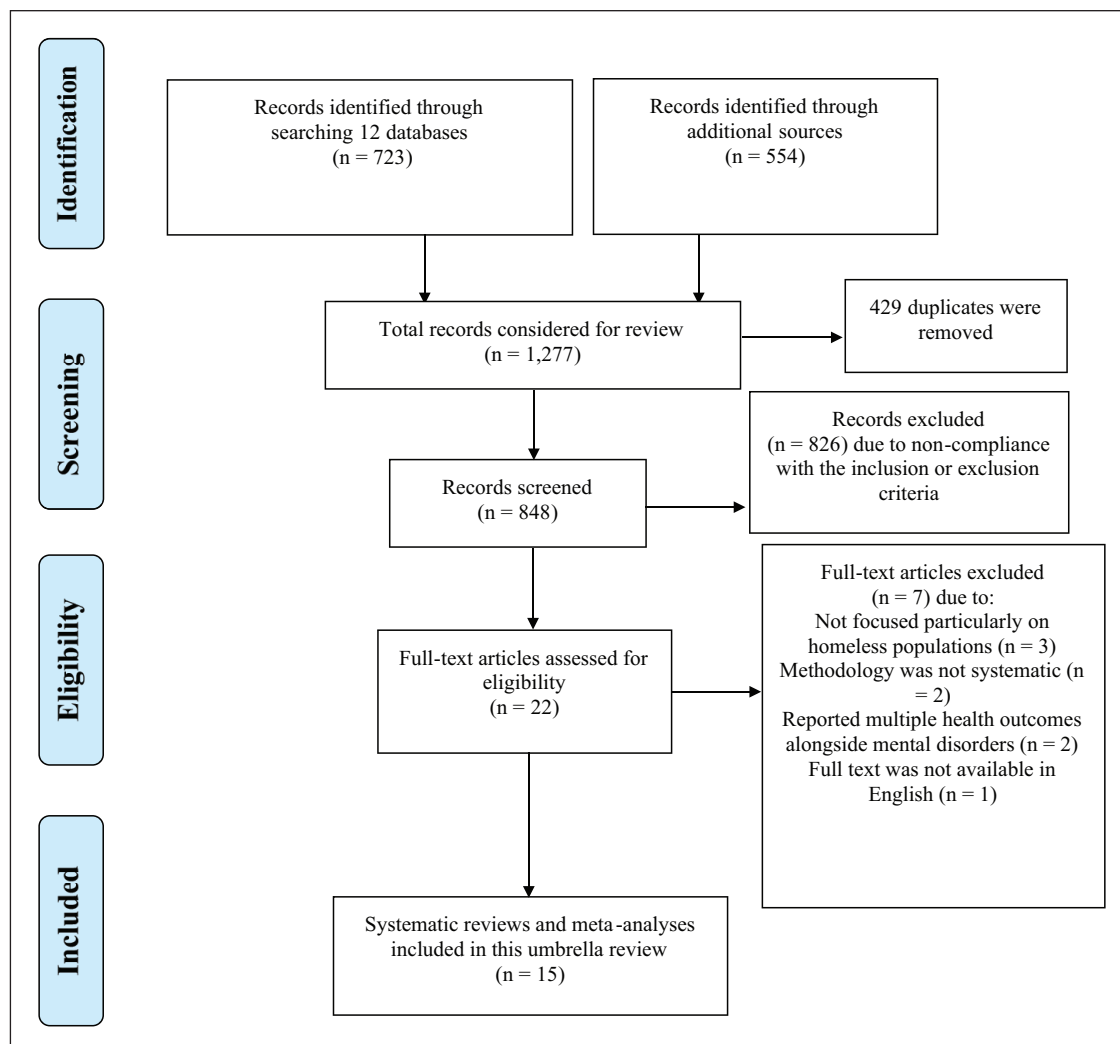
Figure 1. Flow diagram of the umbrella review.

et al., 2015; Duke & Searby, 2019; Fazel et al., 2008; Smartt et al., 2019).

Characteristics of the study populations

The study populations in this review were homeless individuals with diverse characteristics, as identified in different study samples. The sample size among studies ranged from eight to 326,073 (Duke & Searby, 2019; Hodgson et al., 2013). Three reviews focused on adult participants who were homeless (Burra et al., 2009; Depp et al., 2015; Spence et al., 2004). Three reviews focused on homeless children and adolescents (Bassuk et al., 2015; Embleton et al., 2013; Parks et al., 2007). One review included primary studies with youth participants aged from 15 to 24 years (Hodgson et al., 2013). Moreover, one review focused on studies with women participants only (Duke & Searby, 2019). In many samples, racial and ethnic minorities were over-represented within the homeless groups

compared to the general population (Spence et al., 2004). The study participants were recruited from multiple sources, including homeless shelters, social services, temporary residential facilities, downtown locations, suburban areas, health care facilities, community locations and streets (Bassuk et al., 2015; Burra et al., 2009; Duke & Searby, 2019; Embleton et al., 2013; Ennis et al., 2015; Fazel et al., 2008; Folsom & Jeste, 2002; Parks et al., 2007; Schreiter et al., 2017; Smartt et al., 2019; Spence et al., 2004).

Prevalence of mental disorders among homeless people

The prevalence of mental disorders varied across homeless samples. For example, Hodgson and colleagues (2013) reported the overall prevalence of mental disorders ranged from 48.4% to 98% among primary studies included in that review. In a meta-analysis by Schreiter and colleagues

Table 3. Characteristics and the key findings of the included systematic reviews and meta-analyses.

Source	Name(s) and timeframe of searching databases	Number of primary studies; type of review	Country of the study population	Sample size and characteristics of the study population (if reported)	Prevalence rates (or other quantitative measures of the epidemiological burden as specified) and related key findings
Folsom & Jeste (2002)	MEDLINE, PsycINFO and additional sources; post-1966	33; systematic review	Most (*n* = 16) from the United States, remaining studies were from the United Kingdom (*n* = 7), Germany (*n* = 3), Australia (*n* = 2), Canada (*n* = 2) and one study each from Brazil, Spain and France	Sample size ranged from 32 to 27,638; most samples had a higher proportion of male and adult participants; samples were recruited from diverse settings including downtown, suburban areas, rural counties, jails, hostels and homeless shelters	The overall prevalence of schizophrenia ranged from 1% to 45%. Studies with higher quality had a weighted prevalence of 11% (range = 4%–16%). Young participants had a higher prevalence (range = 13%–21%) compared to older participants (range = 8%–14%). Women had a higher overall prevalence than men in five studies. Newly homeless participants had a lower prevalence of schizophrenia (range = 2%–14%) compared to chronically homeless participants (range = 18%–27%)
Spence et al. (2004)	PsycINFO, MEDLINE, Embase, Social Science Citation Index, Science Citation Index, CINAHL, Biological Abstracts, ASSIA, INSPEC, HMIC/ DH Data, British Nursing Index, SPORT Discus, AMED, Econlit and additional sources; search timeframe was not specified	18; systematic review	Country statistics was provided for 18 studies; 11 of them were conducted in the United States, seven were from the rest of the world	The sample size was not reported for all the primary studies; adult homeless were the focus of the review; fewer studies reported demographics of the participants, most were male, with an over-representation of ethnic minorities; most were recruited from hostels	Nearly 30%–40% of homeless adults had cognitive impairment compared to 2%–3% of adults living in the community. Moreover, intelligence quotient (IQ) among homeless adults was lower than the average range. Studies have also reported co-occurring psychiatric morbidity including depression, alcohol dependence and schizophrenia among the homeless population
Parks et al. (2007)	PsycINFO, MEDLINE, Embase, Social Science Citation Index, Science Citation Index, CINAHL, Biological Abstracts, ASSIA, INSPEC, HMIC/DH Data, British Nursing Index, SPORT Discus, AMED, Econlit, Index to Theses, International Bibliography of the Social Sciences and additional sources; post-1966	10; systematic review	Most samples were from the United States, only one study was from South Africa	The total sample was less than 2,000; this review focused on children and adolescents; participants were mostly male, were recruited from shelters	Impaired cognitive functions were found among the study participants. One study found 80% of the participants had 50th percentile or lower language deprivation and learning difficulties; sub-group analysis reported that 11% of children had mild retardation and 35% had learning difficulties
Fazel et al. (2008)	Embase, MEDLINE, PsycINFO and additional sources; 1966–2007	29; meta-analysis	Most studies were from the United States (*n* = 10), followed by the United Kingdom (*n* = 8), Germany (*n* = 6), Australia (*n* = 2) and one each from Netherlands, Greece and France	The total sample was 5,684; most participants were male (82% in the mixed samples), the average age of the participants was 40.1 years in mixed samples; participants were recruited from multiple settings including shelters, hostels, day centers, missions and streets	Studies reported common mental disorders, including alcohol dependence (ranged from 8.1% to 58.5%) and drug dependence (ranged from 4.5% to 54.2%). For psychotic illness, the prevalence ranged from 2.8% to 42.3%. The pooled prevalence of psychotic disorders was 12.7% (95% confidence interval (CI) = 10.2–15.2) in 28 studies. The prevalence of major depression was 11.4% (95% CI: 8.4–14.4) in 19 studies. The pooled prevalence of personality disorders and alcohol dependence was 23.1% (95% CI: 15.5–30.8) and 37.9% (95% CI: 27.8–48) from random-effects models using data from 14 and 10 studies, respectively. Moreover, the pooled prevalence of drug dependence was 24.4% (95% CI: 13.2–35.6) in seven studies. Samples from the United States had lower pooled prevalence (9%, 95% CI: 6–12) compared to samples from Mainland Europe (12%, 95% CI: 7–16), UK (19%, 95% CI: 9–29) and Australia (16%, 95% CI: 10–22)
Burra et al. (2009)	MEDLINE, CINAHL, Embase, PsycINFO, Applied Social Sciences Index and Abstracts, ERIC, Social Sciences Abstracts, Social Sciences Citation Index, Social Services Abstracts, Sociological Abstracts and additional sources; 1970–2007	22; Systematic review	Most studies (*n* = 13) were from the United States followed by the United Kingdom (*n* = 3), Australia (*n* = 2), Brazil (*n* = 2), Germany (*n* = 2) and Spain (*n* = 1)	Sample size ranged from 24 to 1,563; this review focused on adult population; most of the study participants were male, recruited from shelters, hostels, missions, communities and healthcare settings	Among the included studies, 4%–7% of homeless people exhibit global cognitive deficits with focal deficits in verbal and visual memory, attention, speed of cognitive processing, and executive functions

(Continued)

Table 3. (Continued)

Source	Name(s) and timeframe of searching databases	Number of primary studies; type of review	Country of the study population	Sample size and characteristics of the study population (if reported)	Prevalence rates (or other quantitative measures of the epidemiological burden as specified) and related key findings
Embleton et al. (2013)	Scopus, MEDLINE, Embase, Social Sciences Abstract, PsycINFO and additional sources; from the inception of respective databases till 2011	50; meta-analysis	All studies were selected from resource-constrained settings (*n* = 22 countries); most studies (*n* = 17) were from Africa, followed by South and Central America (*n* = 14), Asia (*n* = 12), Europe (*n* = 5), and Middle East (*n* = 2)	The total sample size was 16,987 (ranged from 21 to 2,807); this review focused on children, 75% were boys; most studies did not report recruitment strategies, 25% and 21% of the samples were recruited from off-street and on-street locations, respectively	The pooled prevalence of lifetime drug use was 60% (95% CI: 53–68), which was highest in the Middle East (83%, 95% CI: 79–87) and lowest in Africa (47%, 95% CI: 31–64) as found in the location subgroups. The prevalence rates for specific substance use for the inhalants (47%, 95% CI: 36–58), tobacco (44%, 95% CI: 34–55), alcohol (41%, 95% CI: 31–50), marijuana (31%, 95% CI: 18–44) and cocaine (7%, 95% CI: 5–9) were reported
Hodgson et al. (2013)	Web of Science, PubMed, PsycINFO, and additional sources; 2000–2012	46; systematic review	Studies were conducted in the United States (*n* = 34), followed by Canada (*n* = 8), Australia (*n* = 6), the United Kingdom (*n* = 2), Switzerland (*n* = 1) and Sweden (*n* = 1)	Sample size ranged from 60 to 326,073; youth aged 15–24 were focused in this review and respective studies; recruited from multiple sources including shelters, hostels, streets and support organizations	The prevalence of mental disorders ranged from 48.4% to 98% across samples. Homeless people had high rates of depression (17.6–28.1%), bipolar disorder (26.9%), anxiety (32%), mood disorders (12.2%–41.3%), attention deficit hyperactivity disorder (4.4%), conduct disorder (36%–76.7%), substance or alcohol use disorder (11%–43.7%), self-harm (69%), suicidal ideation (22%–36.8%) and suicidal attempts (8.8%–46%). The prevalence of psychiatric comorbidity in posttraumatic stress disorder ranged from 48% to 80.9%. 40%–67.3% of homeless individuals had co-existing substance use disorder and posttraumatic stress disorder
Ennis et al. (2015)	MEDLINE/PubMed (1966–2013), PsycINFO (1887–2011), CINAHL (1983–2011) and additional sources	11; systematic review	Most studies were from the United States (*n* = 9), remaining from Canada (*n* = 2)	Sample size ranged from 12 to 116; most were men; the mean age was 40.75 years; participants were recruited from homeless shelters, residential services, and healthcare centers	18%–55.4% homeless participants had general cognitive deficits, 33%–69% had verbal memory impairments and 33%–78% had visual memory impairments
Bassuk et al. (2015)	Web of Science, PubMed, PsycINFO. and additional sources; 1990–2013	11; meta-analysis	Studies conducted in the United States were included in this review	Sample size ranged from 53 to 264 across homeless samples; this review recruited primary studies focusing on children and adolescents from multiple sources shelters and housing programs	The overall prevalence of mental disorders was 10%–26% among pre-schoolers and 14%–40% among school-age children who are homeless. In the meta-analysis, the difference in prevalence was not significantly different between homeless and housed preschool children (odds ratio (OR) = 1.49; 95% CI: 0.97–2.28). School-age homeless children were significantly more likely to have a mental health problem (OR = 1.78; 95% CI: 1.19–2.66) compared to housed children. Among individual studies, the prevalence rates of depression (13.8%–46.3%) anxiety (10%–28.4%), conduct problems (36%), disruptive behavioral disorder (19.7%), hyperactivity problems (34%), and mood disorder (5.1%) were reported
Depp et al. (2015)	PubMed, PsycINFO, and additional sources; 1980–2013	24; meta-analysis	Studies were conducted in the United States (*n* = 10), the United Kingdom (*n* = 5); two studies each from Australia, Brazil, and Canada; one study each from Spain and Germany	Total sample size was 2,969 (ranged from 29 to 328 with a mean of 129); mean age of the participants was 46.1 (SD = 6.2) years; the proportion of men was 83.2% across samples; this review focused on adults; the participants were recruited from multiple locations including shelters, meal provision sites, streets and social service settings	The mean prevalence of psychotic disorders in 12 studies was 18.1% (SD = 18.9, median = 9.4%, range = 2%–70%), affective disorders in 11 studies was 27.6% (SD = 18.8, median = 24%, range = 2%–82%), substance use in 10 studies was 49.7% (SD = 20.8, median = 45%, range = 7%–82%), cognitive impairment in 16 studies was 25.4% (SD = 23.8, median = 17.2%, range = 2%–82%), whereas studies reporting Mini-Mental State Exam (MMSE) score below 23 or 24 was 16.1% (SD = 13.1, median = 9.9, range = 2%–43%); 54.7% (SD = 6.5, range = 43%–60%) of the participants had a history of head injury

(Continued)

Table 3. (Continued)

Source	Name(s) and timeframe of searching databases	Number of primary studies; type of review	Country of the study population	Sample size and characteristics of the study population (if reported)	Prevalence rates (or other quantitative measures of the epidemiological burden as specified) and related key findings
Schreiter et al. (2017)	MEDLINE (1946–2016), Embase and Embase Classic (1947–2016), PsycINFO, PSYNDEX, SocINDEX (1910–2016) and additional sources	24 articles (11 studies); meta-analysis	Studies conducted in Germany were included in this review	The total sample size was 1,220 (ranged from 17 to 265); mean age ranged from 29 to 48.1 years; only two samples had all women participants, whereas six samples had no women participants; participants were recruited from homeless shelters, common locations, and other sources from different German cities	In the random-effects model, the pooled prevalence of mental illness was 77.5% (95% CI: 72.4–82.3). The prevalence of axis I disorders was 77.4% (95% CI: 71.3–82.9). Moreover, the prevalence rates for substance-related disorders (60.9%, 95% CI: 53.1–68.5), alcohol dependency (55.4%, 95% CI: 49.2–61.5), drug dependence (13.9%, 95% CI: 7.2–22.2), anxiety disorders (17.6%, 95% CI: 12.9–22.8), affective disorder (15.2%, 95% CI: 9.8–21.5), major depression (11.6%, 95% CI: 4.4–21.3), psychotic illness (8.3%, 95% CI: 5.4–11.8), cognitive impairment (11.7%, 95% CI: 6–18.9) and personality disorders (29.1%, 95% CI: 5.6–59.5) were reported
Smartt et al. (2019)	Embase, MEDLINE, PsycINFO, PsycArticles, Global Health and Ovid journals, and additional sources; studies published till 2018	49; systematic scoping review	Seven studies reported the prevalence of mental illness, among which two were conducted in Brazil, and one study each from Colombia, Ethiopia, Nigeria, Peru and Turkey	Samples comprised of diverse demographic characteristics; recruited from multiple sources including shelters, social programs and outdoor locations	The prevalence of severe mental disorders ranged from 8% to 47.4%
Ayano, Tsegay, & Shumet (2019)	Embase, PubMed, Scopus and additional sources; search timeframe was not specified	20; meta-analysis	Studies were from the United States (n = 12), Canada (n = 4), and one study each from Australia, Japan, Ethiopia and Ghana	Sample size ranged from 60 to 10,111; demographics and recruitment strategy of individual studies were not specified	The pooled prevalence of current suicidal ideation among homeless individuals was 17.83% (95% CI: 10.73–28.14), whereas the prevalence of lifetime suicidal ideation was 41.6% (95% CI: 28.55–55.95); the pooled prevalence rates of current and lifetime suicidal attempt were 9.16% (95% CI: 4.1–19.2) and 28.8% (95% CI: 21.66–37.18); no significant difference in the prevalence of lifetime suicidal attempts was found based on the quality of the studies
Ayano, Tesfaw, et al. (2019)	Embase, PubMed, Scopus and additional sources; search timeframe was not specified	31; meta-analysis	Studies were conducted in the United States (n = 12), Canada (n = 4), Germany (n = 3), two studies each in Ethiopia, France and Scotland; one study each in China, Spain, the United Kingdom, Ireland, Japan, Serbia and Australia	Sample size ranged from 33 to 29,143; demographics and recruitment strategy of individual studies were not specified	The pooled prevalence of psychotic disorder in homeless people was 21.21% (95% CI: 13.73–31.29); pooled prevalence rates of schizophrenia, schizophreniform disorder, schizoaffective disorder and psychotic disorder not otherwise specified (NOS) were 10.29% (95% CI: 6.44–16.02), 2.48% (95% CI: 0.16–28.11), 3.53% (95% CI: 1.33–9.05) and 9% (95% CI: 6.92–11.62), respectively. In sensitivity analyses, developing countries had higher prevalence than developed countries (29.16% compared to 18.8% for psychotic disorders, and 22.15% compared to 8.83% for schizophrenia), screening tools revealed higher prevalence than diagnostic instruments (32.19% compared to 17.42%); both for psychotic disorder and schizophrenia, the prevalence rates were higher for studies published on/after 2010 compared to studies published before 2010; no significant difference in prevalence rates was found for the quality of the studies
Duke & Searby (2019)	CINAHL, PsycINFO, PubMed, Scopus and additional sources; 1996–2017	15; systematic review	Studies were from the United States (n = 10), Canada (n = 2), Spain (n = 1)	Sample size ranged from 8 to 821; this review focused on homeless women; 11 studies reported women with children; samples were recruited from multiple locations including shelters, food programs and outdoor locations	The prevalence rates for schizophrenia (2.5%–17.1%), drug or alcohol dependence (7.8%–60%), posttraumatic stress disorder (29.1%–41.4%) and major depressive episode or disorder (15.8%–57.9%) were reported; 18.3% sample had dual diagnoses in a study included in this review

(2017), the pooled prevalence of mental disorders was found as 77.5% (95% CI: 72.4–82.3). The prevalence rates varied across geographic regions of corresponding primary studies among the reviews. For example, Fazel and colleagues (2008) found that primary studies conducted in the United States had lower pooled prevalence of mental disorders (9%, 95% CI: 6–12) compared to samples from Mainland Europe (12%, 95% CI: 7–16), the United Kingdom (19%, 95% CI: 9–29) and Australia (16%, 95% CI: 10–22). Such variations were also noted between studies from high-income countries and LMICs, studies published in the last decade and earlier years, and for different screening measures used across primary studies (Ayano, Tesfaw, & Shumet, 2019). Moreover, reviews reported different prevalence rates of specific mental disorders among homeless populations, which are presented in the subsequent sections.

Depressive disorders and anxiety disorders

Six reviews reported the prevalence of depressive disorders among homeless people, which ranged from 11.4% to 57.9% (Bassuk et al., 2015; Duke & Searby, 2019; Fazel et al., 2008; Hodgson et al., 2013; Schreiter et al., 2017; Spence et al., 2004). For example, Bassuk and colleagues (2015) found 13.8%–46.3% of the participants in the primary studies had depressive disorders. Another review reported 17.6%–28.1% of the study samples were suffering from depression (Hodgson et al., 2013). Moreover, three reviews reported the prevalence of anxiety disorders, which ranged from 10% to 32% across samples (Bassuk et al., 2015; Hodgson et al., 2013; Schreiter et al., 2017). For example, a meta-analysis by Schreiter and colleagues (2017) found the pooled prevalence of anxiety disorders was 17.6% (95% CI: 12.9–22.8) among homeless participants.

Schizophrenia spectrum and other psychotic disorders

Seven reviews reported the prevalence of schizophrenia spectrum and other psychotic disorders, which ranged from 1% to 45% (Ayano, Tesfaw, & Shumet, 2019; Depp et al., 2015; Duke & Searby, 2019; Fazel et al., 2008; Folsom & Jeste, 2002; Schreiter et al., 2017; Spence et al., 2004). For example, a systematic review found that young participants had higher rates of schizophrenia (13%–21%) than older participants (8%–14%), women participants had higher rates up to 35% compared to men (8%–12%), and chronically homeless individuals had higher prevalence (18%–27%) compared to newly homeless individuals (2%–14%) (Folsom & Jeste, 2002). Another meta-analytic review reported the pooled prevalence of psychotic disorder in homeless people was 21.21% (95% CI: 13.73–31.29), whereas the pooled prevalence rates of schizophrenia, schizophreniform disorder, schizoaffective disorder and

psychotic disorder not otherwise specified (NOS) were 10.29% (95% CI: 6.44–16.02), 2.48% (95% CI: 0.16–28.11), 3.53% (95% CI: 1.33–9.05) and 9% (95% CI: 6.92–11.62), respectively (Ayano, Tesfaw, & Shumet, 2019).

Substance-related and addictive disorders

In this umbrella review, seven reviews were identified that reported the prevalence of substance-related and addictive disorders, which ranged from 4.5% to 60.9% across homeless samples (Depp et al., 2015; Duke & Searby, 2019; Embleton et al., 2013; Fazel et al., 2008; Hodgson et al., 2013; Schreiter et al., 2017; Spence et al., 2004). For example, a meta-analytic review found the pooled prevalence of alcohol dependence was 37.9% (95% CI: 27.8–48) (Fazel et al., 2008). Another review found that 11%–43.7% had alcohol or other substance use disorder (Hodgson et al., 2013).

Neurocognitive disorders

Six reviews reported the prevalence of neurocognitive disorders, which ranged from 4% to 80% (Burra et al., 2009; Depp et al., 2015; Ennis et al., 2015; Parks et al., 2007; Schreiter et al., 2017; Spence et al., 2004). The most commonly reported problems were cognitive impairments among homeless people. For example, Ennis and colleagues (2015) found 18%–55.4% homeless participants had general cognitive deficits. A meta-analytic review found 25.4% of the homeless adults had cognitive impairment (Depp et al., 2015). Another review by Parks and colleagues (2007) found 11%–35% of homeless children had impaired cognitive functions and associated disabilities.

Bipolar disorders and mood disorders

Four reviews reported the prevalence of bipolar and mood disorders among homeless people, which ranged from 5.1% to 41.3% (Bassuk et al., 2015; Depp et al., 2015; Hodgson et al., 2013; Schreiter et al., 2017). A review by Hodgson and colleagues (2013) found 26.9% of homeless participants had bipolar disorders. Moreover, 12.2%–41.3% of homeless samples had mood disorders in this review. Furthermore, a review by Depp and colleagues (2015) reported the prevalence of affective or mood disorders was 27.6% (*SD* = 18.8, median = 24%) in 10 studies.

Suicidal behavior disorder

Two reviews identified prevalence rates for suicidal ideation, attempt and self-injury among homeless people (Ayano, Tsegay, et al., 2019; Hodgson et al., 2013). Hodgson and colleagues (2013) reported the prevalence rates of self-harm (69%), suicidal ideation (22%–36.8%) and suicidal attempts (8.8%–46%). Another review by

Ayano and colleagues reported the pooled prevalence of current suicidal ideation was 17.83% (95% CI: 10.73–28.14), whereas the prevalence of lifetime suicidal ideation was 41.6% (95% CI: 28.55–55.95) (Ayano, Tsegay, et al., 2019). Moreover, the pooled prevalence rates of current and lifetime suicidal attempts were 9.16% (95% CI: 4.1–19.2) and 28.8% (95% CI: 21.66–37.18), respectively.

Other mental disorders among homeless people

Several other mental disorders were reported across reviews. Two reviews reported the prevalence of attention-deficit/hyperactivity disorder and conduct disorder ranging from 4.4% to 34% and 36% to 76.7%, respectively (Bassuk et al., 2015; Hodgson et al., 2013). Moreover, two reviews reported that 23.1%–29.1% of homeless people had personality disorders (Fazel et al., 2008; Schreiter et al., 2017). Furthermore, Bassuk and colleagues found 19.7% of children and adolescents had disruptive behavioral disorders. A review by Smartt and colleagues (2019) found seven studies from LMICs, which reported 8%–47.4% of the homeless samples had severe mental disorders. Another review by Duke and Searby reported that 29.1%–41.4% of homeless women had posttraumatic stress disorder, whereas Hodgson and colleagues found the prevalence of psychiatric comorbidity in posttraumatic stress disorder ranged from 48% to 80.9%. Moreover, 40%–67.3% of homeless individuals had co-existing substance use disorder and posttraumatic stress disorder. Such co-existence of multiple mental disorders and other clinical conditions was reported in several reviews (Depp et al., 2015; Duke & Searby, 2019; Hodgson et al., 2013; Smartt et al., 2019; Spence et al., 2004).

Discussion

Overview of synthesized findings of this umbrella review

To our knowledge, this is the first umbrella review reporting the overall prevalence of different mental disorders among people who are homeless. The synthesized findings from existing evidence-based reviews inform a high burden of depressive disorders, anxiety disorders, schizophrenia spectrum and psychotic disorders, bipolar and mood disorders, substance use disorders, suicidal behavior and self-injury, posttraumatic stress disorders, neurocognitive disorders and other psychiatric conditions. In addition to the adults, high prevalence rates were found among children and adolescents who are homeless. Fewer studies reported high prevalence rates of mental disorders among homeless women (Duke & Searby, 2019). Most reviews had a higher number of primary studies from high-income

countries, and the proportion of racial and ethnic minorities was higher in many reviews (Bassuk et al., 2015; Fazel et al., 2008; Schreiter et al., 2017; Spence et al., 2004). The prevalence rates were different across study samples, which necessitates an in-depth evaluation of the potential reasons contributing to such heterogeneity to better understand the findings of this review.

Psychiatric research on the homeless population is often constrained by several factors, which may have affected the existing evidence base in this domain. The working definition of homelessness may differ across contexts, which may affect the estimation of homeless individuals and evaluate any health problems among this mobile and vulnerable population (Fazel et al., 2014; Williams, 2017). For example, a study in the United States evaluated how changed definitions impacted estimations of homeless populations and found that a change in the definitions excluded nearly half of the chronically homeless individuals (Byrne & Culhane, 2015). Moreover, definitions and measurements of homelessness may also result in inaccurate estimations of mental health conditions. A study found that objectively defined homelessness was associated with higher rates of alcohol use and substance use disorders compared to subjectively reported homelessness (Eyrich-Garg et al., 2008). These differences are critical as the psychosocial epidemiology can be uniquely different among the included or excluded individuals based on such changes. It is essential to consider these issues while using the findings of this study as well as conducting future research in this domain.

Another issue is the changing definitions of mental disorders and instruments measuring the same, which may have resulted in different prevalence estimations across studies (Ayano, Tesfaw, & Shumet, 2019). Also, the low number of reviews and the median number of databases suggest a need to synthesize robust evidence from more data sources focusing on diverse mental health outcomes among homeless people.

The geographic and contextual focus of many studies provided evidence for those areas, whereas many nations with a high number of homeless populations may remain under-examined among the existing reviews, which include countries in South America, Sub-Saharan Africa and South Asia. This can be a result of a gap in evidence synthesis or a critical lack of primary studies conducted in those regions.

Furthermore, the co-existence of multiple mental disorders as well as physical comorbidity among the homeless with mental disorders highlights the severity of disability across samples (Depp et al., 2015; Duke & Searby, 2019; Hodgson et al., 2013; Spence et al., 2004). This may inform inadequate evidence if the primary studies measured only one or a few mental health conditions rather than a thorough evaluation of multiple health problems among the study samples.

Finally, limited evidence is found on how the mental health status changed among people before and after experiencing homelessness or how different the prevalence rates are between the homeless samples and the general population within the same geographic and sociocultural contexts. These issues should be considered to contextualize the findings of the current review and to inform future knowledge synthesis.

Implications for future research, policy development and practice

The findings of this review provide valuable insights to conduct future research, adopt appropriate policies and improve psychosocial care through better practice. First, longitudinal studies using standardized research instruments should be used to evaluate the mental health conditions and associated factors among homeless people, which may further improve the quantity and quality of knowledge in this area and inform evidence-based practice.

Second, psychopathological processes among socioeconomically marginalized populations who are vulnerable to homelessness should be examined. For example, people who experienced forced migration and associated psychosocial trauma may experience higher burden of mental disorders while living in temporary shelters or unstable social settings (Hossain & Purohit, 2018). It is essential to identify various psychosocial factors associated with mental health resilience and outcomes during homelessness, which may help in preventing mental disorders among homeless people through early psychosocial interventions (Hughes et al., 2010; Lee et al., 2011).

Third, it is necessary to examine how different mental disorders evolve over time and change their courses among homeless populations. Multiple psychiatric diagnoses among people who are already experiencing one or more neuropsychiatric conditions is a major global mental health concern (Hossain, Khan, et al., 2020; Hossain, Purohit, et al., 2020). In addition, homeless individuals generally experience instability in terms of residential, occupational, cultural, social and environmental aspects, which is likely to exert a compounding effect of psychosocial burden among those individuals. Therefore, the prognosis of mental disorders among homeless may not be similar to the general population living in comparatively stable conditions (Dawson & Jackson, 2013; Hodgson et al., 2013; Stubbs et al., 2019). Such variability among mental health prognosis may inform the psychiatrists, psychologists, social workers and other caregivers to provide adequate support based on the individual mental health needs.

Fourth, little is known about mental health-seeking behavior among homeless individuals. Identifying the barriers and facilitators of individuals and groups in terms of seeking mental care can be a potential research agenda for future studies, which may inform effective policy development in mental health. In this discourse, homelessness and associated mental health outcomes should be evaluated in respective contexts, especially how these constructs are defined and conceptualized in those places. It is necessary to assess and compare how such problems are different than the general population and what are the determinants of mental health in those contexts. Such contextualization of evidence may inform better decision-making to address mental health gaps across homeless populations.

Fifth, health services research should be conducted to examine how health systems and existing modalities of mental health care are equipped to address the burden of mental disorders among homeless people. This may require policy analyses and evaluations of mental health as well as social care programs to assess the effectiveness of the existing approaches, identify the gaps through rigorous research and address the same through evidence-based multipronged pharmacological and non-pharmacological interventions (Baxter et al., 2019; Fitzpatrick-Lewis et al., 2011).

Last but not least, improving the mental health outcomes among homeless people would necessitate addressing the underlying causes of homelessness and persistent psychosocial stressors (Embleton et al., 2016; Nooe & Patterson, 2010), which should be prioritized across communities and organizations. A meaningful partnership among major stakeholders can mobilize resources alleviating homelessness and improve mental health among homeless individuals.

Limitations

This umbrella review has several limitations. One such limitation is a potential selection bias as we did not search all the databases and excluded unpublished studies and reports. Another limitation is the publication bias within the scientific literature as less significant findings are less likely to get published, thus may not contribute to the evidence base. Moreover, we did not conduct a quantitative evaluation of the patient-level data, which could have eliminated between-study and within-study variations and provided uniform evidence of prevalence estimations across samples. However, this umbrella review was conducted using systematic guidelines involving more than two reviewers to ensure scientific rigor at each stage of review. Future evidence synthesis should address the existing limitations and advance the knowledge base in this domain.

Conclusion

Homelessness is a prevalent problem across societies with enormous psychosocial impacts on population health. This umbrella review systematically evaluated the current evidence on the prevalence of mental disorders among homeless people. The findings of this review inform a high

epidemiological burden of mental disorders in homelessness, which requires multi-level interventions to address the same. Moreover, future research should be conducted to improve the evidence base on psychopathological correlates, processes and outcomes associated with homelessness across populations. The current evidence on mental health problems warrants a better understanding of the underlying socioeconomic challenges that impact overall health and well-being. Nonetheless, the definitions of homelessness and mental health conditions continue to evolve across places and over time, which is a continued challenge for synthesizing knowledge and translating the same in practice. It is essential to acknowledge and address the methodological and contextual issues that may inform a better understanding of mental health among homeless populations. Finally, evidence-based insights should be translated to future policies, programs and services envisaging effective prevention, diagnosis and treatment of mental disorders among people who are homeless.

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Supplemental material

Supplemental material for this article is available online.

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