

Substance-related disorders in refugee populations – a scoping review

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1 Abstract

Background:

The numbers of refugees and asylum seekers worldwide are on the rise. Due to potentially traumatic experiences, various stressors before, during and after migration, and high prevalences of mental health disorders, they might be at risk for substance-related disorders (SRDs). Research on substance use among refugees and asylum seekers is growing but still points towards a limited knowledge and a dearth of interventions. A differentiation between subclinical use and disorders is still missing. This scoping review therefore aimed to synthesize evidence on substance-related disorders and on screening, prevention, and treatment interventions for refugees and asylum seekers.

Methods:

Seven medical, allied health and social science databases were searched from inception to July 2022 in accordance with the PRISMA-ScR and the JBI's (Joanna Briggs Institute) updated methodological guidance for scoping reviews to identify original peer-reviewed primary research articles investigating substance-related disorders in refugees and/or asylum seekers. A descriptive synthesis of evidence from qualitative and quantitative studies was conducted by comparing general study characteristics, examined concepts of disorders, investigated populations and study results regarding SRDs. Basic thematic coding of study results revealed ten areas of research.

Results: Thirty-six quantitative, two qualitative and three mixed-methods studies were identified. Available studies on SRDs are predominantly cross-sectional studies in High-income countries, investigate across settings of refugee camps, reception centers, or the general population, and apply various measures. Investigated concepts of disorders, as well as investigated refugee populations are extremely heterogeneous. Research predominantly focuses on disorders related to alcohol or unspecified substances and most studies estimate prevalences. Several possible risk and protective factors could be identified, many of them specific to the refugee experience. Less and partly inconclusive evidence is available for the comorbidity with other mental health disorders. Remaining areas of research are access to care, clinical correlates of admission to the Emergency Department, characteristics of dependent refugees, perceptions/beliefs around substances, reasons to consume, and possible preventive measures. Identified challenges for the research were linguistic and cultural barriers, possible underreporting, limited access to health care, and the population heterogeneity. Two unvalidated alcohol-related screening interventions for refugee populations were identified. No prevention or treatment interventions for SRDs could be identified.

Conclusion: Estimated frequencies of SRDs are very heterogeneous and hardly comparable due to the general heterogeneity in the existing research. After resettlement in High-income countries, refugees and asylum seekers tend to exhibit lower prevalences of SRDs than the natives, an effect which is called "the refugee paradox". But over time, rates seem to approach those of the natives. More rigorous and longitudinal research is needed to support and expand the limited evidence on the refugee paradox and the patterns of risk and resilience. Development and trajectories of SRDs should also be investigated over the entire course of the refugee experience and in low-income settings. Research points towards the need for culturally adapted screening, prevention and treatment interventions, but available evidence is sparse.

2 Introduction

2.1 A quick history on refugees and asylum seekers¹

The number of forcibly displaced people is on the rise worldwide. According to the United Nations refugee agency (UNHCR), the global number of forcibly displaced people exceeded the 100 million mark for the first time in 2022. As of mid-2024, there are approximately 122 million forcibly displaced people all over the world. Of those, 68.3 million are internally displaced people (IDPs), 37.9 million are refugees, and 8 million are asylum seekers (UNHCR 2024a).

UNHCR, formally known as the Office of the High Commissioner for Refugees, considers itself as the world's leading organization protecting those who flee. It was founded in 1950 in the aftermath of the Second World War and the millions of people who had consequentially lost their homes (UNHCR 2024c). UNHCR is guided by the 1951 Refugee Convention and its 1967 Protocol, which today form the centerpiece of international refugee protection and refugee law. With the 1951 Convention, the term "refugee" was legally defined for the first time: A refugee is someone who "owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of [their] nationality and is unable or, owing to such fear, is unwilling to avail [themselves] of the protection of that country; or who, not having a nationality and being outside the country of [their] former habitual residence, is unable or, owing to such fear, is unwilling to return to it" (UNHCR 2010).

Determining refugee status, that is if a person corresponds to this definition, is incumbent upon the Contracting State in which the person applies for recognition of refugee status. Refugee status not only ensures residence and protection in the receiving country, but also entitles to certain rights related to education, health care, housing, employment, and family among other issues. But UNHCR acknowledges that the process of determination is complex and varies between countries, and much thought has been given to various possible problems of interpretation. Furthermore, other regional instruments in Africa and the Americas have been developed, including the Organisation of African Unity (OAU) Convention Governing the Specific Aspects of Refugee Problems in Africa, which was enacted in 1969. In the OAU convention, the definition of a refugee is expanded beyond the scope of persecution and additionally includes "every person who, owing to external aggression, occupation, foreign domination or events seriously disturbing public order" flees from their country of origin (UNHCR 2019). In conclusion, the legal status of being a refugee can vary according to the different international instruments applied. In contrast to the 1951 convention, the UNHCR defines the term "refugee" in a broader sense and refers as refugees to all people "who have fled their countries to escape conflict, violence, or persecution and have sought safety in another country" (UNHCR 2024e). As a result, the term "non-Convention refugees" emerged, which includes refugees who may not satisfy the 1951 Convention refugee definition as currently interpreted but nevertheless are considered as refugees by UNHCR, e.g. war refugees. For those, industrialized states often provide protection as well under the term of "complementary protection" (Mandal 2005).

¹ As the individuals falling under those two terms share many similarities, this scoping review examines both refugees and asylum seekers, referring to them by using the broader term of "refugee populations".

Before receiving legal protection as a refugee according to the 1951 Convention or receiving complementary protection, individuals must make a formal request. Those individuals are called “asylum seekers” and fall under UNHCRs protection as well. According to the UNHCR, asylum seekers are people who have already requested refugee status or complementary protection and whose request has yet to be processed, and those who equally seek international protection, haven’t made a request yet but intend to do so. Hence, refugees and asylum seekers share many similarities but there is a conceptual difference: “Not all asylum-seekers will be found to be refugees, but all refugees were once asylum-seekers” (UNHCR 2024d).

2.2 General mental health of refugees and asylum seekers

Research has long emphasized the various stressors and potentially traumatic events and the subsequent mental health problems that refugees and asylum seekers face. Research on the mental health of refugees began in the 1970s, when pioneering studies in the United States, Canada, Norway and Southeast Asia investigated symptom levels of anxiety and depression amongst Indochinese refugees. After 1980, when the diagnosis of post-traumatic stress disorder (PTSD) was included for the first time in the third version of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III), the “modern era of research in the refugee field” began (Silove et al. 2017). An ever growing body of literature emerged, leading to the first two systematic reviews focusing on the mental health of refugees, which both were published in 2005 (Silove et al. 2017). The first one was a meta-analysis conducted by Fazel et al. (2005) in response to very diverging prevalence estimates of PTSD and major depression and a subsequent discussion whether low estimates might neglect refugees’ mental health needs or whether high estimates might add to the stigma and to inappropriate assumptions about the degree of disability associated with those disorders. Fazel et al. (2005) only included adult refugees resettled in High-income countries (HICs). As they found prevalences of 9% for PTSD, 5% for major depressive disorder, 4% for generalized anxiety disorder, and 2% for psychotic illness, they concluded that their estimates were “much lower than some frequently recited claims”. The second meta-analysis by Porter and Haslam (2005) compared refugees globally with non-refugee populations and showed that refugees had a modestly elevated risk for a range of adverse mental health outcomes. Additionally, they found that pre-displacement factors (being older, being female, from rural background, well educated, and coming from a higher socio-economic status) and post-displacement factors (living in institutional accommodations, restricted economic opportunities, being internally displaced or involuntarily repatriated, and coming from a country whose conflict was unresolved) were associated with worse mental health outcomes. Porter and Haslam (2005) specifically stressed the importance of post-migration factors in regard to refugees’ mental health. They criticized that due to the “historical focus on the acute stressors of war” and due to the reduction of refugees’ psychopathology to a posttraumatic reaction, other important dimensions of the refugee experience had been neglected so far. Consequentially, other stressors that might accumulate or show up in variable patterns over the migration phase should be recognized as well and “multiple dimensions of psychopathology beyond those that are narrowly posttraumatic” should be considered.

Since the beginning of research on refugees’ and asylum seekers’ mental health, a multitude of stressors has been named that those populations face and that might put them at an increased risk for mental health disorders. Often, researchers have

divided them into pre-, peri- and post-migration factors, or pre-flight, during flight, and post-flight factors (Henkelmann et al. 2020, Kirmayer et al. 2011, Priebe et al. 2016). This categorization is not entirely precise as the same or similar factors can happen in the pre-migration as well as in the peri- or post-migration phase. One example might be the probably most named stressor that refugees and asylum seekers face, which is exposure to trauma or to potentially traumatic events. Historically, research on refugees was based on the “war exposure model” which situated the traumatic experiences of violence, terror and loss within the pre-migration context (Miller and Rasmussen 2017). But traumatic experiences can happen equally during the flight (Mangrio et al. 2018, Pfeiffer et al. 2022, Lindert et al. 2016), as well as after the flight or after resettlement (Marshall et al. 2005, Jensen et al. 2019). To grasp the scope of adverse experiences and conditions that refugees and asylum seekers face, and to understand the subsequent impact on the mental health, common stressors named in the research will be given without any claim to completeness:

Pre-migration stressors include war and armed conflicts, torture, persecution, imprisonment, malnutrition, physical assault, rape, economic hardship, the loss of homes, livelihoods and properties, and disruption of core attachments to family, friends and cultural systems (Henkelmann et al. 2020, Priebe et al. 2016, Patane et al. 2022, Lindert et al. 2016). Peri-migration stressors comprise physical harm, including sexual violence, infectious diseases, extortion and human trafficking, life-threatening conditions, being enclosed or traveling long distances on foot, separation from family members and support networks, uncertainty about migration outcome, and being humiliated and/or betrayed (Priebe et al. 2016, Lindert et al. 2016, Kirmayer et al. 2011). Post-migration stressors include difficulties in integration or acculturation difficulties, reduced social integration, marginalization, discrimination, family separation, worries about family members left behind, increased family violence, loss of social support leading to social isolation, loneliness, socioeconomic disadvantages, loss of social status, unemployment, poverty, uncertainty about the future, feelings of hopelessness, and “cultural bereavement”. Furthermore they also include the failure of the migration project, a limited or complete lack of access to basic resources, e.g. food or medical care, and a lack of safety in refugee camps (Blackmore et al. 2020, Henkelmann et al. 2020, Patane et al. 2022, Porter and Haslam 2005, Priebe et al. 2016, Miller and Rasmussen 2017, Kirmayer et al. 2011). The body of research focusing on asylum seekers underlined the importance of post-migration stressors as specific post-migration stressors for asylum seekers were found, such as prolonged detention, insecure residency status, challenging refugee determination procedures, the uncertainty about the outcome, restricted access to services, and lack of opportunities to work or study. Those also were found to compound the effect of past traumatic experiences on PTSD and depression symptoms (Silove et al. 2017). In light of the multitude and magnitude of stressors that refugees and asylum seekers face, research on mental health expanded further and several more systematic reviews were published. This led to the first umbrella review of systematic reviews summarizing prevalence estimates of common mental disorders and efficacy of psychosocial and pharmacological interventions in asylum seekers and refugees in 2017 (Turrini et al. 2017). In this umbrella review, thirteen reviews reporting data on the prevalence of PTSD or trauma-related symptoms, anxiety and depressive symptoms could be identified. Turrini et al. found that the three reviews conducted with refugees and asylum seekers resettled in low- and middle-income

countries (LMICs) yielded very wide and imprecise prevalence estimates. Five reviews were identified with populations resettled in HICs, with the first systematic review by Fazel et al. (2005) providing the lowest estimates. Other reviews provided very heterogeneous estimates which ranged from 8% (Slewa-Younan et al. 2015) to 54% (Bronstein and Montgomery 2011) for PTSD, 3% (Bronstein and Montgomery 2011) to 100% (Robjant et al. 2009) for depression, and 12% (Alemi et al. 2014) to 77% (Robjant et al. 2009) for anxiety. Five other systematic reviews were available for refugees resettled globally. Two of them were meta-analyses and calculated prevalences of 44% for depression, 40% for anxiety and 36% for PTSD (Lindert et al. 2009) or a prevalence rate of 31% for both depression and PTSD (Steel et al. 2009). In conclusion, Turrini et al. emphasized the extreme heterogeneity of prevalence rates, which might be due to methodological factors (different study design and sampling, inconsistent diagnostic criteria, questionable transfer of instruments to non-western populations) and clinical factors (different cultural groups, home countries, host countries, reasons for migration, lengths of stay, and exposure to post migration stressors). Even most recently, several new systematic reviews and meta-analyses have been published with the aim to determine prevalence estimates of mental health disorders (Morina et al. 2018, Charlson et al. 2019, Blackmore et al. 2020, Henkelmann et al. 2020, Patane et al. 2022). Meta-analyses provided prevalence estimates of 28% for anxiety disorders, 36% for depression, and 29% for PTSD for refugees resettled in HICs (Henkelmann et al. 2020) and a prevalence estimate of 22.1% for any mental disorder (15.3% depression and 10.8% PTSD) for conflict-affected persons resettled in LMICs (Charlson et al. 2019). Two meta-analyses for refugees and asylum seekers globally provided prevalence estimates of 31.5% and 32 % for major depression/depression, 31% and 31.46% for PTSD and 1% and 1.51% for psychotic disorder (Blackmore et al. 2020, Patane et al. 2022). Prevalence for bipolar disorder was 5% (Patane et al. 2022) and prevalence for anxiety disorders was 11% (Blackmore et al. 2020). In summary, the current research on epidemiological data suggests that mental health disorders have a high prevalence in refugees and asylum seekers (Turrini et al. 2017, Charlson et al. 2019) and many researchers assume that the prevalence is higher than in non-refugee populations (Lindert et al. 2016, Henkelmann et al. 2020), especially for PTSD and depression (Blackmore et al. 2020, Patane et al. 2022). Recent evidence also suggests higher prevalence of bipolar and psychotic disorder compared to the general population (Patane et al. 2022). But overall, a substantial heterogeneity in prevalence estimates persists. Apart from the aforementioned methodological and clinical factors that could influence prevalence estimates (Turrini et al. 2017), researchers also have emphasized the importance of cultural adaptation and validation of assessment instruments to linguistically and culturally diverse groups which should be done in the future to provide more reliable estimates (Morina et al. 2018, Charlson et al. 2019, Blackmore et al. 2020). Furthermore, the use of interview-based diagnostic assessments seems more recommendable because self-assessment instruments might have led to artificially high prevalences (Patane et al. 2022, Charlson et al. 2019, Henkelmann et al. 2020). Researchers also have pointed out that there is a paucity of longitudinal studies, which means that knowledge on the trajectories and possible persistence of mental health disorders is very limited (Miller and Rasmussen 2017, Silove et al. 2017). Finally, post-migration stressors still seem to be underexplored although they can be equally influential as pre-migration trauma and may moderate or aggravate trauma-related symptoms (Henkelmann et al. 2020, Hynie 2018).

With the rather recent recognition of the importance of post-migration stressors, a shift in the research perspective happened: An ecological model of refugee distress was proposed to “expand [...] the view beyond the field’s historical focus on war exposure” (Miller and Rasmussen 2017). Displacement-related stressors should equally be considered as determinants of mental health and Miller and Rasmussen conclude that there is a “mutually influential relationship between the effects of war exposure and post-migration stressors”, as trauma affects the ability to deal with daily stressors and post-migration environment plays a critical role in dealing with trauma. Miller and Rasmussen’s model is in line with the demands of scientists who have been calling for a more holistic psychosocial approach for several years. It also presents refugee mental health more as a continuum of stress and subsequent symptoms, where psychological and social functioning is more than absent psychopathology. Additionally, identifying modifiable social determinants of refugee mental health provides targets for socio-culturally-sensitive promotive and preventive interventions (Purgato et al. 2017).

Recent research has tried to identify and conceptualize “daily stressors” which, compared to stressful life events or potentially traumatic experiences, are “usually defined as less severe, but on-going and pervasive stressors” (Miller and Rasmussen 2017). Daily stressors impact mental health and are associated especially to symptoms of depression and anxiety. One way to order them could be to categorize them into material stressors, social stressors, and social exclusion stressors (Behrendt et al. 2023).

As a response to the high mental health burdens that refugees and asylum seekers face, research has focused on interventions as well. Turrini et al. (2017) could identify fourteen reviews that reported data on the efficacy of psychotherapeutic or pharmacological interventions. Mostly, psychotherapeutic interventions such as the narrative exposure therapy and the cognitive behavioral therapy (CBT) were investigated and while many studies focused on PTSD and suggested that those interventions are effective in decreasing PTSD symptoms, less studies focused on depression and anxiety and those presented an inconclusive picture. Turrini et al. (2017) concluded that so far, mental health guidelines or policies do not address the specific needs of refugees and asylum seekers. They called for more research to expand the knowledge about efficacy of interventions and suggested that evidence-based guidelines applicable in diverse contexts and countries should be developed. In the global research on mental health interventions for refugees, the use of brief, structured, manualized psychotherapeutic packages has been recommended and tested. Often, these packages use standard cognitive behavioral components and offer several advantages: they can be adapted to local cultures, allow rapid training of front-line personnel, and allow task-shifting, which is the transfer of skills from professionals to lay workers (Silove et al. 2017). Additionally, transdiagnostic approaches seem recommendable as the same underlying principles are applied across different mental disorders, not restricting the intervention to one specific disorder and not requiring making differential diagnoses, but instead addressing comorbidity (Dawson et al. 2015). Apart from psychotherapeutic interventions, the use of psychosocial interventions has been recommended to address social determinants of refugee mental health. For example, they can rebuild a sense of connectedness, rebuild social networks or promote self-help activities (Silove et al. 2017). Interest in the efficacy and applicability of interventions in refugees and asylum seekers remains and it seems like recent meta-analyses show stronger evidence. Turrini et al. (2019) found both psychotherapeutic and psychosocial

interventions to be effective in reducing PTSD, depressive and anxiety symptoms. Another meta-analysis equally found psychotherapeutic interventions to be effective in reducing symptoms of PTSD and depression while applying a more rigorous design than other meta-analyses beforehand (Kip et al. 2020). Finally, a Cochrane overview of systematic reviews in 2020 found 23 completed reviews and 15 protocols of reviews on the promotion of mental health as well as prevention and treatment of disorders (Uphoff et al. 2020). The study authors concluded that most reviews focused on psychotherapeutic interventions. Also, there was more evidence on interventions for PTSD or trauma-related symptoms in adults or refugees of any age, but less evidence for children, people with depression or anxiety, and for prevention or mental health promotion. Despite the high needs of refugees and asylum seekers and growing evidence on efficacy and applicability of interventions, providing adequate and sustainable mental health care remains a challenge, especially in LMICs and conflict-settings where only very limited resources are available (Silove et al. 2017).

Apart from research on epidemiology and interventions, other topics related to the mental health of refugees and asylum seekers are explored as well. Among other things, barriers and access to mental health care in refugees resettled in HICs as well as living in LMICs emerged as one topic of interest (Dumke et al. 2024, Satinsky et al. 2019, Priebe et al. 2016, Byrow et al. 2020). Researchers outline how refugees and asylum seekers face a number of significant barriers which often are rooted in their cultural and refugee-specific background and for example include mental health related stigma, low awareness, variant help-seeking behaviors, lack of trust and concerns about confidentiality (Satinsky et al. 2019). But also, structural barriers like financial strain, language proficiency and unstable accommodation lead to underutilization (Byrow et al. 2020) and supply-side factors including system structures and attitudes of service providers have to be acknowledged more (Dumke et al. 2024).

Another debate focuses on the differences between the western perceptions of mental health (for which assessment instruments and interventions predominantly have been designed) and refugees' and asylum seekers' perceptions. Researchers subsequently have called out the need for cultural adaptation. There are systematic reviews that examine the cultural adaptation of non-pharmaceutical interventions for PTSD and its effect on trauma and depression symptoms (Naseh et al. 2019, Wright et al. 2020). A more recent systematic review posits that cultural adaptation should exceed the minimum standard of simply translating and facilitating access, and instead should also suit cultural patterns, meanings or values (McDermott et al. 2024). Especially for culturally adapted CBT interventions and other psychotherapies, researchers could find moderate to large effects across measures of psychological distress, but also concluded that more research is needed to expand the knowledge on cultural adaptation of different interventions, provision in different settings and their acceptability (McDermott et al. 2024).

2.3 Research on substance use in refugees and asylum seekers

Until recently, it has been often criticized that research on refugees' and asylum seekers' mental health predominantly focuses on PTSD, followed by depression and anxiety disorders, but that other disorders are being neglected (Turrini et al. 2017, Morina et al. 2018). One domain of mental health that has received less attention so far comprises substance-related disorders (SRDs). Before illustrating the current

state of research on SRDs in refugees and asylum seekers, a quick explanation on the history and nomenclature of SRDs is given:

The terminology around substance-related problems has changed over time. Earliest terms included “addiction”, as well as “drug habituation”. In 1964, the WHO proposed to replace those terms with the newer term of “substance dependence”, as research on alcohol suggested that dependence could be conceptualized as a cluster of symptoms that occurred in heavy users and that could be distinguished from substance-related problems. Therefore, the diagnosis of dependence was distinguished from a secondary diagnostic category, which refers to substance use that caused social or health related harm and is called abuse or harmful use (Degenhardt et al. 2019). Today, the International Classification of Diseases (ICD) and the Diagnostic and Statistical Manual of Mental Disorders (DSM) are the two most widely used psychiatric classification systems. Both systems have treated dependence and abuse/harmful use hierarchically: only if the more severe diagnosis of dependence could not be diagnosed, harmful use or abuse could be diagnosed (Hasin et al. 2006). Although the most recent version of the ICD (ICD-11) has introduced several changes, it retained the bidimensional model of harmful use and dependence (Saunders et al. 2019, Arnaud and Thomasius 2021). Changes in the recent version of the DSM are more drastic. With the introduction of the DSM-V in 2013, the distinction between the concepts of dependence and abuse in the former DSM-IV has been given up for the new diagnosis “substance use disorder” (SUD). The diagnosis of substance use disorder combines the criteria for abuse and dependence and can be rated in its severity according to the number of criteria met (Hasin et al. 2013). Knowing the different diagnoses related to substances and their development over time is essential for understanding that there are different diagnostic entities that vary conceptually. Furthermore, diagnostic entities should be distinguished from umbrella terms. One umbrella term used throughout the scientific literature is the term “substance use disorders” (SUDs). SUDs comprise all different diagnoses of dependence, abuse and harmful use of the two systems ICD and DSM (Hasin et al. 2013, Schuckit 2009). The umbrella term “substance related disorders” (SRDs) is mentioned in the DSM and comprises the two main groups of disorders related to psychoactive substances: substance use disorders and substance-induced disorders. The category of substance-induced disorders includes intoxication, withdrawal and other substance-induced disorders (e.g. psychotic, bipolar, depressive, obsessive-compulsive and anxiety disorder, also sleep disorder, sexual dysfunction, delirium, and neurocognitive disorder) (American Psychiatric Association 2013). In this review, the term substance-related disorder (SRD) will be used as an umbrella term, referring to substance use disorders and substance-induced disorders alike and regardless of whether the respective disorders are defined by the ICD or DSM (see 3.3). Researchers repeatedly have emphasized that refugees and asylum seekers could be vulnerable to substance use and SUDs. First, refugees and asylum seekers show high prevalences of PTSD, anxiety disorders, and depressive disorders. Especially for PTSD, research has shown a strong association to SUDs. It is assumed that there is a bidirectional link between PTSD and SUD. Having one disorder increases future risk for the other, but the effect seems to be stronger for PTSD’s risk on future SUD (Amstadter et al. 2023, Roberts et al. 2022, Volkow and Blanco 2023). Several other theories have also been named, how PTSD could induce SUD and vice versa. The self-medication theory, which is the most prominent theory, assumes that substance use is negatively reinforced because it alleviates PTSD symptoms (Brady et al. 2021).

Additionally, research has shown that PTSD and SUD share similar etiological factors and exposure to those common factors can induce both disorders (Brady et al. 2021, Sloboda et al. 2012). Similarly, frequent comorbidity between SUDs and depression as well as anxiety disorders has been established, with the same bidirectional link and also common genetic vulnerability and common environmental risk factors contributing to the high degree of comorbidity (Volkow and Blanco 2023). Consequentially, researchers have postulated that refugees and asylum seekers might show higher substance use (Horyniak et al. 2016, Ezard 2012, Saleh et al. 2023) and harmful alcohol use (Lo et al. 2017, Weaver and Roberts 2010) because of their high prevalence of other mental health disorders. Second, researchers also suspect refugees and asylum seekers to be at a higher risk for substance use (Horyniak et al. 2016, Lemmens et al. 2017, Saleh et al. 2023) and harmful alcohol use (Lo et al. 2017, Weaver and Roberts 2010) due to the high amounts of potentially traumatic events and the multitude of stressors they face prior, during and after displacement.

Hence, substance use or harmful alcohol use in refugee populations has been described as a coping-mechanism to deal with trauma and other stressors or as a self-medication of symptoms (Ezard 2012, Horyniak et al. 2016, Lemmens et al. 2017, Saleh et al. 2023, Weaver and Roberts 2010).

While research on substance use in forcibly displaced people is still in its infancy (Greene 2023), a considerable body of research has emerged for immigrants (Salas-Wright and Schwartz 2019). Along with other mental health and behavioral problems, immigrants in the US and in other top immigrant receiving countries seem consistently to be at a lower risk for substance use and misuse. This phenomenon is called “the immigrant advantage” and several theories have been postulated for that effect. The most prominent one is the “healthy migrant hypothesis” (Salas-Wright and Schwartz 2019), also called “healthy immigrant effect” or “Immigrant Paradox” (Elshahat et al. 2022). According to the theory, migration is not random, but a positive selection of healthy immigrants into the receiving country at an individual and a national level. Those who are motivated, psychologically healthy and focused on long-term priorities are more likely to successfully migrate (Elshahat et al. 2022, Salas-Wright and Schwartz 2019). Regarding refugees and asylum seekers, conflicting opinions exist: whereas some researchers have postulated that refugees equally have lower rates of SUDs compared to the US native population and called it “the refugee paradox” (Salas-Wright and Vaughn 2014), other researchers have speculated that the healthy immigrant effect might be reduced (Lemmens et al. 2017) or unlikely (Horyniak et al. 2016) for refugees and asylum seekers due to the forcedness of their migration and different migration experiences. Two systematic reviews have been conducted on harmful alcohol use in individuals forcibly displaced by conflict or persecution (Weaver and Roberts 2010) and in conflict-affected civilians in LMICs (Lo et al. 2017). Although both reviews focused on harmful alcohol use, which is a disorder according to the ICD, harmful alcohol use was used as an umbrella term and the reviews rather focused on simple alcohol use by mainly including studies that measured subclinical use. Lo et al. (2017) mentioned that the “varied definitions of harmful alcohol use” posed a problem.

Three systematic reviews (Ezard 2012, Horyniak et al. 2016, Saleh et al. 2023) and one literature overview (Lemmens et al. 2017) examined substance use in slightly different populations, such as populations displaced by conflict, forced migrants, and refugees and asylum seekers. Especially noteworthy is the comprehensive systematic review by Horyniak et al. (2016). The authors found the prevalences of

alcohol and drug use in forced migrants to be very heterogeneous and comparisons to non-forced migrants remained inconclusive. Prevalences of disorders were equally heterogeneous, ranging from 4%-36% for hazardous/harmful alcohol use, <1%-42% for alcohol dependence and from 1%-20% for drug dependence. Correlates of substance use were male sex, trauma experience, and poor mental health.

Although several reviews on substance use in refugees and asylum seekers exist, they are partly outdated (Ezard 2012, Weaver and Roberts 2010). Furthermore, all reviews predominantly include studies that examine simple substance use and not clinical disorders. Apart from one systematic review (Horyniak et al. 2016), reviews don't distinguish between subclinical use and disorders (Ezard 2012, Lemmens et al. 2017, Lo et al. 2017, Saleh et al. 2023, Weaver and Roberts 2010). The intermingling of the different concepts of substance use on the one hand and clinical disorder on the other hand might be due to the fact that the terminology around substance use in general, but especially concerning migrants, asylum seekers and refugees is not well defined or clearly operationalized (Lemmens et al. 2017). Additionally, pre-existing systematic reviews focused on heterogeneous populations and often did not differentiate between IDPs and asylum seekers/refugees (Ezard 2012, Horyniak et al. 2016, Lo et al. 2017, Weaver and Roberts 2010) or included other populations, such as residents staying in conflict-settings (Lo et al. 2017) or people fleeing natural disasters and deportees (Horyniak et al. 2016). The only systematic review focusing strictly on refugees exclusively summarized qualitative research (Saleh et al. 2023). To the best of this author's knowledge, no other review has been published on SRDs in refugees and/or asylum seekers. But researchers have emphasized the multitude of harmful consequences of substance use, including social and legal problems, mental and physical disorders (Lo et al. 2017, Saleh et al. 2023, Horyniak et al. 2016). And while research is growing, it is still unknown whether forcibly displaced people present a higher or a lower prevalence of SUDs (Greene 2023) and researchers have reiterated the need for more research around substance use in refugees and asylum seekers (Roberts and Ezard 2015, Weaver and Roberts 2010, Horyniak et al. 2016). Finally, the lack of evidence regarding interventions for substance use and SUDs in refugees and asylum seekers has been emphasized as well (Horyniak et al. 2016, Saleh et al. 2023, Ezard 2012, Lo et al. 2017).

2.4 Study aim

Given the ever-rising numbers of refugees and asylum seekers worldwide, their potential risk for SRDs and related harmful consequences, and the apparent dearth of research, this scoping review aimed to expand the current knowledge on SRDs in refugees and asylum seekers. All available evidence on SRDs in refugees and asylum seekers was summarized with the intention to clearly distinguish between mere substance use and clinical disorder. Furthermore, this scoping review only focused on refugees and asylum seekers, as those share similarities through the adverse events they endured and the forcedness of their migration but face different conditions than local residents or IDPs because they are internationally displaced (Priebe et al. 2016). UNHCR's definition of refugees and asylum seekers was applied (see 2.1). Because of the following reasons the approach of a scoping review was chosen to investigate the topic of interest: As no other review on SRDs in refugees/asylum seekers could be identified, the scope of the body of literature so far remains unclear. Due to the emerging relevance of this topic, it was also

expected that new studies on SUDs or SRDs would have been published since the last comprehensive systematic review on substance use (Horyniak et al. 2016). Furthermore, researchers have emphasized the heterogeneity of the available studies on substance use in refugees and asylum seekers (Horyniak et al. 2016, Lo et al. 2017). The approach of a scoping review was chosen, because “scoping reviews are an ideal tool to determine the scope or coverage of a body of literature on a given topic” and “are useful for examining emerging evidence when it is still unclear what other, more specific questions can be posed and valuably addressed by a more precise systematic review” (Munn et al. 2018). As scoping reviews “are now seen as a valid review approach for certain indications”, Munn et al. (2018) defined six possible indications for conducting a scoping review. Two of those indications, which were “identifying the types of available evidence” and “clarifying key concepts or definitions used in the literature”, were not pursued in this scoping review as only evidence of primary research was included and no unclear concept was evaluated. Instead, the remaining four indications were of interest for this scoping review, which are: examining how research is conducted on a certain topic, identifying key characteristics related to a concept, identification and analysis of knowledge gaps, and conducting a scoping review as a precursor to a systematic review. Following the argumentation of Munn et al. (2018), this scoping review therefore aimed to a) examine how research on SRDs in refugees and asylum seekers is conducted, b) identify characteristics related to SRDs in refugees and asylum seekers, c) identify and analyze knowledge gaps, and d) summarize evidence as a possible precursor to a systematic review.

The following research questions were defined:

- What specific characteristics (e.g. type of substance and disorder, prevalence, comorbidities, etc.) have alcohol- and drug-related disorders in refugee populations (e.g. regarding country of origin, sociodemographic factors, compared to other populations)?
- Which interventions (screening, prevention, and treatment) have been developed for SRDs in refugees and asylum seekers?
- What are the knowledge gaps around SRDs in refugees and asylum seekers?

While this scoping review was conducted, two other reviews were published that partly explored the topic of interest: One scoping review investigated substance abuse and related interventions in refugee youth (Aleer et al. 2023). But first, this scoping review was limited to adolescents and second, the term “abuse” was used as an umbrella term as well and no distinction was made between use and disorder. Because this scoping review aimed at including all ages, as well as asylum seekers, and aimed at clearly focusing on SRDs, its results were still expected to be of relevance. A second, narrative review was published that aimed to identify and categorize syndemic risks of forced displacement and SUDs (Elkholy et al. 2023). While this review acknowledged that evidence was drawn mostly from “studies focusing on any substance use rather than the development of SUDs”, their syndemic categorization of risk and protective factors offers a new perspective which will be included when discussing the results of this scoping review.

3 Methods

3.1 Scoping review methodology

Scoping review methods were proposed by Arksey and O'Malley already in 2005 (Arksey and O'Malley 2005) but at that point in time, methods and definitions were still unclear. In 2015, the Joanna Briggs Institute (JBI) therefore published a first methodological guidance for the conduct of scoping reviews (Peters et al. 2015). The JBI aimed to provide a guidance so that scoping reviews could be rigorously conducted, transparent, and trustworthy (Peters et al. 2020). With the introduction of the Preferred Reporting Items for Systematic Reviews extension for Scoping Reviews (PRISMA-ScR) in 2018 (Tricco et al.), the JBI published an updated version of the methodological guidance for the conduct of scoping reviews (Peters et al. 2020). As recommended by the authors, this scoping review uses both the updated JBI methodological guidance and the PRISMA-ScR in tandem. The PRISMA-ScR Checklist for this scoping is found in the Appendix.

3.2 Protocol

A preliminary protocol for this scoping review was developed. Shortly afterwards, the best practice guidance for the development of scoping review protocols was published by members of the JBI Scoping Review Methodology Group (Peters et al. 2022). This guidance aims to help study authors with developing a priori study protocols “as a way of enhancing transparency and, thus, the utility and trustworthiness of the resulting review” and includes a checklist of recommended items to report. Therefore, the existing study protocol was revised and changed to be fully compliant with the best practice guidance for the development of scoping review protocols. The final version of the study protocol is found in the Appendix.

3.3 Eligibility criteria

The Eligibility criteria of the present review are based on the PCC-framework (population, concept, context), which is recommended for scoping reviews (Peters et al. 2020, Tricco et al. 2018).

Population: Studies with participants who were either refugees or asylum seekers according to UNHCR's definition or both were included. If the study population additionally comprised other participants as well, studies were included if disaggregated data was presented or if at least 51% of the population consisted of refugees or asylum seekers. Studies that didn't include refugees/asylum seekers were excluded and studies with mixed populations were excluded when data was not disaggregated or when percentage of refugees/asylum seekers was <51%.

Concept: Articles that aimed at studying substance-related disorders as a primary objective were included. Substance-related disorders should therefore be diagnosed or at least be likely to be diagnosed under the following categories of the ICD or the DSM (DSM-V: Substance use disorder/substance-induced disorders, DSM-IV, DSM-IV-TR: Substance abuse/substance dependence, DSM-III: substance use disorders, DSM-III-R: psychoactive substance use disorders, ICD-11: Disorders due to substance use/substance-induced mental disorders, ICD-10: Mental and behavioral disorders due to psychoactive substance use, ICD-9: Alcohol dependence syndrome, Drug dependence, Nondependent abuse of drugs). Studies that investigated simple drug use or concepts related to substance use that were not equivalent to disorders were excluded. Articles that studied substance-related

disorders as a secondary objective or covariate were also excluded. Studies which solely investigated disorders related to nicotine, smoking, tobacco, or caffeine were also excluded.

Context: Studies that exclusively investigated IDPs or refugees/asylum seekers which had not left their home countries were excluded.

Study design: Regarding the high heterogeneity which was to be expected in this field of research and to answer the research questions in an evidence-based manner, only primary research was of interest. Therefore, all quantitative, qualitative or mixed-methods studies were included. Articles with only secondary data (reviews, letters, editorials, comments, book reviews, monographs, opinion pieces, notes, conference abstracts) were excluded. Case reports were excluded as well. Only articles from peer-reviewed journals were included.

Languages: Due to limited resources, only articles which were written in English or German could be included. Full-text articles in other languages were excluded.

Accessibility: Only full-text versions of all articles were included. If the full text was not accessible by authors via institutional access, studies were excluded.

3.4 Information sources and search strategy

A systematic literature search was conducted in seven medical, allied health and social sciences databases. Following databases were searched: Medical Literature Analysis and Retrieval System Online (MEDLINE), EMBASE, Cumulative Index to Nursing and Allied Health Literature (CINAHL), APA PsycInfo, Science Citation Index Expanded (SCIE), Social Sciences Citation Index (SSCI), Cochrane database. A detailed search string was developed, using a broad range of key terms and synonyms which proved to be of interest regarding the applied PCC-criteria. Additionally, thesauri of all databases were checked and all terms relevant to the PCC-criteria were added to the search string. Because the included databases used different thesauri, 6 different search strings were developed eventually. The final search strategies are presented in the Appendix. The systematic literature search was conducted in English, but no limitations regarding language, time or study design were set. All articles published until July 18th, 2022 were included. Reference lists of all included articles were examined for further articles of interest.

3.5 Study selection process

All search results retrieved from the systematic literature were imported into Endnote. A deduplication of all search results was conducted in Endnote. To identify eligible articles for this scoping review, deduplicated search results were screened in a two-staged screening process, applying the predefined eligibility criteria. For the first screening stage, all deduplicated search results were uploaded to Rayyan, an online literature review software. Screening of title and abstract was done independently by the two reviewers F.G. and M.L.. All discrepancies were solved through discussion until consensus was reached. If neither inclusion nor exclusion was possible due to missing information, articles were moved to the second screening stage. For the second screening stage, all remaining articles were uploaded to Covidence, an online software tool for conducting systematic reviews. Full text screening of all articles was done independently by researchers F.G. and M.L. and any discrepancies were solved through discussion until final consensus was reached. References of all included articles were screened for further studies of interest. Additionally identified studies were evaluated for possible inclusion and

discussed by both researchers M.L. and F.G. until a unanimous decision could be taken.

3.6 Data extraction

Extracting all relevant data from the included sources of evidence is called “data charting” in scoping reviews, but to be consistent with other evidence synthesis approaches, it can also be called “data extracting” (Peters et al. 2020). For consistent and structured data extraction, the data extraction tool “Extraction 2” in Covidence was used. The tool provides each reviewer with a consistent data extraction form which then can be used on every included study. Extracted data can be put into the form and saved online with every reviewer only being able to see their own forms. Only after submission of filled out forms to consensus, a designated reviewer can see and compare all extraction forms and decide which data will be extracted finally. For this scoping review, the data extraction form was piloted independently by researchers F.G. and M.L. on a random sample of five included articles and modified as required based on discussions between both researchers. Data extraction was done by a team of four researchers (F.G., M.L., I.P., L.E.) with each study being assessed independently by two persons. Researcher F.G. extracted data from all included studies, the other researchers assigned themselves randomly to assess a subset of included studies. After all studies were assessed and data had been extracted by two reviewers, submitted forms were compared in Covidence to reach a consensus. This was done by researchers F.G. and M.L. who discussed disagreements regarding discrepancies in the data extraction until a consensual decision could be taken. Finally, raw data was downloaded from Covidence and transferred to Excel for formatting and generating charts to present the final data.

3.7 Data items

Several data items which were of interest for this scoping review were predefined and respective data was charted from each included study. First, data related to the general study characteristics was extracted, as it is recommended for scoping reviews (Tricco et al. 2018). Data items regarding general study characteristics were: First author and year; study aim; country where study was conducted, study setting (where and how study took place and information regarding living conditions of participants); study design; sampling method; data collection method (information on the person acquiring the data and on the method of acquiring it); measures for substance-related disorders; other outcomes and their measures; examined sociodemographic variables; total sample size and number and percentage of refugees/asylum seekers; study funding and funding source. Second, data relevant to the research questions of this scoping review was extracted. Data items comprised: investigated substances and substance-related disorders, description of study participants, age and sex distribution of participants, country of origin, subgroups of participants and comparison groups, definition of refugee or asylum seeker status, all study results regarding substance-related disorders, main study conclusions regarding substance-related disorders, and study limitations mentioned.

3.8 Data synthesis

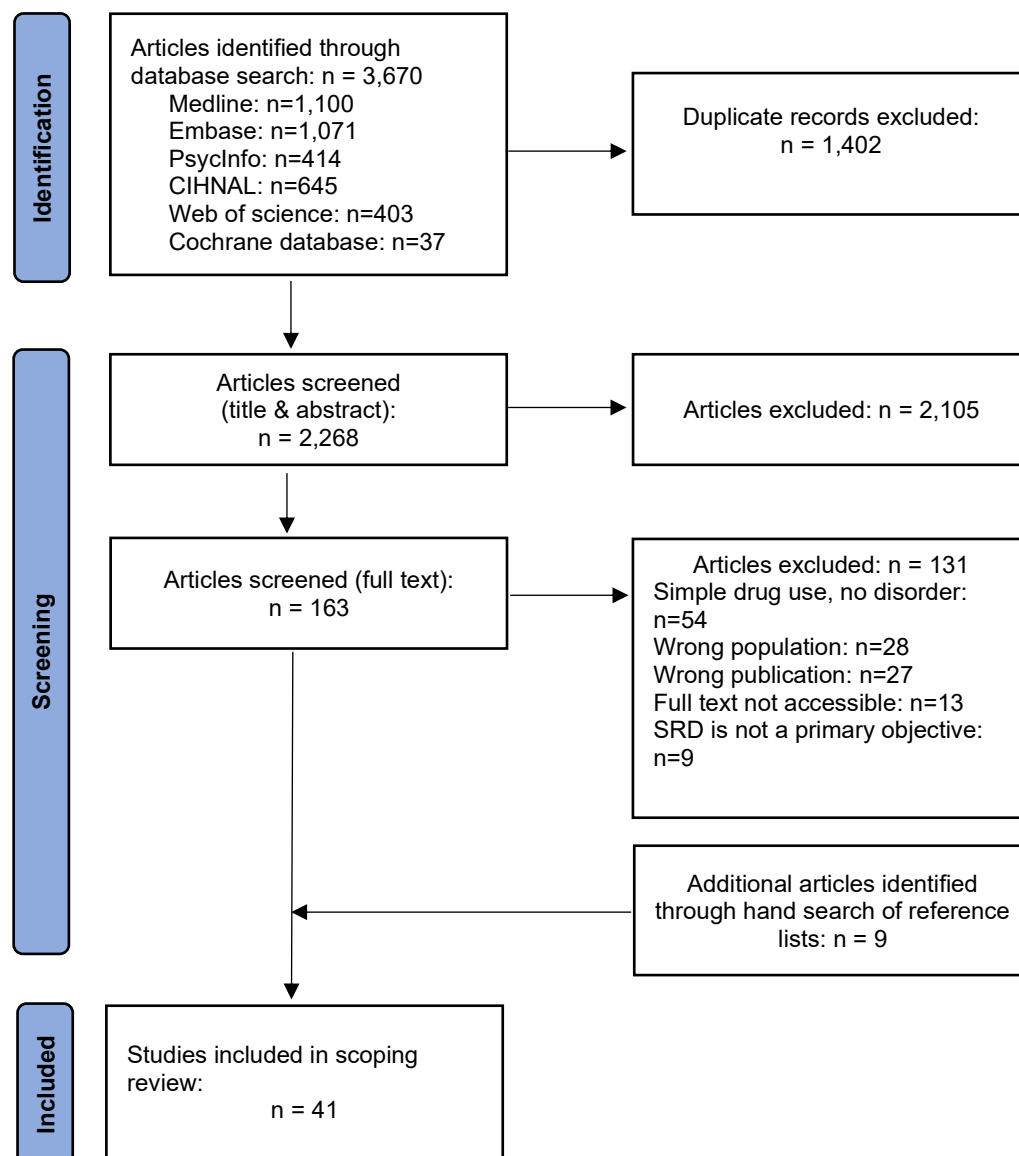
As scoping reviews are used to assess and understand the extent of knowledge in an emerging field and because their research questions are much broader than

research questions of systematic reviews, statistics or meta-analyses are not performed. Data synthesis should rather comprise basic descriptive analysis like frequency counts or basic coding of data. Most important considerations include transparency and clarity regarding approach and rationale and clear reporting of extracted data and analyses (Peters et al. 2020). Following these recommendations, all extracted data was formatted in Excel and then compiled into two tables. One table displays all extracted data for data items regarding the general study characteristics. The second table displays all extracted data specifically relating to the scoping reviews research questions. Both tables with the raw data can be found in the appendix. Analysis of extracted data then followed in a narrative way which will be presented in the results section of this scoping review. Analysis included for example basic descriptions of extracted data with frequency counts or basic grouping and description. Where applicable, extracted data was visualized in the form of graphics or tables. Extracted data for the data item „study results regarding SRDs” included all evidence that could be found regarding SRDs and therefore showed to be quite heterogenous and extensive. Basic thematic coding was used to structure the extracted data of this item and to present the results in a comprehensible way, following the considerations and instructions of Braun and Clarke (2006). Because no extracted data should be omitted and the entire data set should be described, inductive coding was used, which is described as “a process of coding the data without trying to fit it into a preexisting coding frame, or the researcher’s analytic preconceptions” (Braun and Clarke 2006). Extracted data regarding the study results was printed out and read several times. Then, all extracted data was coded manually and systematically by color-coding similar data and writing notes onto the text to develop basic themes. Mind maps were created to help structure the coded data. Through an iterative process, the color-coding was refined by rereading all extracted data several times and eventually, all extracted data could be coded into the emerging themes.

4 Results

4.1 Selection of sources of evidence

A total of 3670 studies were identified through the bibliographic database search (MEDLINE: 1100, Embase: 1071, PsycInfo: 414, CIHNAL: 645, Web of science (SCIE and SSCI): 403, Cochrane database: 37; see graphic 1). In total, 1402 duplicates were found and excluded. In the first screening stage, titles and abstracts of 2268 studies were screened and 2105 studies were excluded. 163 studies remained and were moved to the second screening stage. After full text screening of 163 studies, 130 studies were excluded. Most articles were excluded because they addressed substance use, but not clinical disorders related to substances. 32 studies remained and were included. Screening of the study references yielded another 9 studies matching the eligibility criteria. In total, 41 studies were included for data extraction. The following flow diagram was created according to PRISMA 2020 (Page et al. 2021) to visualize the selection process:



Graphic 1: PRISMA flow diagram of included studies

4.2 General study characteristics

The following sections present an overview of the general characteristics of studies evaluating SRDs in refugees or asylum seekers.

4.2.1 Year of publication

Out of all identified forty-one studies reporting on SRDs, the earliest study was published in 1987 (Mollica et al. 1987) and the most recent study was published in 2022 (Fine et al. 2022). Half of the studies were published between 1987 and 2014; the other half was published between 2014 and 2022.

4.2.2 Study aims

Eleven studies explicitly stated the evaluation of at least one SRD as their study aim (Amosu et al. 2016, Brown et al. 2019, Hewlett et al. 2015, Leao et al. 2006, Luitel et al. 2013, Manhica et al. 2017, Manhica et al. 2016, Posselt et al. 2015a, Posselt et al. 2015b, Harris et al. 2019, Salas-Wright and Vaughn 2014) and three studies aimed to provide information on drug-dependent or addicted refugees (Kuhn et al. 2018, Westermeyer et al. 1989, Westermeyer et al. 1991). Five studies mentioned the evaluation of substance use as their study aim (Ezard et al. 2012, Fine et al. 2022, Kane et al. 2014, Miremadi et al. 2011, Widmann et al. 2014). The remaining twenty-two studies neither mentioned SRDs nor substance use when stating their study aim. Study aims were diverse, but mostly authors used broader terms related to mental health, e.g. psychiatric morbidity, psychiatric or mental disorders (Bapolisi et al. 2020, Heeren et al. 2012, Naeem et al. 2005, Soegaard et al. 2020, Teodorescu et al. 2012, Laban et al. 2004, Marshall et al. 2005, Richter et al. 2018, Mollica et al. 1987, Bogic et al. 2012, Steel et al. 2005) or mental health status, needs and service usage (Nikendei et al. 2019, Steel et al. 2002, Chernet et al. 2021, Maier et al. 2010, Jamil et al. 2002, Marshall et al. 2006) or behavioral health outcomes (Kim 2018). Other study aims were evaluation of diagnoses (Schaffrath et al. 2017), clinical profiles (Betancourt et al. 2017), or patient spectrum (Manok et al. 2017), and developing a psychosocial assessment tool (Haroz et al. 2014).

4.2.3 Countries of research

Three studies were multinational. Two of them were only conducted in LMICs in the UNHCR regions of Africa, Asia and the Pacific, and Middle East and North Africa, either in 15 countries (Kane et al. 2014), or in 24 countries (Fine et al. 2022). The third multinational study was conducted in Italy, Germany and the UK (Bogic et al. 2012). Thirty-eight studies were conducted in only one country. Most strongly represented were the United States with nine studies conducted there (Betancourt et al. 2017, Jamil et al. 2002, Kim 2018, Marshall et al. 2006, Marshall et al. 2005, Mollica et al. 1987, Salas-Wright and Vaughn 2014, Westermeyer et al. 1989, Westermeyer et al. 1991), followed by Germany with five studies conducted there (Kuhn et al. 2018, Manok et al. 2017, Nikendei et al. 2019, Richter et al. 2018, Schaffrath et al. 2017). Four studies were conducted in Sweden (Harris et al. 2019, Leao et al. 2006, Manhica et al. 2017, Manhica et al. 2016), as well as in Switzerland (Brown et al. 2019, Chernet et al. 2021, Heeren et al. 2012, Maier et al. 2010) and in Australia (Posselt et al. 2015a, Posselt et al. 2015b, Steel et al. 2005, Steel et al. 2002). Two studies were conducted in Norway (Soegaard et al. 2020, Teodorescu et al. 2012), as well as in Nepal (Hewlett et al. 2015, Luitel et al. 2013), and in Thailand (Ezard et al. 2012, Haroz et al. 2014). Finally, one study each was conducted in Canada (Miremadi et al. 2011), the Netherlands (Laban et al. 2004),

Kenya (Widmann et al. 2014), Nigeria (Amosu et al. 2016), Pakistan (Naeem et al. 2005), and Uganda (Bapolisi et al. 2020).

4.2.4 Setting

Eight studies were conducted with refugees or asylum seekers who lived in refugee camps (Amosu et al. 2016, Bapolisi et al. 2020, Ezard et al. 2012, Fine et al. 2022, Hewlett et al. 2015, Kane et al. 2014, Luitel et al. 2013, Naeem et al. 2005) and four studies with refugees living in reception centers (Chernet et al. 2021, Manok et al. 2017, Miremadi et al. 2011, Nikendei et al. 2019). Additionally, two studies investigated the difference between more recently arrived asylum seekers residing in asylum centers and asylum seekers who had spent more time in the receiving country and had been discharged from the center (Heeren et al. 2012, Richter et al. 2018). The remaining twenty-seven studies were conducted in community-based settings or across general populations and seven of them specified that refugees and asylum seekers lived outside of camps or reception centers (Haroz 2014; Marshall 2005; Marshall 2006; Steel 2002; Steel 2005; Salas-Wright 2014; Widmann 2014). The remaining twenty studies did not provide enough information to safely determine whether participants resided in camps/centers or in private dwellings (Betancourt et al. 2017, Bogic et al. 2012, Brown et al. 2019, Harris et al. 2019, Jamil et al. 2002, Kim 2018, Kuhn et al. 2018, Laban et al. 2004, Leao et al. 2006, Maier et al. 2010, Manhica et al. 2017, Manhica et al. 2016, Mollica et al. 1987, Posselt et al. 2015a, Posselt et al. 2015b, Schaffrath et al. 2017, Soegaard et al. 2020, Teodorescu et al. 2012, Westermeyer et al. 1989, Westermeyer et al. 1991).

4.2.5 Study design

Mostly, research on SRDs in refugees and asylum seekers was quantitative. There were twenty-seven cross-sectional studies, four retrospective cohort studies, three prospective cohort studies, one instrument validation study, and one case-control study. Apart from the quantitative research, there were two qualitative studies and three mixed-method studies. All three mixed-method studies used cross-sectional designs in their quantitative parts.

4.2.6 Sampling and sampling method

Twelve studies used non-probability sampling with different sampling methods, such as convenience, voluntary, judgement, consecutive, purposive, and snowball sampling. Three studies used both non-probability and probability sampling by combining consecutive and simple random sampling, snowball and simple random sampling, or by using both sampling types but not describing the specific sampling method. Nine studies employed probability sampling by either using multistage sampling, stratified sampling or simple random sampling. Nine studies did not provide enough information to determine the type or method of sampling. Eight studies reported not using any sampling technique, since they used register or census data or included all eligible patients in their study.

4.2.7 Total sample size and percentage of refugees and asylum seekers

The range of total sample size across all studies went from 30 participants with 15 of them being refugees (Posselt et al. 2015a, Posselt et al. 2015b) to a total amount of 2,243,546 participants of which 132,412 (5.9%) were first-generation refugees (Leao et al. 2006). Seven studies used big samples with over 100,000 participants,

of whom mostly only a small percentage were refugees or asylum seekers (Manhica et al. 2017, Manhica et al. 2016, Harris et al. 2019, Leao et al. 2006, Brown et al. 2019) with the exception of two studies that only included refugees (Fine et al. 2022, Kane et al. 2014). On the other side, there were a lot of studies that used low sample sizes: Four studies had 50 or less participants (Westermeyer et al. 1991, Widmann et al. 2014, Posselt et al. 2015a, Posselt et al. 2015b), six studies had between 51 and 100 participants (Mollica et al. 1987, Teodorescu et al. 2012, Miremadi et al. 2011, Maier et al. 2010, Heeren et al. 2012, Westermeyer et al. 1989), and five studies had between 101 and 150 participants (Hewlett et al. 2015, Kuhn et al. 2018, Soegaard et al. 2020, Chernet et al. 2021, Amosu et al. 2016). Eleven studies had between 200 and 500 participants (Schaffrath et al. 2017, Kim 2018, Laban et al. 2004, Manok et al. 2017, Marshall et al. 2006, Marshall et al. 2005, Betancourt et al. 2017, Bapolisi et al. 2020, Jamil et al. 2002, Nikendei et al. 2019, Richter et al. 2018). The remaining seven studies (Steel et al. 2005, Steel et al. 2002, Naeem et al. 2005, Luitel et al. 2013, Ezard et al. 2012, Bogic et al. 2012, Salas-Wright and Vaughn 2014) had sample sizes between 636 participants with 97 of them being refugees and 34,650 participants with 428 (1.24%) of them being refugees.

4.2.8 Data collection method

Studies used different methods to collect data regarding SRDs and linguistic and cultural aspects appeared to be a recurrent theme. Because one study (Nikendei et al. 2019) used all three collection methods, the sum of the numbers mentioned here exceeds the actual number of studies.

Self-report:

Three studies used self-administered instruments. Two of them reported on the availability of languages and either reported that the instrument had been available in 16 languages (Nikendei et al. 2019) or that it had been back- and forward translated into the 11 main languages spoken by participants and that, if necessary, it had been applied by a trained psychologist with a trained interpreter (Maier et al. 2010). The third study (Soegaard et al. 2020) did not provide further information on available languages or the process of assessment.

Interview:

Thirty studies employed (para)professionals that administered interviews. In eight studies, interviews were conducted by linguistically and culturally similar people (Miremadi et al. 2011, Steel et al. 2002, Laban et al. 2004) who sometimes even were trained people from the same refugee community (Luitel et al. 2013, Kim 2018, Ezard et al. 2012, Marshall et al. 2006, Marshall et al. 2005). In one study, interviews were conducted by bilingual professionals who partly originated from the same country and some had been refugees themselves (Bogic et al. 2012). If interviews were not administered by people from the same community or from a similar background, studies sometimes provided information on the available languages. Four studies had bilingual professionals or assistants (Richter et al. 2018, Steel et al. 2005, Chernet et al. 2021, Hewlett et al. 2015). One of them employed gender-matched interviewers (Hewlett et al. 2015). Four studies mentioned having provided different languages for conducting the interviews, for example 5 local languages (Bapolisi et al. 2020), English, Spanish and 4 Asian languages (Salas-Wright and Vaughn 2014), or participants' native language (Westermeyer et al. 1989, Heeren et al. 2012). Three studies conducted interviews with the help of interpreters (Nikendei et al. 2019, Kuhn et al. 2018, Widmann et al. 2014). The aforementioned

study of Heeren et al. (2012) also had help from interpreters. In one study, interviews in languages other than English and Spanish were sometimes available, and interpreters were often available (Betancourt et al. 2017). The remaining nine studies did not provide any information on available languages or on the cultural or linguistic background of people that conducted the interview (Amosu et al. 2016, Fine et al. 2022, Kane et al. 2014, Mollica et al. 1987, Haroz et al. 2014, Posselt et al. 2015a, Posselt et al. 2015b, Westermeyer et al. 1991, Teodorescu et al. 2012).

Preexisting data:

Nine studies used pre-existing medical or register data and did not address possible language or cultural barriers (Nikendei et al. 2019, Manhica et al. 2017, Manhica et al. 2016, Harris et al. 2019, Leao et al. 2006, Brown et al. 2019, Manok et al. 2017, Schaffrath et al. 2017), with the exception of one study that stated that the assessment, diagnosis and treatment of refugees beforehand had been done by bilingual health professionals (Jamil et al. 2002).

Not reported:

One study did not provide any information about how data was collected (Naeem et al. 2005).

4.2.9 Measures of SRDs

Assessment instruments:

Twelve different assessment instruments could be identified in twenty-five studies. Eight studies used the Alcohol Use Disorders Identification Test (AUDIT) (Miremadi et al. 2011, Soegaard et al. 2020, Chernet et al. 2021, Kim 2018, Luitel et al. 2013, Marshall et al. 2006, Marshall et al. 2005, Hewlett et al. 2015), two of them additionally used the Drug Use Disorders Identification Test (DUDIT) (Miremadi et al. 2011, Soegaard et al. 2020). In one instrument validation study, authors tested their own adapted version of the AUDIT in a sample of refugees (Haroz et al. 2014). One study took three questions from the Structured Clinical Interview Schedule (SCID) to screen for three disorders (Nikendei et al. 2019). Ezard et al. (2012) developed an adapted version of the Modified Single Alcohol Screening Questionnaire (mSASQ). Eight studies employed the Mini-International Neuropsychiatric Interview (MINI) (Naeem et al. 2005, Widmann et al. 2014, Teodorescu et al. 2012, Bogic et al. 2012, Heeren et al. 2012, Maier et al. 2010, Richter et al. 2018, Bapolisi et al. 2020) and one of these studies additionally used the modified Severity of Dependence Scale for khat (SDS-khat) (Widmann et al. 2014). Three studies used the Composite International Diagnostic Interview (CIDI) (Steel et al. 2005, Steel et al. 2002, Laban et al. 2004). One study employed the Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV) (Salas-Wright and Vaughn 2014). Two studies combined assessment tools like the Substance Abuse Problem Scale (SAPS), the Substance Abuse Interview Schedule (SAIS), and the Modified Michigan Alcohol-Drug Screening Test (MMADST) with other outcomes of interest like refugees' opium use history or reasons for the opium epidemic (Westermeyer et al. 1991, Westermeyer et al. 1989).

Other diagnostic process:

Two studies reported on a diagnostic process and either diagnosed drug or alcohol addiction according to the DSM-III (Mollica et al. 1987) or rated the degree to which refugees fulfilled criteria for SUDs according to the DSM-IV (those with the rating "possibly present" and "definitely present" were collapsed together) (Betancourt et al. 2017).

Other measures related to SRDs:

Three studies investigated the rates of refugees and asylum seekers being admitted to a hospital due to SRDs (Leao et al. 2006, Manhica et al. 2017, Manhica et al. 2016). Six studies investigated if participants previously had received a diagnosis of an SRD (Brown et al. 2019, Harris et al. 2019, Jamil et al. 2002, Manok et al. 2017, Schaffrath et al. 2017, Nikendei et al. 2019). Two studies investigated the frequency of visits at mental, neurological and substance use (MNS) health care services in refugee camps due to alcohol/substance use disorder (Fine et al. 2022, Kane et al. 2014). Another study investigated if participants had received a treatment recommendation for opioids/benzodiazepine dependence (Manok et al. 2017).

Surrounding topics:

One study examined the attendance to self-help groups (Betancourt et al. 2017) and one study reported on treatment recommendations and following uptake of therapy (Nikendei et al. 2019). Some studies asked addicted or dependent refugees about their substance use history (Westermeyer et al. 1989, Westermeyer et al. 1991), as well as their use patterns, motives for substance use, and treatment requests (Kuhn et al. 2018). Two studies focused on comorbid mental health (MH) and alcohol and other drug disorders (AOD disorders) and explored risk factors of development and associated challenges (Posselt et al. 2015a, Posselt et al. 2015b).

4.2.10 Study funding

One study reported not having received any funding (Chernet et al. 2021). Thirty studies reported on having received funding with the vast majority receiving public funding by national institutions such as research councils, government institutions or universities (Betancourt et al. 2017, Bogic et al. 2012, Ezard et al. 2012, Fine et al. 2022, Haroz et al. 2014, Kane et al. 2014, Kim 2018, Kuhn et al. 2018, Maier et al. 2010, Manhica et al. 2017, Manhica et al. 2016, Manok et al. 2017, Marshall et al. 2006, Marshall et al. 2005, Mollica et al. 1987, Nikendei et al. 2019, Posselt et al. 2015a, Posselt et al. 2015b, Richter et al. 2018, Salas-Wright and Vaughn 2014, Soegaard et al. 2020, Steel et al. 2005, Steel et al. 2002, Teodorescu et al. 2012, Widmann et al. 2014). Four studies were additionally privately funded through foundations and trusts (Brown et al. 2019, Harris et al. 2019, Leao et al. 2006, Luitel et al. 2013) and one study was solely privately funded (Bapolisi et al. 2020). Four studies also reported on funding by international public institutions (Bogic et al. 2012, Luitel et al. 2013, Manhica et al. 2017, Manhica et al. 2016). The remaining ten studies did not report on their funding (Amosu et al. 2016, Heeren et al. 2012, Hewlett et al. 2015, Jamil et al. 2002, Laban et al. 2004, Miremadi et al. 2011, Naeem et al. 2005, Schaffrath et al. 2017, Westermeyer et al. 1989, Westermeyer et al. 1991).

4.3 Characteristics of SRDs in refugees and asylum seekers

4.3.1 Type of SRDs

In total, forty studies investigated different SRDs or combinations of SRDs.

4.3.1.1 Disorders related to alcohol

Twenty-four studies investigated alcohol-related disorders. Thirteen studies exclusively investigated alcohol-related disorders, and eleven studies investigated alcohol-related disorders in addition to other SRDs.

Eight studies examined concepts related to alcohol abuse, which were alcohol abuse according to the DSM-IV (Amosu et al. 2016, Maier et al. 2010, Teodorescu et al. 2012), alcohol misuse according to the DSM-IV (Bogic et al. 2012), alcohol abuse according to ICD-9 or ICD-10 (Leao et al. 2006), or alcohol abuse without mentioning a classification system (Laban et al. 2004, Westermeyer et al. 1991). One study investigated “alcohol-related psychiatric/medical disorders with long-term alcohol misuse” (Manhica et al. 2017). One study investigated acute alcohol or mixed intoxications according to the DSM-IV (Brown et al. 2019). Three studies examined harmful/hazardous alcohol use (Ezard et al. 2012, Luitel et al. 2013) or harmful/high risk alcohol use (Chernet et al. 2021). Seven studies investigated concepts related to dependence, which were alcohol dependence according to DSM-IV (Amosu et al. 2016, Bogic et al. 2012), according to the ICD-10 (Nikendei et al. 2019), or without mentioning a classification system (Laban et al. 2004, Chernet et al. 2021, Luitel et al. 2013, Miremadi et al. 2011). Four studies did not differentiate between the concepts of abuse and dependence and investigated both disorders combined, either after DSM-IV (Heeren et al. 2012, Steel et al. 2005) or without mentioning a classification system (Jamil et al. 2002, Soegaard et al. 2020). Six studies investigated concepts of alcohol use disorder (AUD), most of them did not define that term (Hewlett et al. 2015, Kim 2018, Marshall et al. 2006, Marshall et al. 2005, Salas-Wright and Vaughn 2014), only one study referred to the chapter F10.X of the ICD-10 (Harris et al. 2019).

4.3.1.2 Disorders related to unspecified substances

Twenty-one studies investigated SRDs without specifying which substances were of interest. Twelve studies solely investigated disorders related to unspecified substances. Six studies evaluated disorders related to unspecified substances in addition to alcohol-related disorders, and three studies investigated disorders related to multiple unspecified substances.

Four studies evaluated concepts related to substance abuse, such as substance misuse (Bogic et al. 2012), substance abuse according to the DSM-IV (Betancourt et al. 2017), drug abuse according to the ICD-9 and ICD-10 (Leao et al. 2006), and non-alcohol substance abuse without mentioning a classification system (Naeem et al. 2005). Three studies focused on the concept of substance dependence, either defined by the DSM-IV (Bogic et al. 2012), or dependence issues/drug related problems (Miremadi et al. 2011), or non-alcohol substance dependence (Naeem et al. 2005). Four studies investigated abuse/dependence combined under the term substance use disorder defined by the DSM-IV (Steel et al. 2005) or defined by the ICD-10 (Steel et al. 2002) or did not mention any classification system (Soegaard et al. 2020, Jamil et al. 2002). One study investigated the diagnosis of substance use disorder defined by the DSM-V (Bapolisi et al. 2020). Another study investigated drug and/or alcohol addiction defined by the DSM-III (Mollica et al. 1987). Two studies investigated alcohol/substance use disorders according to the definition of UNHCR’s health information system (Fine et al. 2022, Kane et al. 2014). One study focused on the concept of “substance misuse with a diagnosis of a substance use disorder” (Manhica et al. 2016). Two studies focused on the concept of “Alcohol and other drug disorders” (AOD disorders) (Posselt et al. 2015a, Posselt et al. 2015b). Three studies examined the concept of any F1-diagnosis according to the ICD-10 (Harris et al. 2019, Richter et al. 2018, Schaffrath et al. 2017). Finally, three studies investigated disorders due to multiple drug use which were either any F19-diagnosis

(Harris et al. 2019) or F19.2-diagnosis (Nikendei et al. 2019) according to the ICD-10, or substance abuse/polytoxicomania (Manok et al. 2017).

4.3.1.3 Disorders related to cannabis

Four studies investigated cannabis-related disorders. One study separately investigated cannabis abuse and cannabis dependence defined by the DSM-IV (Amosu et al. 2016). One study focused on any F12-diagnosis according to the ICD-10 (Harris et al. 2019), one on cannabis dependence according to the ICD-10 (Nikendei et al. 2019) and one on cannabis use disorder without mentioning a classification system (Salas-Wright and Vaughn 2014).

4.3.1.4 Disorders related to opioids

Five studies investigated disorders related to opioids or opium. One study investigated dependence on opioids according to the ICD-10 (Nikendei et al. 2019). Two studies evaluated opium dependence/addiction (Westermeyer et al. 1989, Westermeyer et al. 1991) and one study evaluated opioids/heroin use disorder (Salas-Wright and Vaughn 2014) without mentioning a classification system. Finally, one study investigated dependence on benzodiazepines or opioids without differentiating between those two substances and without mentioning a classification system (Manok et al. 2017).

4.3.1.5 Disorders related to sedatives/hypnotics

Apart from the study that investigated benzodiazepines and opioids combined (Manok et al. 2017), one other study evaluated sedatives/hypnotics dependence according to the ICD-10 (Nikendei et al. 2019).

4.3.1.6 Disorders related to other substances

One study evaluated khat dependence defined by the DSM-IV (Widmann et al. 2014). One study evaluated cocaine use disorder, hallucinogen use disorder and amphetamine use disorder without mentioning a diagnostic system (Salas-Wright and Vaughn 2014). One study asked heroin and/or cocaine dependent refugees about their use of alcohol, cannabis, opium, cocaine, amphetamines, heroin, and substitution drugs (Kuhn et al. 2018). Finally, one study investigated analgesics abuse (F55.2) according to the ICD-10 (Nikendei et al. 2019).

4.3.2 Population characteristics

4.3.2.1 Description of study participants

Twenty-two studies (Amosu et al. 2016, Bapolisi et al. 2020, Bogic et al. 2012, Ezard et al. 2012, Fine et al. 2022, Haroz et al. 2014, Hewlett et al. 2015, Kane et al. 2014, Kim 2018, Kuhn et al. 2018, Luitel et al. 2013, Manok et al. 2017, Marshall et al. 2006, Marshall et al. 2005, Miremadi et al. 2011, Mollica et al. 1987, Naeem et al. 2005, Schaffrath et al. 2017, Steel et al. 2002, Teodorescu et al. 2012, Westermeyer et al. 1989, Westermeyer et al. 1991) only included refugees as participants. Twelve studies included not only refugees, but other participants as well. Mostly, those other participants were native populations or non-refugee migrants that served as comparison groups (Leao et al. 2006, Manhica et al. 2017, Manhica et al. 2016, Steel et al. 2005, Betancourt et al. 2017, Harris et al. 2019, Salas-Wright and Vaughn 2014, Soegaard et al. 2020). Two studies included a small percentage of

non-refugee migrants in their refugee sample and did not present disaggregated data (Jamil et al. 2002, Widmann et al. 2014). Two qualitative studies presented disaggregated data of refugee youth and service providers (Posselt et al. 2015a, Posselt et al. 2015b). One study included both refugees and asylum seekers (Chernet et al. 2021). Five studies solely included asylum seekers (Heeren et al. 2012, Laban et al. 2004, Maier et al. 2010, Nikendei et al. 2019, Richter et al. 2018), and one study compared asylum seekers with native residents (Brown et al. 2019). Twenty-seven studies mentioned age restrictions regarding their study sample. Studies mostly focused on adult populations but varied in their age restrictions, including participants older than 18 years (Bapolisi et al. 2020, Kim 2018, Kuhn et al. 2018, Laban et al. 2004, Maier et al. 2010, Nikendei et al. 2019, Salas-Wright and Vaughn 2014, Steel et al. 2005), older than 19 years (Miremadi et al. 2011), 18 to 65 years old (Bogic et al. 2012), 18 to 60 years (Soegaard et al. 2020, Teodorescu et al. 2012), 15 to 65 years (Naeem et al. 2005), 15 to 50 years (Amosu et al. 2016), 20 to 39 years (Leao et al. 2006), and 35 to 75 years old (Marshall et al. 2006, Marshall et al. 2005). Some studies set slightly lower thresholds and included participants who were at least 16 years old (Brown et al. 2019, Chernet et al. 2021), at least 15 years old (Hewlett et al. 2015, Luitel et al. 2013), or at least 14 years old (Harris et al. 2019). Two studies followed a cohort of refugees aged 13 to 19 years old (Manhica et al. 2017, Manhica et al. 2016) and three studies explicitly focused on refugee youth, including participants from birth to the age of 21 years (Betancourt et al. 2017) or from 12 to 25 years old (Posselt et al. 2015a, Posselt et al. 2015b). Fifteen studies focused on populations with specific characteristics: Five studies evaluated SRDs in refugees with a history of trauma by including participants who had experienced trauma (Betancourt et al. 2017), trauma before migration (Marshall et al. 2005), war-related trauma with the final trauma event at 16 years or older (Bogic et al. 2012), or at least one trauma according to the DSM-IV-TR criteria (Soegaard et al. 2020, Teodorescu et al. 2012). One study focused on survivors of systematic violence, but the study authors did not provide a more precise definition (Haroz et al. 2014). Five studies only included refugees with pre-existing mental health disorders, which were either dependence on cocaine and/or heroin (Kuhn et al. 2018), addiction to opium (Westermeyer et al. 1989, Westermeyer et al. 1991), a functional psychiatric illness (Naeem et al. 2005), and PTSD, major depression or alcohol use disorder (Marshall et al. 2006). One study only sampled pregnant refugee women to ask for their self-report and the secondary report of their partners (Ezard et al. 2012). Finally, three studies did not sample participants but reported on the visits of refugees at mental health services without distinguishing first visits from revisits (Fine et al. 2022, Kane et al. 2014, Schaffrath et al. 2017). Five studies specified their inclusion criteria regarding the necessary language skills and included participants who spoke English or their native language (Hewlett et al. 2015, Soegaard et al. 2020), who were fluent in one of the most frequently spoken languages in the asylum center (Nikendei et al. 2019) or who possessed reasonable conversational English skills (Posselt et al. 2015a, Posselt et al. 2015b). Twelve studies mentioned exclusion criteria. Those were mostly related to intellectual disabilities, mental or physical disorders or lacking language proficiency that disabled the participant to complete the interview or questionnaire (Bapolisi et al. 2020, Bogic et al. 2012, Chernet et al. 2021, Hewlett et al. 2015, Kuhn et al. 2018, Laban et al. 2004, Miremadi et al. 2011, Naeem et al. 2005, Nikendei et al. 2019, Soegaard et al. 2020). Additionally, studies excluded participants with an AUDIT-score above 20 or a DUDIT-score above 25 (Soegaard et al. 2020), those

who had had a non-affective psychosis or a substance use disorder before their 14th birthday (Harris et al. 2019), or those who were additionally dependent on other substances than the substance of interest (Widmann et al. 2014). Whereas one study excluded asylum seekers who had a residence permit (Laban et al. 2004), another study excluded refugees who did not have the residence permit (Harris et al. 2019). Two studies excluded first-line relatives or people living together with already included participants (Laban et al. 2004, Hewlett et al. 2015). Eighteen studies reported on different subgroups. One study compared who had resettled in three different European countries (Bogic et al. 2012) and one study compared two refugee camps of Bhutanese refugees (Luitel et al. 2013). Two studies compared between different language/ethnic groups of Burmese refugees (Ezard et al. 2012, Kim 2018) and one study compared Afghans from Afghanistan, Afghans from Iran and Iranians (Kuhn et al. 2018). Kane et al. (2014) and Fine et al. (2022) partly used the same data set of refugee camps and compared between sex groups, age groups and countries. One study compared refugees with AUD against the control group without AUD (Hewlett et al. 2015) and one study tested a screening tool on cases and non-cases of trauma or depression (Haroz et al. 2014). One study compared first-generation refugees, second-generation refugees and second-generation Swedes/refugees (Leao et al. 2006). Two studies compared accompanied and unaccompanied young refugees (Manhica et al. 2017, Manhica et al. 2016). One study compared khat-chewers against non-chewers (Widmann et al. 2014). Two studies had subgroups of two refugees each that either had spent time in a detention facility (Posselt et al. 2015b) or that had arrived as unaccompanied minors (Posselt et al. 2015a), but did not present disaggregated data. Two studies compared asylum seekers who had resided less than six months in their recipient country against asylum seekers who had spent more time (either 12 to 26 months or more than 2 years) in the country (Heeren et al. 2012, Laban et al. 2004). The third study compared help-seeking asylum seekers against a random group of asylum seekers (Richter et al. 2018).

4.3.2.2 Age distribution of refugees and asylum seekers

Eight studies presented participants age distribution with age groups that mostly had a size of 10 to 15 years and spanned from <17 years to >65 years (Haroz et al. 2014, Hewlett et al. 2015, Jamil et al. 2002, Laban et al. 2004, Nikendei et al. 2019, Salas-Wright and Vaughn 2014, Steel et al. 2005, Westermeyer et al. 1989). One study presented age groups in the qualitative part of the study and the median age in the quantitative part of the study (Ezard et al. 2012). Two studies presented median ages of 29 years (Brown et al. 2019) and 25 years (Chernet et al. 2021) with interquartile ranges. Twenty-five studies reported the mean or average age of refugees and asylum seekers, which ranged from 13.07 years to 53.7 years with Standard Deviations of 6.87 up to 15.71 (Amosu et al. 2016, Bapolisi et al. 2020, Betancourt et al. 2017, Bogic et al. 2012, Heeren et al. 2012, Kim 2018, Kuhn et al. 2018, Luitel et al. 2013, Maier et al. 2010, Manhica et al. 2017, Manhica et al. 2016, Manok et al. 2017, Marshall et al. 2006, Marshall et al. 2005, Miremadi et al. 2011, Naeem et al. 2005, Posselt et al. 2015a, Posselt et al. 2015b, Richter et al. 2018, Schaffrath et al. 2017, Soegaard et al. 2020, Steel et al. 2002, Teodorescu et al. 2012, Westermeyer et al. 1991, Widmann et al. 2014). Some of those studies provided data on participants' age only disaggregated by country of origin (Manhica et al. 2016, Manhica et al. 2017), by sex (Teodorescu et al. 2012) or by subgroup of refugees or asylum seekers (Manhica et al. 2016, Manhica et al. 2017, Heeren et

al. 2012, Widmann et al. 2014). Five studies did not report on participants' age distribution (Fine et al. 2022, Harris et al. 2019, Kane et al. 2014, Leao et al. 2006, Mollica et al. 1987).

4.3.2.3 Gender distribution of refugees and asylum seekers

Two studies only investigated male refugees (Widmann et al. 2014, Kuhn et al. 2018). One mixed-method study included only pregnant refugee women in the quantitative part, but sampled both genders for the qualitative part (Ezard et al. 2012). Two studies did not report on participants' gender (Kane et al. 2014, Posselt et al. 2015b). The remaining thirty-six studies included both genders (Amosu et al. 2016, Bapolisi et al. 2020, Betancourt et al. 2017, Bogic et al. 2012, Brown et al. 2019, Chernet et al. 2021, Fine et al. 2022, Haroz et al. 2014, Harris et al. 2019, Heeren et al. 2012, Hewlett et al. 2015, Jamil et al. 2002, Kim 2018, Laban et al. 2004, Leao et al. 2006, Luitel et al. 2013, Maier et al. 2010, Manhica et al. 2017, Manhica et al. 2016, Manok et al. 2017, Marshall et al. 2006, Marshall et al. 2005, Miremadi et al. 2011, Mollica et al. 1987, Naeem et al. 2005, Nikendei et al. 2019, Posselt et al. 2015a, Richter et al. 2018, Salas-Wright and Vaughn 2014, Schaffrath et al. 2017, Soegaard et al. 2020, Steel et al. 2005, Steel et al. 2002, Teodorescu et al. 2012, Westermeyer et al. 1989, Westermeyer et al. 1991).

4.3.2.4 Country of origin of refugees and asylum seekers

Thirteen studies enrolled asylum seekers or refugees from only one country of origin. Countries of origin were Afghanistan (Naeem et al. 2005), Bhutan (Hewlett et al. 2015, Luitel et al. 2013), Burma (Ezard et al. 2012, Haroz et al. 2014, Kim 2018), Cambodia (Marshall et al. 2005, Marshall et al. 2006), Eritrea (Chernet et al. 2021), Iraq (Laban et al. 2004), Somalia (Widmann et al. 2014), and Vietnam (Steel et al. 2002, Steel et al. 2005).

Twelve studies included refugees and asylum seekers from 3 up to 28 different countries of origin (Brown et al. 2019, Heeren et al. 2012, Kuhn et al. 2018, Miremadi et al. 2011, Posselt et al. 2015a, Richter et al. 2018, Schaffrath et al. 2017, Manhica et al. 2016). Some studies focused on specific regions like the former Yugoslavian republic (Bogic et al. 2012), the Indochinese region (Mollica et al. 1987), or countries only from the African continent (Amosu et al. 2016, Bapolisi et al. 2020). Two of those studies summarized a substantial number of participants under the category of "other" countries (Brown et al. 2019, Manhica et al. 2016).

Seven studies only reported on continents or regions of origin, such as Asia (including regions like Southern/Central Asia or South-East Asia), Africa (with regions like Maghreb, North Africa or Sub-Saharan Africa), Europe or Eastern Europe, Mexico and Central or South America or Latin America, and Middle East or Far East (Betancourt et al. 2017, Harris et al. 2019, Maier et al. 2010, Manok et al. 2017, Nikendei et al. 2019, Soegaard et al. 2020, Teodorescu et al. 2012).

Three studies provided for some participants countries of origin and for others only regions (Jamil et al. 2002, Manhica et al. 2017, Posselt et al. 2015b).

Six studies did not report countries or regions of origin (Fine et al. 2022, Kane et al. 2014, Leao et al. 2006, Salas-Wright and Vaughn 2014, Westermeyer et al. 1989, Westermeyer et al. 1991).

4.3.2.5 Definition of a refugee

Four studies defined a refugee according to the 1951 Geneva Convention (Bapolisi et al. 2020, Harris et al. 2019, Manhica et al. 2016, Posselt et al. 2015b) and one

study according to the 1969 OAU Convention and the 1951 Convention (Amosu et al. 2016). Another study referred to the refugee definition of the Cologne refugee council, which includes “people without documents; illegal entry; asylum seekers; people obliged to leave the country; recognized refugees; people allocated to Germany through a quota system; and with residence permit on humanitarian grounds” (Schaffrath et al. 2017). Other definitions included persons “entering Norway either as a refugee on a ‘UNHCR quota’, or as an ‘asylum seeker’” (Teodorescu et al. 2012) or designated refugees by the UNHCR (Hewlett et al. 2015). Two studies used self-report methods and defined refugees as people who gave an affirmative answer to the question “Were you ever a refugee—that is, did you flee from your home to a foreign country or place to escape danger or persecution?” (Salas-Wright and Vaughn 2014) or to both of the following questions: 1. Is the child (and/or family) a refugee, asylum seeker, or immigrant with a history of exposure to community violence? And 2. Did the child (and/or family) experience war, terrorism, or political violence outside the United States? (Betancourt et al. 2017). One study differentiated between the concepts of first-generation refugees, which were people born outside of Sweden, Finland and labor immigrant countries (for which a list was provided), and Second-generation refugees, which were Swedish-born people with both parents born in refugee countries, and Second-generation Swedes/refugees, which were defined as Swedish-born people with one parent born in Sweden and one parent born in a refugee country (Leao et al. 2006). One study defined asylum seekers as individuals who applied for asylum in the Swiss Federal Office for Migration (Maier et al. 2010). The remaining 29 studies did not provide a definition of a refugee or an asylum seeker.

4.3.3 Study Results

The following chapter summarizes all study results on SRDs in refugees or asylum seekers. Basic thematic coding led to the identification of ten aspects that are investigated in the available literature: Frequencies of SRDs, possible risk factors and protective factors, comorbidity of SRDs, service use and access to care, clinical correlates of admission to the emergency department (ED) with acute alcohol intoxication, characteristics of addicted/dependent refugees, perceptions and beliefs around substances, reasons to consume, and possible prevention measures (see Table 1).

Table 1: Thematic aspects examined in the identified studies

[illegible]

Hewlett 2015	x	x							x	x
Jamil 2002	x									
Kane 2014	x	x								
Kim 2018	x	x	x							
Kuhn 2018		x					x			
Laban 2004	x	x								
Leao 2006	x	x								
Luitel 2013	x	x	x							
Maier 2010	x									
Manhica 2016	x	x								
Manhica 2017	x	x	x							
Manok 2017	x									
Marshall 2005	x	x	x	x						
Marshall 2006	x									
Miremadi 2011	x	x		x						

Mollica 1987	x									
Naeem 2005	x			x						
Nikendei 2019	x				x					
Posselt 2015				x						
Posselt 2015				x						
Richter 2018	x									
Salas-Wright 2014	x	x	x							
Schaffrath 2017	x									
Soegaard 2020	x									
Steel 2002	x		x							
Steel 2005	x	x								
Teodorescu 2012	x			x						
Westermeyer 1989							x			
Westermeyer 1991							x			
Widmann 2014	x	x		x			x			

4.3.3.1 Frequencies of SRDs: prevalence, incidence, hospitalization rate, and health care visits

Thirty-five studies provided study results on rates of SRDs in refugees or asylum seekers. Identified measures used to examine the rates of SRDs were prevalences or incidences of SRDs, as well as hospitalization rates or visits at health care facilities due to SRDs. The following sections present all study results on rates of SRDs, sections are structured according to the different substances examined.

Disorders related to alcohol

Prevalence:

Prevalence of hazardous/harmful use was 0.2% in pregnant refugee women and 24.4% in their male partners (Ezard et al. 2012). In another study the total prevalence was 2.8% (n=222), with 5.1% (n=198) in men and 0.6% in women (n=24) (Luitel et al. 2013).

Prevalence for alcohol abuse ranged from 4.3% (Bogic et al. 2012) over 5% (n=4) (Maier et al. 2010) and 10% (n=6) (Teodorescu et al. 2012) to 17.1% (with 23.5% in males and 7.3% in females) (Amosu et al. 2016).

Prevalence of alcohol dependence was 1.8% (Bogic et al. 2012) or 2% (Amosu et al. 2016). Prevalence of possible dependence was 0.6% (n=51), with 1.2% (n=46) in men and 0.1% (n=5) in women (Luitel et al. 2013) or 9.3% (n=3), with only males scoring positively (Miremadi et al. 2011). One study found that prevalence of alcohol dependence was 81.3% in refugees who self-identified and had been identified as cases of AUD by other refugees (Hewlett et al. 2015).

Combined prevalence of abuse or dependence ranged from 1.9% in a population of Iraqi-borns of whom 87.8% were refugees (Jamil et al. 2002) over 4.7% (n=4) (Heeren et al. 2012) to 8% (n=2) (Soegaard et al. 2020).

Prevalence of alcohol use disorders was 4% (n=14) (Marshall et al. 2005), 5% (n=14) (Marshall et al. 2006) or 9% (n=16) (Kim 2018).

12-month prevalence of harmful alcohol use, abuse or dependence was 1.1% (Steel et al. 2005).

Lifetime prevalence of alcohol dependence was 3.4% and lifetime prevalence of alcohol abuse was 0% (Laban et al. 2004).

Change of prevalence over time:

Nikendei et al. (2019) found that at baseline, 7.5% (n=17) of the asylum seekers screened positively concerning alcohol consumption, but no data was provided for follow-up. They found a prevalence of 0.4% for alcohol dependence at baseline and at follow-up 3 months later a prevalence of 0%.

On arrival, one refugee (0.9%) scored for high risk/harmful alcohol use and one year later, one of the remaining participants still scored positively (2.1%). Prevalence of alcohol dependence had changed from 0% at arrival to 2.1% (n=1) one year later (Chernet et al. 2021). Heeren et al. (2012) examined abuse/dependency and did not find a statistically significant difference between the asylum seekers that had arrived 0-5 months prior to the assessment (7%, n=3) and the asylum seekers that had arrived 12-26 months prior to the assessment (2.3%, n=1). Laban et al. (2004) on the other hand found a statistically significant difference in lifetime prevalences of alcohol dependence between asylum seekers, who had resided less than 6 months (0%) and who had been living for at least 2 years (6.6%) in their recipient country (p=.002).

Comparison to natives and other immigrants:

Jamil et al. (2002) found that the prevalence of 1.9% of alcohol abuse/dependence in Iraqi-borns was lower than the rate of 3.7% in other Arab Americans. Soegaard et al. (2020) found that the native Norwegian participants had significantly higher rates of alcohol use disorder (36.4%) than the refugee group (8%, $n=2$) ($p<.005$) while the group of non-refugee immigrants had a rate in between the two groups but did not reach statistical significance. Steel et al. (2005) also found that refugees had a significantly lower prevalence (1.1%) of alcohol use disorders compared to their native Australian counterparts (6.7%). Salas-Wright and Vaughn (2014) calculated odds ratios of refugees meeting criteria for a lifetime AUD compared against the American-born participants and found that controlling for sociodemographic, parental and psychiatric factors, refugees were seven times less likely in men ($OR=0.13$) and four times less likely in women ($OR=0.26$). In total, the odds ratio of refugees was 0.16 compared to the natives. Compared to immigrants, refugees were also less likely to meet criteria for AUD ($OR=0.44$, 95% CI 0.41-0.47). Another study investigated the incidence of alcohol use disorder and found that with a hazard ratio of 0.38, refugees had a significantly lower rate than the native Swedish population ($p<.001$), but that there was no difference in incidence rates between refugees and migrants (Harris et al. 2019). In a Swiss Emergency department, a higher proportion of asylum seekers (3.7%) had an acute alcohol or mixed intoxication compared to Swiss nationals (1.6%) and asylum seekers had 1.6 higher odds (95% CI 1.3-2.0) for acute alcohol or mixed intoxication ($p<.001$). In contrast, asylum seekers were less likely though to have chronic alcohol abuse compared to patients with a Swiss nationality ($p<.001$) (Brown et al. 2019).

Hospitalization rate:

Regarding hospitalization due to alcohol abuse, first-generation refugees in Sweden had the lowest age- and sex-adjusted incidence per 100,000 person-years (30 cases in women and 59 in men) compared to second-generation refugees, labor immigrants, Finns and native Swedes. Using Swedes as a reference, first generation refugees had the lowest hazard ratios ($HR=0.57$ in women and $HR=0.40$ in men) compared to all other subgroups. After additionally adjusting for income, HRs decreased further ($HR=0.50$ in women and $HR=0.22$ in men) (Leao et al. 2006). For hospitalization due to an alcohol related psychiatric or medical disorder with long-term misuse, refugees had lower rates (0.8%) than native Swedes (1.1%). When adjusted for age, gender, and domicile, refugees had a lower risk ($HR=0.65$) and after adjusting for income, the hazard ratio decreased further ($HR=0.48$) (Manhica et al. 2017).

Disorders related to unspecified substances

Prevalence:

Prevalence of drug related problems/substance dependence issues was 3.1% ($n=1$) in male refugees and 2.8% ($n=1$) in female refugees and when asked, both subjects reported using Tylenol 3 (acetaminophen/codeine) (Miremedi et al. 2011). Prevalence of substance abuse ranged from 0.2% ($n=2$) (Naeem et al. 2005) to 3.6% (Betancourt et al. 2017) and 4.2% (Bogic et al. 2012). The combined prevalence of substance abuse and polytoxicomania was 17.4% (Manok et al. 2017). Prevalence of substance dependence ranged from 1.9% (Bogic et al. 2012) to 9.9% ($n=101$) (Naeem et al. 2005). Combined prevalence of substance abuse

and dependence ranged from 0.6% (n=1) in Iraqi-born participants of whom 87.3% were refugees (Jamil et al. 2002) to 4% (n=1) (Soegaard et al. 2020).

12-month prevalence for substance abuse/dependence was 1% (n=11) (Steel et al. 2002) and 0.5% (Steel et al. 2005).

Prevalence of drug and/or alcohol addiction was 2% (n=1) (Mollica et al. 1987).

Prevalence of substance use disorder was 30% (32% in men and 29% in women) (Bapolisi et al. 2020).

Change of prevalence over time:

Two studies evaluated the prevalence of SRDs over time: One study examined the 12-month prevalence for any F1-diagnosis in a subgroup of help-seekers, who had contacted the psychiatric center on their own impetus, and in a random subgroup of asylum seekers. At baseline, 1 participant in the help-seeker group (0.6%) and 1 participant in the control group (0.8%) met the criteria for an F1-diagnosis. At follow-up four to ten months later, no asylum seeker met the criteria (Richter et al. 2018). The other study evaluated the dependence syndrome with multiple drug use (ICD-10 F19.2) and found that at baseline, 0.9% (n=2) asylum seekers, and at follow-up 3 months later, 2.3% (n=2) fulfilled criteria for that diagnosis. At baseline, 6.6% (n=15) of asylum seekers had had a presumed drug-related mental illness based on one screening question, but no further analysis or comparison was conducted between asylum seekers with positive screening and asylum seekers who had received a substance-related diagnosis (Nikendei et al. 2019)

Comparison to natives and other immigrants:

One study found that Iraqi-born refugees had a slightly higher prevalence of drug abuse/dependency (0.6%, n=1) compared to other Arab Americans (0.5%, n=1), but no statistical analysis was conducted (Jamil et al. 2002). In another study, the 12-month prevalence of drug abuse/dependence in refugees (0.5%) was lower than the prevalence of 3.2% in Australian born native participants, but again no statistical analysis was conducted (Steel et al. 2005). Soegaard et al. (2020) found that the native Norwegian participants had a significantly higher prevalence of drug abuse/dependence (25%) than the refugees (4%, $p<.05$). The subgroup of immigrants had a rate between the other two groups, but statistical significance was not reached. Betancourt et al. (2017) found that the prevalence of substance abuse was significantly higher in the U.S. original youth (13.3%, n=17) compared to the refugee youth (3.6%, n=2, $p<.05$). Immigrants' prevalence was not significantly higher (8.5%, n=12). Harris et al. (2019) found that the crude incidence for any F1-diagnosis per 100,000 person-years was higher in the Swedish-born (290.2) than in the refugee (149.3) population. In the unadjusted and in the model adjusted for age, sex, birth year, family income and employment, population density and PTSD-diagnosis, refugees were less likely than native Swedes to have a substance use disorder (unadjusted HR=0.42 and adjusted HR=0.52, $p<.001$) or to have a polydrug use disorder (HR=0.58, $p<.001$). There were no differences in the rates of substance use disorders between refugees and migrants apart from weak evidence that polydrug use disorder might have been somewhat higher in refugees (HR=1.34, $p=.06$).

Hospitalization rate:

Two studies calculated the age- and sex-adjusted incidence per 100,000 person years for hospitalization due to drug abuse. The first study compared refugees, labor

immigrants and native-born Swedes and found that first-generation refugee women had the lowest rate of 33 for hospitalization due to drug abuse compared to immigrant and Swedish women. But in men, native born Swedes had the lowest incidence rate for hospital admission due to drug abuse (77), whereas first-generation refugees had the fifth lowest rate of 130, and second-generation refugees had the second lowest rate of 117. Using Swedes as a reference, age-adjusted hazard ratios were calculated and again in women, first-generation refugees had the lowest risk (HR=0.77), but in men, first-generation refugees (HR=1.61) were more at risk than first-generation immigrants, second-generation Swedes/immigrants and swedes/refugees. After additionally adjusting for income, in men and women, first-generation refugees had the lowest risk of all subgroups (women HR=0.66, men HR=0.80) (Leao et al. 2006). The second study focused on hospitalization due to substance misuse with a diagnosis of a substance use disorder and differentiated between accompanied and unaccompanied refugees. The hospitalization rate was 336.7 for accompanied and 250.4 for unaccompanied male refugees. In female refugees, rates were 52.4 for accompanied and 59.7 for unaccompanied refugees. Male refugees had a higher incidence rate (167.3) compared to their Swedish counterparts, but female refugees had lower rates (78.2) than the Swedish women (Manhica et al. 2016).

Visits at mental health services:

Two studies found that compared to other mental and neurological health disorders, the smallest number of visits in refugee camps was due to alcohol/substance related disorders. Rates of visits were 2.2% (Fine et al. 2022) and 1.1% (Kane et al. 2014). Also, the weighted mean rates of visits per 1,000 refugees per month was lowest for the MNS category of alcohol/substance use disorders (ranging from 0.05 to 0.11 for men and 0.01 to 0.05 for women) (Fine et al. 2022). Mean rates differentiated by sex were 0.08 in men and 0.02 in women and mean rates differentiated by country ranged from 0.0006 in Bangladesh to 1.46 in Liberia (Kane et al. 2014). Among all included countries, highest percentage for visits were 9.6% in Zambia, 6.2% in Liberia, and 4.6% in Namibia (Kane et al. 2014). One study examined the prevalence of any F1-diagnosis in the cases of refugees seeking help at a clinic. 15% of all cases were diagnosed with a F1-diagnosis. After the group of F4-diagnoses (40,2%) and F3-diagnoses (31%), F1-diagnoses were the third most prevalent diagnosis group with 15% (Schaffrath et al. 2017).

Disorders related to cannabis

Prevalence:

Prevalence of cannabis abuse in refugees was 6.7%, but only males abused cannabis and therefore the prevalence in male refugees was 10.9% (n=7) (Amosu et al. 2016). Prevalence of cannabis dependence in refugees was 0% (Amosu et al. 2016).

Change of prevalence over time:

One study examined the prevalence of dependence on cannabinoids in asylum seekers over time. At baseline, 0.9% (n=2) had a dependence syndrome and at follow-up 3 months later, 1.1% (n=1) (Nikendei et al. 2019).

Comparison to natives and other immigrants:

Regarding the incidence of cannabis use disorders, after adjusting for confounders, the risk was not lower in refugees compared to native Swedes (HR=0.96) and no difference in rates could be found between refugees and non-refugee migrants (Harris et al. 2019). When comparing the lifetime prevalence of refugees to native Americans, another study found that refugees were significantly less likely than Americans to meet criteria for cannabis use disorder (OR=0.29), but compared to non-refugee migrants, the rate of refugees did not differ significantly (OR=1.10) (Salas-Wright and Vaughn 2014).

Disorders related to opioids

Prevalence:

In one study, 14.2% of refugees had received a recommendation for substance withdrawal therapy due to dependence on benzodiazepines or on opioids (Manok et al. 2017).

Change of prevalence over time:

Another study examined the prevalence of dependence on opioids in asylum seekers over time. At baseline, 1.6% (n=4) had a dependence, but at follow-up, opioid dependence was not prevalent anymore. Study authors also had found that at baseline, 22.8% (n=52) had screened positively for medication addiction, but no further statistical analysis or comparison was conducted (Nikendei et al. 2019).

Comparison to natives and other immigrants:

Refugees were significantly less likely to meet criteria for a lifetime opioids/heroin use disorder than native-born Americans (OR=0.21) and non-refugee migrants (OR=0.62) (Salas-Wright and Vaughn 2014).

Disorders related to sedatives/hypnotics

Change of prevalence over time:

Apart from the study by Manok et al. (2017) which did not differentiate between benzodiazepines and opioids, one other study (Nikendei et al. 2019) examined the prevalence of dependence on sedatives or hypnotics in asylum seekers: At baseline, 7.5% (n=17) had a dependence syndrome and at follow-up three months later, 4.5% (n=4) were dependent on hypnotics or sedatives.

Disorders related to Analgesics

Change of prevalence over time:

At baseline, 1 asylum seeker (0.4%) abused analgesics (F55.2) and at follow-up 3 months later, analgesic abuse was not prevalent anymore (Nikendei et al. 2019).

Disorders related to Cocaine and Amphetamines

Comparison to natives and other immigrants:

Refugees had a lower risk of a lifetime cocaine use disorder compared to native Americans (OR=0.15, 95% CI 0.14-0.17) and compared to non-refugee migrants (OR=0.54, 95% CI 0.50-0.59). Refugees also had a lower risk of a lifetime

amphetamine use disorder compared to Americans (OR=0.20, 95% CI 0.18-0.22) and to non-refugee migrants (OR=0.87, 95% CI 0.74-1.03) (Salas-Wright and Vaughn 2014).

Disorders related to Hallucinogens

Comparison to natives and other immigrants:

Refugees had a lower risk of a lifetime hallucinogen use disorder compared to Americans (OR=0.25, 95% CI 0.23-0.28) and to non-refugee migrants (OR=0.66, 95% CI 0.58-0.74) (Salas-Wright and Vaughn 2014).

Disorders related to Khat

Prevalence:

One study examined two subgroups of refugees who either chewed khat or did not chew khat. 72% of the khat-chewers were diagnosed with psychological dependence according to the SDS-khat. 100% of the khat-chewers fulfilled criteria for khat dependence according to DSM-IV (Widmann et al. 2014).

Combinations of disorders

Change of prevalence over time:

One study measured the combined prevalence for dependence on sedatives/hypnotics, cannabinoids, alcohol, opioids, multiple drugs and for analgesics abuse. At baseline, 10.5% (n=24) of asylum seekers had one of these SRDs and at follow-up three months later, 6.8% (n=6) met criteria (Nikendei et al. 2019).

Comparison to natives and other immigrants:

One study examined the lifetime prevalence in refugees and in native-born Americans for all substance use disorders with a prevalence of at least 1.5% in the general population. Controlling for sociodemographic, parental and psychiatric factors, refugees were three to six times less likely to meet criteria for all disorders combined (alcohol, cannabis, cocaine, hallucinogen, amphetamine, and opioids/heroin use disorder) (Salas-Wright and Vaughn 2014).

4.3.3.2 Possible risk factors

Male sex:

In total, fourteen associations could be found between male sex and SRDs. Male refugees had a significantly higher rate of hazardous/harmful drinking than females (Ezard et al. 2012, Luitel et al. 2013) and significantly higher AUDIT-scores (Luitel et al. 2013, Miremadi et al. 2011). Asylum seekers admitted to the ED due to Acute alcohol and mixed intoxication were significantly more often male (Brown et al. 2019). One study found that males had higher rates for alcohol abuse (23.5% compared to 7.3% in females) as well as for alcohol dependence (2% compared to 0% in females), but no statistical analysis was conducted (Amosu et al. 2016). Another study described a higher 12-month prevalence of alcohol abuse/dependence in male refugees of 2.3% (95% CI 0.3-4.2%) compared to the rate of 0.0% in female refugees (95% CI 0.0-0.0%) (Steel et al. 2005). For alcohol

use disorder, being male was found to be a risk factor with an odds ratio of 3.4 (95% CI 1.35-8.67) (Hewlett et al. 2015). Being male was associated with higher odds of alcohol abuse/dependence as well as substance abuse/dependence (Bogic et al. 2012). Similarly, drug use disorders (excluding alcohol) had a higher 12-month prevalence of 0.8% in male refugees (95% CI 0.0-1.9) compared to a rate of 0.2% in female refugees (95% CI 0.0-0.5%) (Steel et al. 2005). Being male was also significantly associated with cannabis abuse (Amosu et al. 2016). When analyzing cases of refugees seeking help at mental health services because of alcohol/substance use disorders, two studies found that a higher proportion of males (2% (Kane et al. 2014) and 3.3% (Fine et al. 2022)) was seeking help compared to female refugees (0.4% (Kane et al. 2014) and 1.1% (Fine et al. 2022)). Kane et al. (2014) also calculated the mean visit rate per 1,000 refugees per month which was higher in men (0.08, SD 0.15) than in women (0.02, SD 0.06), but no further statistical analysis was conducted.

Older age

In total, seven associations between an older age group and SRDs were found. Male refugees engaging in risky drinking were significantly more likely to be over 25 years old and the highest prevalence was in the age group of 40-44 years (Ezard et al. 2012). Risk factors for AUD in refugees were being in the age group of 36-50 years (OR=10.5, 95% CI 2.17-50.81) and in the age group of +50 years (OR=10.3, 95% CI 2.02-52.71). Although not statistically significant, being part of the age group of 26-35 years might be an important risk factor (Hewlett et al. 2015). Older age ($b=0.257$, SE 0.131, $p<.052$) was marginally associated with increased AUD symptoms in refugees, but statistical significance was not reached (Kim 2018). One study found that the older age group of 31-40 years abused cannabis significantly more often (20%) than the younger age group of 15-30 years (1.3%, $p<.05$) (Amosu et al. 2016).

Younger age

Two studies showed an association between younger age and alcohol-related disorders. Younger age was associated with higher odds of alcohol and substance abuse/dependence in refugees (Bogic et al. 2012). Asylum seekers admitted to the ED due to acute alcohol intoxication were significantly younger than Swiss nationals ($p<.001$) (Brown et al. 2019).

Country of origin

Four associations between specific countries of origins and SRDs were identified. Male refugees from the Horn of Africa (HR=1.77, 95% CI 1.37-2.30) and both male and female refugees from Iran (HR=2.51, 95% CI 1.93-3.25) had higher hazard ratios for hospitalization due to substance misuse compared to native Swedes (Manhica et al. 2016). The risk for hospitalization due to long-term alcohol misuse was higher in Somali refugees (HR=2.17, 95% CI 1.59-2.98) compared to native Swedes when adjusted for age and domicile. After additionally adjusting for income, risk was still elevated (HR=1.49, 95% CI 1.08-2.07) (Manhica et al. 2017). One study only sampled cocaine/heroin dependent refugees and found that people from Iran had had significantly more dependent drug use in their home country compared to people from Afghanistan (Kuhn et al. 2018).

Christian religion

There were two associations between Christian religion and alcohol-related disorders. Being Christian (OR=2.78, 95% CI 1.09-7.07) was associated with possible alcohol dependence in refugees after adjusting for all significant covariates (Luitel et al. 2013). The total AUDIT scores of refugees differed significantly by religion ($p=.000$), with higher scores in Christians (Miremadi et al. 2011).

Being married

One study stated that being married was not significantly associated with alcohol use disorder due to a wide confidence interval (OR=2.7, 95% CI 0.72-9.92) but might be important nonetheless (Hewlett et al. 2015).

Caste

The same study (Hewlett et al. 2015) compared refugees from different castes and described being from the Gurung/Limbu/Rai caste as a potentially important risk factor for AUD which again, did not reach statistical significance due to a wide confidence interval (OR=4.8, 95% CI 0.57-39.46).

Language/ethnicity

Refugees from Burma had a higher prevalence of hazardous/harmful drinking when they belonged to the language group of Poe Karen (26.5%) or Sgaw Karen (28.6%) compared to the group of Burmese speakers (13.4%, $p<.001$) (Ezard et al. 2012).

Not living with a partner

Not living with a partner was associated with higher odds of alcohol and substance abuse/dependence in refugees (Bogic et al. 2012).

Lower income

All three studies that examined hospitalizations due to SRDs found an association with lower income in refugees. One study initially found a higher incidence of hospitalization due to substance misuse in male refugees (accompanied: HR=2.52; unaccompanied: HR=2.88), but the risk was attenuated when income was additionally adjusted for (accompanied: HR=1.65; unaccompanied: HR=1.95). This effect only showed in males, not in females (Manhica et al. 2016). Another study (Leao et al. 2006) found a gradient in male refugees between socioeconomic status and hospitalization due to alcohol abuse or to drug abuse when calculating age-adjusted hazard ratios with native Swedes as a reference. Regarding alcohol abuse, HRs of female refugees only slightly decreased from 0.57 (95% CI 0.48-0.67) to 0.50 (95% CI 0.42-0.59) after additionally adjusting for income, but in male refugees they dropped markedly from 0.40 (95% CI 0.36-0.45) to 0.22 (95% CI 0.20-0.25). Focusing on drug abuse, first-generation refugee women had the lowest HR of all women with 0.77 (95% CI 0.65-0.90), but first-generation male refugees were more at risk than three other immigrant or second-generation refugee subgroups with an HR of 1.61 (95% CI 1.48-1.74). After additionally adjusting for income, HRs decreased further to 0.66 (95% CI 0.56-0.77) in female first-generation refugees and to 0.80 (95% CI 0.74-0.87) in male first-generation refugees, who now had the lowest HR of all men as well. However, for female refugees no gradient for income was found (Leao et al. 2006). Refugees also had lower risks for hospitalization due to alcohol misuse compared to Swedes when adjusted for age, gender, and domicile

(HR=0.65, 95% CI 0.56-0.77) and after further adjusting for income, the HR decreased more (HR=0.48, 95% CI 0.40-0.57) (Manhica et al. 2017).

Low literacy

Being illiterate was a significant risk factor for AUD in refugees (OR=7.3, 95% CI 2.8-18.42), low literacy turned out to be not statistically significant but an important risk factor as well (Hewlett et al. 2015).

Being unaccompanied

One study found that compared to native Swedes, accompanied refugees were less likely to be hospitalized for alcohol misuse, males (HR=0.68, 95% CI 0.55-0.85) and females alike (HR=0.37, 95% CI 0.24-0.56). Hazard ratios for unaccompanied refugees were not statistically significantly different to Swedes. Compared to accompanied refugees, unaccompanied young male and female refugees were at higher risks of alcohol-related hospitalization (Manhica et al. 2017).

Earlier age at migration

There were two associations between earlier age at migration and SRDs. One study found dose-response relationships between the incidence of any F1-diagnosis, cannabis or polydrug use disorder on one side and earlier age at migration on the other side. Those who had immigrated when being between 0 and 6 years old did not have significantly different rates to the native Swedes, whereas refugees who had been older while immigrating were significantly less likely to have the investigated disorders (Harris et al. 2019). Younger age at U.S. arrival ($b=-0.277$, SE 0.182, $p=.057$) was marginally associated with increased AUD symptoms in refugees, but level of statistical significance was not reached (Kim 2018).

Longer time of resettlement

Four associations were found between longer time of resettlement and SRDs. After adjusting for age, sex, year of immigration, pre- and post-migration trauma exposure, alcohol use disorder in refugees was associated with year of immigration (OR=6.15, 95% CI 1.14-33.3) (Marshall et al. 2005). There was also a dose-response relationship between rates of SRDs and longer time in Sweden, the HRs of refugees tended to converge to the Swedish-born rate over time. For alcohol use disorder, cannabis use disorder, polydrug use disorder and any F1-diagnosis (F10.X-F19.X), there were no statistically significant differences anymore in rates between refugees who had lived in Sweden for over 10 years and the Swedish-born population (Harris et al. 2019). A longer period of residence over 10 years was associated with higher incidence in male refugees (accompanied: HR=2.52, unaccompanied: HR=2.88), but the effect was attenuated when income was additionally adjusted for (accompanied: HR=1.65, unaccompanied: HR=1.95) (Manhica et al. 2016). Hospitalization due to alcohol misuse was linked to the length of stay as well in refugees from Somalia and the Middle East. In Somali refugees, both males and females who had resided in Sweden for more than 10 years were found to have “exceedingly high risks” (HR=2.52, 95% CI 1.62-3.92; HR=2.43, 95% CI 1.01-5.87), when adjusted for age and domicile. After additionally adjusting for income, risks decreased considerably (HR=1.68, 95% CI 1.05-2.66; HR=1.65, 95% CI 0.68-3.97) but were still elevated (Manhica et al. 2017).

Longer asylum procedure

One study compared asylum seekers residing less than 6 months in the Netherlands with asylum seekers who had been residing at least for 2 years in the Netherlands. Lifetime prevalence for alcohol dependence was 0% in the recently arrived asylum seekers and 6.6% in asylum seekers who had been waiting for a longer time. The differences between groups reached statistical significance ($p=.002$) (Laban et al. 2004).

Refugee duration

In one study (Salas-Wright and Vaughn 2014), researchers examined refugee duration on the basis of the question “How long were you a refugee?” and found a nuanced relationship between refugee duration and lifetime SUD: those being refugees for one year or longer were significantly more likely to meet the criteria of alcohol use disorder (OR=2.65, 95% CI 1.77-3.98).

Receiving country

Two studies showed associations between different receiving countries and SRDs. Alcohol dependence, alcohol misuse, substance dependence, and substance misuse were all more prevalent in refugees who had resettled in Germany ($p<.001$) compared to refugees resettled in the UK and Italy. After adjusting for confounders, refugees in Germany had the highest odds of those SRDs compared to the other two countries. Only pre-war and post-migration factors significantly contributed to variance in the rates of disorders (10.8% and 20.7%) but country differences in SRD rates were only partially explained, mainly by post-migration factors (Bogic et al. 2012). Another study compared cases of refugees visiting camp mental health services due to alcohol/substance use disorders between different countries. Among those countries, the highest percentages of visits due to alcohol/substance disorder were 9.6% in Zambia, 6.2% Liberia, and 4.6% in Namibia (Kane et al. 2014).

Certain refugee camp

One study compared refugees from two different refugee camps (Goldhap and Timai camp) and showed that living in Timai camp (OR=1.55, 95% CI 1.07-2.25) was associated with higher odds of hazardous/harmful alcohol consumption (Luitel et al. 2013).

Number of traumatic events

Khat-chewers fulfilling criteria for khat dependence had experienced significantly more traumatic events than non-chewers ($p=.007$) (Widmann et al. 2014).

Trauma count after immigration

In one study (Marshall et al. 2005), study authors examined the number of traumatic events experienced both before and after migration, which they called premigration or postmigration trauma count. After adjusting for age, sex, year of immigration, pre- and postmigration trauma exposure, AUD in refugees was associated with trauma count after immigration to the United States (bivariate OR=1.99, 95% CI 1.23-3.23).

PTSD and PTSD symptoms

Two studies showed an association between PTSD and SRDs. Khat dependent chewers experienced significantly more PTSD symptoms ($p=.002$) and were more likely to have a PTSD diagnosis ($p=.020$) than non-chewers (Widmann et al. 2014).

In the other study (Harris et al. 2019), PTSD was significantly associated with higher risk for any substance use disorder (F10.X-F19.X) (HR=5.94), alcohol use disorder (HR=3.82), and polydrug use disorder (HR=13.77) in refugees ($p<.001$), but not with cannabis use disorder (HR=2.6, $p=.19$). Association between PTSD and all substance use disorders differed by migrant status, typically PTSD was associated with a larger risk for substance use disorder in the Swedish-born population compared to refugees or migrants (Harris et al. 2019).

Using tobacco

Three associations between tobacco use and alcohol-related disorders could be found. Use of tobacco in refugees was associated with higher odds of hazardous/harmful alcohol consumption (OR=2.10, 95% CI 1.35-3.27) as well as with higher AUDIT scores (OR=1.29, 95% CI 0.48-2.09) (Luitel et al. 2013). Using tobacco (OR=4.3, 95% CI 1.84-10.01) was a statistically significant risk factor for alcohol use disorder in refugees (Hewlett et al. 2015).

Using other substances

One study showed that the use of other substances was associated with higher odds of hazardous/harmful alcohol consumption (OR=10.77, 95% CI 3.90-29.75), higher odds of alcohol dependence (OR=7.84, 95% CI 2.89-21.24), and with higher AUDIT scores (OR=7.69, 95% CI 5.20-10.18) (Luitel et al. 2013).

History of alcohol use in family

The same study showed that a history of alcohol use in the family was associated with hazardous/harmful alcohol consumption (OR=1.55, 95% CI 1.07-2.25) as well as with higher AUDIT scores (OR=1.11, 95% CI 0.35-1.88) (Luitel et al. 2013).

4.3.3.3 Possible protective factors

Some studies provided information about factors that were associated with lower rates of SRDs or lesser burdens of SRDs in refugees and asylum seekers. Hewlett et al. (2015) who explicitly searched for protective factors against AUD in refugees could not identify any protective factors.

Female sex

There were three negative associations between female sex and SRDs. Being female ($b= -3.643$, SE 0.627, $p<.001$) was associated with decreased symptoms of AUD (Kim 2018). Female gender was also negatively associated with AUD (OR=0.28, 95% CI 0.07-1.06) (Marshall et al. 2005). Female refugees also had a lower rate of substance abuse/dependence than men ($n=2$ (0.3%) vs. $n=9$ (2%), $p=.01$) (Steel et al. 2002).

Older age

AUD in refugees was negatively associated with age (OR=0.60, 95% CI 0.41-0.89) (Marshall et al. 2005).

Country of origin

Two negative associations were found between country of origin and alcohol-related disorders. Compared to native Swedes, hazard ratios for hospitalization due to alcohol misuse were lower in male refugees from the former Yugoslavian republics and the Middle East when adjusting for age and domicile. After additionally adjusting

for income, risks were even lower (F. Yugoslavia HR=0.40, 95% CI 0.28-0.56 and Middle East HR=0.46, 95% CI 0.34-0.61), opposite to Somali refugees, which were at a higher risk compared to Swedes (Manhica et al. 2017).

Religion

Kirat religion was associated with lower AUDIT-Scores (OR=-1.16, 95% CI -2.18 to -0.14) compared to Hindu religion (Luitel et al. 2013).

Language

Risky alcohol use was lower among Burmese speakers (13.4%) compared to Poe Karen (26.5%) or Sgaw Karen (28.6%) speakers ($p<.001$) (Ezard et al. 2012).

Education

Intermediate or above education was associated with lower odds of hazardous/harmful alcohol use (OR=0.35, 95% CI 0.16-0.75) and with lower AUDIT-scores (OR=-1.81, 95% CI -3.12 to -0.51) (Luitel et al. 2013).

Longer time of resettlement

One study found opposite associations between length of residence and risk of hospital admission due to alcohol misuse, depending on the country of origin. For refugees from the former Yugoslavia, the risk decreased among those who resided in Sweden for more than 10 years, whereas risk had increased in refugees from other countries (Manhica et al. 2017).

Refugee duration

Opposite to the positive association of refugee duration and alcohol use disorder, Salas-Wright and Vaughn (2014) found negative associations between duration as a refugee and other lifetime SUDs: Those being refugees for one year or longer were significantly less likely to meet criteria for cannabis use disorder (adjusted OR=0.24, 95% CI 0.22-0.27) or any other illicit drug (hallucinogens, cocaine, amphetamines, opioids/heroin) use disorder (adjusted OR=0.26, 95% CI 0.25-0.28).

4.3.3.4 Comorbidity

General mental health

Two studies focused on the general concept of comorbid mental health (MH) and alcohol and other drug (AOD) disorders in young refugees (Posselt et al. 2015b, Posselt et al. 2015a). One of them presented six broad themes and risk factors to the development of MH and AOD comorbidity which were: 1) Premigration experiences of torture, trauma, grief and loss; 2) familial factors of intergenerational conflict or separation; 3) post-migration factors: adjustment difficulties around culture and language; 4) exposure to and availability of substances; 5) maladaptive coping strategies, self-medication and misuse of prescription medication; 6) access to information, awareness and concepts of MH and AOD problems and services. The other study explored challenges that comorbid young refugees face. Among refugee youth, the most common cited challenges for youth with comorbidity were social disconnection ($n=13$), employment and education ($n=9$) and housing and homelessness ($n=8$). Service providers reported service provision ($n=16$) most commonly. Less often cited challenges were violence, crime and involvement in criminal justice system ($n=5$), unwanted or teenage pregnancy ($n=3$), physical

health issues (n=2), lost opportunities; financial issues and poverty; and managing life generally (each n=1). One study measured comorbid SUDs in their sample of refugees and found that 26 participants (2.5%) had a comorbid substance dependence compared to the 101 (9.9%) participants with non-alcohol substance dependence and that 53 participants (5.2%) had comorbid substance abuse compared to the 2 participants (0.2%) with non-alcohol substance abuse (Naeem et al. 2005).

PTSD

Among refugees with PTSD, 30% also had a SUD which corresponded to the prevalence of 30% for SUD in the whole sample. But refugees with SUD had 5.13 higher odds of having PTSD (OR=5.13, 95% CI 2.32-11.34) (Bapolisi et al. 2020). Total AUDIT-score was significantly correlated with the IES-R score (Impact of Events Scale-Revised), which was used to assess impact of trauma and indicated PTSD (Miremadi et al. 2011). Two other studies did conclude that neither AUD was significantly associated with PTSD (Marshall et al. 2005), nor alcohol abuse (Teodorescu et al. 2012).

Major Depression

Marshall et al. (2005) found that AUD was not significantly associated with major depression.

Psychotic symptoms

When comparing khat-dependent chewers against non-chewers, only khat chewers reported true psychotic symptoms (n=8 (24.2%), p=.044) or khat-related psychotic symptoms (n=25, 76%) (Widmann et al. 2014).

4.3.3.5 Service use and access to care

One study found that 24 asylum seekers (10.5%) met criteria for a substance dependence and that 17 participants were dependent on sedatives/hypnotics. The study authors additionally found that 4 participants had received a recommendation for detoxification and 2 participants a recommendation for addiction treatment regarding benzodiazepines. At follow up 3 months later, the authors evaluated the access to care and found that out of 4 participants, one (25%) had started a therapy and out of 2 participants none (0%) had started therapy for benzodiazepine addiction which was seen as inadequate health care (Nikendei et al. 2019).

In refugee youth, none of the refugees attended self-help groups (e.g. Alcoholics Anonymous, Narcotics Anonymous) compared to 2.2% (n=3) of the native U.S. youth and to 0.7% (n=1) of the immigrant youth, but the difference was not statistically significant (Betancourt et al. 2017).

4.3.3.6 Clinical correlates of admission to the ED with alcohol intoxication

Compared to Swiss-nationals, asylum seekers that had been admitted to the ED with an acute alcohol intoxication were more likely to be admitted for trauma (e.g., superficial wounds), less frequently referred to a psychiatrist, more often brought in by police, and less likely to be hospitalized (p<.001) (Brown et al. 2019).

4.3.3.7 Characteristics of addicted or dependent refugees

Use patterns

Kuhn et al. (2018) examined a sample of refugees who were dependent on heroin and/or cocaine and asked about their substance use patterns. 64 refugees were already dependent in their country of origin and the most frequently used drugs in their country of origin were opium, heroin and cannabis. People from Iran significantly consumed more alcohol in their home country compared to people from Afghanistan. During the flight, $n=7$ of those 64 dependent refugees used cannabis, $n=10$ used opium, $n=11$ smoked heroin, $n=1$ heroin i.v., and $n=22$ substitution drugs. Also, Afghans had significantly more often bought substitution substances than Iranians during the flight. The whole sample of 116 refugees was dependent on drugs in Germany, their recipient country. The most prevalent drugs in the recipient country were smoked heroin ($n=78$, 67.2%), crack ($n=44$, 37.9%) and intravenous heroin ($n=28$, 24.1%). Other drugs were cocaine i.v. ($n=12$, 10.3%), alcohol ($n=14$, 12.1%), substitution substances from the black market ($n=6$, 5.8%), and cannabis ($n=11$, 14.7%). No differences between subgroups could be found.

Westermeyer et al. (1989) examined a sample of refugees who were addicted to opium. Most subjects had begun opium use while still young, as follows: teens: $n=3$, twenties: $n=21$, thirties: $n=17$, forties: $n=11$, fifties: $n=2$, sixties: $n=1$. 32 subjects had begun opium use in Laos, 5 subjects began use in Thai refugee camps, and 18 subjects had started opium use in the United States. All were opium smokers who consumed opium two or more times daily; only one male engaged solely in opium eating. No one admitted to any lifetime use of other substances than alcohol or tobacco.

Similarly to the study before, Westermeyer et al. (1991) examined Indochinese refugees who were addicted to opium. 30 subjects had used opium in their home country for the first time, 5 in a Thai refugee camp and 15 subjects in the United States. Mean age of onset was 32.8 years (SD 9.2). The mean years of active use was 8.7 years (SD 7.9). Former addicts who arrived in the United States after 1985 had shorter periods of abstinence than those who had arrived before 1980. The mean number of pipes daily was 47.9 (SD 29.6). 29 subjects had used opium every day during the last year, 7 subjects had used opium for 6 to 10 months, 4 had used it for 2 to 5 months, the remaining 10 were uncertain. Study authors also conducted a data analysis and found that the current age of those who first used opium in the United States was significantly younger on average (mean age 32.8) when compared to those who first used in Asia (mean age 51.6, $p<.001$). The duration of addiction of those who began opium use in Asia was 11.0 years compared to 3.2 years for those beginning in the United States. Those who used opium more days in the last year were also using significantly more pipes per day ($p<.001$).

Needs and support wishes

In a sample of drug dependent refugees 75.0% wished for detoxification treatment, 54.3% for withdrawal treatment and 43.1% for substitution treatment. In addition, 52.2% expressed that the facility should also take care of the asylum application and 50.9% wished for support in finding housing. The proportion of patients wishing a detoxification treatment was significantly higher in the treatment-naïve group than in those with treatment experience in their home country (Kuhn et al. 2018).

Addiction-related consequences

In opium-addicted refugees, 73% reported that most of their current friends had problems related to opium use, 73% reported having lost friends due to drugs, and 73% reported taking money from family members without their permission in order to purchase drugs. As a result of drug-related family conflicts, 35% had left home and 25% had been alienated from their families for a prolonged period. 13% were divorced/separated due to opium use. Subjects were spending between U.S. \$200 to \$1,000 per month for their opium, with most spending \$300 to \$500 (Westermeyer et al. 1989).

In their second study, Westermeyer et al. (1991) evaluated opium-addicted refugees with the Substance Associated Problems Scale (SAPS). On the pharmacological-based 12-item subscale, which measured symptoms of substance abuse and dependence, participants had a mean of 7.9 problems (SD 2.0). On the 17-item subscale of psycho-behavioral symptoms associated with substance use disorders, participants had a mean of 11.9 problems (SD 3.4). On the 6-item interpersonal symptom subscale, participants had a mean of 3.6 problems (SD 1.9). On the 7-item subscale for family problems associated with drug abuse, participants had a mean score of 3.1 problems (SD 1.9). On the 5-item subscale for occupational/academic problems, participants had a mean score of 2.7 problems (SD 1.4). On the financial problem 5-item subscale, participants had a mean of 2.0 opium-related financial problems (SD 1.8). On the 8-item subscale for legal problems, the mean score was 0.1. Study authors additionally used the Modified Michigan Alcohol-Drug Screening Test (MMADST) to assess problem severity. Participants had a mean score of 24.9 (SD 9.6) on the MMADST. Number of patients by score severity was as follows: borderline or mild severity (scores of 6 to 10): n=3, moderate severity (scores of 11 to 20): n=15, very severe (scores of 21 to 30): n=16, extremely severe (scores of 31 and above): n=16. The MMADST score, SAPS Pharmacological Symptoms, SAPS Psycho-behavioral Symptoms, SAPS Interpersonal Problems, SAPS Family Problems, SAPS Occupational Problems, and SAPS Financial Problems correlated strongly with each other at the .001 level of significance or less. However, demographic variables and opium variables were not associated with any of the scales (Westermeyer et al. 1991).

Khat dependent chewers reported an average of 4 (+/- 1.7) withdrawal symptoms out of a total of 6 withdrawal symptoms (Widmann et al. 2014).

Reasons for the opium epidemic

In the qualitative part of their study, Westermeyer et al. (1989) identified four reasons for the opium epidemic in the U.S.: against immigration law, opium-dependent persons were permitted entry to the U.S., local county and state policies facilitated availability of opium, drug enforcement was not taken seriously by refugees, and connections between Mexican smugglers and Hmong youths facilitated drug smuggling and involvement in criminality.

4.3.3.8 Perceptions and beliefs around substances

Ezard et al. (2012) explored the topic of alcohol use in semi-structured interviews with refugee camp residents. Refugees described a gendered dimension of alcohol consumption (considered masculine and not feminine), where abstinence was associated with femininity. Karen refugees described social controls that predated the displacement: alcohol was seen as a social activity, and was seen positively when consumed in moderation. Small amounts were considered beneficial for

physical health. On the contrary, intoxication and dependence were seen negatively, as well as drinking in women. These social controls were thought to be changing due to the displacement and refugee camp life, and more people and women were using alcohol to intoxication or dependence. Explanations for the change of social controls included exposure to new cultures; ongoing population movements; increased social diversity in camp; increased economic resources; and changing social networks.

4.3.3.9 Reasons to consume substances

Hopelessness; the pressures of displacement; and the refugee camp life were identified as factors that drove alcohol use in refugee camps (Ezard et al. 2012). Refugees named following four reasons that made them start drinking regularly: influences of friends; sadness and loneliness; having nothing to do; and being tired from work. Additionally, they identified three main reasons for drinking to excess, which were tensions (usually related to family dynamics); unemployment/free time; and the influence of friends (Hewlett et al. 2015).

4.3.3.10 Possible prevention measures

Refugees in camps suggested that hopefulness provided by access to education and resettlement could prevent problem alcohol use in the refugee camp (Ezard et al. 2012). Refugee camp residents also suggested four possible strategies to control excessive alcohol intake: support services, more education (awareness and information dissemination), control of alcohol use by legal forces, and addressing underlying issues such as unemployment (Hewlett et al. 2015).

4.3.4 Study limitations

Four studies did not mention any study limitations (Laban et al. 2004, Mollica et al. 1987, Westermeyer et al. 1989, Westermeyer et al. 1991). The remaining thirty-seven studies reported between one and nine limitations (Amosu et al. 2016, Bapolisi et al. 2020, Betancourt et al. 2017, Bogic et al. 2012, Brown et al. 2019, Chernet et al. 2021, Ezard et al. 2012, Fine et al. 2022, Haroz et al. 2014, Harris et al. 2019, Heeren et al. 2012, Hewlett et al. 2015, Jamil et al. 2002, Kane et al. 2014, Kim 2018, Kuhn et al. 2018, Leao et al. 2006, Luitel et al. 2013, Maier et al. 2010, Manhica et al. 2017, Manhica et al. 2016, Manok et al. 2017, Marshall et al. 2006, Marshall et al. 2005, Miremadi et al. 2011, Naeem et al. 2005, Nikendei et al. 2019, Posselt et al. 2015a, Posselt et al. 2015b, Richter et al. 2018, Salas-Wright and Vaughn 2014, Schaffrath et al. 2017, Soegaard et al. 2020, Steel et al. 2005, Steel et al. 2002, Teodorescu et al. 2012, Widmann et al. 2014). The mentioned study limitations were very diverse, but many referred to the general study characteristics. As those aspects have already been extensively evaluated in earlier sections of this scoping review, they are not presented here. Although, other study limitations shed light on additional aspects that showed to be of importance for the research on SRDs in refugee populations.

Cultural validity and adaptation of assessment instruments

Several studies mentioned that the tools that were used had not been validated for their population of refugees or asylum seekers or for their different cultural backgrounds (Bapolisi et al. 2020, Ezard et al. 2012, Jamil et al. 2002, Kim 2018, Marshall et al. 2006, Marshall et al. 2005, Teodorescu et al. 2012) and one study that tested the reliability of a self-developed screening tool stated that cultural

adaption in general is difficult and knowledge on how to test cultural validity is still lacking (Haroz et al. 2014). Accordingly, another study stated that definitions of some terms and concepts may vary between (sub)cultures (Soegaard et al. 2020).

Underreporting

Some studies reported that there might have been an underreporting of symptoms due to a self-reporting bias (Chernet et al. 2021, Kim 2018, Luitel et al. 2013), which might be aggravated by the sensitivity of the topic or stigma (Ezard et al. 2012, Luitel et al. 2013) and modulated through cultural influences (Hewlett et al. 2015, Miremadi et al. 2011).

Influence of access/barriers to care

One study mentioned that the presented rates of SRDs in refugees might have been underestimated because of restricted access to healthcare (Harris et al. 2019). Similarly, another study speculated that variations in the risk of hospitalization due to substance misuses between countries might be due to different help-seeking patterns or barriers to care (Manhica et al. 2016).

Population heterogeneity

Several studies reported on the limitation that with regard to their study population, there probably exists a lack of generalizability to other refugee populations (Bogic et al. 2012, Brown et al. 2019, Ezard et al. 2012, Harris et al. 2019, Heeren et al. 2012, Kim 2018, Marshall et al. 2006, Marshall et al. 2005, Miremadi et al. 2011, Posselt et al. 2015a, Posselt et al. 2015b, Soegaard et al. 2020, Steel et al. 2005). Two studies mentioned a high heterogeneity in their study sample (Nikendei et al. 2019) or in subparts of their sample (Manhica et al. 2016).

4.4 Interventions

This scoping review identified two interventions regarding SRDs for refugees. Both focused on screening for SRDs.

4.4.1 MHAP-I

Haroz et al. (2014) developed a screening intervention called “Mental Health Assessment Project Instrument (MHAP-I)”, which combines adapted versions of the Hopkins Symptom Checklist 25-item version (HSCL), the Harvard Trauma Questionnaire (HTQ), a self-devised scale to measure functional impairment, and the AUDIT. The adaptation of the AUDIT for Burmese refugees included translation based on local idioms. For this scale (10 items), responses were based on how often a respondent experienced a certain type of drinking related experience: “never” (0), “monthly or less” (1), “2-4 times a month” (2), “2-3 times a week” (3) and “4 or more times a week” (4). It was scored as the sum of the item responses. The study authors tested the MHAP-I in their study and found that the MHAP-I and interview process were understandable to the interviewees. In the first testing, the first version the modified AUDIT was found to be unacceptable due to poor interrater reliability and low internal consistency. There were also problems with the translation of the AUDIT. Hence, the scales were revised and retested in a smaller sample. In the retesting, interrater reliability (Mean first interview: 4.79 (6.20); Repeat interview: 0.46 (5.88); Correlation: 0.86) and internal consistency (Cronbach’s alpha: Total sample: 0.79; Males: 0.70; Females: 0.57) could be significantly improved and the

MHAP-I was found to be good. But authors did not assess criterion validity for the AUDIT-scale, which in contrary they had done for the depression and trauma related scales and where they had found a lack of criterion validity. Authors stated that one of the main problems that remained was the lack of criterion validity and lack of an accepted gold standard, especially in lower resource settings.

4.4.2 mSASQ

Ezard et al. (2012) used an adapted version of the Modified Single Alcohol Screening Questionnaire (mSASQ) as a screening intervention to assess risky alcohol use in Burmese refugees. The mSASQ was changed by the study authors into a two-part question, so not only their own, but also the partner's alcohol consumption (frequency of consumption of 6 standard drinks or more) was assessed, and it asked about a specific time period (December 1st until pregnancy). The authors did not assess the psychometric properties in their study. Instead, they administered the adapted mSASQ to pregnant refugee women to assess their own alcohol use and their male partners' alcohol use. Study results have already been described (see 4.3.3.1).

5 Discussion

This scoping review identified a total of forty-one studies. Forty studies investigated one or more SRDs. One study solely evaluated a new screening intervention, and one study presented both, the investigation of SRDs and a screening intervention.

5.1 General study characteristics

5.1.1 Year of publication, study aims, countries of research and setting

The investigation of SRDs in refugees and asylum seekers is a rather nascent but emerging topic, demonstrated by the finding that most of the identified studies were published in the last fifteen years. Only fourteen studies explicitly aimed to investigate SRDs, and five studies aimed to study substance use. Most studies rather treated SRDs as a byproduct next to the predominant topic of general mental health. In conclusion, future research needs to focus more on SRDs to grasp the scope of the problem and the subsequential public health challenges, because a potentially rising number of people might need support.

In the research, there is an imbalance in the global representation. Roughly 75% (thirty-one) of the included studies were conducted in HICs and 25% (ten) studies in LMICs (World Bank 2024). This distribution is almost opposite to the global distribution, as only 25% of all refugees worldwide are hosted in HICs, but 75% are hosted in LMICs (UNHCR 2023). Some LMICs which host or have hosted large amounts of refugees in recent years, e.g. Turkey, Iran, Syria, Lebanon, Jordan or Venezuela (Fransen and de Haas 2022), have not been included in the research body. The underrepresentation of LMICs in the global research has been criticized by other authors before who have also argued that findings on substance use in high-income settings might not be applicable to low-income settings (Horyniak et al. 2016). As resources of any kind often are much more limited in low-income settings (Silove et al. 2017), more knowledge is needed regarding SRDs in LMICs to distribute resources most effectively.

Additionally, research in LMICs predominantly focused on the refugee camp setting, yet only 22% of refugees worldwide reside in camps (USA for UNHCR 2021). Knowledge on SRDs in refugees living outside of camps in LMICs remains very limited. In the context of HICs, studies paid less attention towards the housing situation with many of them not reporting any information. Although two studies compared asylum seekers living in and outside of reception centers, their goal was to evaluate the influence of time spent in the receiving country. Opinions on the link between housing and SRDs seem to differ. Some researchers claimed refugees in low-income and non-camp setting to be the most vulnerable (Weaver and Roberts 2010), others suspected the camp-setting to increase the prevalence of SUDs (Horyniak et al. 2016). A case will be made here for a possible link between housing and SRDs:

Especially for refugee camps, e.g. in Kenya or in southern Europe, extremely adverse conditions have been described, e.g. (sexual) violence, armed robbery, neglect of basic human needs, general unpredictability of life, lack of information, and boredom (Crisp 2000, Pérez-Sales et al. 2022, Wagner and Finkielstein 2021). But also, in reception and asylum centers in HICs, insufficient housing conditions such as lack of privacy, overcrowding, and insufficient kitchen or sanitary facilities have been criticized up to the point that German or British accommodation centers have been “often referred to as ‘camps’ by critics” (Fachinger et al. 2024) or as

prisons (Asylum matters 2021). Boredom drives substance use in asylum centers (Dupont et al. 2005). Furthermore, detention has become more common with refugees being held in so-called “closed refugee camps” (Revkin 2022) or in reception centers (Sironi et al. 2019) due to increased mandatory detention of asylum seekers in western countries (Filges et al. 2024). Detention and institutional accommodation of refugees and asylum seekers increases risk of mental health disorders, such as anxiety, depression, PTSD, suicidal ideation and suicide (Filges et al. 2024, Porter and Haslam 2005, Priebe et al. 2016, von Werthern et al. 2018). In conclusion, living in refugee camps or in institutional accommodations might promote the development of SRDs, either directly or through the development of comorbid mental disorders. The link between refugee camps and SRDs was supported only by one study identified in this scoping review in which refugee camp life was named as one driver of alcohol consumption (Ezard et al. 2012). Recently, a study in Germany suggested that little privacy and autonomy, as well as high availability through drug dealing and recommendation from fellow housemates in German refugee shelters led to substance use. Study authors also found the setting of shelters in rural or urban areas to increase substance use, either through limited prospects and boredom or through contact with an open drug scene, and that consequentially, risk for SUD is elevated (Hertner et al. 2023). At the same time, it is also important to consider that living conditions in refugee camps or reception centers might differ a lot from each other, depending on a multitude of factors, such as the respective country, the financial situation, the composition of inhabitants, etc. This consideration is supported by the results of one study which found the risk of hazardous/harmful drinking to differ between two different refugee camps and speculated that camp-level influences might shape the risk (Luitel et al. 2013). In conclusion, there might not be a uniform refugee camp or refugee center setting, but future research could examine how refugee camps, institutional accommodation and detention are linked to SRDs because knowledge on those links remains scarce. Emphasis needs to be put on the individual contextual factors which define the living conditions of refugees and asylum seekers in different housing situations.

5.1.2 Study design, sampling methods and sample size

Usually, it is not necessary or beneficial to conduct a systematic appraisal of quality in a scoping review (Munn et al. 2018). But since this scoping review only included primary studies, comparing the general characteristics helped to roughly assess how research was conducted, how that might have influenced the available evidence and what can be concluded from that for future research.

Among thirty-nine quantitative studies, thirty studies used a cross-sectional design, and one study used a case-control-design. Both are considered to be on the lower end of the hierarchy of evidence (Wallace et al. 2022). The predominance of cross-sectional studies also means that mostly, the temporal nature of SRDs and their associated factors could not be investigated (Lo et al. 2017) and the causality between investigated factors such as risk or protective factors and SRDs could not be ascertained (Wallace et al. 2022, Bapolisi et al. 2020, Lo et al. 2017). In 2016, Horyniak et al. (2016) reported on “a dearth of studies using longitudinal methods, which limits our understanding of how substance use changes across the migration trajectory including following resettlement.” Almost all longitudinal studies identified in this scoping review were published subsequently. Three prospective cohort studies had short follow-up intervals of 3 months to 1 year and conducted no statistical analysis on how time is related to the SRDs. The remaining four

retrospective studies reported on dose-relationships between longer time of resettlement and SRDs but were conducted exclusively in Sweden. Robust data on how SRDs and time are associated in refugees and asylum seekers outside of the country of Sweden is missing. Longitudinal research is still urgently needed, not only across refugees' lifespan but also across generations (Elkholy et al. 2023).

Concern arises with regards to the sampling methods, as fifteen studies reported having used non-probability sampling and nine studies did not report on their sampling technique. This leaves most of the studies with unclear or less rigorous sampling methods. As recent research has shown that the sampling method influences prevalences of mental disorders, study authors have argued for the importance of statistically representative samples when studying populations "as various and difficult to study [...] as refugees and asylum seekers" (Patane et al. 2022). The same approach should be taken in the future when estimating prevalences of SRDs. Additionally, several included studies used rather small sample sizes. While those might be more feasible and suitable for qualitative research, future studies should aim to establish sample sizes big enough to estimate prevalences or to conduct statistical analyses which are needed when investigating risk or protective factors or other epidemiological factors.

5.1.3 Data collection method

Considering the linguistic and cultural aspects in the research around refugee populations seems of importance. Of three studies using self-reporting instruments, two reported having different languages or a translator available. Of thirty-two studies using interview-based assessments, twenty-three addressed cultural and/or linguistic barriers. Of the nine studies that used preexisting data, only one study addressed linguistic barriers. In summary, more than a third of studies did not report on linguistic or cultural aspects regarding the process of data collection.

Language barriers might lead to incorrect assessments, e.g. wrong prevalence estimates or faulty conclusions. Providing assessment in participants' native languages seems especially difficult when considering the fact that refugees and asylum seekers are a very heterogeneous population. Even within a population from one geographic location, there might be wide linguistic or cultural differences, as has been demonstrated by one study with refugees from Burma who belonged to different language/ethnic groups (Ezard et al. 2012).

Additionally, cultural barriers can affect the process of collecting data (SAMHSA 2009). Various precautions can be considered, for example gender-matched study assistants (Hewlett et al. 2015) or having culturally similar experts available for discussion if questions are not understood (SAMHSA 2009). Regarding other mental disorders, researchers have argued that for culturally diverse populations, administering instruments by clinicians provides more reliable results than self-report instruments (Charlson et al. 2019, Henkelmann et al. 2020, Patane et al. 2022). Regarding SRDs, it has been recommended to conduct interviews in the client's preferred language by trained staff members or with an interpreter from the same culture (SAMHSA 2009). Future studies on SRDs should contemplate linguistic and cultural barriers when deciding on the process of data collection.

5.1.4 Measures used for SRDs

In the assessment of SRDs, it is crucial to define the specific goal before deciding which instrument to administer (Boness et al. 2024). There is an important difference between screening and diagnostic instruments: whereas screening instruments

determine if there is a need to conduct further assessment and if the person might be at risk for a SRD, diagnostic tools can reliably provide diagnoses (Boness et al. 2024, SAMHSA 2009). This scoping review identified three screening (AUDIT, DUDIT, mSASQ) and five diagnostic instruments (MINI, SDS-khat, SCID, CIDI, AUDADIS-IV) that were used to measure SRDs in refugees/asylum seekers. Several studies exercised caution when applying the AUDIT and spoke for example of “possible alcohol dependence” (Miremadi et al. 2011), “probable AUD” (Marshall et al. 2005), or “likely dependence” (Hewlett et al. 2015). Other studies though used the AUDIT or DUDIT to diagnose alcohol and drug use disorder (Soegaard et al. 2020), to determine “the rate of AUD” (Kim 2018) or to report how often “criteria for AUD had been met” (Marshall et al. 2006). Imprecise use of assessment instruments has been criticized in the general scientific literature before, demonstrated for example by researchers criticizing that the AUDIT is often used to ascertain if individuals are likely to meet diagnostic criteria for AUDs and not whether they have hazardous or risky drinking patterns, as it was the original purpose of that tool (Lange et al. 2019). A recent meta-analysis concluded that the AUDIT is not recommended for identifying individuals with an AUD, especially not among populations with a low AUD prevalence (Lange et al. 2019). Therefore, study results of SRDs based on the AUDIT or other screening instruments should be handled with caution, especially when considering the potentially low prevalence of SUDs in refugees and asylum seekers. Future studies should apply diagnostic interviews when investigating SRDs in refugee populations as those are less prone to bias and provide more reliable results (Patane et al. 2022).

Additionally, there were three assessment instruments developed by the study authors Westermeyer et al. (Westermeyer et al. 1991, Westermeyer and Neider 1988). According to the authors, those measured drug use, drug-related behaviors and problems (SAIS), problem severity (SAPS), or drug-and alcohol-related symptoms (MMADST). To the best of this authors knowledge, those instruments do not seem to be commonly used in the scientific literature and, when used, often appear in other works published by the same authors (Westermeyer and Boedicker 2000, Westermeyer et al. 1997, Westermeyer et al. 1994, Westermeyer et al. 2001, Westermeyer et al. 2004, Westermeyer et al. 1998). The scarce use of these tools in the general scientific literature and the mostly unclear psychometric properties, except for the SAPS which has been validated by its authors (Westermeyer et al. 1998), limit the conclusions that can be drawn from them. For future research on SRDs, it therefore seems more recommendable to use preexisting, validated instruments.

Apart from using assessment instruments, two studies diagnosed participants otherwise. While the validity of those diagnoses remains unclear, it is noteworthy that one of the two studies aggregated data of refugees with possibly present abuse and those with definitive abuse, which might have led to a bias in prevalence estimates (Betancourt et al. 2017).

Results on hospitalization rates might provide information about the extent to which hospital care is used, but any other use of health care was not investigated, potentially excluding a substantial amount of other refugees and asylum seekers, e.g. in outpatient care (Leao et al. 2006). Additionally, the measured hospitalization rates most likely do not represent the actual need for treatment, since refugees face restricted access to substance use treatment (Saleh et al. 2023). Most importantly though, the rates of hospital admission do not necessarily represent the actual rates of alcohol and substance abuse in refugees and asylum seekers. The same

concerns can be extended to studies that examined the frequency of health care visits in refugee populations. Future studies therefore should differentiate between actual rates of disorders, rates of hospitalizations or health care visits due to those disorders, and the extent to which healthcare is needed, as those three concepts are all interesting, but not equal. In summary, the heterogeneity in measures of SRDs can be expected to produce a heterogeneous evidence base and to limit comparability across studies.

5.2 Characteristics of SRDs in refugees and asylum seekers

5.2.1 Examined SRDs

The predominant focus of research concerning SRDs in refugees and asylum seekers lies on alcohol-related disorders and on disorders related to unspecified substances. Less evidence is available for cannabis and opium/opioids related disorders. Very limited evidence is available for disorders related to sedatives/hypnotics, analgesics, amphetamines, cocaine, hallucinogens and khat. It could be argued that so far, researchers mostly looked at SRDs from a western viewpoint by paying less attention to substances which are beyond their cultural scope. But there is a substantial prevalence of disorders related to the Areca Nut (or “Betel Squid”) in different parts of Asia (Ko et al. 2024) and disorders related to Khat in East African countries like Ethiopia (Duresso et al. 2016) and in the Middle East in Yemen (Nakajima et al. 2017). Opium is a widely used substance in Iran (Dupont et al. 2005). And research has shown that refugees and asylum seekers practice the use of traditional substances after resettlement in HICs (Dupont et al. 2005, Bongard et al. 2015, Cumming et al. 2021). Their use patterns can even intensify when rituals have to be changed due to external factors such as limited availability (Dupont et al. 2005). As only three studies examined disorders related to Khat or Opium (Westermeyer et al. 1991, Westermeyer et al. 1989, Widmann et al. 2014), it remains unclear whether disorders related to exotic or traditional substances are of major concern in refugee populations. This might depend on the question whether refugees rather develop SRDs in the receiving countries and show clinical profiles similar to the native population, whether they bring patterns of use and disorders from their countries of origin or migration route, or whether they initiate use and disorders related to traditional substances after resettlement, for example through contact with the local refugee community (Westermeyer et al. 1989). A recent study on refugees resettled in Germany describes how teenage refugees consume more alcohol and cannabis and how refugees generally do not tend to consume illicit party drugs because of inadequacy of effect and limited access. But the study reinforces reports that refugees might have access to traditional drugs such as opium through refugee communities (Hertner et al. 2023). More research is recommended to expand the knowledge on traditional substances and how availability and use or disorders change over the course of the migration process. Examining SRDs in refugees and asylum seekers also raises questions about the terminology around “substances” or “drugs”. This is especially relevant, since the second most researched substance was the very broad category of unspecified substances, which was often also just called “drugs”. In the scientific research, there has been a debate about the wording in that context, highlighting the fact that the word “drugs” has different meanings. A drug can be either a medicine, a psychoactive substance, or a dangerous, moralized and often illegal substance. The

distinction between those meanings is often not made explicit and therefore impedes an objective and coherent discourse and adds to the stigma and discrimination of people who use and abuse substances (Tupper 2012). Also, the predominant belief remains that the substance alcohol is somehow ontologically different to other psychoactive substances which is sometimes expressed through the clear distinction from alcohol to “drugs”, for example in phrases like “alcohol and drugs” (Tupper 2012). This distinction and the semantic confusion have partly played a role in the research on SRDs in refugees and asylum seekers as well. Many studies investigated disorders related to unspecified substances without providing more information about the substances of interest. In this meaning of “substance” or “drug”, it can be assumed that any substance, alcohol as well, is included. Other studies though investigated disorders related to unspecified substances as well as alcohol-related disorders. Although mostly not mentioned, in this context, the term “substance” or “drug” probably included all psychoactive substances, except alcohol. Only one study (Naeem et al. 2005) clearly differentiated between alcohol and other substances by using the term “non alcohol substance”. In conclusion, the term “substance” or “drug” has different meanings, in the research around refugee populations. This issue adds to the heterogeneity of evidence on SRDs in refugees and asylum seekers and study results are not fully comparable if central terms are used ambiguously.

When comparing not only the substances, but all the different disorders which have been studied, the complexity of the current state of research becomes even more apparent. The spectrum of investigated disorders included concepts of abuse, misuse, harmful use, hazardous use, dependence, abuse or dependence, substance use disorders, and intoxication. Those were partially used in the sense of specific diagnoses defined by the ICD and the DSM, but partially used without giving a definition and without a reference to a diagnostic system. Sometimes those concepts also represented disorders defined by other institutions, like UNHCR’s health information system. Whether the concepts of disorders that were either undefined or defined by other institutions fully correspond to the official diagnoses of the ICD or the DSM cannot be determined definitively, but nonetheless, respective studies were included in this scoping review since they claimed to investigate disorders. Studies investigating official diagnoses referred to the versions of DSM-III, DSM-IV and DSM-V, as well as ICD-9 and ICD-10. Although the ICD and the DSM have been developed in close conjunction with each other to have comparable diagnostic entities, the different versions contain different diagnostic entities which are not always fully comparable (Saunders et al. 2019, Hasin et al. 2006). Whereas research has found excellent concordance between the dependence syndrome across both diagnostic manuals, the diagnoses of harmful use and abuse showed poor agreement as those disorders are fundamentally different (Saunders et al. 2019, Hasin et al. 2006) and DSM-V substance use disorder is a different condition to the previous disorders of dependence and harmful use/abuse or their combination (Saunders et al. 2019). In conclusion, study results referring to different diagnostic entities are not fully comparable.

The heterogenous state of research is further complicated by semantic confusion: One study used the terms “misuse” and “abuse” interchangeably (Bogic et al. 2012). This reflects on the general semantic confusion in the scientific literature, where the term “misuse” has been used interchangeably with other substance-related concepts and a standardized definition is still missing (Mahmoud et al. 2017, Saitz et al. 2021). Other study outcomes were imprecisely defined, such as “alcohol-

related psychiatric/medical disorders with long-term alcohol misuse” (Manhica et al. 2017) or “substance misuse with a diagnosis of a substance use disorder” (Manhica et al. 2016). The term “substance use disorder” was ambiguously used, sometimes as an umbrella term and sometimes as the DSM-V diagnosis. Additionally, some studies investigated alcohol use disorders without specifying whether it was used as an umbrella term or as a diagnosis according to the DSM-V. Future research should either precisely define the substance-related concepts that are studied or use pre-defined concepts, such as diagnostic entities, to ensure that study outcomes are comprehensible and comparable.

Although the research regarding SRDs in refugees and asylum seekers seems to be very heterogenous due to the variety of substances, diagnoses and concepts that have been applied, it remains congruent in one point: all the identified studies examined only substance use disorders. There is a dearth of research regarding substance-induced disorders in refugees and asylum seekers. Only one study concluded that large amounts of khat probably can induce psychotic symptoms and disorders but whether the measured psychotic symptoms corresponded to a substance-induced psychosis remained unclear (Widmann et al. 2014). It seems likely though that refugees and asylum seekers are more vulnerable for substance induced disorders due to their often already preexisting mental health burdens and more research is needed.

5.2.2 Examined populations of refugees and asylum seekers

The majority of thirty-four studies examined refugees, whereas only six studies examined asylum seekers. The evidence base for refugees seems to be more robust because roughly a third of the respective studies also included native-born and immigrant participants as a comparison group. For asylum seekers, there was only one study that compared them to natives. Although both populations are often considered to be very similar (Patane et al. 2022, Priebe et al. 2016), some researchers point out a difference due to the specific stressors associated with the asylum-seeking process, such as long waiting times, uncertainty, detention, possible rejection, and the temporary nature of assigned protection, which have been associated with a deterioration of mental health (Li et al. 2016, Priebe et al. 2016). In this scoping review, only one study found longer asylum procedure to be associated with alcohol dependence, evidence on other factors specific to asylum seekers is missing. Because no study compared between refugees and asylum seekers, it remains unclear whether asylum seekers face different risks or show different prevalences than refugees.

One of the big issues identified in this scoping review is the extreme heterogeneity between and within the examined populations. Studies for example set different age restrictions and mostly focused on adult persons, but a small subset also focused on refugee youth. Varying age restrictions probably led to a big discrepancy between the average age of study participants which reached from roughly 13 years to 53 years. The identified studies also differed in their inclusion and exclusion criteria, leading to populations of refugees and asylum seekers with different characteristics. One study on alcohol use disorders excluded people with positive AUDIT screening results and one study on khat excluded refugees that were additionally dependent on other substances. Both might have led to a relevant exclusion of potential participants and to a subsequent bias. Several studies took differences within their study sample into account and compared subgroups, resulting in a variety of subgroups and comparisons. While those comparisons

yielded interesting results, the strength of evidence remains limited because each comparison was conducted by only one or two studies. Furthermore, asylum seekers and refugees originated from many different countries, mainly from countries located on the African or Asian continent. Only two studies mentioned having included refugees from the South American continent, one of them only at a percentage of 5 percent. Approximately a third of studies included refugees from only one country and another third included people from multiple countries. The remaining studies either named continents or subregions of continents or did not specify at all where participants originally had come from.

Definitions of refugees varied and comprised convention-refugees, refugees recognized by UNHCR or people who self-described as refugees. Two studies additionally classified asylum seekers or other individuals such as undocumented or illegal migrants and people with a residence permit on humanitarian grounds as refugees. But mostly, studies did not provide a definition.

Summarizing all the characteristics in which the studied populations differed, shed light on the extreme heterogeneity of studied refugees and asylum seekers. This might limit the comparability of studies because etiologies, diagnostic processes and trajectories of SRDs might vary accordingly. As shown in the study results, factors such as age, country of origin, language/ethnicity, religion, trauma and trauma count, PTSD, status of accompaniment, time of resettlement and duration of asylum procedure are associated with different risks of disorders. Neither the term “refugee” nor the term “asylum seeker” seems to be able to adequately describe the very diverse identities and experiences of the concerned individuals. It seems crucial that future studies define their samples beyond their status as refugees or asylum seekers. By doing this, associations between specific characteristics and disorders can be investigated more thoroughly and reliably. Subsequent study results might become more comparable and knowledge on SRDs can be expanded.

5.2.3 Study results

5.2.3.1 Frequencies of SRDs

Results on hospital admission due to SRDs were mostly homogenous. Two studies showed that refugees were at a lower risk of being hospitalized for alcohol abuse compared to natives (Manhica et al. 2017, Leao et al. 2006). Two studies found that for hospitalization due to substance abuse, female refugees were at a lower risk, but male refugees were at a higher risk compared to natives (Manhica et al. 2016, Leao et al. 2006) and study results differed only as one of the two studies (Leao et al. 2006) found male refugees to be at a lower risk as well after additionally adjusting for income. The consistency of those results might be caused by the extreme similarity of the studies, as all of them were conducted in Sweden and because the two studies by Manhica et al. (2016, 2017) used almost identical study cohorts. Results on the risk of hospitalization might therefore be specific to the country of Sweden or to the population of refugees that was residing there. Evidence for other resettlement countries could not be identified.

Studies on visits at mental health care facilities were more divergent. While two studies conducted in refugee camps found visits due to alcohol/substance use disorders to be the lowest with 2.2% and 1.1% (Kane et al. 2014, Fine et al. 2022), a third study, which was conducted in a community setting, found that visits for SRDs were the third most prevalent visits with 15% (Schaffrath et al. 2017). Results are

hardly comparable due to the different samples and settings and might be biased by barriers to healthcare.

Many studies provided prevalence estimates of SRDs. But while only few studies estimated prevalences of disorders related to cannabis, opioids, hypnotics/sedatives or khat (Widmann et al. 2014, Nikendei et al. 2019, Manok et al. 2017, Amosu et al. 2016), most studies focused on disorders related to alcohol or to unspecified substances and provided partially very heterogeneous estimates. This can be exemplified by the prevalence estimates for alcohol abuse, which ranged from 4.3% up to 17.1%, as well as their apparent contradiction to a lifetime prevalence estimate of 0% for alcohol abuse or to the prevalence estimates of combined abuse/dependence, which ranged from only 1.9% to 8%. For disorders related to unspecified substances, prevalence estimates were similarly contradictory: Prevalence ranged from 0.2% to 4.2% for substance abuse, and from 1.9% to 9.9% for dependence, but combined prevalence of abuse/dependence seemed low with 0.6% and 4%. On the other hand, one study found an outstandingly high prevalence of 30% for substance use disorders (Bapolisi et al. 2020) and another study a prevalence of 17.4% for substance abuse/polytoxicomania (Manok et al. 2017). It is not feasible to determine the specific reasons for the divergent prevalence estimates in a scoping review, as a statistical analysis would be needed and all factors suspected to influence the outcome would have to be minutely extracted and compared. But since this scoping review could only identify forty studies that examined a plethora of different disorders and diagnoses, so far, the identified evidence base does not seem solid enough for a meta-analysis calculating estimates for specific disorders or diagnoses. An extreme heterogeneity existed regarding the general study characteristics (camp/center vs. community setting, different data collection method/measures and country of research), in applied concepts of disorders (different or undefined diagnostic entities or umbrella terms), and in sampled refugee populations (preexisting trauma or MH condition, different age, country of origin, or subgroups). It is likely that this heterogeneity caused the divergence of prevalence estimates. Thus, future research needs rigorous study designs and analyses, as well as precisely defined study populations to provide estimates of prevalences. Finally, it must be acknowledged that research which solely aims to estimate prevalences neglects contextual factors in the development of SRDs (Hertner et al. 2023). Important and still understudied questions remain mostly unanswered, which might be for example “Where in their migration journey are refugees and how does that affect the development of SRDs (are they on the flight, protracted in a refugee camp, recently or for a longer time resettled, or repatriated)?”, or “How is the prevalence of SRDs compared to other populations?”, or “Which factors and mechanisms shape the risk and how do they differ compared to other populations?”. Attempts to answer some of those questions and to address the contextual factors will be presented in the following sections.

All five studies that examined the change of prevalences over time focused on the period after refugees' and asylum seekers' resettlement in a HIC. Study results were divergent as prevalence estimates developed in opposite directions: For disorders related to alcohol and to unspecified substances, prevalences sometimes slightly increased, but sometimes also slightly decreased after resettlement. For other disorders, which were related to sedatives/hypnotics, cannabinoids, opioids, and analgesics, only one study could be identified (Nikendei et al. 2019), which showed that those prevalences mostly slightly decreased. Furthermore, most of the respective studies did not provide a statistical analysis and changes over time were

often marginal. Both observations raise concern about the strength of evidence. Only two studies provided a statistical analysis and showed contrary results: in one study, alcohol abuse/dependency did not change significantly 12 to 26 months after resettlement (Heeren et al. 2012), in the other study, lifetime prevalence of alcohol dependence was higher after 2 years (Laban et al. 2004). At first glance, those inconclusive results contradict the findings of other studies, which found longer time of resettlement to be a risk for higher rates of SRDs. This apparent contradiction might be explained by the fact that the studies referred to different time periods: Those studies which observed the change of prevalence over time used rather short time frames from three months up to two years. Studies that described longer time of resettlement as a possible risk factor examined time frames of 10 years or longer. Hence, an increase in prevalence of SRDs probably happens only after several years. For future studies, long observation periods, preferably spanning over decades, are needed.

Similar to the immigrant advantage (Salas-Wright and Schwartz 2019), researchers have postulated the existence of a so-called “refugee paradox” (Salas-Wright and Vaughn 2014). According to the refugee paradox, Salas-Wright et al. (2014) could show that refugees equally showed lower rates of SUDs compared to natives, and refugees were less likely to meet criteria for disorders related to alcohol, but also to cannabis, opioids/heroin, amphetamines, cocaine and hallucinogens. Supporting the existence of this refugee paradox, all other identified studies unanimously showed that resettled refugee populations presented lower rates for all disorders related to unspecified substances or alcohol than natives. While researchers have argued that refugees are less likely to exhibit a healthy immigrant effect because their migration is forced and not based on self-selection (Elshahat et al. 2022, Horyniak et al. 2016), other theories from the field of immigrant research might be applicable for explaining the refugee paradox. Refugee populations could profit from internalized conservative substance norms of their country of origin (“inoculation hypothesis”), they could be protected through a herd immunity in their refugee communities (“cultural armamentarium”), or they might avoid substances due to fear of legal consequences (“deterrence theory”) (Salas-Wright and Schwartz 2019). For cannabis use disorders, evidence was mixed as one study found the same incidence, and another study found a lower prevalence compared to natives. More research is needed to clarify if cannabis use disorder shows different patterns compared to other SRDs. Finally, one study showed that asylum seekers in a Swiss ED were more likely to have an acute alcohol intoxication compared to natives. It is unclear if that finding can be extended to other refugee populations. Originating from countries with alcohol prohibition or stricter rules and less availability of alcohol might pose refugees and asylum seekers resettled in westernized countries at a higher risk for alcohol intoxication due a combination of alcohol availability and a lack of personal experience or knowledge of alcohol (Dupont et al. 2005). Since acute and high alcohol consumption is associated with increased risk of unintentional and intentional injury and suicide attempts (Taylor et al. 2010, Borges et al. 2017) it presents a major risk, especially for refugees and asylum seekers who might already be burdened with mental health problems. Consequently, more research is needed to clarify if they are at risk for acute alcohol intoxication, which pathways underly this mechanism and which preventive measures could be taken. Comparisons between refugee populations and other immigrants remained inconclusive. Mostly, the differences did not reach statistical significance, and while one study found a marginally higher prevalence of drug abuse/dependence and a

lower prevalence of alcohol abuse/dependence in refugees, the researchers did not conduct a statistical analysis (Jamil et al. 2002). Salas-Wright and Vaughn (2014) on the other side showed that refugees were at a lower risk for all SUDs (i.e. alcohol, cocaine, amphetamines, opioids, and hallucinogens), except for cannabis use disorder, which was not significantly different between refugees and immigrants. While Salas-Wright and Vaughn (2014) speculated that refugees' advantage over immigrants might be due to their specific institutional support and benefits, the remaining identified evidence base could not demonstrate a similar advantage of refugees. In conclusion, it remains unknown which mechanisms exactly could cause the refugee paradox or the immigrant advantage, if one of them might be stronger, or if those populations face different risks due to their varying journeys and experiences. More research is needed to uncover possible differences and similarities between refugee populations and other immigrants.

5.2.3.2 Possible risk factors and protective factors

Throughout the course of research on addiction and on SUDs, one of the main goals has been to uncover the etiology of those disorders. Most etiological studies focus on the framework of "risk" and describe risk or protective factors, which are predictive factors associated with a higher or a lower probability of SUD. Meanwhile, it is important to understand that posited risk is neither equivalent to causality nor to predestination, a risk factor therefore does not necessarily play a causal role in the development of a disorder (Sloboda et al. 2012). Risk factors may act as mediators/mediating factors, which do not cause the outcome but represent the mechanism through which the causal factors acts, or may act as moderators/mediating factors, that alter the direction or strength of how a risk factor influences the outcome (Weinberg 2001). With twenty-one studies, a substantial part of the identified evidence base investigated factors that were either positively or negatively associated with SRDs in refugee populations. Whereas some studies explicitly called those "risk factors" or "protective factors" (Bogic et al. 2012, Hewlett et al. 2015, Luitel et al. 2013, Laban et al. 2004, Posselt et al. 2015b), the remaining studies simply reported on the positive or negative associations of factors with SRDs. For a clearly structured presentation, the approach of most of the pre-existing reviews was followed (Lo et al. 2017, Ezard 2012, Lemmens et al. 2017, Weaver and Roberts 2010, Saleh et al. 2023) and factors associated with SRDs were categorized as either risk factors or protective factors. To indicate the risk of bias that lies within the process of this categorization, factors were called "possible risk factors" or "possible protective factors".

In total, twenty-four possible risk factors and eight possible protective factors for SRDs in refugees and asylum seekers could be identified. In the following section, factors related to the migration experience will be discussed more in-depth as those are specific to refugees, asylum seekers or other migrants.

Specific **countries of origin** showed divergent associations with the risk of hospitalization: Males and females from Iran and males from the Horn of Africa were at a higher risk for hospitalization due to substance misuse. Study authors (Manhica et al. 2016) hypothesized that higher risk for refugees from those countries might reflect the patterns of drug use that they bring with them, as Dupont et al. (2005) showed that Iranians continued opium use and Somalis continued Khat use in the Netherlands. As the study only focused on unspecified substances, this theory could not be further supported, which again underlines the earlier debated importance to clearly report on specific substances. While the study authors (Manhica et al. 2016)

argue that female refugees in general have lower risks for substance misuse due to cultural factors, it remains unclear why Somali females did not have a higher risk, but Iranian females did. There might be a more complex interplay between gender and country of origin, maybe due to divergent cultural factors from different countries of origin. Refugees from Somalia also had higher risks of hospitalization due to alcohol misuse but refugees from the former Yugoslavian Republic and the Middle East seemed to have a protective effect. Study authors argued that higher psychiatric morbidity and more pronounced socioeconomic disadvantages in Somali refugees might explain their higher risk (Manhica et al. 2017). The question arises though if that explanation is sufficient, especially because for refugees from the former Yugoslavian Republic and from Iran/Iraq similar burdens have been described in a study cited by the authors (Lundborg 2013), but also in other articles (Bogic et al. 2015). Leaning on the theory by Dupont et al. (2005), different risks could be seen as a continuation of the different values, traditions and standards of the respective country of origin. Dupont et al. highlight the possibility of different and partly opposite trajectories: whereas people from former Yugoslavia might decrease their alcohol use, people with Muslim backgrounds might either practice complete abstinence, low, or excessive consumption, partly because of puzzlement with new substance policies or a lack of experience. Recently, one qualitative study in Germany has emphasized the complex interplay between country of origin and post-migration substance (mis)use. The authors suggested that the link might not be direct but indirect, as prospects and opportunities, such as residential and work status, living conditions and prospect of family reunion, depend on refugees countries of origins and shape the risk for substance (mis)use (Hertner et al. 2023). While Dupont et al. focus on cultural differences across the various countries of origin, this perspective is not without problems as researchers have pointed out that the concept of culture is imprecisely defined, specific cultures are difficult to measure and that against long-standing belief, there might not always be such a thing as national culture, as culture not necessarily equals country (Taras et al. 2016). More research is needed to identify countries or cultural backgrounds that act as risk or protective factors, and to uncover the mechanisms of those effects to find target points for possible interventions and to adapt public policies.

One study in Germany showed that refugees from Iran were more likely to be already drug dependent in their home country. This stands more in contrast to the study of Dupont et al. (2005) that mainly emphasized a recreational use in the home country and an exacerbation in the receiving country among opium-using Iranian refugees. Nonetheless, it could be an indication that the temporal onset of SRDs varies between refugees from different countries of origin and that this effect could also be mediated by different cultures related to substance use.

Longer time of resettlement equally acted both as a possible risk and protective factor. In Amerika, AUD was associated with year of immigration, and in Sweden, incidence of AUD, cannabis and polydrug use disorder, and any F1-diagnosis (F10.X-F19.X) increased with longer time of resettlement. Additionally, hospitalization due to substance misuse increased, but only in male refugees. Hospitalization due to alcohol misuse increased only in refugees from Somalia and the Middle East. For refugees from the Former Yugoslavian Republic, longer time of resettlement seemed to have a protective effect. One of the most prominent theories on how longer time of resettlement increases the risk of SRDs is the “acculturation effect” in which migrants presumably take over values and norms of their receiving country, including health behaviors and increased risk of SRDs

(Manhica et al. 2016, Manhica et al. 2017, Harris et al. 2019). Other explanations might be long-term social maladjustment or better access to the healthcare system which could act as mediating factors (Harris et al. 2019, Manhica et al. 2016). The association between **earlier age at migration** and any SRD supports the theory that refugees might be more at risk due to better acculturation and that numbers increase due to better health care access and improved health literacy (Harris et al. 2019).

Because the acculturation effect does not seem specific for certain countries of origin or for gender, other mediating factors might additionally account for differences over time. One factor that might be more specific is acculturative stress. Acculturative stress has been named repeatedly as a possible reason for psychological distress in refugees (Betancourt et al. 2017, Soegaard et al. 2020, Teodorescu et al. 2012) and as a factor that might drive substance abuse (Manhica et al. 2016, Manhica et al. 2017, Posselt et al. 2015b). Although there is little research on long-term acculturative stress in refugees, acculturative stress can be present after twenty or more years post-resettlement and is associated with psychological distress and depressive symptoms (Tingvold et al. 2015, Lincoln et al. 2016). Based on cultural similarity or dissimilarity between culture of origin and receiving culture, risk might be lower or higher, which would explain why refugees from the Former Republic of Yugoslavia had a lower risk as their cultural background is more similar to Sweden's compared to Somalis or people from the Middle East (Lundborg 2013). Opposite to the paucity of research on refugees, research on immigrants has found more robust evidence that both acculturation as well as acculturative stress might promote substance use and misuse (McCabe et al. 2021, Salas-Wright and Schwartz 2019). Scientists have criticized that those two different concepts have been confused in the past (Meca and Schwartz 2020) and that associations between acculturation and substance misuse have not been fully understood due to a simplistic view on acculturation (Schwartz et al. 2010, Salas-Wright and Schwartz 2019). Salas-Wright and Schwartz (2019) have hypothesized that cultural stress not only directly increases risk for substance misuse but also mediates the risk through impaired family functioning. Furthermore, they call for a transnational theory of cultural stress, which a) incorporates pre-, peri- and post-migration related contexts equally, b) accounts for the diversity of receiving contexts, and c) considers that migrants still have close ties to the homeland which influences substance-related behavior. Applying their theory on refugees could explain how the possible risk factor **country of resettlement** might also be mediated by cultural stress, next to a difference in socioeconomic disadvantages which was theorized by study authors (Bogic et al. 2012). Furthermore, the availability of substances is not only a general risk factor for SUDs (Volkow and Blanco 2023), but has been cited repeatedly as a factor which might promote substance use in refugees as well (Lindert et al. 2021, Horyniak et al. 2016, Saleh et al. 2023, Dupont et al. 2005) and might differ across various resettlement countries.

Leaning on those opinions, this scoping review calls for more research to investigate how the complexities of acculturation and acculturative stress influence SRDs in refugees and asylum seekers. This might point to possible target points for preventive measures in public policies and mental health care. Understanding how acculturation can be promoted without at the same time adopting substance use patterns or attitudes that drive the development of SRDs seems especially important.

Being unaccompanied was associated with a higher risk of hospitalization due to alcohol misuse. Study authors argued that psychosocial distress and lack of support due to the separation from the family might promote alcohol use as a coping mechanism and the lack of social control might facilitate acculturation to the drinking culture (Manhica et al. 2017). Little evidence exists that underpins those considerations, but two qualitative studies in Germany offer first insights on how social relations affect substance (mis)use through interviews and focus groups with refugees and professional key persons (Hertner et al. 2023, Lindert et al. 2021). Separation from the family meant a loss of structure, responsibility, preoccupation, social control and support. A loss of those “protective force[s]” (Lindert et al. 2021) facilitated the use. On the other side, loneliness, missing and worrying about the family actively led to substance (mis)use. While Manhica et al. (2017) examined the risk in refugees who had migrated as minors, the qualitative studies in Germany extended the importance of family accompaniment from minors to adults as well. Nonetheless, unaccompanied minors might be at an even higher risk, as for teenage refugees specifically, the “age-related peer trend of (mis)using cannabis and alcohol” offered “a sense of belonging” (Hertner et al. 2023). A recent scoping review on refugee youth reported that substance abuse led to poor family relationships and social disconnection (Aleer et al. 2023). There might be a vicious cycle in which increased substance abuse leads to decrease in family support and control, which in turn, increases the abuse again. Increased abuse can then lead to SUDs (Aleer et al. 2023, Hertner et al. 2023). In summary, research highlights the importance of refugees’ familial relationships in the context of substance use and SUDs.

While AUD was associated with **post-migration trauma count**, it was, unlike PTSD and major depression, not associated with pre-migration trauma count. This finding equally speaks for the change in dominant explanatory models, where not only pre-migration trauma or individual psychological factors, but also receiving contexts influence substance use and following risk of SRDs (Hertner et al. 2023, Salas-Wright and Schwartz 2019).

A longer asylum procedure acted as a risk factor for alcohol dependence and the study authors argued that this factor probably represented the cumulated postmigration stress factors (Laban et al. 2004). Among other factors, they named the fear of being sent away and the uncertainty of the duration or the outcome of the asylum process. There has been a debate whether asylum seekers differ from refugees with a legal status or a residence permit due to the stressors that an ongoing asylum process entails. Evidence suggests that asylum seekers in middle-to high-income countries have higher prevalences of mental disorders than refugees (Posselt et al. 2020). Whether those risks translate into a higher risk or higher prevalence of SRDs remains unknown.

Salas-Wright and Vaughn (2014) argued that **longer duration of being a refugee** acted as a risk factor for AUD because refugees might have spent more time in refugee camps where the prevalence of hazardous drinking might be elevated and where refugees might use alcohol as a coping-strategy. Why the longer duration of being a refugee at the same time acted as a protective factor for all other examined SUDs remains unclear. Additionally, it seems likely that the influence of **refugee camps** might be more complex than suggested by Salas-Wright and Vaughn as one study showed that risk for hazardous/harmful drinking differed significantly between certain camps, indicating that camp-level differences shape the risk as well (Luitel et al. 2013). Finally, Salas-Wright and Vaughn (2014) determined refugee duration by asking the participants “how long were you a refugee?”. Concerns could be

voiced about the validity of that measure because persons might answer differently based on varying opinions when exactly “being a refugee” ends. That could be, for example, when entering a safe country or the country of destination, with receiving legal status and residence permit or with acquiring a new citizenship. While the subjectivity of the refugee experience or identity must be acknowledged, objective definitions of concepts are needed when conducting epidemiologic research.

In summary, the evidence on possible risk and protective factors specific to refugees and asylum seekers is mostly coherent. Although most studies could show statistical significance, few studies categorized factors as protective or risk factors even though statistical significance was not reached (Hewlett et al. 2015) or did not conduct an analysis to test for statistical significance (Amosu et al. 2016, Fine et al. 2022, Kane et al. 2014). In addition, the strength of the identified evidence base varied significantly, especially between the different factors that were negatively associated with SRDs. Whereas there were fourteen negative associations found for the factor of male sex and seven for older age, for most of the other factors only one or two associations could be identified throughout all included studies.

A plethora of possible underlying mediating factors have been named that might shape the risk of SRDs in refugees and asylum seekers, but quantitative evidence on those links is missing. Furthermore, it seems that those mediating factors are not only associated to one, but to several different risk and protective factors, resulting in a very complex interplay of different factors that is still difficult to grasp. This complexity is illustrated by a recent narrative review on syndemic risks of forced displacement and SUD (Elkholy et al. 2023) which identified the four main risk areas “trauma and violence”, “loss and instability”, “transit and resettlement”, and “acculturation”. In this review, causal loop diagramming illustrates the various and complex interactions of risk and protective factors within but also between those main risk areas. There might be more refugee-specific risk and protective factors which, so far, have not been identified yet. As a conclusion, future research should try to uncover the mechanisms if and how certain risk and protective factors or their underlying mediating factors shape the risk of SRDs in refugees and asylum seekers. Only through a thorough understanding of those mechanisms, effective preventive or treatment interventions can be developed and tested, and their efficacy adequately judged (Kraemer et al. 2001).

In this discussion, less emphasis will be put on the remaining possible risk and protective factors as they are not necessarily specific to refugees and asylum seekers. Partly, they have already been investigated in other populations and strong evidence could be found for associations between SUDs and male gender, lower income, exposure to trauma, PTSD, substance use in the family, use of tobacco, and other substances (Stone et al. 2012, Volkow and Blanco 2023, Weinberg 2001, Goldman et al. 2005). Nonetheless, a couple of considerations will be mentioned that seem to be of special interest when investigating those factors in populations of refugees or asylum seekers:

Study results unanimously supported **male gender** as possible risk and **female gender** as possible protective factor. The influence of refugees’ cultural norms and values on gender-related risk might be especially pronounced. One study reported on the gendered norms of alcohol use and how those were weakened through the refugee migration experience (Ezard et al. 2012). There already have been reports about changing gender roles in refugees after resettlement (Young and Chan 2015) and how acculturation and gender influences substance use in immigrants (Rote and Brown 2013). Interestingly enough, **lower income** was mainly identified as a

risk factor for resettled male refugees, whereas for female refugees the effect was weaker or nonexistent. Future research could shed more light on gender-related risks and their changes throughout the refugee experience.

Less evidence pointed to **Christian religion** being a risk factor. There could be a correlation with other already established risk factors, such as increased availability, more permissive attitudes and positive expectancies towards alcohol (Volkow and Blanco 2023, Carvalho et al. 2019). Also, studies compared Christian religion against other religions which could have had protective effects. While being Muslim has been speculated to be a protective factor for SRDs (Dupont et al. 2005, Lindert et al. 2021, Manhica et al. 2017), this scoping review could not find evidence for that association. Future studies should evaluate the role of religion while paying attention to underlying factors that might contribute to shaping the risk.

Evidence on the association of **age** with SRDs seemed to be very inconclusive. Opposite associations might be explained by heterogeneity between study designs (e.g. camp setting vs resettlement) or study populations (e.g. varying inclusion criteria regarding age or extremely varying age distributions). As there is growing consensus that SUDs tend to be chronic disorders with most individuals alternating between periods of remission and relapse (Volkow and Blanco 2023), the benefit of trying to associate certain age groups with higher or lower risk seems questionable. As there is consensus that earlier substance use initiation increases risk for SUDs (Behrendt et al. 2009, Volkow et al. 2021), future research could focus instead on substance initiation in refugees and asylum seekers and how it might be influenced by refugee-specific factors such as the perils of the flight, living in refugee camps, or foreign receiving contexts. This perspective seems to be especially relevant since according to UNHCR, 40% of all forcibly displaced people worldwide are children under 18 years old (UNHCR 2024a).

Only two studies identified **number of traumatic events** and **PTSD** as possible risk factors. One even stated that the PTSD-SUD link in refugees was weaker than in the native population. The sparse evidence stands in stark contrast to the predominant theories on self-medication and coping with traumatic experiences and PTSD symptoms (Kim 2018, Posselt et al. 2015b, Dupont et al. 2005, Manhica et al. 2016, Lindert et al. 2021) and more research is needed.

To understand risk factors in refugees and asylum seekers is of importance because it can help to identify those at risk and to administer purposive screening and prevention interventions. This is especially relevant since refugees and asylum seekers face significant barriers to accessing health care (Priebe et al. 2016) and therefore probably are less likely to receive help once they are at risk or have developed a disorder (Elkholy et al. 2023). Since SRDs might increase the risk for other psychiatric conditions, early identification and treatment might even prevent or attenuate consequential psychiatric diseases (Volkow and Blanco 2023) and facilitate their treatment (Schäfer et al. 2022). Identifying protective factors might be equally important as those can offer target points for interventions. So far, the focus of attention has been more on risk factors (Aleer et al. 2023, Ezard 2012, Lemmens et al. 2017, Lo et al. 2017, Weaver and Roberts 2010, Saleh et al. 2023), and only one review (Horyniak et al. 2016) explicitly underlined the importance of identifying protective factors for substance use in forced migrants. Therefore, this scoping review aimed to identify evidence both on possible risk and on protective factors and found that overall, the strength of evidence lacks consistency, e.g. a causal effect on the outcome of SRDs often cannot be ascertained due to cross-sectional design (Kraemer et al. 2001) and for several identified factors few studies or only

one study was available. In comparison to risk factors, evidence on possible protective factors remains limited. Future research is needed to expand the current knowledge.

5.2.3.3 Comorbidity

Eight studies presented results on comorbidity of SRDs with other disorders.

Two qualitative studies investigating MH and AOD comorbidity asked participants about their opinions but did not specify which disorders exactly they referred to. Investigated comorbidity in that context might not necessarily correspond to what clinicians would define as disorders. On the other side, their participatory action research approach might have provided valuable insights that are maybe not accessible for researchers and also acknowledges important ethical considerations, such as redistribution of power and battling institutional inequalities (Cornish et al. 2023). Study authors presented six themes and risk factors that, according to the participants, drove the development of MH and AOD disorders in refugees. Many of them, such as trauma, grief and loss, familial conflict, exposure to and availability of substances, are generally considered as risk factors for SUDs (Stone et al. 2012, Volkow and Blanco 2023, Andrade et al. 2023). The remaining factors supported the theories of familial separation, maladaptive coping, self-medication and acculturation difficulties that have been postulated specifically for refugee populations. Additionally, it was emphasized how MH and AOD comorbidity was caused by considerable barriers to mental health services, such as low health literacy, stigma and shame, lack of awareness and limited attempts to disseminate information in refugee youth. As those factors or themes do not represent statistically significant associations, they do not agree with the definition of risk factors applied in this scoping review. But the attempt to explore refugees' subjective explanations on how comorbid AOD disorders develop corresponds to the work of other researchers who have investigated explanatory models of substance use in Syrian refugees in Germany and who have emphasized their consequential use for designing interventions (Lindert et al. 2021).

The second qualitative study identified social disconnection, employment and education, and housing and homelessness as the most important challenges. Those results are indicative of a vicious circle that might reinforce the development of comorbid AOD disorders in refugees, as the identified challenges have also been identified as risk factors for SUDs (Volkow and Blanco 2023, Stone et al. 2012).

The remaining results referred to quantitative data on comorbidity of SRDs and MH disorders. Study results of Naeem et al. (2005) cannot be properly interpreted here because it remained unclear what qualified as a primary diagnosis and what qualified as comorbid abuse/dependence. No further conclusions can be drawn here, apart from the recommendation that future studies should report transparently on their applied methods.

Interestingly, the quantitative evidence on the comorbidity between SRDs and PTSD was mixed. One study showed that SUD increased the risk of having PTSD and one study found an association between PTSD and AUDIT-score but did not specify the directionality. Two studies concluded that there was no comorbid association. Those contradictory results stand in contrast to the general knowledge on comorbidity between PTSD and SUD and to the assumption of comorbidity in refugees specifically (Lindert et al. 2021). Equally in contrast to the current state of knowledge (Volkow and Blanco 2023), major depression did not seem to be associated with AUD in refugees. The so far contradictory results regarding PTSD-SUD comorbidity

and the scarce evidence regarding comorbidity with major depression call for more research. Especially in light of the fact that PTSD is four to five times more prevalent, and major depression seven times more prevalent in refugees and asylum seekers compared to general populations (Patane et al. 2022), possible comorbidity with SRDs deserves more attention.

Finally, very little evidence was available for the association of khat-dependence with psychotic symptoms, but the exact relationship remained unclear. Knowledge on SUD-Psychosis comorbidity showed to be extremely sparse.

5.2.3.4 Service use and access to care

Evidence on service use and access to care for SRDs was limited, as one study could not find a statistical significance and the other study had a limited sample size with a high loss-to-follow-up rate. Authors conclude that refugees in the United States might use mental health service for SRDs less than natives or other immigrants, and that asylum seekers in Germany only receive inadequate care for their SRDs (Betancourt et al. 2017, Nikendei et al. 2019). Organizational and cultural barriers, as well as lack of substance and treatment awareness in refugees have been described recently as barriers to substance use treatment (Saleh et al. 2023). Future research could explore whether barriers to care are more pronounced for SRDs compared to other mental health disorders, because refugee populations might come from cultures with strongly moralized views and more stigma and shame attached to substances. As Syrian refugees resettled in Germany mentioned barriers of accessing support as one factor that drove substance use (Lindert et al. 2021), this avenue of research would not only support those already in need for SUD treatment, but could also promote prevention.

5.2.3.5 Clinical correlates of admission to the ED with AAMI

Study authors only provided an explanation for one of the four statistically significant correlates and hypothesized that asylum-seekers might be more likely to be admitted due to trauma because Swiss natives might be able to seek special care directly (Brown et al. 2019). Explanations for other correlates, which were less referrals to psychiatrists, lower hospitalization rates, and increased escort by police, might include barriers to (mental) health care (Satinsky et al. 2019) and structural discrimination and racial policing in High-income countries (Horyniak et al. 2017).

5.2.3.6 Addicted/dependent refugees

Three studies only focused on refugees that already were dependent. Although the study authors presented very extensive data on use patterns and consequences of addiction, fewer relevant conclusions can be drawn from that. This is partly because they conducted very little statistical analysis or had small sample sizes, but mainly because a contextualization within the broader context could not be achieved, due to limiting the study sample to dependent refugees only. Trajectories towards the dependence, risk or protective factors, comparisons to non-dependent refugees or other populations remained obscure. While Kuhn et al. (2018) provided information about additional use of other substances in cocaine/heroin dependent refugees, it remained unclear if those substances were used, abused or if it was a co-dependent use. Examining addiction-related consequences, Westermeyer et al. (1991, 1989) demonstrated the detrimental effects of refugees' opium dependence in different aspects of their lives. They also postulated four reasons for the so called "opium-epidemic" in the United States, but those considerations seem of less relevance

today as the political and societal landscape is likely to have changed in the subsequent 35 years. The approach of Kuhn et al. (2018) to ask dependent refugees about their needs and support wishes might help tackling the barriers they face to adequate treatment (Saleh et al. 2023). Future studies could focus on refugees' suggestions on how mental health care in general, but also SUD treatment could be made more available for individuals with substance dependence.

5.2.3.7 Perceptions and beliefs around substances

Only one study explicitly investigated the gendered dimension of alcohol use in refugees from Burma. The theory of gendered substance norms with stricter rules for females has been postulated in the research concerning SRDs in refugees and asylum seekers (Manhica et al. 2016, Manhica et al. 2017) and has been described as part of their culture of origin (Amosu et al. 2016). Consequentially, varying cultural norms might be present in refugee populations according to their respective home countries, ethnicities or other culturally relevant group memberships. This is also demonstrated by the traditional social controls of Karen refugees where alcohol in moderation was seen positively and healthy, which stands in stark contrast to other cultural norms of refugees, e.g. from strict Muslim background where only complete abstinence is tolerated (Dupont et al. 2005). Maintaining traditional, conservative norms of migrants after resettlement has been proposed as one way to prevent disorders (Salas-Wright and Schwartz 2019).

5.2.3.8 Reasons to consume substances

Two studies provided reasons for alcohol use or for regular and excessive drinking among refugees. It remained unclear if those reasons only led to subclinical alcohol use or if they led to disorders, such as harmful use or alcohol use disorder that were investigated as well. Although evidence so far is limited and interpretations should be done very cautiously, evidence might point towards the importance of social connection or peer pressure ("influences of friends"), alcohol use as coping strategy ("sadness and loneliness", "hopelessness" and "tensions") and preoccupation and meaningful activities ("having nothing to do", "unemployment/free time"). Reasons to use other substances than alcohol remained unknown and knowledge on how the context of resettlement shapes reasons to consume substances was lacking as well, as both studies were conducted in refugee camps.

This knowledge gap is addressed by one recent study in Germany that investigated explanatory models of substance use in resettled refugees from Syria (Lindert et al. 2021). Refugees reported that the motives to consume substances were escaping the past (traumatic experiences, separation of family and worry) and escaping the present in which an unsuccessful integration led to boredom, loneliness and a lack of connection. The third motive was connecting to others and having fun.

Future research could continue exploring reasons for substance use as specific reasons such as coping with negative affect or boredom might predict subsequent AUD (Patrick et al. 2011) and because it might aid in offering support and designing interventions.

5.2.3.9 Suggestions for prevention measures

Suggestions of refugees in camps demonstrate the importance that they place in hopefulness, education, support services, legal reinforcement of rules regarding alcohol, and employment. Hopefulness and reduction of problem alcohol use that refugees expected from leaving the camp by resettling somewhere else could

indicate a causal link between camp life and psychological distress and alcohol use that has been discussed earlier. While UNHCR aims to provide educational and livelihood opportunities in refugee camps (USA for UNHCR 2024), in the context of resettlement researchers equally have emphasized the importance of public policies aiming to provide access to education, support e.g. through mental health services, and employment opportunities (Hertner et al. 2023, Horyniak et al. 2016). Future research could investigate refugees' suggestions further to inform public policies and interventions more thoroughly.

5.2.3.10 Study limitations

The mentioned study limitations shed light on several difficulties that researchers face when investigating SRDs in refugee populations. Concerns have been raised that conventional assessment instruments may neither be valid instruments to assess other mental disorders in refugees (Keyes 2000, Patane et al. 2022), nor valid to assess SUDs (Schäfer et al. 2023). Regarding SRDs, research has argued that “[i]nstruments that are not normed for the population being evaluated can contain cultural biases and produce misleading results” (SAMHSA 2009). While a growing body for cultural adaptation and cultural validation of various assessment instruments emerges (Gadeberg et al. 2017), little is known on cultural adaption regarding the assessment of SRDs. This scoping review could only identify one adaptation of the screening instrument “AUDIT” for Burmese refugees which included a translation based on local idioms, but criterion validity was not tested (Haroz et al. 2014). The complete lack of culturally sensitive screening instruments for refugees has been criticized and researchers argued that with such instruments identification and treatment of SUDs could be improved (Marth et al. 2021). Cultural adaptation and validation will be complicated furthermore by the heterogeneity of refugee populations that has been demonstrated in this scoping review and that is an important limiting factor of the generalizability.

Two additional factors have been identified which might impede the research and skew study results. First, a self-reporting bias might distort the study results. For other mental health disorders researchers have speculated that overestimation might occur through an over-endorsement bias in refugees (Patane et al. 2022). Regarding SRDs, researchers have voiced concern that refugees might under-report symptoms, for example due to fear of legal consequences (Salas-Wright et al. 2017) or due to stigma (Luitel et al. 2013, Horyniak et al. 2016). Second, barriers to substance-related health care might lead to artificially lower numbers in diagnoses or health care visits. In conclusion, those limitations underline the need for robust study designs that pay attention to the cultural diversity and to the general difficulties of studying the refugee population, which appears to be hard to reach for research anyway (Hertner et al. 2023).

5.3 Interventions

Two screening interventions for alcohol-related disorders were found, the MHAP-I and the mSASQ. Whereas the mSASQ was applied on a population of pregnant refugee women living in a camp and psychometric properties remained unclear, the MHAP-I was tested regarding its reliability and internal consistency but was not applied. Validity of both screening interventions remained unknown.

Screening interventions for disorders related to substances other than alcohol could not be found. Any prevention or treatment interventions for refugees could not be

identified either. In conclusion, this scoping review confirmed the immense lack of interventions targeted at SRDs in refugees and asylum seekers that already has been criticized by other researchers (Aleer et al. 2023, Horyniak et al. 2016). Especially in light of the growing research on interventions for other mental health conditions in refugee populations (Uphoff et al. 2020), more effort needs to be put in the design and testing of prevention, screening and treatment interventions for SRDs in refugee populations. Interventions should be structurally and culturally sensitive (Elkholy et al. 2023).

Although not yet completed, the projects of the PREPARE network in Germany are especially noteworthy in that context as they aim to improve assessment, prevention and treatment of substance-related disorders in refugees (Schäfer et al. 2023). Next to the development of a culturally sensitive screening instrument, the consortium aims to develop and test a culturally adapted app which aims to prevent SRDs in refugees. Additionally, the effectiveness of a culturally sensitive group therapy approach (STARK-SUD) for refugees with hazardous substance use or SUD and co-occurring psychological distress will be tested with the aim to reduce refugees' psychological distress (Schäfer et al. 2022).

5.4 Strengths and limitations of this scoping review

To the best of this author's knowledge, this scoping review is the first review to exclusively investigate SRDs in refugee populations. While previous reviews mostly focused on substance use, this review aimed to summarize all evidence on substance use disorders, as well as substance-induced disorders. The systematic literature research proved to be very exhaustive with over 2.000 different articles screened and the broad scope was also demonstrated by the number of studies and their characteristics that were identified. While other researchers have claimed that "[m]ost studies on substance use disorders in refugee groups have been conducted outside Europe" and cited only one study on refugees/asylum seekers in western Europe (Bogic et al. 2012), this scoping review identified several more studies on SUDs in Europe. Since the last comprehensive systematic review on substance use that included articles published before May 2015 (Horyniak et al. 2016), a substantial amount of new studies could be identified. Apart from its broad scope, this scoping review also aimed to synthesize the evidence rigorously and transparently and followed both JBI's updated methodological guidance for scoping reviews and the PRISMA extension for Scoping Reviews (Peters et al. 2020, Tricco et al. 2018).

The differentiation between disorder and subclinical use pattern is not only a strength and a unique characteristic of this scoping review, but also a possible limitation: the already mentioned variety in the examined concepts of SRDs and their partly different meaning, e.g. for "harmful use", posed sometimes a difficulty to clearly distinguish between disorder and non-disorder. That is in line with a general debate about the applied terminology in the field of substance research and researchers have pointed out that some terms like "problem use" or "at-risk drinking" are not well-defined concepts (Berner et al. 2007, Saitz et al. 2021). Subsequently, over 50 studies were excluded in the second screening stage because they focused on subclinical substance use. Sometimes, those excluded studies examined concepts of substance use with inconsistent meaning or terminology. Examples for that phenomenon are studies on substance use which was called "misuse" (McDougal et al. 2022), "harmful alcohol use" as a culturally defined concept (McCleary 2017, McCleary and Wieling 2017), "alcohol problems" and "drug

problems” (Jeon et al. 2008, King et al. 2020), problematic use (Begemann et al. 2020), or undefined concepts of “abuse” or “dependence” that were not used in the sense of a disorder or diagnosis (Chiumento et al. 2020, Ezard 2014). Although during the screening process problematic articles were discussed between both reviewers and in- or exclusion was done on a common consensus, the discrimination between articles examining SRDs and articles examining other aspects related to substance use might not always have been completely accurate due to unclear or missing information in the studies. The sometimes difficult discrimination between subclinical use and disorder is also reflected by the fact that all included studies regarding harmful alcohol use did not differentiate between the clinical disorder of harmful use on the one side and the subclinical concept of hazardous use on the other side (Saunders et al. 2019). Nonetheless, they were included since they evaluated a disorder. Difficulties in the screening process or in maintaining a consistent selection also showed for two related topics regarding substance use and disorders: Four studies that examined service use/access to health services (McCleary et al. 2016, Posselt et al. 2017, Welbel et al. 2013, De Kock 2022) and two studies that evaluated stigma (Deilamizade et al. 2020, Ahn et al. 2015) were excluded as their primary outcomes were not SRDs. Also, studies on service use and access mostly did not investigate refugees but interviewed service providers instead. Nonetheless, those topics appeared in other studies that were included. It should be therefore acknowledged, that stigma and barriers to mental health care are important to consider in the research around SRDs in refugees as well but their thorough investigation was beyond the scope of this review.

Due to the anticipated high heterogeneity and limited resources, only studies with primary data were included and a grey literature search could not be conducted. Also, only articles written in English or German could be included. It is therefore possible that other relevant studies were not identified. Furthermore, there might be a publication bias in general regarding mental health problems in refugee populations. As most refugees reside in LMICs, scarce structural or financial resources might limit the research. Also, a selection bias could have occurred in the screening or data extraction process which was minimized by following the up-to-date guidelines on the conduct of scoping reviews and additionally employing two more researchers to conduct data extraction. Most data items showed high concordance between the reviewers and none or only formal alterations were necessary to reach consensus. The item “study results regarding SRDs” showed less concordance due to the high heterogeneity and broad scope of extracted data. Therefore, extracted data of this item was thoroughly compared for every included study by the two reviewers M.L. and F.G. and full text articles were revisited to reach a consensus.

Basic thematic coding of study results was necessary due to the high heterogeneity of data but might have introduced a bias. This might be especially relevant for the categorization of associated factors into possible risk and protective factors. Due to the high heterogeneity of evidence, factors were categorized irrespective of substance or specific concepts measures. Because a statistical analysis was not conducted, it remains unclear to which extent the identified factors influence the risk of SRDs.

As the study item “study conclusions” showed to be too unspecified and incapable to reliably summarize and structure the wide range of conclusions that were drawn or implied in the included studies, this item was not included in this scoping review but remains in the raw data as it provides a brief summary for each study.

Although the substances nicotine and caffeine were not of interest and studies exclusively on those substances were excluded, a relevant number of included studies examined disorders related to unspecified substances. Because study authors mostly did not specify inclusion criteria more thoroughly and did not provide information on the distribution of specific disorders or substances in their sample, it remains unclear if disorders related to nicotine and caffeine are part of those study results and if yes, how big the proportion was.

Lastly, the complex terminology around refugee populations should be pointed out as a possible limitation for the research in general. Different and ambiguously used terms appear in the literature or in the public, such as forcibly displaced or forced migrants, which can include several other categories of people who have fled (Horyniak et al. 2016, Elkholy et al. 2023, UNHCR 2024b). A differentiation between refugees/asylum seekers and migrants, especially irregular or undocumented migrants, can be difficult (Priebe et al. 2016, Sironi et al. 2019). This scoping review only included refugees and asylum seekers as those populations have been defined by UNHCR as a leading international institution. Studies referring to the same population and using divergent declarations might not have been identified. There is already a semantic confusion regarding the term “refugee” (different legal statuses, UNHCR definition or a wider common parlance definition) (Hertner et al. 2023). It was beyond the scope of this review to precisely define which individuals that were forced to flee fall within that population as that opens a philosophical and political discussion which points towards the topicality of this subject.

5.5 Knowledge gaps and recommendations for future research

More evidence is needed to support the existence of a refugee paradox for SRDs and to contrast evidence on refugees against the evidence on immigrants and the immigrant advantage. Research suggests that the refugee paradox, similarly to the immigrant advantage, vanishes over time and after settling in a high-income receiving country. Future studies should investigate the dynamics of that deterioration to identify opportunities for prevention and treatment.

Evidence on the barriers to service access was limited and more research could support future efforts to make mental health care for SRDs more accessible.

The predominance of cross-sectional studies in HICs fails to address the bigger context of the refugee experience, which spans from the upbringing in a different country or culture and the events leading to the flight over very individual but often perilous and tedious migration trajectories to a possible arrival in a safe country and a change to settle in unknown receiving contexts. How SRDs are situated within that context remains mainly unclear as most of the evidence refers to the receiving context of HICs. Longitudinal studies are needed and especially feasible in HICs where trajectories of SRDs can be studied in different receiving contexts. While it might be difficult to conduct longitudinal research in conflict settings or on populations on the move, longitudinal research across different camp settings might be a starting point and international efforts must be made to expand the research focus to encompass the entire refugee experience.

Evidence on cannabis and illicit drugs is very limited, and more research is needed. Future studies should report clearly which specific substances and disorders/diagnoses they investigate, which will increase the comparability of evidence. The scope of the research should also be broadened from traditionally western drugs to other substances as well to assess whether disorders related to

indigenous drugs are of concern in refugee populations and how they might be shaped throughout the refugee journey.

Future studies should also apply rigorous study designs and factor in the heterogeneity in populations of refugees and asylum seekers. Depending on the study aim, studies could investigate populations with rather narrow or wide ranges of characteristics.

Lastly, linguistic and cultural barriers in the research need to be addressed when studying refugee populations which are linguistically and culturally diverse. Additionally, those barriers should be equally addressed in the development of interventions. But so far, evidence on culturally adapted screening interventions is very limited and there is a complete lack for culturally adapted prevention or treatment interventions. Future research is needed to inform the development of culturally adapted and validated interventions. Reliable and valid screening will help to scope the problem and the subsequent public mental health challenges and might facilitate access to cost-saving preventive measures or required treatments.

6 Summary

English summary:

This scoping review identified forty-one studies that investigated SRDs in refugee populations. Those are predominantly cross-sectional studies in High-income countries, investigate across settings of refugee camps, reception centers, or the general population, and apply various measures. Investigated concepts of disorders and refugee populations are extremely heterogeneous. Research predominantly focuses on disorders related to alcohol or unspecified substances and most studies estimate prevalences but those are very heterogeneous and hardly comparable. After resettlement in HICs, refugees and asylum seekers tend to exhibit lower prevalences of SRDs than the natives, an effect called “the refugee paradox”. But over time, rates seem to approach those of the natives. Several possible risk and protective factors could be identified, many of them specific to the refugee experience. Less and partly inconclusive evidence is available for the comorbidity with other mental health disorders. Remaining areas of research are access to care, clinical correlates of admission to the ED, characteristics of dependent refugees, perceptions/beliefs around substances, reasons to consume, and possible preventive measures. Identified challenges for the research were linguistic/cultural barriers, possible underreporting, limited access to health care, and the population heterogeneity. More rigorous and longitudinal research is needed. Development and trajectories of SRDs should be investigated over the entire course of the refugee experience and in low-income settings. Two unvalidated alcohol-related screening interventions for refugee populations were identified, but no prevention or treatment interventions. Research points towards the need for culturally adapted interventions, but available evidence is sparse.

German summary:

In dieser Übersichtsarbeit wurden einundvierzig Studien zu substanzbezogenen Störungen in Flüchtlingspopulationen identifiziert. Diese waren überwiegend Querschnittsstudien in Ländern mit hohem Einkommen. Die Studien wurden in Flüchtlingslagern, Aufnahmelagern oder in der Allgemeinbevölkerung durchgeführt und benutzten unterschiedliche Messmethoden. Untersuchte Störungskonzepte und Flüchtlingspopulationen waren äußerst heterogen. Der Großteil der Forschung konzentriert sich auf Alkohol oder unspezifisch auf “Substanzen” und die meisten Studien schätzen Prävalenzen, die jedoch unterschiedlich ausfallen und kaum vergleichbar sind. Nach der Umsiedlung in Länder mit hohem Einkommen zeigen Geflüchtete und Asylsuchende niedrigere Prävalenzen als Einheimische, was als „Flüchtlingsparadoxon“ bezeichnet wird. Mit der Zeit nähern sich die Raten jedoch denen der Einheimischen an. Mehrere mögliche Risiko- und Schutzfaktoren wurden identifiziert, viele davon sind flucht-spezifisch. Zur Komorbidität mit anderen psychischen Störungen liegen weniger und teilweise uneindeutige Erkenntnisse vor. Weitere Forschungsbereiche sind der Zugang zur Versorgung, klinische Korrelate der Alkoholintoxikation in der Notaufnahme, Charakteristika abhängiger Geflüchteter, Wahrnehmungen/Meinungen zu Substanzen, Gründe für den Konsum und mögliche Präventionsmaßnahmen. Hürden in der Forschung sind sprachliche/kulturelle Barrieren, mögliches Underreporting, erschwelter Zugang zur Versorgung und die Heterogenität der Geflüchteten. Gründlichere und auch longitudinale Forschung ist erforderlich. Entstehung und Verlauf der Störungen sollten über die gesamte Flüchtlingserfahrung hinweg und auch in Ländern mit

niedrigem Einkommen untersucht werden. Zwei unvalidierte alkoholbezogene Screening-Interventionen wurden gefunden, aber keine Präventions- oder Behandlungsinterventionen. Die Forschung weist auf die Notwendigkeit kulturell adaptierter Interventionen hin, aber wenig Evidenz hierzu ist verfügbar.

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8 List of Abbreviations

AOD	Alcohol and other drugs
APA	American Psychological Association
AUD	Alcohol use disorder
AUDADIS	Alcohol Use Disorder and Associated Disabilities Interview Schedule
AUDIT	Alcohol Use Disorders Identification Test
CBT	Cognitive behavioral therapy
CI	Confidence interval
CIDI	Composite International Diagnostic Interview
DSM	Diagnostic and Statistical Manual of Mental Disorders
DUDIT	Drug Use Disorders Identification Test
ED	Emergency Department
HIC	High-income countries
HR	Hazard ratio
HSCL	Hopkins Symptom Checklist
HTQ	Harvard Trauma Questionnaire
ICD	International Classification of Diseases
IDP	Internally displaced people
IES-R	Impact of Events Scale-Revised
JB	Joanna Briggs Institute
LMIC	Low- and middle-income countries
MH	Mental health
MHAP-I	Mental Health Assessment Project Instrument
MMADST	Modified Michigan Alcohol-Drug Screening Test
MNS	Mental, neurological and substance use
OAU	Organisation of African Unity
OR	Odds ratio
PCC	Population, concept, and context
PRISMA	Preferred Reporting Items for Systematic reviews and Meta-Analyses
PTSD	Post-traumatic stress disorder
SAIS	Substance Abuse Interview Schedule
SAMHSA	United States Substance Abuse and Mental Health Services Administration
SAPS	Substance Abuse Problem Scale
SCID	Structured Clinical Interview Schedule
SCIE	Science Citation Index Expanded
SDS	Severity of Dependence Scale
SRD	Substance-related disorder
SSCI	Social Sciences Citation Index
SUD	Substance use disorder
UNHCR	Office of the United Nations High Commissioner for Refugees
WHO	World Health Organization

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11 Statement of contribution

The doctoral candidate (Friederike Gauß) participated in writing the study protocol and was as one of two reviewers (in addition to Mayte López Atanes) involved in the two-staged screening process. In the first screening stage, the candidate and Dr. Mayte López Atanes both independently read all titles and abstracts. After screening all titles and abstracts, the candidate and Dr. Mayte López Atanes came together and discussed all conflicting decisions by re-reading together all titles and abstracts that had been rated differently beforehand. In the second screening stage, the candidate and Dr. Mayte López Atanes both independently read all full texts. Afterwards, they came together and discussed and reread again all studies that had been rated differently. Additionally, the candidate screened all references of included studies. After deduplication in Endnote, the candidate read all full texts and assigned them to either an inclusion- or exclusion-group in Endnote based on the eligibility criteria. Finally, the candidate presented all additionally included studies by giving a short summary to Dr. Mayte López Atanes and through joint discussion of each study, an unanimous decision to either include or exclude the respective study could be taken. For the process of data extraction, the candidate defined all items that should be extracted. Then, the candidate developed an extraction form with the data extraction tool “Extraction 2” in Covidence which allows to build an extraction form from scratch. Before the process of data extraction began, the candidate and Dr. Mayte López Atanes each independently piloted the extraction form on five studies. Then they came together and compared extracted data and discussed all difficulties with the extraction form. The candidate revised the extraction form according to the discussion. Data extraction was conducted by four reviewers. While the candidate independently extracted data for each study, Dr. Mayte López Atanes, Leire Esteban and Itziar Pintado each assigned themselves to a subset of the studies and independently extracted the data of the respective studies. After all studies had been read and extracted by two reviewers, the candidate and Dr. Mayte López Atanes came together and compared all extracted data for each study. Finally, the candidate downloaded the raw data from Covidence and entered the data set into Excel. The candidate then formatted the data in Excel and corrected grammar and spelling mistakes. As a last step, the candidate created two tables to structure and present all raw data. The candidate analyzed the raw data without additional help. Lastly, the candidate wrote the scoping review without any additional help. While writing, the candidate retrieved suitable background literature through manual literature searches in PubMed and Google Scholar.

12 Affidavit

Ich versichere ausdrücklich, dass ich die Arbeit selbständig und ohne fremde Hilfe, insbesondere ohne entgeltliche Hilfe von Vermittlungs- und Beratungsdiensten, verfasst, andere als die von mir angegebenen Quellen und Hilfsmittel nicht benutzt und die aus den benutzten Werken wörtlich oder inhaltlich entnommenen Stellen einzeln nach Ausgabe (Auflage und Jahr des Erscheinens), Band und Seite des benutzten Werkes kenntlich gemacht habe. Das gilt insbesondere auch für alle Informationen aus Internetquellen.

Soweit beim Verfassen der Dissertation KI-basierte Tools („Chatbots“) verwendet wurden, versichere ich ausdrücklich, den daraus generierten Anteil deutlich kenntlich gemacht zu haben. Die „Stellungnahme des Präsidiums der Deutschen Forschungsgemeinschaft (DFG) zum Einfluss generativer Modelle für die Text- und Bilderstellung auf die Wissenschaften und das Förderhandeln der DFG“ aus September 2023 wurde dabei beachtet.

Ferner versichere ich, dass ich die Dissertation bisher nicht einem Fachvertreter an einer anderen Hochschule zur Überprüfung vorgelegt oder mich anderweitig um Zulassung zur Promotion beworben habe.

Ich erkläre mich damit einverstanden, dass meine Dissertation vom Dekanat der Medizinischen Fakultät mit einer gängigen Software zur Erkennung von Plagiaten überprüft werden kann.

28.02.2025

Friedenke Gays

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Apart from the scientific support that I received, I also need to thank all the people who contributed to my dissertation in other ways:

I am so grateful to all of my friends. Even when they sometimes struggled in similar ways or when they were concerned with other things in their lives, they cheered me up and offered emotional support.

Finally, I am extremely lucky to not only have my family, especially my parents and my sister, by my side, but also my loving partner. Thank you all for your unwavering love, support and belief in me.

14 Appendix

14.1 Search strategy

Ovid MEDLINE(R) ALL / PubMed(R) <1946 to Present>

- 1 exp substance-related disorders/ 302557
- 2 exp Drinking Behavior/ 82676
- 3 exp Alcoholics/ 869
- 4 exp Alcoholic Beverages/ 22460
- 5 exp Drug Users/ 3791
- 6 exp Amphetamines/39691
- 7 exp Hallucinogens/ 27407
- 8 exp Cannabis/ 12223
- 9 exp "Hypnotics and Sedatives"/ 128306
- 10 exp Narcotics/ 138528
- 11 exp Substance Abuse Treatment Centers/ 5423
- 12 exp Cocaine/26667
- 13 exp Catha/ 626
- 14 exp Illicit Drugs/ 13660
- 15 ("drug abuse*" or "drug use*" or "substance abuse*" or "substance use*" or "addict*" or "drug dependence" or "substance dependence" or "alcohol*" or "cannabis" or "phencyclidine" or "hallucinogen*" or "inhalant*" or "glue sniff*" or "opioid*" or "narcotic*" or "heroin" or "opium" or "methadone" or "sedativ*" or "hypnotic*" or "anxiolytic*" or "stimulant*" or "speed" or "mdma" or "ecstasy" or "amphetamin*" or "methamphetamine*" or "ketamine" or "bath salts" or "cocaine" or "multiple drug*" or "psychoactive substance*" or "benzodiacepin*").ti,ab. 983047
- 16 exp Refugees/ 12413
- 17 exp "Transients and Migrants"/ 13567
- 18 ("refugee*" or "asylum" or "forced-migration" or "forced-migrant" or "humanitarian entrant*").ti,ab. 15600
- 19 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15
1266668
- 20 16 or 17 or 18 30863
- 21 19 and 20 1100

Embase <1974 to 2022 Week 28>

- 1 exp "substance use"/ 565050
- 2 exp drinking behavior/ 53349
- 3 exp withdrawal syndrome/ 36293
- 4 exp drug dependence/ 258937
- 5 exp drug abuse/ 131300
- 6 exp substance abuse/ 56618
- 7 exp "drug use"/ 352253
- 8 exp amphetamine/ 32454
- 9 exp cocaine/ 58449
- 10 exp psychedelic agent/ 93105
- 11 exp hypnotic sedative agent/ 457381
- 12 exp cannabis/ 40133

13 exp narcotic agent/ 297120
 14 exp drug dependence treatment/ 24749
 15 exp Catha/ 669
 16 exp illicit drug/ 17224
 17 ("drug abuse*" or "drug use*" or "substance abuse*" or "substance use*" or
 "addict*" or "drug dependence" or "substance dependence" or "alcohol*" or
 "cannabis" or "phencyclidine" or "hallucinogen*" or "inhalant*" or "glue sniff*" or
 "opioid*" or "narcotic*" or "heroin" or "opium" or "methadone" or "sedativ*" or
 "hypnotic*" or "anxiolytic*" or "stimulant*" or "speed" or "mdma" or "ecstasy" or
 "amphetamin*" or "methamphetamin*" or "ketamine" or "bath salts" or "cocaine" or
 "multiple drug*" or "psychoactive substance*" or "benzodiacepin*").ti,ab. 1279340
 18 exp forced migrant/ 15883
 19 ("refugee*" or "asylum" or "forced-migration" or "forced-migrant" or
 "humanitarian entrant*").ti,ab. 16891
 20 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or
 16 or 17 2564420
 21 18 or 19 20769
 22 20 and 21 1071

APA PsycInfo <1806 to July Week 2 2022>

1 exp "substance use prevention"/ 4840
 2 exp addiction treatment/ 36149
 3 exp "substance use disorder"/ 139708
 4 exp alcoholic beverages/ 3247
 5 exp drug usage/ 109030
 6 exp cocaine/ 14731
 7 exp narcotic drugs/ 32761
 8 exp cannabis/ 10193
 9 exp hallucinogenic drugs/ 4294
 10 exp benzodiazepines/ 11133
 11 exp amphetamine/ 14253
 12 ("drug abuse*" or "drug use*" or "substance abuse*" or "substance use*" or
 "addict*" or "drug dependence" or "substance dependence" or "alcohol*" or
 "cannabis" or "phencyclidine" or "hallucinogen*" or "inhalant*" or "glue sniff*" or
 "opioid*" or "narcotic*" or "heroin" or "opium" or "methadone" or "sedativ*" or
 "hypnotic*" or "anxiolytic*" or "stimulant*" or "speed" or "mdma" or "ecstasy" or
 "amphetamin*" or "methamphetamin*" or "ketamine" or "bath salts" or "cocaine" or
 "multiple drug*" or "psychoactive substance*" or "benzodiacepin*").ti,ab. 376833
 13 exp refugees/ 7618
 14 exp asylum seeking/ 880
 15 exp political asylum/ 56
 16 ("refugee*" or "asylum" or "forced-migration" or "forced-migrant" or
 "humanitarian entrant*").ti,ab. 12425
 17 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 442836
 18 13 or 14 or 15 or 16 12961
 19 17 and 18 414

CIHNAL

(((MH "Substance Use Disorders+") OR (MH "Drinking Behavior+") OR (MH "Substance Abusers+") OR (MH "Substance Use Rehabilitation Programs+") OR (MH "Amphetamines+") OR (MH "Cocaine+") OR (MH "Antianxiety Agents, Benzodiazepine+") OR (MH "Hallucinogens+") OR (MH "Narcotics+") OR (MH "Street Drugs+") OR (MH "Cannabis+")) OR (TI ("drug abuse*" or "drug use*" or "substance abuse*" or "substance use*" or "addict*" or "drug dependence" or "substance dependence" or "alcohol*" or "cannabis" or "phencyclidine" or "hallucinogen*" or "inhalant*" or "glue sniff*" or "opioid*" or "narcotic*" or "heroin" or "opium" or "methadone" or "sedativ*" or "hypnotic*" or "anxiolytic*" or "stimulant*" or "speed" or "mdma" or "ecstasy" or "amphetamin*" or "methamphetamin*" or "ketamine" or "bath salts" or "cocaine" or "multiple drug*" or "psychoactive substance*" or "benzodiacepin*")) OR AB ("drug abuse*" or "drug use*" or "substance abuse*" or "substance use*" or "addict*" or "drug dependence" or "substance dependence" or "alcohol*" or "cannabis" or "phencyclidine" or "hallucinogen*" or "inhalant*" or "glue sniff*" or "opioid*" or "narcotic*" or "heroin" or "opium" or "methadone" or "sedativ*" or "hypnotic*" or "anxiolytic*" or "stimulant*" or "speed" or "mdma" or "ecstasy" or "amphetamin*" or "methamphetamin*" or "ketamine" or "bath salts" or "cocaine" or "multiple drug*" or "psychoactive substance*" or "benzodiacepin*")) AND (((MH "Refugees+") OR (MH "Transients and Migrants+") (MH "Refugees+") OR (MH "Transients and Migrants+")) OR (TI ("refugee*" or "asylum" or "forced-migration" or "forced-migrant" or "humanitarian entrant*")) OR AB ("refugee*" or "asylum" or "forced-migration" or "forced-migrant" or "humanitarian entrant*"))))

645 results

WEB OF SCIENCE

(TI=("drug abuse*" or "drug use*" or "substance abuse*" or "substance use*" or "addict*" or "drug dependence" or "substance dependence" or "alcohol*" or "cannabis" or "phencyclidine" or "hallucinogen*" or "inhalant*" or "glue sniff*" or "opioid*" or "narcotic*" or "heroin" or "opium" or "methadone" or "sedativ*" or "hypnotic*" or "anxiolytic*" or "stimulant*" or "speed" or "mdma" or "ecstasy" or "amphetamin*" or "methamphetamin*" or "ketamine" or "bath salts" or "cocaine" or "multiple drug*" or "psychoactive substance*" or "benzodiacepin*")) OR AB=("drug abuse*" or "drug use*" or "substance abuse*" or "substance use*" or "addict*" or "drug dependence" or "substance dependence" or "alcohol*" or "cannabis" or "phencyclidine" or "hallucinogen*" or "inhalant*" or "glue sniff*" or "opioid*" or "narcotic*" or "heroin" or "opium" or "methadone" or "sedativ*" or "hypnotic*" or "anxiolytic*" or "stimulant*" or "speed" or "mdma" or "ecstasy" or "amphetamin*" or "methamphetamin*" or "ketamine" or "bath salts" or "cocaine" or "multiple drug*" or "psychoactive substance*" or "benzodiacepin*"))

AND

(TI=("refugee*" or "asylum" or "forced-migration" or "forced-migrant" or "humanitarian entrant*")) OR AB=("refugee*" or "asylum" or "forced-migration" or "forced-migrant" or "humanitarian entrant*"))

403 RESULTS

COCHRANE

ID	Search	Hits	
#1	MeSH descriptor: [Substance-Related Disorders] explode all trees	16380	
#2	MeSH descriptor: [Drinking Behavior] explode all trees	4431	
#3	MeSH descriptor: [Alcoholics] explode all trees	9	
#4	MeSH descriptor: [Alcoholic Beverages] explode all trees	553	
#5	MeSH descriptor: [Drug Users] explode all trees	122	
#6	MeSH descriptor: [Amphetamine] explode all trees	989	
#7	MeSH descriptor: [Hallucinogens] explode all trees	276	
#8	MeSH descriptor: [Cannabis] explode all trees	377	
#9	MeSH descriptor: [Hypnotics and Sedatives] explode all trees	3935	
#10	MeSH descriptor: [Narcotics] explode all trees	9255	
#11	MeSH descriptor: [Substance Abuse Treatment Centers] explode all trees	362	
#12	MeSH descriptor: [Cocaine] explode all trees	978	
#13	MeSH descriptor: [Illicit Drugs] explode all trees	280	
#14	MeSH descriptor: [Catha] explode all trees	11	
#15	("drug abuse*" or "drug use*" or "substance abuse*" or "substance use*" or "addict*" or "drug dependence" or "substance dependence" or "alcohol*" or "cannabis" or "phencyclidine" or "hallucinogen*" or "inhalant*" or "glue sniff*" or "opioid*" or "narcotic*" or "heroin" or "opium" or "methadone" or "sedativ*" or "hypnotic*" or "anxiolytic*" or "stimulant*" or "speed" or "mdma" or "ecstasy" or "amphetamin*" or "methamphetamin*" or "ketamine" or "bath salts" or "cocaine" or "multiple drug*" or "psychoactive substance*" or "benzodiacepin*"):ti,ab,kw (Word variations have been searched)		232460
#16	MeSH descriptor: [Refugees] explode all trees	164	
#17	MeSH descriptor: [Transients and Migrants] explode all trees	76	
#18	("refugee*" or "asylum" or "forced-migration" or "forced-migrant" or "humanitarian entrant*"):ti,ab,kw (Word variations have been searched)		598
#19	#1 or #2 or #3 or #4 or #5 or #6 or #7 or #8 or #9 or #10 or #11 or #12 or #13 or #14 or #15		235380
#20	#16 or #17 or #18		671
#21	#19 and #20		37

Total 3670

after deduplication: 2400 articles

14.2 Review protocol

Substance-related disorders in refugee populations - Protocol for a scoping review

This Version of the Protocol represents an amendment of a previously published protocol, which was written by Mayte López Atanes. Due to the publication of a guidance for the development of a scoping review protocol by the JBI Scoping Review Methodology Group, the previous protocol was revised by Friederike Gauß and changes made according to the guidance.

Changes include:

1. Addition of the name of the planned scoping review in the protocol title
2. Addition of the email correspondences of the authors
3. Addition of an abstract of the scoping review protocol in item 2
4. Updated number of refugees worldwide in item 3
5. Addition of the DOI of the protocol
6. Addition of research question “Which screening interventions of substance-related disorders in refugee populations have been developed?” in item 4
7. Specification of the term “substance-related disorder” regarding comprised diagnoses in item 6
8. Addition of substance-related disorders concerning nicotine, tobacco and caffeine as an exclusion criteria in item 6
9. Specification of “case reports” as a stand-alone exclusion criteria in item 6
10. Specification of the search strategy in item 8
11. Correcting the term “substance use disorders” to “substance-related disorders” in item 11 to capture other possible disorders than only substance use
12. Distinction in item 11 between charting items “Tools used for assessment” and “Characteristics” of substance-related disorders
13. Explicit listing of all data items for which data will be extracted in item 11
14. Specification of anticipated synthesis and presentation of results in item 14
15. Addition of templates for data charting in item 14

Table of contents

General information	Fehler! Textmarke nicht definiert.
1. Title of the scoping review	Fehler! Textmarke nicht definiert.
2. Research team and organisational affiliations	Fehler! Textmarke nicht definiert.
3. Timeline	Fehler! Textmarke nicht definiert.
4. Funding sources.	Fehler! Textmarke nicht definiert.
Project details according to the PRISMA-ScR checklist	Fehler! Textmarke nicht definiert.
Item 1. Title	Fehler! Textmarke nicht definiert.
Item 2. Abstract	Fehler! Textmarke nicht definiert.
Item 3. Rationale	Fehler! Textmarke nicht definiert.
Item 4. Objectives	Fehler! Textmarke nicht definiert.
Item 5. Protocol and registration	Fehler! Textmarke nicht definiert.
Item 6. Eligibility criteria	Fehler! Textmarke nicht definiert.
Item 7. Information sources	Fehler! Textmarke nicht definiert.
Item 8. Search	Fehler! Textmarke nicht definiert.

Item 9. Selection of sources of evidence	Fehler! Textmarke nicht definiert.
Item 10. Data charting process	Fehler! Textmarke nicht definiert.
Item 11. Data items	Fehler! Textmarke nicht definiert.
Item 12. Critical appraisal of individual sources of evidence	Fehler! Textmarke nicht definiert.
Item 13. Summary measures	Fehler! Textmarke nicht definiert.
Item 14. Synthesis of results	Fehler! Textmarke nicht definiert.
Item 15. Risk of bias across studies	Fehler! Textmarke nicht definiert.
Item 16. Additional analyses	Fehler! Textmarke nicht definiert.
Items 17-26: Results / Discussion	Fehler! Textmarke nicht definiert.
Item 27: Funding	
Appendix: PRISMA extension for scoping reviews (PRISMA-ScR) checklist	Fehler! Textmarke nicht definiert.

General information

1. Title of the scoping review

Substance-related disorders in refugee populations - a scoping review

2. Research team and organisational affiliations

1. Prof. Dr. Med. Ingo Schäfer^{1,2}: i.schaefer@centra.hamburg
2. Dr. Mayte López Atanes²: m.LopezAtanes@centra.hamburg
3. Dr. Melav Bari^{1,2}: m.bari@centra.hamburg
4. Friederike Gauß³: friederike.gauss@stud.uke.uni-hamburg.de

¹Klinik und Poliklinik für Psychiatrie und Psychotherapie im Universitätsklinikum Eppendorf

²Centra - Koordinierendes Zentrum für traumatisierte Geflüchtete

³Medizinische Fakultät der Universität Hamburg

3. Timeline

1. Start date: 01.07.2022
2. Anticipated completion date: 31.12.2022
3. Project stage at registration 01.08.2022
 - Preliminary searches conducted in June 2022
 - Study selection and data coding not yet initiated.

4. Funding sources.

No funding has been granted for this project.

Project details according to the PRISMA-ScR checklist

Item 1. Title

Substance-related disorders in refugee populations - a scoping review

Item 2. Abstract

Objective: The scoping review aims to summarise evidence about drug-related disorders in refugee populations, especially highlighting features of included studies regarding study design, setting, screening tools used and population characteristics. Furthermore, it aims to specify characteristics of drug-related disorders in refugee populations and to detect prevention and treatment interventions which have been used so far.

Introduction: The number of refugees worldwide is on the rise. Refugees often face potentially traumatic events and their prevalence of certain mental health disorders is higher than in respective native-born populations. There is high heterogeneity in studies concerning drug-related disorders and to the best of our knowledge there has not been published a scoping review so far about drug-related disorders in refugee populations.

Eligibility criteria: According to the PCC framework peer reviewed studies will be included which investigate substance-related disorders (Concept) in refugees according to the definition of a refugee by UNHCR (Population), who are displaced in a foreign country (Context). Studies which don't contain primary data and are written in other languages than English and German will be excluded.

Methods: A systematic literature research will be conducted in seven electronic databases. Two reviewers will independently screen search results in a two-staged process. Data from the included studies will then be independently charted by these two reviewers with an extraction tool they developed beforehand. Charted data will be presented in tables with a text narrating the results, further visual formats might be considered in the process of analysis. The scoping review will adhere to the PRISMA-ScR guidelines.

Item 3. Rationale

Refugees are people forced to flee from their country due to persecution, war or violence. The United Nations Refugee Agency (UNHCR) reported in May 2022 that for the first time there were over 100 Million refugees worldwide.

Refugees encounter many risk factors that predispose them to mental health problems: they often experience violence and other potentially traumatic events, economic difficulties as well as social isolation and exclusion in the host country. Their prevalence of mental health disorders such as anxiety, depression and PTSD is higher than in the respective native-born population, and this may predispose them to drug use and abuse.

Current studies on substance-related disorders among refugees show high heterogeneity and discordant results, probably due to the different cultures and settings in which the studies take place. A systematic review published in 2016 estimated that drug dependence ranged from 1 to 20%, but concluded that the understanding of substance abuse in refugees is low (1). The purpose of this scoping review is to map the current evidence on the topic and describe potential knowledge gaps.

Item 4. Objectives

This scoping review aims to describe the extent and nature of the research activity on substance-related disorders in refugees, regarding study-design, populations studied and primary or secondary prevention interventions and treatments. The review questions are:

1. What are the features of the studies that evaluate substance-related disorders in refugee populations (e.g. setting, methods used and population characteristics)?
2. What specific characteristics have alcohol- and drug-related disorders in refugee populations?
3. Which prevention interventions of substance-related disorders in refugee populations have been developed?
4. Which screening interventions of substance-related disorders in refugee populations have been developed?
5. Which treatment interventions of substance-related disorders in refugee populations have been developed?
6. What are the knowledge gaps in this field of study?

Item 5. Protocol and registration

This scoping review protocol will be prospectively registered at the Center for Open Science (OSF): <https://osf.io/>, DOI 10.17605/OSF.IO/E3F8U) The scoping review adheres to the PRISMA-ScR guidelines for scoping reviews (Tricco et al., 2018; refer to the Appendix).

Item 6. Eligibility criteria

The eligibility criteria for this scoping review are based on the PCC (Population, Concept and Context) criteria recommended for scoping reviews:

Inclusion criteria:

1. Study designs: quantitative, qualitative and mixed-methods designs.
 - a. Experimental, quasi-experimental.
 - b. Observational studies.
 - c. Program and treatment evaluations.
2. Publication status: published in peer-reviewed journals.
3. **P: Population:** Refugees, according to the UHNCR definition: “someone who has been forced to flee his or her country because of persecution, war or violence” or asylum seekers. If the population is mixed and data is not disaggregated, at least 51% of the population should be a refugee.
4. **C: Concept:** Primary objective should be evaluation of substance-related disorders. Investigated disorders should not only be mere drug use but should be diagnosed or at least be likely to be diagnosed as actual disorders (DSM5: Substance use disorder/substance-induced disorders, DSM4: Substance abuse/substance dependence, ICD11: Disorders due to substance use/substance-induced mental disorders, ICD10: Mental and behavioral disorders due to psychoactive substance use). We will include both organic and mental health disorders that may be related to substance-related disorders.
5. **C: Context:** Displacement in a foreign country.

Exclusion criteria:

1. No primary data: literature reviews, scoping reviews, systematic reviews, letters, editorials, comments, book reviews, monographs, opinion,
2. Case reports.
3. Populations that do not match either the refugee UHNCR definition (natural disasters, students, voluntary or labour migration) nor the definition of an asylum seeker.
4. Internal displacement (in the same country of origin, not crossing an international border).
5. Studies on other health conditions than substance-related disorders.
6. Substance-related disorders as secondary objective or covariable in the study.
7. Substance-related disorders concerning nicotine, tobacco or caffeine.

8. Conference abstracts.
9. Other languages than English or German.
10. Full-text not accessible.

Item 7. Information sources

The following bibliographic databases will be searched from inception to July 2022.

1. MEDLINE via OvidSP.
2. EMBASE via OvidSP
3. CINAHL via EBSCO.
4. PsycInfo via OvidSP
5. Science citation index expanded via Web of Science.
6. Social Sciences Citation Index (SSCI) via Web of Science.
7. Cochrane database.

The reference lists of all sources included in the scoping review will be screened for further sources of interest.

Item 8. Search

The systematic search will be conducted in English. No language or date limitations will be set at the search stage. We aim to include sources in English or German. The search terms will reflect the PCC criteria relevant for this scoping review: **Population** (Refugees) *AND* **Concept** (substance-related disorders). Through a preliminary literature search different keywords and synonyms were identified for all of the 7 databases. Due to variations in taxonomy between the databases 6 different search strings will be used to search the databases.

Item 9. Selection of sources of evidence

Data will be extracted to Endnote. After deduplication, the remaining results will be exported to the literature review software Rayyan. The scoping review will be done in two stages: (i) screening of titles and abstracts and (ii) screening of full texts of the studies included into the next stage. Two reviewers based on the inclusion and exclusion criteria will screen the articles independently. Any discrepancies will be resolved during discussion until consensus is reached.

Item 10. Data charting process

A data-charting form² will be developed for this scoping review. The team will discuss and agree upon how data items will be selected and the software to be used and will test and refine the charting form to ensure that all relevant data will be captured. The full data charting will be conducted independently by two team members. Any discrepancies will be discussed until consensus is reached.

Item 11. Data items

The following data items for data charting will be coded:

1. Generic bibliographic information (Authors names, year and country of publication)
2. Study design (Type of design, tools/methods used) and study aim
3. Main findings and limitations
4. Characteristics of examined population (Size, composition: e.g. refugees/asylum seeker, country of origin)
5. Tools used for assessment of substance-related disorder
6. Characteristics of substance related disorders (Type of drug, type of disorder, comorbidities, prevalent in which population)
7. Characteristics of the treatment or intervention (Type of intervention, name, developer, method)
8. Which definition of a “refugee” was applied?

Item 12. Critical appraisal of individual sources of evidence

As a scoping review, the objective is the synthesis of the evidence rather than the evaluation of the quality of the individual studies. For this reason, an overall assessment of the strength of the evidence will not be performed.

Item 13. Summary measures

Not applicable for scoping reviews.

Item 14. Synthesis of results

²¹ The term ‘data charting’ rather than ‘data extraction’ is used in a scoping review to describe the methods of extracting the data from the included sources of evidence (e.g., calibrated or tested forms) and any processes for obtaining and confirming data from investigators (e.g. Arksey and O’Malley, 2005; Tricco et al 2018).

Extracted data will be charted in tables and summarised in the written text. Further visual formats might be considered after analysis of the data. Synthesised evidence will be categorised into following preliminary topics: General overview about present studies, characteristics of substance-related disorders, characteristics of interventions.

Following preliminary templates have been developed so far:

Year of publication 2020-2022 2017-2019 2014-2016 2011-2013 2008-2010 2005-2007 2002-2004 1999-2001 1996-1998 1993-1995 1990-1992 1987-1989 1984-1986	<i>Number of studies (%)</i> e.g. 6 (11%)
Country of conducted research USA Germany Etc.	
Funding source No funding Public funding source Private funding source Not specified	

Authors names, year	Study aim	Study design	Methods/Tools used	Population size and composition	Origin of population	Main findings	Limitations	Prevalence estimation

Drug	Disorder	Comorbidities	Origin of population

Intervention name	Intervention type	Developer	Method

Item 15. Risk of bias across studies

Not applicable for scoping reviews.

Item 16. Additional analyses

Not applicable for scoping reviews.

Items 17-26: Results / Discussion

Not applicable at the protocol stage.

Item 27: Funding

No funding has been granted for this project.

Appendix: PRISMA extension for scoping reviews (PRISMA-ScR) checklist

Tricco AC, Lillie E, Zarin W, O'Brien KK, Colquhoun H, Levac D, et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Annals of Internal Medicine*. 2018;169(7):467-73. doi:10.7326/M18-0850

Section	Item	PRISMA-ScR Checklist Item
Title	1	Identify the report as a scoping review.
Abstract		
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.
Introduction		
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.
Methods		
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.
Information sources	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.
Selection of sources of evidence	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.
Data charting process	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.

Critical appraisal of individual sources of evidence	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).
Summary measures	13	<i>Not applicable for scoping reviews</i>
Synthesis of results	14	Describe the methods of handling and summarizing the data that were charted.
Risk of bias across studies	15	<i>Not applicable for scoping reviews</i>
Additional analyses	16	<i>Not applicable for scoping reviews</i>
Results		
Selection of sources of evidence	17	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.
Characteristics of sources of evidence	18	For each source of evidence, present characteristics for which data were charted and provide the citations.
Critical appraisal within sources of evidence	19	If done, present data on critical appraisal of included sources of evidence (see item 12).
Results of individual sources of evidence	20	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.
Synthesis of results	21	Summarize and/or present the charting results as they relate to the review questions and objectives.
Risk of bias across studies	22	<i>Not applicable for scoping reviews</i>
Additional analyses	23	<i>Not applicable for scoping reviews</i>
Discussion		
Summary of evidence	24	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.
Limitations	25	Discuss the limitations of the scoping review process.
Conclusions	26	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.
Funding	27	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.

Bibliography:

- 1) Horyniak D, Melo JS, Farrell RM, Ojeda VD, Strathdee SA. Epidemiology of Substance Use among Forced Migrants: A Global Systematic Review. PLoS One. 2016 Jul 13;11(7):e0159134. doi: 10.1371/journal.pone.0159134. PMID: 27411086; PMCID: PMC4943736.

14.3 Prisma-Scr Checklist

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
TITLE			
Title	1	Identify the report as a scoping review.	1
ABSTRACT			
Structured summary	2	Provide a structured summary that includes (as applicable): background, objectives, eligibility criteria, sources of evidence, charting methods, results, and conclusions that relate to the review questions and objectives.	5
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known. Explain why the review questions/objectives lend themselves to a scoping review approach.	11-15
Objectives	4	Provide an explicit statement of the questions and objectives being addressed with reference to their key elements (e.g., population or participants, concepts, and context) or other relevant key elements used to conceptualize the review questions and/or objectives.	15
METHODS			
Protocol and registration	5	Indicate whether a review protocol exists; state if and where it can be accessed (e.g., a Web address); and if available, provide registration information, including the registration number.	16, 99-111
Eligibility criteria	6	Specify characteristics of the sources of evidence used as eligibility criteria (e.g., years considered, language, and publication status), and provide a rationale.	16-17
Information sources*	7	Describe all information sources in the search (e.g., databases with dates of coverage and contact with authors to identify additional sources), as well as the date the most recent search was executed.	17
Search	8	Present the full electronic search strategy for at least 1 database, including any limits used, such that it could be repeated.	95-98
Selection of sources of evidence†	9	State the process for selecting sources of evidence (i.e., screening and eligibility) included in the scoping review.	17-18
Data charting process‡	10	Describe the methods of charting data from the included sources of evidence (e.g., calibrated forms or forms that have been tested by the team before their use, and whether data charting was done independently or in duplicate) and any processes for obtaining and confirming data from investigators.	18
Data items	11	List and define all variables for which data were sought and any assumptions and simplifications made.	18
Critical appraisal of individual sources of evidence§	12	If done, provide a rationale for conducting a critical appraisal of included sources of evidence; describe the methods used and how this information was used in any data synthesis (if appropriate).	-

SECTION	ITEM	PRISMA-ScR CHECKLIST ITEM	REPORTED ON PAGE #
Synthesis of results	13	Describe the methods of handling and summarizing the data that were charted.	18-19
RESULTS			
Selection of sources of evidence	14	Give numbers of sources of evidence screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally using a flow diagram.	20
Characteristics of sources of evidence	15	For each source of evidence, present characteristics for which data were charted and provide the citations.	22-53
Critical appraisal within sources of evidence	16	If done, present data on critical appraisal of included sources of evidence (see item 12).	-
Results of individual sources of evidence	17	For each included source of evidence, present the relevant data that were charted that relate to the review questions and objectives.	26-53
Synthesis of results	18	Summarize and/or present the charting results as they relate to the review questions and objectives.	26-53
DISCUSSION			
Summary of evidence	19	Summarize the main results (including an overview of concepts, themes, and types of evidence available), link to the review questions and objectives, and consider the relevance to key groups.	54-74
Limitations	20	Discuss the limitations of the scoping review process.	74-76
Conclusions	21	Provide a general interpretation of the results with respect to the review questions and objectives, as well as potential implications and/or next steps.	76-77
FUNDING			
Funding	22	Describe sources of funding for the included sources of evidence, as well as sources of funding for the scoping review. Describe the role of the funders of the scoping review.	25, 109

14.4 Raw Data

14.4.1 General study characteristics

Study ID (First author, year)	Study aim	Country and Setting	Study design, Sampling and Sampling method	Data collection method	Measures regarding SRDs	Other measures	Socio-demographic variables	Total sample / n(%) refugees/asylum seeker	Study funding and Funding source
Amosu 2016	To determine the prevalence and pattern of alcohol and drug abuse among the refugees at Oru refugee camp in Nigeria.	Nigeria Refugees living in an open refugee camp	Cross sectional study Probability sampling: Simple random sampling	Clinical interview (and self-administered instrument for other measures)	Substance use disorder module of the Structured Clinical Interview Schedule (SCID)	- Psychological morbidity: General Health Questionnaire (GHQ-30)	Sex, age, religion, nationality, marital status, present employment status, occupation at exit country, educational level, years since fled home country	105/105 (100%) refugees	Not reported
Bapolisi 2020	To determine the prevalence of post-traumatic stress disorder, its main psychiatric comorbidities and perceived psychosocial needs among refugees in	Uganda Community survey in the refugee settlement camp	Cross sectional study Probability sampling: Stratified sampling	Community health workers working within the camp were trained for 5 days and conducted interviews in five local languages. Questionnaires were translated and then	Mini-International Neuropsychiatric Interview 7 (MINI)	- Perceived needs: Humanitarian Emerging Settings Perceived Needs Scale (HESPER)	Age, sex, marital status, nationality, education level, years spent in Nankivell camp	387/387 (100%) refugees	Funding: NGO Förderverein Uni Kinshasa e. V., fUNIKIN, Else-Kroener-Fresenius Stiftung, Holger-Poehlmann Foundation

	Nakivale refugee camp.			corrected using blind back translation.					
Betan-court 2017	To compare and contrast trauma histories, clinical profiles, and patterns of service utilization across three service-referred groups: refugee-origin, immigrant-origin and U.S.-origin youth.	United States National Child Traumatic Stress Network (56 centers across the US, community-based organizations, hospitals, and universities)	Cross sectional study Probability sampling: Stratified sampling	Trained Clinicians conducted interviews; interpreters were often available. All instruments were available in English and Spanish, some instruments were available in other languages after forward- and back-translation.	- The degree to which patients fulfilled 13 disorders of the DSM-IV (including substance use disorders). Rating according to a 3-point scale 0 (not present), 1 (possibly present/subclinical), and 2 (definitely present/met full criteria). Probable and definite ratings were collapsed together. - Services utilized: Self-help groups (e.g. Alcoholics Anonymous, Narcotics Anonymous)	- Trauma History Profile (THP) - Service utilization (services received 30 days before assessment) - Indicators of severity (IOS): Likert scale to rate impairments in day-to-day functioning - The degree to which patients fulfilled 13 disorders of the DSM-IV (e.g. depression, PTSD generalized anxiety, etc.)	Age, gender, race, Hispanic or Latino, place of birth, primary residence, primary language spoken at home, public insurance, region	339/60 refugees	Funding: Funding in part from Center for Mental Health Services, Substance Abuse and Mental Health Services Administration, U.S. Department of Health and Human Services, Sidney Sax Early Career Fellowship from the National Health and Medical Research Council of Australia
Bogic 2012	To test whether the same sociodemographic characteristics,	Multinational: Germany, Italy, UK	Cross sectional study	Face-to-face interviews were conducted by 11 trained bilingual interviewers	Mini-International Neuropsychiatric Interview (MINI)	- 24-item Life Stressor Checklist-Revised: pre-, during and post-war - For war event: year	Country of origin, age, gender, marital status, educational level,	854/854 (100%) refugees	Funding: European Commission

	war experiences and post-migration stressors are associated with mental disorders in similar refugee groups resettled in different countries.	Refugees were resettled in West European countries. Interviews took place at participants' homes, community organizations or research centers.	Probability and non-probability sampling: Italy, Germany: simple random sampling, snowball sampling UK: snowball sampling	(psychologists and one sociologist and one ethnologist). Seven originated from Yugoslavia, four were refugees themselves.		of occurrence/year of the most stressful event and distress in a Likert scale - Perceived level of acceptance in the host country (Likert scale) - Command of the language of the host country (Likert scale)	employment, and residence status		
Brown 2019	To check the incidence and characteristics associated with alcohol-related illness among asylum seekers admitted to the Emergency department.	Switzerland Emergency Department	Cross sectional study: Sampling not specified	Medical reports were extracted from a computerized patient database and medical history field and patient diagnosis field were manually screened.	Alcohol intoxication according to the criteria in the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV-TR)	- Laboratory analysis (breath and estimated blood alcohol concentration) - Signs of mixed intoxication or chronic alcohol abuse - Clinical presentation, i.e. signs of aggression, vital signs, Glasgow Coma Scale, trauma grouped by fractures, burns, brain concussion, cerebral or internal bleeding, superficial wounds, contusion, luxation - Course at the ED, i.e.	Age, sex, country of origin, residency status	117,716/2,490 (2.12%) asylum seekers	Funding: Gottfried and Julia Bangerter-Rhyner-Foundation. Department of Emergency Medicine, Inselspital, Bern University

						stitches, rehydration, psychiatrist/special sergeant needed, sedation, fixation, intubation - Discharge procedure: emergency surgery, ambulant setting, hospitalization - Initial referral type			
Chernet 2021	To assess the mental health status and resilience of Eritrean asylum seekers and refugees in Switzerland upon arrival and one-year post-arrival.	Switzerland Refugee Centers of Basel-Land and Basel-Stadt cantons	Prospective cohort study Sampling not specified	Interviews were conducted in Tigrina by the first author.	Alcohol Use Disorders Identification Test (AUDIT)	At baseline: - Patient Health Questionnaire Somatic Anxiety and Depression Syndrome (PHQ-SADS) - Post-Traumatic Disorder Check List-Civilian Version (PTSD-CL-S) - 14-Item Resilience Scale (RS-14) On follow up: - previous questionnaires plus additional questionnaire on experiences during migration and current status of integration	Age, sex, marital status, educational background smoking history, employment	107/107 (100%) refugees and asylum seekers	No funding

Ezard 2012	To assess alcohol use among refugees from Burma living in Mae La refugee camp.	Thailand Ante-natal clinic of refugee camp	Mixed-methods study Survey: Quantitative research Interviews: Qualitative research Non-probability sampling: Survey: Purposive sampling Interviews: Purposive and snowball sampling	Survey: Screening questionnaire administered by trained women mental health workers in Burmese, Poe or Sgaw Karen. Interviews: Semi-structured interviews conducted by trained and supervised camp-residents.	Survey: Adapted Version of the Modified Single Alcohol Screening Questionnaire (mSASQ): 'Starting from last year "Sweet December" [1 December] until before you got pregnant, how often did you drink six standard drinks or more than six standard drinks in one occasion?' and 'Starting from last year "Sweet December" until today, how often does your husband drink six standard drinks or more than six standard drinks in one occasion?'	Survey: - language in which it was conducted Interviews: - language in which interview was conducted - current alcohol use	Survey: age (own age and age of male partner) Interviews: age, gender, ethnicity, religion, duration of residence in Mae La	Survey: 636/636 (100%) refugees Interviews: 97/97 (100%) refugees	Funding: Commonwealth Scholarships Commission, UK
Fine 2022	To examine mental, neurological, and substance use (MNS)	Multinational: Africa (Burkina Faso, Burundi, Cameroon, CAR, Chad, DRC,	Cross sectional study	Standardized reporting form filled by clinicians	HIS case definition of alcohol/substance use disorder: Consumption of	HIS case definition for: - Epilepsy/seizures - Mental retardation /intellectual disability - Psychotic disorder	Sex, age group (<5 years old/5 and above)	744,036 reported visits for any MNS disorder (100% refugees)	Funding: National Institute of Mental Health, Eunice Kennedy

	service usage within refugee camp primary health care facilities in low- and middle-income countries (LMICs).	Djibouti, Eritrea, Ethiopia, Ghana, Kenya, Liberia, Namibia, Republic of the Congo, Rwanda, South Sudan, Sudan, Tanzania, Uganda, Zambia), Asia and the Pacific (Bangladesh, Nepal, Thailand), and Middle East and North Africa (Yemen) Primary Health care services in refugee camps	No sampling, all data present analyzed		alcohol (or other addictive substances) on a daily basis with difficulties controlling consumption. Personal relationships, work performance, and physical health often deteriorate but consumption continues despite these problems.	- Severe emotional disorder - Medically unexplained somatic complaint - Other psychological complaint			Shriver National Institute of Child Health & Human Development, National Institute on Alcohol Abuse and Alcoholism
Haroz 2014	To develop reliable and valid instruments that could be used as screening, monitoring, and evaluation tools in a subsequent randomized controlled trial of a	Thailand Community of Burmese migrants living outside of refugee camps in Mae Sot, Thailand	Instrument validation study Non-probability sampling: Judgment sampling	Interviews	Adapted version of the Alcohol Use Disorders Identification Test (AUDIT)	Mental Health Assessment Project Instrument (self-developed): - Depression: Hopkins Symptom Checklist 25-item version HSCL-25 + two additional local items	Gender, Age, marital status, education, ethnic group	First testing: 158/158 (100%) refugees Retesting: 66/66 (100%) refugees	Funding: USAID Victims of Torture fund; the first author is supported by a training grant from the National Institute of Mental Health.

	psychotherapeutic intervention among Burma refugees in Thailand					- Anxiety: HSCL-25 + two additional local items - Harvard Trauma Questionnaire HTQ (Section traumatic experiences: 25 items and post-traumatic stress symptoms: 30 items) - Assessment of functionality: 11 items for men and 14 for women based on previous qualitative studies			
Harris 2019	To investigate whether the incidence of substance use disorders in refugees and non-refugee migrants differed from the native-born Swedish population.	Sweden General population	Retro-spective cohort study No sampling, register data	Use of different national registers which can be linked from a Swedish database	- ICD-10 diagnosis of mental and behavioral disorder due to psychoactive substance use (F.10.X-F19.X) - Separate outcomes: - Alcohol use disorder (F10.X) - Cannabis use disorder (F12.X) - Polydrug use disorder (F19.X)	- PTSD diagnosis (as cofounder variable)	Sex, year of birth, family income, employment status, population density, migration status, country of origin, age at migration, time in Sweden	1,241,901/17,783 (1,4%) refugees	Funding: Wellcome Trust, the Royal Society, Mental Health Research UK, UCLH NIHR Biomedical Research Centre, Public Health Agency of Sweden

Heeren 2012	To evaluate psychiatric morbidity in asylum seekers within the first two years in the host country in relation to pre and post migratory living circumstances.	Switzerland Group 1: housed in asylum centers Group 2: living in own or shared apartments	Cross sectional study Non-probability sampling: Consecutive sampling	Interviews were conducted in participants native language with assistance from a trained interpreter.	Mini-International Neuropsychiatric Interview (MINI)	- Pre-migration traumatic experience: First section of the Harvard Trauma Questionnaire - Psychiatric disorders (DSM-IV): MINI - Symptom severity: self-report questionnaire and PTSD symptom severity: Section III of the PDS (post-traumatic diagnostic scale) - Anxiety and depression: Hopkins Symptom Checklist-25 (HSCL-25) - Pain intensity: Verbal rating scale (VRS) - Post-migration factors	Age, gender, marital status, level of education and region of origin	Group 1: 43/43 (100%) asylum seekers Group 2: 43/43 (100%) asylum seekers	Not reported
Hewlett 2015	To explore factors associated with Alcohol use disorder (AUD) among Bhutanese	Nepal Refugees living in camps and selected for third-country resettlement,	Case control study Non-probability sampling for cases,	Gender-matched study assistants from the local Nepali community conducted interviews.	Nepali version of the Alcohol Use Disorders Identification Test (AUDIT)	- Resettlement-related information - Community perceptions of alcohol use	Sex, age, which camp, family type, caste, religion, marital status, education, literacy, general	128/128 (100%) refugees	Not reported

	refugees living in camps in Nepal.	attending the International Organization for Migration (IOM) in Jhapa district of eastern Nepal	Probability sampling for controls: Cases: Consecutive sampling (identified as possible AUDs during health assessment) Controls: Simple random sampling			- Suggestions how to control excessive intake Additionally for case-participants: - Information regarding onset of drinking - Reasons for drinking	activities, tobacco, distance from health clinic, average income		
Jamil 2002	To clarify the mental health needs of Iraqi immigrants who arrived in the United States in the 1990s after the Persian Gulf War.	United States Arab Community Center for Economic and Social Services in Dearborn	Cross sectional study Sampling not specified	Mental health professionals reviewed medical charts and filled a data sheet. Assessment, diagnosis and treatment of patients had been done by bilingual (Arabic and English) health professionals.	Diagnosis mentioned in medical chart: -Drug abuse/dependence - Alcohol abuse/dependence	- Symptoms - Medical conditions - Diagnoses - Outcome of the treatment received	Country of origin, age, gender, education, marital status, employment, disability status, reason for coming to the United States	375/140 (37.3%) refugees	Not reported
Kane 2014	To estimate contact coverage of mental,	Multinational: Central Africa and the Great	Cross sectional study	Data was entered on tally	HIS case definition of alcohol/substance	HIS case definition for: - Epilepsy/seizures - Mental retardation	Sex, age group (under 5 years old/5 and above)	211,728 reported visits for any MNS	Funding:

	neurological and substance use (MNS) services in 90 refugee camps in low- and middle-income countries (LMIC).	Lakes (Burundi, Rwanda, Tanzania); East and Horn of Africa (Chad, Djibouti, Ethiopia, Kenya, Uganda); Southern Africa (Namibia, Zambia); West Africa (Liberia); Middle East (Yemen); South Asia(Nepal); South-East Asia (Bangladesh, Thailand) Primary health care services in refugee camps	No sampling, all data present analyzed	sheets by clinicians.	use disorder: Consumption of alcohol or another substance on a daily basis with difficulty controlling consumption. Social relationships, functioning and physical health may deteriorate but use continues.	/intellectual disability - Psychotic disorder - Severe emotional disorder - Medically unexplained somatic complaint - Other psychological complaint		disorder (100% refugees)	National Institute for Drug Abuse
Kim 2018	To examine how sociodemographic and migration-related factors are associated with behavioral health outcomes among refugees from Burma with either Burman or Karen ethnicity.	United States Community-based study of Burmese refugees resettled in New York	Cross sectional study Non-probability sampling: Convenience sampling	Interviews were conducted by six trained community members. Survey instruments were pilot-tested and available in English or Burmese through forward- and back-translation.	Alcohol Use Disorders Identification Test (AUDIT)	- Migration-related factors (whether they stayed in a refugee camp, length of camp stay, age at arrival in the United States) - English proficiency: Three items from the Asian American multidimensional acculturation scale	Ethnic background, native language, age, sex, marital status, education, employment, monthly household income	256/256 (100%) refugees	Funding: University at Buffalo School of Social Work

						- Anxiety and depression: 15-item and 10-item subscales from the Hopkins symptom Checklist (HSCL-25) - PTSD: Refugee health screener-15 (RHS-15)			
Kuhn 2018	To provide information on the nationality of drug-dependent refugees, their respective drug-use histories, consumption patterns and treatment needs.	Germany German drug addiction facilities	Cross sectional study Non-probability sampling: Convenience sampling	Face-to-face interviews were conducted by a team of a research assistant and a translator.	- Substance use in home country - Substance use during flight - Substance use in Germany - Motives for substance use - Treatment requests	- Year of arrival in Germany - Length of flight - Asylum status - Accommodation - HIV and Hepatitis C infections	Age, year of migration, status of the asylum procedure, housing, ethnicity, country of origin	128/128 (100%) refugees	Funding: Bundesministerium für Gesundheit
Laban 2004	To assess the prevalence of psychiatric disorders in asylum seekers and the possible influence of the length of the asylum procedure.	The Netherlands Community-based	Cross sectional study Probability sampling: Simple random sampling	All interviewers (14) were Iraqi and fluent in Dutch and Arabic and were selected and trained by a WHO-acknowledged CIDI trainer in a 4-day training session followed	Iraqi-Arabic version of the WHO Composite International Diagnostic Interview (CIDI) 2.1: Palestinian-Arabic version (which was translated and culturally validated),	- Somatoform, anxiety, depressive and obsessive-compulsive disorder and PTSD: Modified Iraqi-Arabic version of the CIDI 2.1 - Adverse life events: 163 questions + 14 items + Conflict-related events from	Age, sex, marital status, children, ethnicity, religion, literacy, geographic background, length of stay in the Netherlands, education and occupation in Iraq, language skills, psychiatric	294/294 (100%) asylum seekers	Not reported

				up by two refresher training sessions.	modified for the Iraqi population by a focus group of 8 men and women from different ethnic and professional backgrounds	the Harvard Trauma Questionnaire (HTQ)	problems in the past		
Leao 2006	The first aim was to investigate if the increased risk of being hospitalized for alcohol and drug abuse among certain immigrant groups is present in the next generation. The second was to investigate if having a Swedish parent was a protective factor. The third was to check its association with individual socioeconomic factors.	Sweden General population	Retro-spective cohort study No sampling, register data	Anonymous national health registers which can be linked through a unique personal identification number	First hospital admission for alcohol abuse and drug abuse according to the International Classification of Diseases (ICD): - alcohol abuse (ICD-9: 291, 303, 305A and ICD-10: F10) - drug abuse (ICD-9: 292, 304, 305X and ICD-10: F11-F16, F18-F19)	none	Age, gender, migration status, income	2,243,546/132,412 first-generation (5.9%) and 6320 (0.28%) second generation refugees	Funding: National Institutes of Health, the Swedish Council for Working Life and Social Research, the Swedish Research Council, the Knut and Alice Wallenberg Foundation, the Karolinska Institute, and the Stockholm County Council
Luitel 2013	To evaluate the prevalence of hazardous and harmful alcohol	Nepal Refugee camps	Cross sectional study	Face-to-face interviews were conducted by trained, gender	Alcohol Use Disorders Identification Test (AUDIT)	- History of alcohol use in the family - Smoking and tobacco	Gender, age category, caste/ethnicity, educational	8,021/8,021 (100%) refugees	Funding: United Nations High Commission

	use and factors of elevated risk in Bhutanese refugees living in refugee camps in eastern Nepal.		No sampling, census data	matched-research assistants hired from the same refugee community. Instruments were pretested.		use - Substance use - Refugee camp	status, marital status, religion, resettlement status, working status		for Refugee (UNHCR), Nepal; Wellcome Trust Research Career Development award in Basic Biomedical Science
Maier 2010	To assess current mental health status and patterns of healthcare utilization in asylum seekers compared to residents.	Switzerland Asylum seekers were assessed after their first year of residency in Switzerland. Participants were interviewed in their homes or at the researchers' department.	Cross sectional study Non-probability sampling: Consecutive sampling	Self-administered questionnaires, if necessary, applied as a structured interview performed by a trained clinical psychologist, if needed, with trained interpreters. All questionnaires were forward- and back-translated into 11 main languages spoken by participants.	Mini-International Neuropsychiatric Interview (MINI)	- Psychiatric disorders: MINI - Average annual healthcare cost - Appointments with doctors per year - Psychiatric treatment (psychotherapy, psychosocial counselling, psychopharmacotherapy or combination) - Physical diseases	Sex, Marital status, status of residence, region of origin	78/78 (100%) asylum seekers	Funding: Swiss Federal Office for Migration
Manhica 2016	To investigate the patterns of hospital care and criminality associated with substance	Sweden General population	Retrospective cohort study	Anonymous national health registers which can be linked through a unique personal	First hospitalization due to substance misuse with a diagnosis of	- Criminal conviction related to substance misuse (defined as the handling of narcotic drugs)	Age, gender, disposable income, domicile	960,641/27,688 (2.9%) refugees	Funding: Swedish Research Council for Health, Working Life and Welfare

	misuse among accompanied and unaccompanied refugees who settled in Sweden as teenagers and among their native Swedish peers.		No sampling, register data	identification number	substance use disorder				(Forte), and Nordforsk
Manhica 2017	To investigate the risk of hospitalization due to alcohol related disorders among refugees who arrived to Sweden as teenagers, to explore whether the risks are different between accompanied and unaccompanied refugees and whether the risks vary according to region of birth and length of residence.	Sweden General population	Retro-spective cohort study No sampling, register data	Anonymous national health registers which can be linked through a unique personal identification number	- Alcohol related medical care with a diagnosis of an alcohol related psychiatric or medical disorder due to long-term alcohol misuse	none	Age, gender, disposable income, domicile	1,029,233/20,210 refugees	Funding: NordForsk, FORTE, The Swedish Research Council for Health, Working Life and Welfare

Manok 2017	To describe the development of a psychosocial outpatient clinic in a register center for refugees and to examine the spectrum of patients as well as first experiences of service providers.	Germany Psychosocial outpatient clinic of the reception center Heidelberg-Kirchheim, Germany	Mixed-methods study Sampling not specified	Quantitative part: Medical reports (Qualitative part: Interviews with health professionals for other measures)	Quantitative part: - Clinical diagnoses from patient record - Treatment recommendation for opioid/benzo-diazepine dependence	Qualitative part: Five questions regarding experiences, challenges and difficulties with offering care for traumatized and burdened refugees	Age, gender, country of origin, religion, language spoken, reason for flight, sending institution	317/317 (100%) refugees	Funding: Ministry of Science, Research and Arts, Baden-Württemberg, Germany
Marshall 2005	To assess the prevalence, comorbidity, and correlates of psychiatric disorders in the US Cambodian refugee community 25 years after resettlement.	United States 4 census tracts with the largest proportion of Cambodians in Long Beach, California	Cross sectional study Probability sampling: Multistage sampling within households: First: simple random sampling. Second: stratified random sampling. Third: single random.	Face-to-face fully structured interviews were conducted by trained bilingual Cambodian refugees. Instruments were pretested and available in English and Khmer, using forward- and back-translation.	Alcohol Use Disorders Identification Test (AUDIT)	- Overseas trauma exposure: Modified version of 17-item Cambodian Harvard Trauma Questionnaire with additional items from the 46-item Bosnian version - Exposure to violence in the United States: Modified version of the Survey of Exposure to Community Violence - Past 12-month diagnoses of PTSD and major depression: CIDI 2.1.	Age, year of immigration, education, marital status, religion, employment, self-assessed English proficiency, household size, household income	490/490 (100%) refugees	Funding: National Institute of Mental Health, National Institute on Alcohol Abuse and Alcoholism (Dr Marshall)

Marshall 2006	To identify the rates and correlates of seeking mental health services among Cambodian refugees in the United States.	United States 4 census tracts with the largest proportions of Cambodians in Long Beach, California	Cross sectional study Probability sampling: Multistage sampling: First: simple random sampling. Second: stratified random sampling. Third: single random.	Face-to-face fully structured interviews were conducted by trained and supervised bilingual interviewers who were refugees as well. Instruments were pretested and available in English and Khmer, using forward- and back-translation.	Alcohol Use Disorders Identification Test (AUDIT)	- PTSD and major depression: CIDI 2.1 - Seeking services for mental health problems - Pre-migration trauma exposure: Modified version of the 17-item Cambodian Harvard Trauma Questionnaire (HTQ) + items from the 46-item Bosnian version of the HTQ - Post-migration Trauma exposure: Modified version of the Survey of Exposure to Community Violence - Symptom severity: 12-item short form health survey (SF-12) + summing across the dichotomous CIDI items	Age, gender, mean year of immigration, marital status, education, employment, household income, health insurance status, government assistance, English proficiency	339/339 (100%) refugees	Funding: National Institute of Mental Health, National Institute on Alcohol Abuse and Alcoholism
Mire-madi 2011	To study the prevalence of PTSD, depression, and substance use by	Canada Immigrant Services Society	Cross sectional study	Face to face interview administered by a linguistically and culturally	- Alcohol Use Disorders Identification Test (AUDIT)	- Impact of traumatic events: Impact of Events Scale-Revised (IES-R)	Age, sex, marital status, number of children, years of primary/seconda	68/68 (100%) refugees	Not reported

	Middle-Eastern Government Assisted refugees (GARs) resettled in British Columbia, Canada.	(intake facility upon arrival)	Non-probability sampling: Voluntary sampling	similar psychiatrist	- Drug Use Disorders Identification Test (DUDIT)	- Depressive symptoms: Patient Health Questionnaire (PHQ-9)	ry education, attended post-secondary institution, religious affiliation, country of origin, country of residence before displacement, length of time in Canada		
Mollica 1987	To evaluate refugee trauma and associated psychiatric and social impairments of Indochinese refugees living in the United States.	United States Indochinese Psychiatric Clinic of St Elisabeth's Hospital in Boston	Cross sectional study Non-probability sampling: Consecutive sampling	DSM-III diagnoses: made by psychiatrists with more than 2 years of experience (Questionnaires for other outcomes: administered by paraprofessional Indochinese staff)	DSM-III diagnosis of drug and/or alcohol addiction	- Traumatic events: Life Events and Social History Questionnaire - Diagnosis of PTSD: National Institute of Mental Health Diagnostic Interview Schedule (DIS) - Highest level of adaptive functioning during the previous year: DSM-III axis 5 criteria. - Medical disorders: Assessed by a primary physician	Sex, ethnicity, marital status	52/52 (100%) refugees	Funding: U.S. Office of Refugee Resettlement
Naeem 2005	To measure the prevalence of psychiatric morbidity	Pakistan Refugees resided in	Cross sectional study	Not specified if interview or self-fulfilled questionnaire	- Mini-International Neuropsychiatric Interview (MINI)	- Psychopathology: MINI - Self-developed form	Gender, marital status, level of education, employment	1,020/1,020 (100%) refugees	Not reported

	among Afghan refugees.	camp and attended a psychiatric facility in Peshawar	Sampling not specified			to record experiences of trauma	status, children, migration period in years, age, ethnic group		
Nikendi 2019	To investigate the mental health and treatment utilization of asylum seekers after they were transferred from a state registration- and reception-center to municipal shelters in Germany.	Germany Outpatient clinic of the Heidelberg Center for Psychosocial Medicine, which is located in a reception center. At t1, asylum seekers resided in the reception center; at t2, they had been allocated to municipal shelters.	Prospective cohort study All patients selected, no sampling	Baseline assessment (t1): Self-administered questionnaires in 16 languages + clinical record data (diagnoses and treatment recommendations) Follow-up interviews (t2): Questionnaires and semi-structured interviews carried out via phone by researcher or translator	- Psychiatric diagnoses after ICD-10 from clinical record (t1) - Three screening questions taken from the SCID: (t1) 1) "Do you regularly have five or more drinks of beer, wine, or liquor on one occasion?", 2) "Do you use street drugs at the moment?", 3) "Are you currently addicted to a prescribed medicine or take a lot more of it than you were supposed to?" - Treatment recommendations (t1) and access to psychiatric or	Baseline assessment (t1) and follow-up interviews (t2): - Primary care PTSD screening (PC-PTSD) - Patient health questionnaire for depressive disorders (PHQ-2) - General anxiety disorder questionnaire (GAD-2) - Patient health questionnaire for panic disorder (PHQ-PD) - WHO-Five: Well-Being Index (WHO-5) - Number and kind of diagnoses and treatment recommendations recorded in discharge letter	Baseline assessment (t1): Sex, age, origin, religion/atheism, number of children, individual reasons for flight	Baseline t1: 228/228 (100%) asylum seekers follow-up t2: 88/88 (100%) asylum seekers	Funding: Ministry of Science, Research and Arts, Baden-Württemberg, Germany

					psychotherapeutic care (t2)	Follow-up interviews (t2): - Access to psychiatric and psycho-therapeutic care			
Posselt 2015	To study the needs of young refugees with comorbid mental health (MH) and alcohol and other drugs (AOD) disorders, looking at the perspectives of both workers and consumers.	Australia Northern Adelaide, South Australia	Qualitative research (derived from a bigger mixed-methods study) Non-probability sampling: Purposive and snowball sampling	Semi-structured interviews	Challenges associated with experiencing MH and AOD comorbidity as a refugee and the top three challenges	- Difficulties resettling in Australia - Barriers and facilitators to accessing support	Gender, age, ethnicity/cultural background, country of birth, years in Australia, age on arrival, arrived as unaccompanied minor	30/15 (50%) refugees	Funding: Australian Research Council
Posselt 2015	To identify risk factors and patterns of development of comorbid Mental health (MH) and Alcohol and other Drug (AOD) disorders in young people from refugee backgrounds.	Australia Northern Adelaide, South Australia	Qualitative research Non-probability sampling: Snowball and consecutive sampling	Semi-structured interviews	- Factors associated with the development of MH and AOD disorders in refugee youth - Challenges associated with experiencing MH and AOD disorders - Perceived barriers and	none	Gender, age, country of origin	30/15 (50%) refugees	Funding: Australian Research Council

					facilitators to accessing support Interviews with youth: Conceptualization of such problems and the attitudes towards these issues in their culture				
Richter 2018	To evaluate the psychiatric diagnoses in the first weeks after arrival in the host country, to verify the diagnosis after the discharge from the center and check whether adequate treatment was provided.	Germany Admission Center for Asylum Seekers Zirndorf. At t1 asylum seekers resided in the admission center, at t2 asylum seekers had been discharged from the admission center to steadier accommodations.	Prospective longitudinal study (no control group) Probability sampling and non-probability sampling: Two samples: - Help seeking individuals (sampling not mentioned) - Randomly selected residents of the center	t1: trained bilingual specialists administered questionnaires; medical history and psychometric testing was done by a psychiatrist and a psychologist. t2: not mentioned	Mini-International Neuropsychiatric Interview (MINI)	- Psychiatric symptoms: Brief symptom inventory (BSI) - Suicidal thoughts: Item 10 of the Montgomery Asberg Depression Rating Scale (MADRS) - PTSD symptoms: Essen Trauma inventory (ETI) - Sleep disturbances: Pittsburgh Sleep Quality Index (PSQI)	Sex, age, marital status, education, professional status, country of origin, religion	t1: 283/283 (100%) asylum seekers t2: 34/34 (100%) asylum seekers	Funding: Bavarian State Ministry of Employment and Social Order, the Family and Women

Salas-Wright 2014	To evaluate the prevalence of SUD among refugees in contrast to native-born Americans and non-refugee immigrants.	United States Data from non-institutionalized U.S residents in all 50 states and Washington DC.	Cross sectional study Probability sampling: Multistage cluster sampling + over-sampling in minority populations	Participants completed the NESARC interview in English, Spanish, or one of the four Asian languages (Mandarin, Cantonese, Korean, Vietnamese).	Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV)	- Lifetime diagnosis of major depressive disorder and PTSD - Refugee duration: "How long were you a refugee?"	Age, gender, race/ethnicity, household income, education level, marital status, region of the USA and urbanicity, parental antisocial influence, parental substance use problems	34,650/428 (1,24%) refugees	Funding: National Institute on Drug Abuse at the National Institutes of Health
Schaff-rath 2017	To examine cases of refugees who were in contact with the LVR Clinics Cologne between April 2015 and March 2016 regarding diagnoses, admission modalities and socio-demographic variables.	Germany Psychiatric hospital (in and outpatient) in Cologne	Cross sectional study Sampling not specified	Patient data	F1-diagnosis (ICD-10)	- Patient cases per month - Frequency of contact with clinic - Access course to clinic - Main diagnoses - Treatment setting - Duration of stay on ward - Costs for language professionals per year	Country of origin, mother tongue or language spoken during consultations, status of residence, housing status (in- or outside cologne)	239 (100%) cases of refugees seeking help, generated through 180 refugees	Not reported

Soe-gaard 2020	To examine differences in psychiatric morbidity in traumatized patients with immigrant, refugee and Norwegian background referred to psychiatric treatment in Southern Oslo.	Norway Patients referred to Southern Oslo District Psychiatric Centre, a part of Oslo University Hospital	Cross sectional study Sampling not specified	Self-reported questionnaires (followed by semi-structured interviews for other measures)	- Alcohol Use Disorders Identification Test (AUDIT) - Drug Use Disorders Identification Test (DUDIT)	- Symptom level: Symptom Checklist 90-Revised (SCL-90-R) - Somatic pain: 'Norsk Smerteforenings Minimumsskjema' (NOSF-Miss) - Traumatic events: Life events checklist (LEC) - Psychiatric diagnosis: MINI Plus - PTSD: SCID-I PTSD - Symptom level and functioning: Global assessment of functioning scales (GAF function and GAF symptom)	Age, gender, marital status, number of children, number of close friends, education years, job any, use of welfare system, current daily smoking, country of origin	110/25 (22.7%) refugees	Funding: Regional Health Authority of South-Eastern Norway, Oslo University Hospital
Steel 2002	To assess the long-term effects of trauma on mental health and disability in Vietnamese refugees resettled in Australia.	Australia 44 census collection areas in New South Wales, Australia, that included 71% of all Vietnamese-born residents	Cross sectional study Probability sampling: Multistage sampling	Computer-based face-to-face interviews conducted by trained Vietnamese bilingual interviewers	Vietnamese translation of the WHO Composite International Diagnostic Interview (CIDI) 2.0	- 12-month prevalence of psychiatric disorders according to ICD-10: Vietnamese translation of the CIDI 2.0 - Culturally relevant idioms and expressions of psychological distress:	Sex, age, language most often spoken at home, method of leaving Vietnam, lived in refugee camp, time in refugee camp, time in Australia, separated from immediate	1,161/1,161 (100%) refugees	Funding: National Health Medical Research Council

						Phan Vietnamese psychiatric scale (PVPS) - Mental and physical health function in the 4 weeks prior to interview: Vietnamese translation of the Medical Outcomes Study Short Form-12 (SF-12) - 1 question about the number of days in the previous 4 weeks that the respondent had been unable to work or do normal activities as a result of ill health - Traumatic events interview based on a standard measure - Trauma events component of the Harvard Trauma Questionnaire	family/close relatives/close friends, education level, marital status, employment status, home ownership, number of adults living in household, self-rated acculturation, English proficiency		
Steel 2005	To assess the prevalence of mental disorders, disability and mental health	Australia Parallel data from 2 studies: Vietnamese survey: Five	Cross sectional study Probability sampling:	Interviews Vietnamese study: trained bilingual interviewers	ABS and Vietnamese study: WHO Composite International Diagnostic	ABS and Vietnamese study: - 12-month prevalence of DSM-IV diagnoses: UM CIDI 2.1	Gender, age, marital status, education, time in Australia (years)	9,122 /1,161 refugees	Funding: Australian National Health and Medical Research Council

	service utilization among Vietnamese refugees resettled in Australia compared to the host population.	local government areas that include 75% of the adult Vietnamese population of New South Wales, Australia ABS survey: Australia-wide sampling of private households	Vietnamese survey: Stratified multistage sampling ABS survey: Multistage sampling		Interview (UM CIDI) 2.1	- Disability: Medical Outcomes Study Short Form 12 (SF-12) - Two questions assessing the number of disability days reported in the 4 weeks prior to interview - Contact with health care providers in the previous 12 months and whether these consultations were related to mental health problems - Total number of consultations per 1000 persons per annum Vietnamese study: - Culturally relevant idioms and expressions of psychological distress: Phan Vietnamese Psychiatric Scale (PVPS)			
Teodoro-rescu 2012	To describe psychiatric morbidity and to investigate the	Norway Outpatient psychiatric	Cross sectional study	Clinically structured interviews conducted by	Mini-International Neuropsychiatric Interview (MINI)	- Diagnosis of PTSD: SCID PTSD - Axis 1 DSM-IV	Age, marital status, education, employment,	61/61 (100%) refugees	Funding: Southern and Eastern Norway

	relationship between multiple exposure to traumatic events, severity of traumatic symptoms and post-migration stressors in outpatient refugees.	clinics in four hospitals in Southern and Eastern Norway	Sampling not specified	trained first author (and self-report questionnaires for other measures)		disorders: MINI - Symptom domains of complex PTSD/DESNOS: Structured Interview for Disorders of Extreme Stress (SIDES) - Psychological distress: Hopkins Symptom Checklist (HSCL-25) - PTSD-symptoms during last week: Impact of Event Scale-Revised (IES-R) - Potentially traumatic events: Life Events Checklist (LEC) - Symptom severity: Total severity score of HSCL-25, IES-R, and SIDES - Nicotine dependence: "Have you smoked/are you smoking?" - Total number of psychiatric diagnoses	years in Norway, Nationality of origin, Social Integration into Norwegian culture (N) and into immigrant ethnic culture in Norway (I), social network, unemployment, proficiency of Norwegian language		Regional Health Authority
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Wester-meyer 1989	To describe the characteristics and opium use of the Hmong addicts in the U.S.	United States Substance Abuse Treatment Program (Department of Psychiatry, Minnesota Hospital)	Mixed-methods study Non-probability sampling: Clinical part: Consecutive sampling Qualitative part: Not specified	Clinical part: Interviews in native language Qualitative part: Interviews and observations	Clinical part: - Dependence on opium: Assessed as increased tolerance or appearance of withdrawal symptoms - Substance Abuse Interview Schedule (SAIS)	none	Clinical part: sex, marital status, employment, residence status, age	Clinical part: 55/55 (100%) refugees	Not reported
Wester-meyer 1991	To report on demographic characteristics and opium use patterns in a group of Asian opium addicts.	United States University of Minnesota Hospital and Clinic	Cross sectional study Sampling not specified	Interviews	-Substance Abuse Problem Scale (SAPS) - Modified Michigan Alcohol-Drug Screening Test (MMADST) - Opium use history	- Use of other substances last year	Age, sex, level of education, marital status, employment status	50/50 (100%) refugees	Not reported
Wid-mann 2014	To explore khat consumption patterns and to study the associations between khat use, traumatic experiences, PTSD, and psychotic symptoms.	Kenya Refugees living in a disadvantaged urban settlement area in Eastleigh, a suburb of Nairobi	Cross sectional study Non-probability sampling: Convenience sampling	Clinical interviews were conducted in English by a master-level psychologist, assisted by an interpreter, and supervised by a bilingual Somali psychiatrist.	- Psychological dependence: Modified Severity of Dependence Scale for khat (SDS-khat) - DSM-IV khat dependence: Mini-International	-6 Amphetamine withdrawal symptoms of DSM-IV - Khat use patterns in the last 7 days, last khat use before interview, lifetime use and function of khat use	Gender, age, marital status, education, occupation, refugee status	48/46 refugees	Funding: Khat Research Program, University of Minnesota, University of Konstanz

					Neuropsychiatric Interview (MINI)	- Screened somatic health - Psychotic symptoms with and without influence of khat: CIDI - Traumatic events: event list from the Somali version of Post-traumatic Diagnostic Scale (PDS) - PTSD: MINI			
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14.4.2 Characteristics of SRDs in refugees and asylum seekers

Study ID (First author, Year)	Type of substance-related disorder	Participants	Country of origin	Age with SD and Sex distribution	Comparis on groups	Definition of a "refugee" provided?	Results	Main conclusions and Limitations
Amosu 2016	alcohol abuse, alcohol dependence, cannabis abuse, cannabis dependence (DSM-IV)	Refugees aged 15-50 years from the 2005 camp register.	Liberian: n=79 (75.2%) Ivorian: n=2 (1.9%) Cameroonians: n=8 (7.6%) Congolese: n=6 (5.7%) Sierra-Leonians: n=10 (9.5%)	mean age 26.62 (SD 6.87) Female: n=41 (39.1%) Male: n=64 (60.9%)	none	Yes: Refugee status according to the 1969 OAU Convention and the 1951 Convention.	In total 18 participants (17.1%) abused alcohol. Rate of alcohol abuse was higher in males (23.5%) than among females (7.3%). In total 2% were dependent on alcohol, who were only males. Cannabis was abused by 7 (10.9%) of the males, in total 6.7% of the whole sample. Only males abused cannabis ($p<.05$). The older age group of 31-40 years abused cannabis significantly more often (20%) than the younger age group of 15-30 years (1.3%). The rate of cannabis dependence was 0%.	Alcohol, tobacco, and cannabis were abused by refugees in Nigeria and associated with positive GHQ-30 scores. Males and older individuals showed higher drug use. Public health measures should be developed to address the problem. Limitations: - GHQ-30 is a screening instrument and not diagnostic
Bapolisi 2020	Substance use disorder (DSM-V)	Refuges older than 18 years old and living in the camp for at least 6 months. Exclusion: presence of serious mental disorders or physical disabilities that disable the participant	Burundian: n=104 (27%) Congolese: n=176 (45%) Eritrean: n=3 (1%) Ethiopian: n=3 (1%) Rwandese: n=36 (9%) Somali: n=64 (16%) Sudanese: n=1 (0%)	mean age 33.01 (SD 12.2) Female: n=219 (56.59%)	none	Yes: Refugee status according to the 1951 Convention.	Prevalence of substance use disorders was 30% (32% in men and 29% in women), but no statistical analysis was conducted regarding association with gender or sociodemographic factors. Among participants with PTSD, 30% also had a substance use disorder. Multivariate logistic regression: patients with SUD had 5.13 higher odds of having PTSD (OR=5.13, 95% CI 2.32-11.34, $p<.001$).	PTSD is highly comorbid with other psychiatric disorders like substance use disorders, and is associated with perceived psychosocial needs. Interventions should therefore not only address mental health but also identify the basic needs most associated with mental health outcomes and address those that are modifiable. Studies of the

		to complete the interview.						long-term impact of such holistic interventions are necessary. Limitations: - cross-sectional design doesn't confirm cause-and-effect relationship - few participants in some minority subgroups - the tools used have not been adapted and validated across different cultural backgrounds - limited sample size - limited number of variables tested
Betan-court 2017	Substance abuse (DSM-IV)	Youth, aged birth to 21 years, who presented for assessment and treatment following trauma exposure at 56 National Child Traumatic Stress Network (NCTSN) sites across the US.	Mexico, Central or South America (34.5%), African (25.9%), European (20.7%) and Asian countries (12.1%)	mean age 13.07 (SD not reported) Female: n=29 (48.3%)	Immigrant youth: n=143 U.S.-origin youth: n=140	Yes: Affirmative answers to both questions: 1. Is the child (and/or family) a refugee, asylum seeker, or immigrant with a history of exposure to community violence?	Substance abuse in the refugee population had a prevalence of 3.6% (n=2), vs. 13.3% (n=17) and 8.5% (n=12) in the U.S. original and immigrant population, respectively. Differences between refugee and U.S.-origin youth were statistically significant ($p<.05$), but not between refugees and immigrants. Respecting service use, no refugee attended self-help groups (e.g. Alcoholics Anonymous, Narcotics Anonymous) vs. 2.2% (n=3) and 0.7% (n=1) of Native U.S. and immigrants, respectively, but difference was not statistically significant.	Substance abuse diagnosis was significantly lower in refugees compared to U.S. born individuals which suggests that refugee youth may have unique protective factors. Limitations: - small study sample - non-random sampling (non-generalizability) - lack of structured interviews - broad age range

						2. Did the child (and/or family) experience war, terrorism, or political violence outside the United States?		
Bogic 2012	Alcohol dependence, alcohol misuse, substance dependence, substance misuse (DSM-IV)	Refugees, irrespective of formal residence status (e.g. citizenship of recipient country, asylum seeker, refugee), who were born in the territory of former Yugoslavia and 18 to 65 years old, who had experienced at least 1 war-related traumatic event and had experienced the final war-related event	Bosnia and Herzegovina: n=489 (57.3%) Kosovo: n=150 (17.6%) Serbia: n=108 (12.6%) Croatia: n=84 (9.8%) Macedonia: n=23 (2.7%)	mean age 41.6 (SD 10.8) Female: n=438 (51.3%)	none	No	Prevalence of any substance disorder was 4.4% across all countries. Across all countries: Total alcohol dependence: 1.8%; Alcohol misuse: 4.3%; Substance dependence: 1.9%; Substance misuse: 4.2%. Prevalence of any substance disorder in different countries: Germany 11.8% vs. Italy 0.7% and UK 1.7% ($p<.001$). All types of substance use disorders were more prevalent in Germany ($p<.001$) compared to UK and Italy. Hierarchical regression analysis: A younger age, being male and not living with a partner were associated with higher odds of substance use disorders. After adjusting for confounders, refugees in Germany had the highest odds of SUDs compared to other countries. Only pre-war and post-migration factors significantly contributed to variance in the rates of SUDs (10.8% and 20.7%). There was no evidence for an interaction	Risk factors for SUDs were being male, not living with a partner and younger age. The highest prevalence was found in Germany, and these differences were only partly explained by post migration stressors. Limitations: - sampling methods (register and snowball sampling) - low response rates - lack of generalizability to other refugee populations - the retrospective nature of the study

		at or after 16 years of age. Exclusion: severe intellectual disability or mental impairment. Subgroups: Recipient countries: Germany: n=255 Italy: n=297 UK: n=302					effect between country and predictor variables. Country differences in SUD rates were only partially explained by post-migration factors: Temporary residence status and number of traumatic experiences after the war were the factors with the strongest impact on country differences in rates of SUDs.	
Brown 2019	Acute Alcohol or mixed intoxication (DSM-IV-TR)	Adult (≥16 years) asylum seekers and Swiss residents who presented to the Bern University Hospital ED between January 1, 2013 to December 31, 2016.	Eritrea: n=423 (17%) Syria: n=306 (12.3%) Afghanistan: n=293 (11.8%) Somalia: n=277 (11.1%) Iraq: n=121 (4.9%) Other: n=1070 (43%)	median age 29 (IQR 22-37) Female: n=789 (31.7%) Male: n=1701 (68.3%)	Swiss residents: n=115,226	No	Of the total ED consultations, a higher proportion of asylum seekers (3.7%) had alcohol intoxication compared to Swiss-nationals (1.6%, p<.001). Asylum seekers with AAMI were also younger and male (p<.001). Characteristics of AAMI: Compared to Swiss-nationals, Asylum seekers with AAMI were more likely to be admitted for trauma (e.g., superficial wounds), less frequently referred to a psychiatrist, more often brought in by police, and less likely to be hospitalized (p<.001). They were less likely to have chronic alcohol abuse (p<.001). Regression analysis: Asylum seekers had 1.6 higher odds (95% CI 1.3-2.0, p<.001) of acute alcohol or mixed intoxication in the ED.	Compared to Swiss nationals, asylum seekers were more likely to be admitted in the emergency department due to alcohol-related issues. There should be more prevention, screening, and intervention of alcohol-related illness among asylum seekers in EDs. Limitations: - retrospective design - limited patient data - potential non-generalizability

Chernet 2021	High risk/harmful alcohol use, alcohol dependence	Eritrean refugees and asylum seekers, who had arrived in 2014 and 2015, who were at least 16 years old and without major medical complaints.	Eritrea (100%)	median age 25 (IQR 21-29) Female: n=12 (11%) Male: n=95 (89%)	none	No	At baseline, 1 participant (0.9%) had an AUDIT score of 16-19, indicating high risk/harmful alcohol use. None had an AUDIT score >20 which would indicate almost certain alcohol dependence. At follow-up 1 year later, 1 of the remaining 48 participants still scored for harmful alcohol use (2.1%), 1 participant (2.1%) scored for almost certain alcohol dependence.	On arrival, refugees showed a high burden of mental health disorders, that improved one year later, except for alcohol abuse that remained unchanged. Limitations: - small sample size - low participation in the follow-up interview - low participation of women and potential self-reporting bias - questionnaires constituted only screening result and not a definite diagnosis
Ezard 2012	Risky alcohol use (=hazardous and harmful use)	Survey: Pregnant women seen in the camp ANC clinic between 15 and 28 December 2009. Subgroups: Sgaw Karen: n=374 (58.8%) Burmese: n=164 (25.8%) Poe Karen: n=98 (15.4%)	Survey and Interviews: Burma (100 %)	Survey: Women (self-report): median age 26.2 Men (secondary report): median age 29.0 n=636 (100%) women and secondary report of men	none	No	Survey: In total, the proportion of women screening positive for risky alcohol use was 0.2% (1/636, 95% CI 0.0-0.9%), but they screened their male partners significantly higher with 24.4% (155/636, 95% CI 21.2-27.9%) (p<.001). Proportion of 6 or more drinks daily was 0% in women and 5.5% (n=35, 4.0%-7.6%) in men, and weekly 0% in women and 6.4% in men (n=41, 4.8%-8.6%), and monthly 0.2% in women (n=1, 0.0%-0.9%) and 12.4% in men (n=79, 10.1%-15.2%). Males who scored positive for risky drinking were significantly more likely to be over 25 years old, the highest prevalence was in the age group of 40-44 years. Risky drinking in male partners according to the language: lower prevalence of 13.4%	Risky alcohol use among reproductive age men is common, but not among women. Cultural controls against women's drinking and against drinking until intoxication remain strong and could be used to prevent hazardous drinking. Limitations: - bias due to the cultural adaptation of the survey and lack of validity and reliability - screening nature of the study may decrease

		Interviews: Key informants, defined as people living in Mae La with first-hand experience of alcohol use and other household members.		Interviews: Age categorized: 15-20 years: n=13 (13%) 20-44 years: n=58 (60%) 45 and more: n=26 (27%) n=32 (32%) women		($p < .001$) in Burmese compared to Poe Karen (26.5%) and Sgaw Karen (28.6%). Interview: The most common alcoholic drink was artisanal rice based distilled alcohol. Thematics: pressures of displacement and hopelessness and refugee camp life drive alcohol consumption; hopefulness provided by access to education and resettlement can prevent problem alcohol use; gendered dimension of alcohol consumption (considered masculine and not feminine). Karen refugees described social controls that predated the displacement: alcohol was seen as a social activity, and in moderation seen positively. Small amounts were considered beneficial for physical health. On the contrary, intoxication and dependence were seen negatively, as well as drinking in women. These social controls were thought to be changing due to the displacement and refugee camp life, and more people and women were using alcohol to intoxication or dependence. Explanations for the change of social controls included exposure to new cultures, on-going population movements, increased social diversity in camp, increased economic resources and changing social networks. Screening intervention: The mSASQ was changed into a two-part question, so not only the own, but also the partner's alcohol consumption (frequency of	specificity and overestimate the prevalence - secondary report with men (may underestimate the consumption) - non-generalizability of the study due to the sampling method - difficulties to study sensitive topics such as alcohol
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							consumption of 6 standard drinks or more) was assessed, and it asked about a specific time period (1 December until pregnancy). The answer monthly, weekly or daily or nearly daily was considered positive, the answer less than monthly or never were considered as negative.	
Fine 2022	Alcohol/substance use disorder	Visits of refugees at MNS services in 175 refugee camps from January 2009 to December 2018. No distinction between new and revisit cases. Subgroups: Participating HIS countries: n=24 Age groups: <5 years vs. 5 and above Sex group: male vs. female	Not reported	Age not reported weighted mean rates of MNS visits per 1000 refugees per month: 2009-2010: Male 1.94; Female 2.17 2011-2012: Male 2.98; Female 3.12 2013-2014: Male 2.42; Female 2.50 2015-2016: Male 2.64; Female 2.69 2017-2018: Male 2.61; Female 2.75	none	No	The smallest number of visits was due to alcohol/substance use disorders (2.2%). Weighted mean rates of visits per 1,000 refugees per month was also lowest for MNS category of alcohol/substance use disorders, ranging from 0.05 (SD 0.07) to 0.11 (SD 0.45) among males, and 0.01 (SD 0.02) to 0.05 (SD 0.23) among females. Males had higher service utilization rates than females for alcohol/substance use disorders, which is also reflected in the difference in the proportion of overall visits attributable to that MNS category: alcohol/substance use disorders (males: 3.3%; females: 1.1%). Service utilization rates for alcohol/substance use disorders was negligible for boys and girls under five years.	Low service utilization for substance use problems in health facilities may relate to differences in illness beliefs and health-seeking behaviors compared to neurological and psychotic disorders. Limitations: - no differentiation between new and revisit consultations - independence of data collected over different years is not proven - no information about comorbidity and no measure of problem severity was captured - available data didn't allow analysis by more specific age groups than under 5 and above 5 years old - MNS service utilization rates might be underestimated,

								particularly for substance use conditions, because HIS data didn't include other possible support programs outside of primary health care facilities.
Haroz 2014	not specified	Adult refugees from Burma who were survivors of systematic violence. Participants were classified by key informants as either having symptoms of depression, symptoms of trauma or no symptoms of depression or trauma. Participants that categorized themselves according to the key informants' opinion as having symptoms	Burma (100%)	Age categorized First testing: 18-24: n=29 (18%) 25-34: n=58 (37%) 35-44: n=43 (27%) 45-59: n=24 (15%) >60: n=4 (3%) Male: n=82 (52%) Female: n=76 (48%) Retesting: 18-24: n=14 (21%) 25-34: n=25 (38%) 35-44: n=19 (19%) 45-59: n=6 (9%)	none	No	Screening intervention: The Mental Health Assessment Project Instrument (MHAP-I) combines adapted versions of the Hopkins Symptom Checklist 25-item version (HSCL-25), the Harvard Trauma Questionnaire (HTQ), and the Alcohol Use and Disorders Identification Test (AUDIT), and a self-devised scale to measure functional impairment. Adaptation included translation based on local idioms and for HSCL and HTQ also addition of items specifically relevant to the local context. For the alcohol use scale (10 items), responses were based on how often a respondent experienced a certain type of drinking related experience: "never" (0), "monthly or less" (1), "2-4 times a month" (2), "2-3 times a week" (3) and "4 or more times a week" (4). It was scored as the sum of the item responses. The pilot study found that the MHAP-I and interview process were understandable to the interviewees. First testing of alcohol scale: Interrater reliability: Mean first interview: 2.13 (SD 2.33) Repeat interview: 2.68 (SD 3.03)	The original audit scale performed poorly respecting internal consistency and had to be revised and adapted regarding the local understandings of mental health problems, with significant improvement afterward. In lower resource settings, one of the main problems remains lack of criterion validity and lack of an accepted gold standard. Limitations: - lack of professional sources of knowledge to adapt the scales (they relied on the criteria of members of the community) - risk of Key informants influencing the responses of the participants - lack of blinding in the self-report collection - concerns respecting the ability of key informants to

		were included as cases. Subgroups: Cases Non-cases		>60: n=0 (0%) Male: n=35 (53%) Female: n=31 (47%)			Correlation: 0.63 Internal consistency (Cronbach's alpha): Total sample: 0.73 Males: 0.73 Females: 0.64 The original versions of the function scales and AUDIT had poor interrater-reliability, low internal consistency and problems with translation for the audit. They were revised and retested in a small sample (n=66). Retesting of alcohol scale: Interrater reliability: Mean first interview: 4.79 (SD 6.20) Repeat interview: 0.46 (SD 5.88) Correlation: 0.86 Internal consistency (alfa) (Cronbach's alpha): Total sample: 0.79 Males: 0.70 Females: 0.57 Criterion validity was not assessed for the alcohol scale.	select cases and non-cases. - selection bias (due to the sampling)
Harris 2019	Diagnosis of mental and behavioral disorders due to psychoactive substance use (ICD-10, F10.X-F19.X).	Refugees and non-refugee migrants and Swedish-born participants born between 1984 and 1997. All participants	Eastern Europe and Russia: n=1,066 (6%) Asia: n=3,063 (17.2%) Middle East and North Africa: n=7,363 (41.4%) Sub-Saharan	Age not reported Females: n=7,798 (43.8%) Males: n=9,985 (56.2%)	Swedish-born: n=1,119, 868 (90.2%) Non-refugee migrants:	Yes: Refugee status according to the 1951 Convention.	The crude incidence per 100,000 person-years of any substance use disorder was higher in the Swedish-born (290.2, 95% CI 267.3-293.1) than in the refugee (149.3, 95% CI 130.9-170.2) population. In the unadjusted and in the model adjusted for age, sex, birth year, family income, family employment, population density, and PTSD	Refugees were less likely to be diagnosed with SUD than Swedish-born individuals, but this difference tended to decrease over time in a dose-response manner. No significant differences between refugees and migrants were found.

alcohol use disorders (ICD-10, F10.X), cannabis use disorders (ICD-10, F12.X) polydrug use disorders (ICD-10, F19.X)	were considered at risk of developing a substance use disorder from their 14th birthday or arrival in Sweden (earliest: 1 January 1998). Those without officially granted residence in Sweden (i.e., asylum seekers) or with a diagnosis of non-affective psychosis or substance use disorder before their 14th birthday were excluded.	Africa: n=6,291 (35.4%)		n=104,250 (8.4%)		diagnosis, refugees were less likely to have received a diagnosis for any substance use disorder than Swedish-born population (unadjusted HR=0.42 and adjusted HR=0.52, $p<.001$). Regarding specific substance use disorders, rates of alcohol (HR=0.38, 95% CI 0.31-0.46) and polydrug use disorder (HR=0.58, 95% CI 0.44-0.78) were lower in refugees than in Swedish-borns ($p<.001$), but for cannabis use disorder risk was not lower (HR=0.96, 95% CI 0.72-1.29). There were no differences in the rates of disorders between refugees and migrants apart from weak evidence that polydrug use disorder might have been somewhat higher in refugees (HR=1.34 95% CI 0.99-1.80; $p=.06$). For all disorders, there were dose-response relationships between rates of specific disorder and earlier age at migration or longer time in Sweden, the HRs tended to converge to the Swedish-born rate over time. For almost all disorders, there were no statistically significant differences in rates between those who immigrated between 0 and 6 years old or those who had lived in Sweden for over 10 years and the Swedish-born population. PTSD was significantly associated with higher risk for any substance use disorder (adjusted HR=5.94), alcohol use disorder (HR=3.82), and polydrug use disorder (HR=13.77) in refugees	People with PTSD had a higher risk of a SUD, but the effect was higher in Swedish-born than in refugees or migrants. Limitations: - data from secondary care (not primary care), which may underestimate the rates of some SUD (like alcohol) - caution with the validity of the diagnosis - possibility of underestimating the rates in refugee populations, that are less likely to access healthcare - broad category of refugees, with the exclusion of asylum seekers, lack of generalizability - exclusion of subclinical substance use
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							(p<.001), but not with Cannabis use disorder (HR=2.6, p=.19). Association between PTSD and all substance use disorders differed by migrant status, typically PTSD was associated with a larger risk for substance use disorder in the Swedish-born population compared to refugees or migrants.	
Heeren 2012	Alcohol abuse/dependency (DSM-IV)	Two groups of asylum seekers residing in the Canton of Zurich. Subgroups: Group 1: arrival 0 to 5 months prior to assessment n=43 Group 2: arrival 12-26 months prior to assessment n=43	Group 1: Afghanistan (n=2), Algeria (n=1), Cote d'Ivoire (n=2), Eritrea (n=2), Guinea (n=1), Iraq (n=5), Iran (n=5), Kosovo (n=9), Lebanon (n=1), Liberia (n=1), Morocco (n=1), Nigeria (n=1), Serbia (n=2), Somalia (n=1), Sri Lanka (n=2), Sudan (n=2), Syria (n=4), Tunisia (n=1) Group 2: Afghanistan (n=5), Angola (n=1), Burkina Faso (n=1), Cote d'Ivoire (n=1), Eritrea (n=2),	Group 1: mean age 26.7 (SD 7.2) Male: n=31 (72.1%) Group 2: mean age 32.9 (SD 9.6) Male: n=29 (67.4%)	none	No	Alcohol abuse/dependency rates were the lowest compared to other diagnoses. Post-migration factors or time since arrival did not correlate with overall psychiatric morbidity (= having at least one psychiatric disorder), but higher number of trauma did. Four participants (4.7%) were diagnosed with alcohol abuse or dependency. The two groups did not differ significantly in their rates of alcohol abuse/dependency (group 1: n=3.7% vs. group 2: n=1. 2.3%).	Psychiatric morbidity was high, but it was not associated with post-migration factors or time since arrival. Past traumatic experiences play a major role regarding mental health during first period after arrival. Limitations: - cross-sectional design. - potential lack of comparability - lack of matching of the participants - post-migration factors limited to social factors

			Iraq (n=8), Iran (n=3), Kosovo (n=2), The Maledives (n=3), Nigeria (n=1), Palestine (n=2), Serbia (n=4), Sri Lanka (n=2), Tibet (n=2), Turkey (n=6)					
Hewlett 2015	Alcohol use disorder	Refugees living in Beldangi or Sanischare Bhutanese camps who were at least 15 years old and able to speak English or Nepali. Exclusion: unable to give informed consent, to respond to questionnaire or living in the same hut as participants already recruited. Subgroups: Cases of AUD: n=32	Bhutan (100%)	Cases: Age categorized: 18-25: n=2 (6.2%) 26-35: n=6 (18.8%) 36-50: n=14 (43.8%) >51: n=10 (31.2%) Male: n=25 (78.1%), Female: n=7 (21.9%) Controls: Age categorized: 18-25: n=33 (34.4%) 26-35: n=25 (26.0%) 36-50: n=22	none	Yes	Cases: median AUDIT score was 15. 81.3% scored in alcohol dependence category (≥ 11). Odds ratios of Cases vs. Controls: Statistically significant risk factors for AUD were: being older (36-50 years) (OR=10.5, 95% CI 2.17-50.81), (+50 years) (OR=10.3, 95% CI 2.02-52.71) male sex (OR=3.4, 95% CI 1.35-8.67) using tobacco (OR=4.3, 95% CI 1.84-10.01) being illiterate (OR=7.3, 95% CI 2.8-18.42) Not statistically significant but important risk factors were: being from the Gurung/Limbu/Rai caste, low literacy, being married, age 26-35. No statistical differences between cases and controls respecting resettlement factors. No protective factors against AUDs were found. Case participants named influences of friends, sadness and loneliness, having nothing to do and being tired from work as factors that made them start drinking regularly.	In refugees, being male, illiteracy, using tobacco and ≥ 36 years was associated with AUD. No protective factors against AUD were found. Refugees reported unoccupied time and unemployment as the main reasons for drinking. Interventions should be developed to address this population with emphasis on early detection and prevention. Limitations: - sample size was too small and yielded large CI for some variables - possible underreporting of alcohol use due to cultural influences

		Controls without AUD: n=96		(22.9%) >51: n=16 (16.7%) Male: n=49 (51%), Female: n=47 (49%)			(Participants described drinking as acceptable but excessive drinking as problematic and identified tensions, unemployment/free time and the influence of friends as main reasons for excess. They suggested support services, more education (awareness and information dissemination), control of alcohol use by legal forces and addressing underlying issues (unemployment) as possible solutions.)	
Jamil 2002	Drug abuse/dependence, Alcohol abuse/dependence	Immigrants from Iraq and from other Arab countries, who sought mental health services at the Arab Community Center for economic and social services in Dearborn, from 1998 to 1999.	Iraq: n=137 (87.8% of all Iraqis) Other Arab countries: n=3 (1.4% of other Arab)	Iraqi-born: Age categorized: <17: n=11 (7.1%) 18-29: n=24 (15.4%) 30-39: n=61 (39.1%) >40: n=60 (38.5%) Male: n=94 (60.3%) Female: n=62 (39.7%)	none	No	Iraqi-born: Drug Abuse/dependence: n=1 (0.6%) Alcohol abuse/dependence: n=3 (1.9%) Non-Iraqi (Other Arab): Drug Abuse/dependence: n=1 (0.5%) Alcohol abuse/dependence: n=8 (3.7%) No disaggregated data respecting presence or absence of substance abuse and refugee /immigrant status.	Iraqi patients (87.8% of them were refugees) were more likely to have a PTSD diagnosis and medical comorbidities than other Arab Americans. However, rates of substance abuse were low, except for smoking. It is unclear whether pre- or postmigration stressors cause increased health problems in Iraqi refugees. Limitations: - need to control for Age, gender, and number of years since immigration - lack of standardized measurements - need of cultural sensitivity
Kane 2014	Alcohol/substance use disorder	Reported visits for any MNS disorder at outpatient facilities in 90	Not reported	Age not reported	none	No	Compared to other MNS disorders, the smallest number of visits was due to alcohol/substance use disorder: 1.1%. Proportion of visits was 2.0% in males and 0.4% among females.	Rates of visits due to alcohol/substance use problems were low, with a clear gender disparity towards men. However, the

		refugee camps from January 2009 to March 2013. New visits and revisits could not be distinguished. Subgroups: Participating HIS countries: n=15 Age groups: <5 years vs. above 5 Sex groups: male vs. female		Sex distribution not reported			Mean MNS visits rate per 1000 refugees per month attributable to SUD: - men 0.08 (SD 0.15) vs. women 0.02 (SD 0.06) - range from 0.0006 (SD 0.001) in Bangladesh to 1.46 (SD 1.24) in Liberia Among countries, the highest percentages of visits due to alcohol/substance disorder were 9.6% in Zambia, 6.2% Liberia, and 4.6% in Namibia.	numbers varied a lot between countries. Several filters modulate how rates of disorder at the population level may translate into contact coverage. Limitations: - no distinction between new and revisits - lack of use of established classification systems - comorbidity is not recorded - variation in the number of months each country collected data - age could only be analyzed as younger and older than 5 years - variation across countries regarding the data collection - no measure of MNS problem severity
Kim 2018	Alcohol use disorder	Adult refugees, at least 18 years old, from Burma who resided in Erie County. Subgroups:	Burma (100%)	mean age 40.7 (SD 12.8) Females: 57.4%	none	No	In total, 16 (9%) participants met screening threshold for Alcohol use disorder (AUD), 9 of them were Burman and 7 were Karen. For AUD symptoms, being female ($b = -3.643$, $SE = 0.627$, $p < .001$) was associated with decreased symptoms of AUD. Older age ($b = 0.257$, $SE = 0.131$, $p < .052$) and younger age at U.S. arrival ($b = -0.277$, $SE = 0.182$, $p = .057$)	Burmese refugees had higher prevalence of AUD, although ethnicity was not a significant factor in predicting AUD. Christian religion might have had a protective effect on Karen refugees. Females had a lower prevalence of

		Ethnic groups: - Karen n=100 (39.2%) - Burmans n=84 (32.9%) Other ethnicities left out due to small numbers: - Karennis n=21 (8.2%) - Arankans n=18 (7.1%) - Mon n=9 (3.5%) - Chin n=8 (3.1%) - Shan n=4 (1.6%) - Kachin n=3 (1.2%)					were marginally associated with increased AUD symptoms.	AUD symptoms. Limitations: - cross-sectional design - convenience sampling - lack of generalizability to other ethnic populations - lack of validation of psychometric tests - self-reported symptoms, risk of bias
Kuhn 2018	Cocaine/heroin dependence	Refugees with illegal drug dependence (cocaine or heroin), aged over 18 years old, who arrived in Germany after 2015. An asylum petition was	Afghans from Afghanistan: n=35 Afghans from Iran: n=37 Iranians: n=44 Syria: n=2 Aserbaidshian: n=2 Morocco: n=2 Georgia: n=1 Kazakhstan: n=1	mean age 30.0 (SD 9.6) Male: 100%	none	No	Substance use in Germany: The most prevalent drugs were: smoked heroin (n=78, 67.2%), crack (n=44, 37.9%) and intravenous heroin (n=28, 24.1%). Other drugs were: cocaine i.v. (n=12, 10.3%), alcohol (n=14, 12.1%), substitution substances from the black market (n=6, 5.8%), and cannabis (n=11, 14.7%). No differences between subgroups. Substance use in country of origin: 64 refugees were already dependent in the origin country. Their most frequently used	All the patients were male and most of them Farsi speakers, with high consumption of heroin. The study showed that most dependent refugees come from Iran and Afghanistan, and not from Syria. There is a high demand for treatment and addiction services among refugees.

		initiated or there is the possibility to be initiated. Exclusion: Dependence only on alcohol and/or cannabis, migrants from the European Union. Subgroups: Only Afghans from Afghanistan, Afghans from Iran and Iranians were included in Data analysis (n=116). Other refugees were excluded without explanation.	Ukraine: n=1 Turkey: n=1 Siberia: n=1				drugs were opium, smoked heroin and cannabis. People from Iran significantly consumed more alcohol and reported more dependent drug use in home country. Drug use during flight of the 64 refugees that already were dependent in their home country: n=7 used cannabis, n=10 used opium, n=11 smoked heroin, n=1 heroin i.v., and n=22 substitution drugs. Afghans had significantly more often bought substitution substances than Iranians. Needs of the dependent refugees: 75.0% wished for detoxification treatment, 54.3% for withdrawal treatment and 43.1% for substitution treatment. In addition, 52.2% expressed that the facility should also take care of the asylum application and 50.9% wished for support in finding housing. The proportion of patients wishing a detoxification treatment was significantly higher in the treatment-naïve than in those with treatment experience in their home country.	Limitations: - explorative study. - selection bias (not a representative sample) - recall bias (for retrospective data) - extent of substance use not assessed
Laban 2004	Lifetime prevalence of Alcohol abuse, alcohol dependence	Adult (equal or more than 18 years) Iraqi asylum seekers resettled in the	Iraq (100%)	Age categorized: 18-24: 15.3% 25-34: 45.6% 35-44: 20.4% 45-64: 13.6% >64: 5.1%	none	No	Alcohol dependence: the total lifetime prevalence was 3.4%. Lifetime prevalence was 0% in group 1 and 6.6% in group 2. The differences between groups reached statistical significance (p=.002). Alcohol abuse: prevalence was 0% in both groups.	Psychiatric disorders are more prevalent in asylum seekers with long asylum procedures, including alcohol dependence. Long asylum procedure was the most important risk

		Netherlands. Exclusion: first-line relative, too sick to be interviewed, received residence permit, language problems. Subgroups: Group 1: resided less than 6 months in the Netherlands n=143 Group 2: living in the Netherlands for at least 2 years n=151		Female: 35.4% Male: 64.6%				factor after female sex for general psychopathology. This suggests an increase in psychopathology after arrival, and government policies could be needed. Limitations: none mentioned.
Leao 2006	Alcohol abuse, drug abuse (ICD-9, ICD- 10)	Women and Men aged 20- 39 years, residing in Sweden from 1 January 1992 until 31 December 1999.	Not reported	Age not reported First- generation refugees: Female: n=63,855 (48,22%) Male: n=	Swedes: n=1,700, 912	Yes: First- generation refugees: individuals born in a country outside Sweden, Finland, and	Hospitalization due to alcohol abuse: First-generation refugees had the lowest age- and sex-adjusted incidence per 100,000 person years (30 cases in women and 59 in men). Highest incidence was in Finns (men: 604, women: 183). Using Swedes as a reference, age-adjusted hazard ratios (HRs) were calculated. First- generation refugees had the lowest HRs of all groups:	First generation refugees had the lowest risk of hospitalization due to alcohol or drug abuse, while Finnish migrants had the highest. The risk decreased after adjusting for income in men, but not in women. Limitations:

		Subgroups: First-generation refugees: n=132,412 Second-generation refugees: n=6,320 Second-generation Swedes/refugees: n=21,944		68,557 (51,78%) Second-generation refugees: Female: n=3,053 (48,31%) Male: n=3,267 (51,69%) Second-generation Swedes/refugees: Female: n=10,753 (49%) Male: n=11,191 (51%)	labor immigrant countries (mainly in refugee countries). Second-generation refugees: Swedish-born individuals with both parents born outside Sweden, Finland, and labor immigrant countries (mainly in refugee countries). Second-generation Swedes/refugees: Swedish-born individuals with one parent born in Sweden	- Women: 0.57 (95% CI 0.48-0.67). - Men: 0.40 (95% CI 0.36-0.45) After additionally adjusting for income, HRs decreased further: - Women: 0.50 (95% CI 0.42-0.59) - Men: 0.22 (95% CI 0.20-0.25) Hospitalization due to drug abuse: Age- and sex-adjusted incidence per 100,000 person years divided by sex: In women first generation refugees had the lowest rate (33). In men, second generation refugees had the second lowest rate (117) and first-generation refugees the fifth lowest rate (130). Age-adjusted HRs: First-generation refugee women had the lowest HR with 0.77 (95% CI 0.65-0.90). First-generation male refugees were with an HR of 1.61 (95% CI 1.48-1.74) only more at risk than first-generation labor immigrants, and second-generation Swedes/labor immigrants and refugees. After additionally adjusting for income, HRs decreased further. First-generation refugees had the lowest HRs: - Women: 0.66 (95% CI 0.56-0.77) - Men 0.80 (95% CI 0.74-0.87)	- residual cofounding - exclusion of outpatients - missing data regarding differences between regions - social services for SUD patients were excluded - bias due to translation of the ICD - lack of other potential cofounder variables in the regression analysis (like internal and external resources)
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						and one parent born in a country outside Sweden, Finland, and labor immigrant countries (mainly in refugee countries). (Labor immigrant countries mainly included countries from the Organization for Economic Cooperation and Development and southern Europe, list provided)		
Luitel 2013	Hazardous or harmful alcohol consumption, possible	Entire population of refugees aged 15 years and older living during May-	Bhutan (100%)	mean age 35.3 (SD 16.7)	none		Hazardous or Harmful drinking (AUDIT >7): Total: n=222 (2.8%) Men: n=198 (5.1%) Women: n=24 (0.6%) Possible dependence (AUDIT>19):	Rates of hazardous/harmful drinking were high and similar to western countries, rates of dependence were also comparable to other

	alcohol dependence	June 2010 in the camps Goldhap and Timai in Nepal. Subgroups: Goldhap camp: n=3,660 Timai camp: n=4,361		Male: 48.8% Female: 51.2%			Total: n=51 (0.6%) Men: n=46 (1.2%) Women: n=5 (0.1%) Regression analysis: Variables associated with higher odds of hazardous/harmful alcohol consumption in the adjusted model were male sex (OR=2.81, 95% CI 1.71-4.64), history of alcohol use in the family (OR=1.55, 95% CI 1.07-2.25), use of tobacco (OR=2.10, 95% CI 1.35-3.27), use of other substances (OR=10.77, 95% CI 3.90-29.75) and living in Timai camp (OR=1.55, 95% CI 1.07-2.25). Intermediate or above education was associated with lower odds (OR=0.35, 95% CI 0.16-0.75). Variables associated with alcohol dependence in the adjusted model were being Christian (OR=2.78, 95% CI 1.09-7.07) and use of other substances (OR=7.84, 95% CI 2.89-21.24). Continuous AUDIT score: In the adjusted model, being male, alcohol use in the family (OR=1.11, 95% CI 0.35-1.88), smoking (OR=1.29, 95% CI 0.48-2.09), and substance use (OR=7.69, 95% CI 5.20-10.18) were associated with higher AUDIT scores. Kirat religion (OR=-1.16, 95% CI -2.18 to -0.14) and having intermediate or above education (OR=-1.81, 95% CI -3.12 to -0.51) were associated with lower AUDIT-Scores.	populations. Age and resettlement status did not show to be a risk factor for hazardous/harmful use, but new risk factors "family history of substance abuse", "use of other drugs" and "use of tobacco" emerged. Limitations: - low numbers in some analysis - screening measurement, not a diagnostic detailed one - reporting bias - camp-level influences of the two different camps were not addressed
Maier 2010	Alcohol Abuse (DSM-IV)	Individuals above the age of 18 who applied for asylum after 1	Asia (incl. Turkey): n=37 (47%) Africa: n=21 (27%)	average age 29.9 (SD 8.4) Male: n=57 (73.0%)	none	Yes: Asylum seekers defined as individuals	4 asylum seekers (5%) were diagnosed with alcohol abuse.	Asylum seekers are at high risk of mental disorders and incur significantly higher health costs than residents and consult doctors more

		August 2007 and were assigned to the canton of Zurich.	Europe: n=20 (26%)	Female: n=21 (27.0%)		who applied for asylum in the Swiss Federal Office for Migration.		frequently when having a psychiatric disorder. However, they barely receive specific mental health care. Limitations: - authors did not directly assess the health condition of the patients
Manhica 2016	Substance misuse with a diagnosis of a substance use disorder	Individuals born between 1972 and 1984, alive and resident in Sweden on 31st of December 2004. Refugees and refugee related individuals were aged 13 to 19 years when settling in Sweden. Individuals who were granted residence permit in Sweden on humanitarian	Former Yugoslavian Republics: n=9,438 Horn of Africa (Somalia, Eritrea, Ethiopia): n=3,408 Iraq: n=4,671 Iran: n=2,358 Others: n=7,813	Accompanied young refugees: Mean age: F. Yugoslavia: 25.2 Horn of Africa: 25.4 Iraq: 23.3 Iran: 26.7 Others: 26.1 F. Yugoslavia: Male: 52.3% Horn of Africa: Male: 55.9% Iraq: Male: 53.8% Iran: Male: 54.5% Others: Male: 53.3%	Swedish-born individuals with two Swedish-born parents: n=932,953	Yes: Refugee status according to the 1951 Convention.	Hospital care due to substance misuse incidence rates (per 100,000 person years) were higher in male refugees (accompanied: 336.7; unaccompanied: 250.4) compared to Swedish-born individuals (167.3), and lower for female refugees (accompanied: 52.4; unaccompanied: 59.7) compared to the Swedish counterparts (78.2). Regression Analysis: A longer period of residence over 10 years was associated with higher incidence in male refugees (accompanied HR=2.52, unaccompanied HR=2.88) but was attenuated when income was additionally adjusted for (accompanied HR=1.65, unaccompanied HR=1.95). This effect did not show in females and the HRs of female refugees were in all but one case lower compared to Swedish counterparts. Comparison between country of origin: Male refugees from the Horn of Africa and Iran and females from Iran had the highest HRs.	Unaccompanied and accompanied male refugees were at particular risk of hospital care associated with substance misuse in comparison to Swedish born individuals and these higher risks were associated with lower income. Limitations: - lacking information on type of substance - high heterogeneity in country category "others" and "East Africa" - true length of residency might be longer in some cases - variations between refugees from different countries of origin might be due to different help-seeking patterns and barriers to care

		grounds were also included. Subgroups: Accompanied young refugees: n=22,002 Unaccompanied: n=5,686		Unaccompanied young refugees: Mean age: F. Yugoslavia: 27.1 Horn of Africa: 28.1 Iraq: 24.9 Iran: 29.5 Others: 27.3 F. Yugoslavia: Male: 53.8% Horn of Africa: Male: 60.9% Iraq: Male: 72.1% Iran: Male: 75.7% Others: Male: 64.1%				
Manhica 2017	Alcohol related psychiatric or medical disorder with long-term misuse	Individuals born between 1972 and 1985, alive and resident in Sweden on 31 December 2004. Refugees were	Yugoslavian republic: n=9,776 Somalia: n=2,372 Middle East: n=8,062	Mean age: F. Yugoslavia: Acc: 24.9 Unacc: 26.9 Somalia: Acc: 24.1 Unacc: 27.1	Swedish-born individuals: n=1,009, 027	No	Rates of hospital admission were 1.1% in native Swedes and 0.8% in young refugees. The risks of hospital admission of young refugees compared to Swedes were lower when adjusted for age, gender, and domicile (HR=0.65, 95% CI 0.56-0.77). After further adjusting for income, the HR decreased more (HR=0.48, 95% CI 0.40-0.57).	The risk of hospitalization due to alcohol related disorders was lower in young refugees aged 13 to 19 when they settled in Sweden compared to native Swedes. However, some subgroups, such as Somalis with longer residence or

		between 13 and 19 years of age when they received permanent residency in Sweden as a refugee. Individuals who were granted residence permit in Sweden on humanitarian grounds were also included. Subgroups: Accompanied refugees: n=15,834 Unaccompanied refugees: n=4,376		Middle East: Acc: 23.7 Unacc: 26.1 Males: F. Yugoslavia: Acc: 52.1% Unacc: 53.7% Somalia: Acc: 56.4% Unacc: 61.3% Middle East: Acc: 54.1% Unacc: 73.3%		Interaction analysis: Female young refugees had lower risks of hospital admission compared with male refugees: HR=0.58, 95% CI 0.39-0.87 when adjusted for age and domicile, and HR=0.51, 95% CI 0.41-0.93 when additionally adjusted for income. Gender: HRs were lower for refugee women compared to Swedish women. Compared to Swedes, accompanied refugees were less likely to be admitted, males (HR=0.68, 95% CI 0.55-0.85) and females alike (HR=0.37, 95% CI 0.24-0.56). Hazard ratios for unaccompanied refugees were not statistically significantly different to Swedes. Compared to accompanied refugees, unaccompanied young male and female refugees were at higher risks of alcohol-related hospitalization. Comparison between regions of origin: When adjusted for age and domicile, risks were higher in Somali male refugees (HR=2.17, 95% CI 1.59-2.98) compared to Swedes. These risks, however, decreased (HR=1.49, 95% CI 1.08-2.07), when income was additionally adjusted for. In contrast, HRs were lower in male refugees from the Yugoslavian republics (HR=0.40, 95% CI 0.28-0.56) and Middle East (HR=0.46, 95% CI 0.34-0.61). Patterns were similar for female refugees. Length of stay: For refugees from the former Yugoslavia, the risk of hospital admission decreased as the length of stay increased. For Somalia and Middle East refugees, the trend was the opposite. In Somali refugees, both	unaccompanied minors seemed particularly vulnerable. Limitations: - data inaccuracy (respecting religion or length of stay in Sweden)
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							males and females who had resided in Sweden for more than 10 years had “exceedingly high risks” (HR=2.52, 95% CI 1.62-3.92; HR=2.43, 95% CI 1.01-5.87), when adjusted for age and domicile. After additionally adjusting for income, risks decreased considerably (HR=1.68, 95% CI 1.05-2.66; HR=1.65, 95% CI 0.68-3.97), but were still elevated.	
Manok 2017	Substance abuse or polytoxicomania, dependence on benzodiazepines or opioids	Patients seen in the psychosocial unit of the reception center Heidelberg-Kirchheim during March 2016 to December 2016.	South-east Europe: 33,1% Sub-Saharan Africa: 33,1% Middle East: 23,7% Maghreb: 9,1% Others: 0,9%	mean age 31.18 (SD 10.41) Male: n=206 (65%) Female: n=111 (35%)	none	No	17.4% of patients whose medical reports were reviewed had received a diagnosis of substance abuse or polytoxicomania. 14.2 % of the patients had received a recommendation for substance withdrawal therapy for dependence on benzodiazepines or opioids.	Refugees with substance abuse disorders are a challenging group that usually developed benzodiazepine dependence due to prescription by doctors during the flight process, possibly due to self-medication of hyperarousal. Limitations: - clinical diagnosis without standardized interviews - lack of translators
Marshall 2005	Alcohol use disorder	Refugees from Cambodia who were aged between 35 and 75 years, had lived in Cambodia during some portion of the Khmer Rouge regime (April	Cambodia (100%)	mean age 52 (SD 13.4) Female: n=319 (61%)	none	No	The prevalence of PTSD was high (62.0%), but probable AUD was low (n=14.4%). Only AUD: n=2 (1%) PTSD and AUD n=4 (1%) Major depression and AUD: n=1 (<1%) PTSD, AUD and depression: n=7 (1%) AUD was not significantly associated with PTSD or major depression. AUD was less prevalent in older individuals and women.	The prevalence of probable AUD was much lower than that found in previous studies or in the general US population, and, surprisingly, not associated with PTSD. For this reason, the cultural context in which drinking occurs should be considered as a moderating factor.

		1975 to January 1979) and had left Cambodia prior to the 1991 cease-fire.					Regression Analysis: After adjusting for age, sex year of immigration, pre- and postmigration trauma exposure, AUD was associated with trauma count after immigration to the United States (bivariate odds ratios: 1.99, 95% CI 1.23-3.23), year of immigration (OR=6.15, 95% CI 1.14-33.3) and negatively associated with female gender (OR=0.28, 95% CI 0.07-1.06) and age (OR=0.60, 95% CI 0.41-0.89).	Limitations: - cross-sectional design - recall bias - lack of representativity to other Cambodian populations - possible lack of reliability and validity of the used instruments - lack of information regarding treatment utilization
Marshall 2006	Alcohol Use Disorder	Cambodian refugees aged 35 to 75 years who spoke Khmer and had resided in Cambodia during the Khmer rouge regime, and who resided in Long Beach between 2003 and 2005. All met diagnostic criteria for either PTSD, major depression disorder or alcohol use disorder.	Cambodia (100%)	mean age 53.7 (SD 10.9) Female: n=210 (57.0%)	none	No	14 participants (5%) met criteria for alcohol use disorder.	The use of mental and general health services was higher than expected, and factors typically associated with unmet mental health needs were actually associated with seeking services. Limitations: - recall bias - lack of generalizability - lack of reliability of the instruments (CIDI), as it might overestimate the prevalences and there was little research of its use in this population - authors did not check if participants received care and its nature, duration or scope

Mire-madi 2011	Possible alcohol dependence, drug-related problems/substance dependence issues	GARs 19 years of age and older, referred to the immigrant service society between 1 September 2008 to 31 March 2009. Exclusion: developmental disability or incapability to complete the questionnaires.	Iran: n=51 (75.0%) Iraq: n=12 (17.6%) Afghanistan: n=5 (7.4%)	mean age 34.1 (SD 12.8) Female: n=36 (52.9%) Male: n=32 (46.1%)	none	No	AUDIT: - Females: none reported score >6 - Males: 5 individuals (15.6%) reported 8 or more. 3 individuals (9.3%) had scores of over 20, indicating dependence. Total AUDIT scores differed significantly by sex (p=.017) and religion (p=.000), with higher scores in males and in Christians. Total AUDIT score was significantly associated with the total IES-R score. DUDIT - Males: n=1 (3.1%) reported a score of 6 - Females: n=1 (2.8%) reported a score of 12. Both used Tylenol 3 (acetaminophen/codeine).	Middle-Eastern GARs presented symptoms of PTSD, depression and potential comorbid alcohol use, but not substance use. Alcohol-related issues were not found in females with the applied cut-off score. Substance dependence issues were comparable to Canadian rates but the type of substance differed markedly. The mental health system should improve assessment, access and treatment of comorbid PTSD and alcohol use in refugee populations. Limitations: - small sample size - lack of generalizability - recall and cultural bias
Mollica 1987	Drug and/or alcohol addiction (DSM-III)	All patients in treatment in January 1984 and all new admissions to the clinic over the following 6-month period.	Vietnam: n=18 (35%) Cambodia: n=21 (40%) Laos: n=13 (25%)	Age not reported Female: n=27 (51.9%) Male: n=25 (48.1%)	none	No	In total, n=1 participant (2%) had a drug and/or alcohol addiction: - Cambodian (0/21) - Hmong/Laotian (0/13) - Vietnamese (1/18)	Indochinese refugees suffered from multiple traumatic events, major affective disorder and PTSD. Drug use disorder prevalence was low. Limitations: none mentioned.
Naeem 2005	non alcohol substance abuse, non	Afghan refugees between the	Afghanistan (100%)	mean age 33 (age range 15-64)	none	No	101 persons (9.9%) were diagnosed with a non alcohol substance dependence. 2 participants (0.2%) were diagnosed with	The rates of substance abuse were low, probably due to stigma and cultural

	alcohol substance dependence	ages of 15 and 65 with a diagnosis of a functional psychiatric illness. Those with a diagnosis of a learning disability, dementia and organic brain disorder were excluded.		Male: n=436 (56.2%) Female: n=340 (43.8%)			non alcohol substance abuse. When looking for comorbid mental illness, 26 participants (2.5%) had a comorbid substance dependence and 53 participants (5.2%) had comorbid substance abuse.	values attached to the use of drugs in Muslim societies. Limitations: - selection bias
Niken-dei 2019	Sedatives or hypnotics: dependence syndrome (ICD-10 F13.2) Cannabinoids : dependence syndrome (ICD-10 F12.2) Alcohol: dependence syndrome (ICD-10 F10.2) Opioids: dependence syndrome	Asylum seekers who consulted the walk-in clinic, were fluent in one of the 16 most frequently spoken languages in the PHV, and aged 18 years or older. Exclusion: disabilities affecting cognitive abilities (e.g. mental disability or dissociative	Baseline: Asia (incl. Turkey): n=113 (49.6%) Africa: n=74 (32.5%) Eastern Europe (incl. Caucasus and Russia): n=40 (17.5%) Others: n=1 (0.4%) Follow up: Asia (incl. Turkey): n=46 (52.3%) Africa: n=27 (30.7%) Eastern Europe (incl. Caucasus	Baseline (t1): Age categorized: 18-24 years: n=61 (26.8%) 25-34 years: n=82 (36.0%) 35-44 years: n=57 (25.0%) ≥45 years: n=28 (12.3%) Female: n=95 (41,7%) Male: n=133 (58,3%) Follow up (t2): Age categorized:	none	No	At baseline: total F1 disorders n=24 (10.5%) 17 individuals (7.5%) had a dependence syndrome (ICD-10, F13.2) with Sedatives or hypnotics, 2 individuals (0.9%) a dependence (F12.2) on cannabinoids, 1 individual (0.4%) a dependence (F10.2) on alcohol, 4 (1.6%) were dependent on opioids (F11.2), 2 (0.9%) were dependent and used multiple drugs, and 1 person (0.4%) abused analgesics (F55.2). Follow-up 3 months later: total F1-disorders n=6 (6.8%) Alcohol and opioid dependence and analgesic abuse were not prevalent anymore, 4 people (4.5%) were dependent on sedatives or hypnotics, 1 person (1.1%) was dependent on cannabinoids and 2 persons (2.3%) were dependent with multiple drug use. Screening questions on alcohol and drug addiction:	Asylum seekers are highly burdened by mental health problems. Among them, addictive disorders have a prevalence of 10%, which is higher than the one in the general population. However, very few asylum seekers received specialized psychotherapeutic care after 3 months. Health care provided to asylum seekers after arrival is inadequate in relation to the high level of mental health problems. Limitations: - small number of participants - high heterogeneity of participants

	(ICD-10 F11.2) Multiple drug use: dependence syndrome (ICD-10 F19.2) Analgesics: abuse (ICD-10 F55.2)	stupor), illiteracy, and age below 18 years.	and Russia): n=14 (15.9%) Others: n=1 (1.1%)	18-24 years: n=20 (22.7%) 25-34 years: n=34 (38.6%) 35-44 years: n=23 (26.1%) ≥45 years: n=11 (12.5%) Female: n=34 (38.6%) Male: n=54 (61.4%)			At baseline (t1), there were in total 84 participants with presumed mental illness based on screening scores. 17 participants (7.5%) were screened positively concerning alcohol consumption, 15 participants (6.6%) concerning drug use, and 52 participants (22.8%) concerning medication addiction. No data provided for follow-up (t2). Treatment recommendations (t1) and access to care (t2): 4 participants had received a recommendation for detoxification, with one of them (25%) having started therapy at follow up (t2). 2 participants had received a recommendation for addiction treatment regarding benzodiazepines, none of them (0%) had a therapy uptake at t2.	- short follow-up period - previous medical history could not be collected consistently, including protective factors - considerable loss-to-follow-up rate might influence estimates for access to mental health care (attrition bias) - carry-over effects cannot be ruled out. - gender-specific barriers were not examined.
Posselt 2015	Alcohol and other drug disorders	Refugee youth aged 12 to 25 years, with reasonable conversational English who could speak about their experiences and knowledge of comorbidity within their community and service providers working in	Afghanistan: n=7 Iran: n=2 Burundi: n=1 South Africa: n=1 Liberia: n=1 Congo: n=1 Bhutan: n=1 Nepal: n=1	average age 17.7 (age range 12-25) Male: n=6 Female: n=9	none	No	Among refugee youth, the most common cited challenges for youth with comorbidity were social disconnection (n=13), employment and education (n=9) and housing and homelessness (n=8). Service providers reported service provision (n=16) most commonly. Less often cited challenges were: Violence, crime and involvement in criminal justice system (n=5), Unwanted or teenage pregnancy (n=3), physical health issues (n=2), Lost opportunities; Financial issues and poverty; and Managing life generally (each n=1).	Overall, there was great convergence between the perspectives of service providers and refugee youth. Most frequent challenges mentioned by refugees were social disconnection, employment and education, and housing and homelessness. Holistic, flexible service delivery is needed with an integrative approach that also includes non-clinical issues. Limitation: - small sample size

		government and non-government MH, AOD and refugee services. Subgroups: n=2 refugees arrived as an unaccompanied minor.						- lack of generalizability to other geographical areas
Posselt 2015	Alcohol and other drugs disorder	Refugee youth aged 12 to 25 years with sufficient conversational English skills and service providers from government and non-government organizations who worked in the drug and alcohol service sector or in refugee- or migrant-specific programs or had contact with refugee youth or	Bhutanese background: n=2 (13%) Afghan background: n=9 (60%) African background: n=4 (27%)	average age 17 (age range 12-25) Sex distribution not reported	none	Yes: Refugee status according to the 1951 Convention.	Six broad themes and risk factors to the development of comorbidity of MH and AOD disorders emerged: 1) Premigration experiences of torture, trauma, grief and loss; 2) familial factors of intergenerational conflict or separation; 3) post-migration factors: adjustment difficulties around culture and language; 4) exposure to and availability of substances; 5) maladaptive coping strategies, self-medication and misuse of prescription medication; 6) access to information, awareness and concepts of MH and AOD problems and services.	There are specific and overlapping risk factors involved in the development of AOD disorders and mental health problems. Establishing directionality between both disorders is difficult. Limitations: - limited generalizability due to the specific population and setting - small sample size

		personally recognized gaps in their services. Subgroups: n=2 young people arrived as asylum seekers and had spent time in detention facilities						
Richter 2018	12-month prevalence of any F1 diagnosis (Mental and behavioral disorders due to psychoactive substance use) (ICD-10)	Asylum seekers residing in the admission center Zirndorf between 01/2011 and 05/2012. The help-seeker sample consisted of individuals who had contacted the psychiatric center of their own impetus. The random sample consisted of	t1: Iran: 30.4% Afghanistan: 20.1% Russia: 19.4% Iraq: 14.5% Azerbaijan: 5.7% t2: Iran: 44.1% Afghanistan: 26.5% Russia: 11.8%	t1: age 31.9 (SD 10.6) t2: age 32.5 (SD 11.14) t1: Female: n=125 Male: n=158 t2: Sex distribution not reported	none	No	At t1, the 12-month prevalence of any F1-diagnosis was n=1 (0.6%) in the help-seeker group and n=1 (0.8%) in the randomly selected group. At t2 (four to ten months later), no patient met criteria for a F1-diagnosis.	Although the levels of psychiatric morbidity were high, the prevalence of substance related disorders was low. Temporal duration of the application procedure for asylum status should be reduced and psychiatric screening upon arrival be done. This population needs to be addressed with a multilingual and multiprofessional, culture-sensitive team. Limitations: - random sampling may be affected by the fluctuation of residents - short term duration of the

		randomly selected residents. Subgroups: help-seeking sample: t1: n=158; t2: n=11 random group: t1: n=125; t2: n=23						study - influence of the interview site on the results - follow up lost individuals
Salas-Wright 2014	Lifetime prevalence of SUDs with a prevalence of at least 1.5% in the general population were examined: alcohol use disorder, cannabis use disorder, cocaine use disorder, hallucinogen use disorder, amphetamine use disorder, opioids/heroin use disorder	Participants from the NESARC study (nationally representative sample of non-institutionalized U.S. residents aged 18 years and older, living in all 50 States and Washington DC).	Not reported	Age categorized: 18-34: n=73 (25.9%) 35-49: n=145 (32.7%) 50-64: n=88 (19.8%) >65: n=122 (21.2%) Female n=200 (40.4%) Male: n=228 (59.6%)	Native-born Americans: n=29,267 Non-refugee Immigrants: n=4,955	Yes: Those who responded affirmatively to the following question, were classified as refugees: "Were you ever a refugee—that is, did you flee from your home to a foreign country or place to escape danger or	Controlling for sociodemographic, parental and psychiatric factors, refugees were three to six times less likely than native-born Americans to have met criteria for all SUDs examined. The effect was more robust in men than in women, e.g. for alcohol use disorder, refugee men were seven times less likely (OR=0.13; 95% CI 0.12-0.15), refugee women four times less likely than native-born Americans (OR=0.26; 95% CI 0.23-0.28) to have met criteria. For illicit drug use as well, the refugee-SUD link was significantly greater in men (OR=0.23, 95% CI 0.20-0.26) than in women (OR=0.40, 95% CI 0.36-0.45). Compared to non-refugee immigrants, refugees were also less likely to have met criteria for most SUD examined. There was a relationship between refugee duration and lifetime SUD: those being refugees for one year or longer were significantly more likely to meet the criteria of	The study suggests a “refugee paradox” for substance use disorders in America, because refugees were substantially less likely to present SUDs than natives and, albeit with weaker effects, less likely than non-refugee migrants (probably due to institutional refugee support). The longer the refugee duration, the higher the risk of alcohol use disorder, most likely as a coping mechanism. Limitations: - study design: NESARC is not a true longitudinal study - lack of a precise refugee

						persecution?"	alcohol use disorder (OR=2.65, 95% CI 1.77-3.98), but less likely to meet criteria for cannabis (OR=0.24, 95% CI 0.22-0.27) or illicit SUD (OR=0.26, 95% CI 0.25-0.28) compared to those that were refugees for less than a year. Odds ratio: Vs. native-born Americans: Alcohol: OR=0.16 (95% CI 0-15-0.17) Cannabis: OR=0.29 (95% CI 0.26-0.32) Cocaine: OR=0.15 (95% CI 0.14-0.17) Hallucinogens: OR=0.25 (95% CI 0.23-0.28) Amphetamines: OR=0.20 (95% CI 0.18-0.22) Opioids/Heroin: OR=0.21 (95% CI 0.19-0.24) Vs. non-refugee migrants: Alcohol: OR=0.44 (95% CI 0.41-0.47) Cannabis: OR=1.10 (95% CI 0.93-1.31) Cocaine: OR=0.54 (95% CI 0.50-0.59) Hallucinogens: OR=0.66 (95% CI 0.58-0.74) Amphetamines: OR=0.87 (95% CI 0.74-1.03) Opioids/heroin: OR=0.62 (95% CI 0.58-0.66)	definition (self-reported) - small sample of refugees
Schaff-rath 2017	F1 diagnosis (ICD-10)	Cases of Refugees who sought help at the LVR-Klinik Cologne between April 2015 and March 2016.	Afghanistan: 10.0% Serbia: 9.6% Kosovo: 8.8% Algeria: 7.5% Albania: 6.7% Iran: 6.7% Iraq: 5.0% Syria: 4.6% Bangladesh: 4.2% Nigeria: 4.2% Morocco: 3.8%	mean age 31.3 (SD 9.4) Male: 75.3%	none	Yes: Definition of the Cologne Refugee Council: 1) people without documents; 2) illegal entry; 3) asylum seekers; 4) people	15% of all cases were diagnosed with a F1-diagnosis. After the group of F4 diagnoses (40.2%) and F3 diagnoses (31%), F1-diagnoses were the third most prevalent diagnosis group.	The study population was very heterogenous and differed greatly from general refugee statistics. This could be explained through a delay in seeking mental health services, or through different pre-, peri-, and post-flight stressors, or due to different access to mental health services for refugees from different countries. Most prevalent

			Macedonia: 3.8% Bosnia: 2.5% Somalia: 2.5% Guinea 1.7% Montenegro: 1.7% Azerbaijan: 1.3% Eritrea 1.3% Ex-Yugoslavia: 0.8% Georgia: 0.8% Russia: 0.8% Turkey: 0.8% Armenia: 0.4% Bulgaria: 0.4% Hong Kong: 0.4% Croatia: 0.4% Libya: 0.4% Pakistan: 0.4% Not clear: 7.9%			obliged to leave the country; 5) recognized refugees; 6) allocated to Germany through a quota system; 7) residence permit on humanitarian grounds.		disorders were PTBS and affective disorders. Limitations: - cross-sectional design (lack of controls)
Soegaard 2020	Alcohol use disorder (abuse or dependence), substance use disorder (abuse or dependence)	Newly referred patients and patients already receiving treatment at the Southern Oslo District Psychiatric center who were aged between 18	Middle East and North Africa: 46% Eastern Europe: 25% Southern/Central Asia: 13% Southern/Eastern Africa: 12% South-East Asia: 4%	mean age 44.72 (SD 11.0) Female: n=8 (32%) Male: n=17 (68%)	Ethnic Norwegians (NOR): born in Norway, both parents also born there n=44 Immigrants (IMI):	No	2 refugees (8%) were diagnosed with an alcohol use disorder. 1 refugee person (4%) was diagnosed with a drug use disorder. The NOR patients had significantly higher rates of alcohol use disorder (36.4%) and drug use disorder (25%) than the RFG group (p<.05). The IMI group had a rate in between the two other groups, but no statistical significance was reached. Regarding comorbidity, NOR had significantly more often depression and alcohol use	Norwegians had more anxiety disorders, immigrants more pain related disorders and refugees higher rates of PTSD and depression. Alcohol and drug use as a coping mechanism after trauma might differ, according to cultural and religious background.

		and 60 years, proficient in a Scandinavian language or English, and who had previously experienced at least one serious trauma according to the DSM-IV-TR criteria. Exclusion: Patients with an AUDIT>20 or DUDIT>25, experienced trauma was less than one month ago, serious brain- or other organic disease, serious head injury, chronic psychotic disorder, serious dyslexia or other serious difficulties with oral or			born in any other country or being born in Norway but both parents being born in another country n=41		disorder in combination than the IMI group ($p<.05$), no other significant comorbidities showed regarding alcohol or drug use disorder comorbidities.	Limitations: - cross-sectional design - no control group - limited generalizability and selection bias (excluding patients without major trauma, who could not speak English or one Scandinavian language or who were not referred to specialized treatments) - definition of some terms and concepts may vary between (sub)cultures - time since arrival was not known in this sample - IMI group was very heterogenous - sample was generally limited - all patients from outpatient clinic
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		written language or lacking proficiency in Scandinavian or English.						
Steel 2002	12-month prevalence of substance use disorder (alcohol and harmful substance abuse or dependence) (ICD-10)	Vietnamese-born residents (Vietnamese Australians) from five local-government areas in New South Wales, Australia.	Vietnam (100%)	mean age 41 (SD 14.2) Female: n=472 (59%) Male: n=689 (41%)	none	No	11 participants (1%) were diagnosed with a substance use disorder according to ICD-10. Women had a lower rate of substance use disorders than men (n=2 (0.3%) vs. n=9 (2%), p=.01).	There was a close association between incremental levels of trauma and risk of mental illness, psychosocial dysfunction and tendency to use mental health services. Trauma exposure seemed to remain relevant for a small subgroup of people exposed to high levels of trauma who were at increased risk of mental illness, even after 10 years or more. Limitations: - possible recall bias - cross-sectional design resulted in causal inferences being derived from correlational data - mental illness was treated as one broad category - risk of transcultural errors during translation
Steel 2005	12-month prevalence of alcohol use	Vietnamese refugees >18 years old,	Vietnam (100%)	18-24: n=192 (16,5%) 25-34: n=326	ABS survey: Weighted	No	Prevalence of substance use disorders was 1.6% (95% CI 0.4-2.8%) in Vietnamese-born compared to 8.8% (95% CI 8.6-8.9%) in	Vietnamese refugees showed substantially low rates of substance use

	disorder (alcohol harmful use/abuse and dependence), drug use disorder (harmful use/abuse and dependence) (DSM-IV)	resettled in Australia for an average of 11 years, and a weighted sample to match the age and sex distribution of the Australian-born population.		(28,1%) 35-44: n=346 (29,8%) 45-54: n=157 (13,5%) 55-64: n=52 (4,5%) >65: n=88 (7,6%) Female: n=584 (50.3%) Male: n=577 (49.7%)	sample to match age and sex distribution of Australia n-born n=7,961		Australian-born. Subtypes of SUD in refugees vs. Australian-born: Alcohol use disorder in refugees 1.1% (95% CI 0.1-2.1%) vs. 6.7% (95% CI 6.5-6.9%) in Australian-born Drug use disorder in refugees 0.5% (95% CI 0.0-1.1%) vs. 3.2% (95% CI 3.1-3.3%) in Australian-born In both groups males showed higher rates of substance use disorders: in the Vietnamese-born group, prevalence in males was 3.1% (95% CI 0.8-5.4%) compared to 0.2% (95% CI 0.0-0.5%) in females. Alcohol use disorder: Males 2.3% (95% CI 0.3-4.2%) vs. Females 0.0% (95% CI 0.0-0.0%) Drug use disorder: Males 0.8% (95% CI 0.0-1.9%) vs. Females 0.2% (95% CI 0.0-0.5%)	disorders. This could be explained by an accurate estimate, meaning a good adaptation to the host country, or a measurement bias due to low accuracy of western diagnostic assessments or due to a cultural tendency of under-reporting symptoms. Limitations: - possible selection-bias in the Vietnamese group - limited generalizability of findings to other refugee populations or Vietnamese refugees who arrived only recently
Teo-dorescu 2012	Alcohol abuse disorder (DSM-IV)	All patients with refugee background, aged between 18 and 60 years, and with permanent residency, who visited the outpatient psychiatry departments of the 4 hospitals and	21 countries: Eastern Europe: n=23 (38%) Africa: n=9 (15%) Middle East: n=16 (26%) Far East: n=10 (16%) Latin America: n=3 (5%)	Male: average age 44 Female: average age 38 Female: n=25 (41%) Male: n=36 (59%)	none	Yes: A refugee was defined as "a person entering Norway either as a refugee on a 'UNHCR quota', or as an 'asylum seeker'."	6 individuals (10%) were diagnosed with an Alcohol abuse disorder. There were no significant correlations between PTSD and alcohol abuse disorders.	Refugee patients suffered an extensive number of traumas and comorbidities, but no association between PTSD and substance abuse disorders was found. There is a need for an integrative approach that addresses psychiatric, somatic and social aspects. Limitations: - cross-sectional design - small sample size - assessment of diagnosis

		had experienced any traumatic event according to the DSM-IV-TR.						was done by only one person - proficiency in the Norwegian language was only assessed by one question - level of psychiatric morbidity might not present the real level - possible bias due to cultural differences, diversity of participants and due to social desirability
Wester-meyer 1989	Opium dependence/addiction	Clinical part: Opium addicts from a Substance Abuse Treatment Program within the Department of Psychiatry, admitted between 1985 and 1988. Qualitative part: informed people (including patients, family members, services	Not reported	Age categorized: Twenties: n=6 Thirties: n=15 Forties: n=8 Fifties: n=18 Sixties: n=6 Seventies: n=2 Female: n=15 Male: n=38	none	No	Clinical part: Most subjects had begun opium use while still young, as follows: teens: n=3; twenties: n=21; thirties: n=17; forties: n=11; fifties: n=2; sixties: n=1. Thirty-two subjects had begun opium use in Laos; 5 subjects began use in Thailand refugee camps, and 18 subjects had started opium use in the United States. All were opium smokers who consumed opium two or more times daily; only one male engaged solely in opium eating. Noone admitted to any lifetime use of other substances than alcohol or tobacco. 73% reported that most of their current friends had problems related to opium use; the same number reported having lost friends due to drugs. 73% took money from other family members without their permission in order to purchase drugs. As a result of drug-related family conflicts, 35% had left home and 25% had been alienated from their	Hmong refugees in the U.S. are being newly exposed to opium use. Additionally, dormant skills regarding opium production and trafficking might be reactivated with flourishing crime among this immigrant group as a consequence. Also, Hmong refugees might be at risk to turn to heroin use. The study authors name 5 points of intervention which policies should include to prevent that. Limitations: none mentioned.

		providers) and observations of members of Hmong community in California.					families for a prolonged period. 13% were divorced/separated due to opium use. Subjects were spending between U.S.\$200 to \$1000 per month for their opium, with most spending \$300 to \$500. Qualitative part: Four reasons were identified for the opium epidemic: against immigration law, opium-dependent persons were permitted entry to the U.S, local county and state policies facilitated appearance of opium, drug enforcement was not taken seriously by refugees, and connections between Mexican smugglers and Hmong youths facilitated drug smuggling and involvement in criminality.	
Wester-meyer 1991	Opium addiction, alcohol abuse	Indochinese (49 Hmong, 1 Lao) refugees addicted to opium who sought treatment at the University of Minnesota Hospital and Clinic.	Not reported	mean age 46.0 (SD 12.8) Male: n=35 Female: n=15	none	No	Opium use history: 30 subjects used opium in their home country for the first time, 5 in a Thailand refugee camp and 15 subjects in the United States. Mean age of onset was 32.8 years (SD 9.2). The mean years of active use was 8.7 years (SD 7.9). Former addicts who arrived in the United States after 1985 had shorter periods of abstinence than those who had arrived before 1980. The mean number of pipes daily was 47.9 (SD 29.6). 29 subjects had used opium every day during the last year, 7 subjects had used for 6 to 10 months, 4 had used for 2 to 5 months, the remaining 10 were uncertain. SAPS: On the pharmacological-based 12-item subscale, which measured symptoms of substance abuse and dependence, participants had a mean of 7.9 problems (SD	Opium addiction predominantly starts in the early phase of adult productivity and tends to spread to younger people. Opium addiction is associated with significant psychosocial difficulties and criminality. Opium availability increases risk of addiction. Limitations: none mentioned.

						2.0). On the 17-item sub-scale of psycho-behavioral symptoms associated with substance use disorders, participants had a mean of 11.9 problems (SD 3.4). On the 6-item interpersonal symptom subscale, participants had a mean of 3.6 problems (SD 1.9). On the 7-item subscale for family problems associated with drug abuse, participants had a mean score of 3.1 problems (SD 1.9). On the 5-item subscale for occupational/academic problems, participants had a mean score of 2.7 problems (SD 1.4). On the financial problem 5-item subscale, participants had a mean of 2.0 opium-related financial problems (SD 1.8). On the 8-item subscale for legal problems the mean score was 0.1, the SD was not reported. MMADST: Participants had a mean score of 24.9 (SD 9.6). Number of patients by score severity was as follows: borderline or mild severity (scores of 6 to 10) = 3 patients, moderate severity (scores of 11 to 20) = 15, very severe (scores of 21 to 30) = 16, extremely severe (scores of 31 and above) = 16. 1 male participant also met criteria for alcohol abuse in addition to opium dependence. Analysis: The current age of those who first used opium in the United States was younger on average (mean age 32.8) as compared to those who first used in Asia (mean age 51.6), a	
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							statistically significant difference ($p<.001$). Duration of addiction of those who began opium use in Asia was 11.0 years compared to 3.2 years for those beginning in the United States. Those who used opium more days in the last year were also using significantly more pipes per day ($p<.001$). The MMADST score, SAPS pharmacological symptoms, SAPS psycho-behavioral symptoms, SAPS interpersonal problems, SAPS family problems, SAPS occupational problems, and SAPS financial problems correlated strongly with each other at the .001 level of significance or less. However, demographic variables and opium variables were not associated with any of the scales.	
Widmann 2014	Khat dependence (DSM-IV)	Male Somali khat users recruited in khat selling facilities within the community. Controls were recruited asking khat users for friends that do not chew khat. Exclusion: severe mental disorders (severe depression,	Somalia (100%)	Khat chewers: mean age 34.0 (SD 10.96) Non-chewers: mean age 35.1 (SD 15.71) Male: n=48 (100%)	none	No	SDS: 72% of the khat-chewers were diagnosed with psychological dependence. Chewers with and without psychological dependence had similar khat use patterns. MINI DSM-IV: 100% of the chewers fulfilled the criteria for khat dependence. Withdrawal symptoms in chewers: average 4 (+/- 1.7) out of 6 symptoms. Khat chewers experienced significantly more traumatic event types ($p=.007$) and more PTSD symptoms ($p=.002$) than non-chewers and had more often a PTSD-diagnosis ($p=.020$). Most notably, only khat chewers reported	Refugees are prone to substance dependence, which affected all khat users in this sample. Whether traumatic events and PTSD trigger substance use or excessive substance use triggers PTSD symptoms remains to be elucidated. Evidence suggests that large amounts of khat can induce psychotic symptoms and disorders. Limitations: - convenience sampling and risk of biased sample - difficulty of reliable

		mania, schizophrenia), neurological disorders/impairments, substance dependence other than to khat. Subgroups: Khat chewers: n=33 Non-chewers: n=15					psychotic symptoms (true psychotic symptoms n=8, 24.2% (p=.044) and khat-related psychotic symptoms n=25, 76%).	diagnosis (due to symptom overlap and intoxication of the participants with khat)
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