

SUBSTANCE USE AND MISUSE AMONG MIGRANT POPULATIONS IN EUROPE: A
SYSTEMATIC REVIEW

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Abstract

Background and aims: Migration to Europe and across European countries has increased in recent years. Migrants may be at elevated risk for substance use and misuse for reasons including pre-migration trauma, post-migration stressors such as social and economic inequality, a lack of social support, and acculturation challenges and consequences. The aim of this study is to systematically review the recent literature investigating the prevalence and contextual factors (potential mechanisms, risk factors, protective factors) of substance use and misuse among all migrant populations in Europe.

Methods: Three key databases (MEDLINE, psychoINFO, SocINDEX) were systematically searched using key terms to retrieve relevant studies from 1995 to 2018. Eligible studies were peer-reviewed articles written in the English language of any design reporting findings on alcohol and/or illicit substance use among migrant populations (involuntary and voluntary migrants) in Europe. Data was extracted using templates created specifically for this review. A descriptive synthesis of evidence from quantitative and qualitative studies of the prevalence in migrant groups and the key contextual factors that were associated with substance use and misuse was conducted. The methodological quality of the included studies was assessed.

Results: Forty-one quantitative (n=34 cross-sectional, n=7 cohort), two qualitative, and two mixed-methods studies were included. Fifteen studies were rated as high methodological quality, sixteen as medium, and fourteen as low quality. There was a lack of longitudinal designs found. Relative to migrant populations, the majority population (native born) was found to be at a higher risk of alcohol use whilst differences between these groups varied among studies reporting illicit substance use. For all substances, the prevalence among second-generation migrants was closer to that of the majority population than that of first-generation migrants. Migrants from Africa, the Middle East and refugees all had a low risk of alcohol use than other migrant groups and the majority population however this was not found to be the case for illicit substance use. Being male, a lower income, symptoms of mental illness, living without a partner, a lack of family support, religion and acculturation factors were all associated with substance use.

Conclusion: Some groups of migrants are at a higher risk of substance use and a targeted approach to prevent substance related harm may be needed. Future research should try to clarify the complex relationship between migrant substance use and the contextual factors identified in this review using stronger designs (longitudinal studies) and qualitative methods.

1. Introduction

1.1 Migrant definitions

Migrants can be defined by their citizenship, nationality, by foreign birth, or by movement into a new country. In epidemiological literature, migrants are usually classed as all foreign-born persons (The Migration Observatory, 2017). The International Organization for Migration (IOM), the leading inter-governmental organisation dedicated to promoting international cooperation on migration issues, defines a migrant as ‘any person who is moving or has moved across an international border or within a state away from his/her habitual place of residence’ (International Organization for Migration, 2018). In their definition, for example, EU nationals moving across EU states are considered migrants, regardless of citizenship. Migrants are often considered ‘involuntarily’ and ‘voluntary’. Involuntarily migrants (also known as forced migrants) have been classed as refugees, asylum seekers, and displaced persons who are forced to migrate due to violent coercion (war, conflict, displacement due to natural disasters). Voluntary migrants (also referred to as economic and labour migrants) migrate in the hope of a more prosperous life (International Organization for Migration, 2015).

In 1995, the Schengen Agreement led 26 states to largely abolish their border checks, allowing free movement of persons legally present in EU territory (European Commission, 2013). Migration to Europe has increased in recent years: a record one million refugees arrived in Europe in 2015 (IOM, 2015) and during 2016, 4.3 million people immigrated to EU member states (European Commission, 2018). This flow of voluntary and involuntary migrants has created a multicultural and ethnically diverse Europe (The Migration Observatory, 2016; Eurostat 2018). Policies and services of European nations must be adapted to ensure these migrants can be integrated into society.

1.2 Migrant health

A substantial body of research shows that migrants experience poor physical and mental health outcomes (Bhugra, 2004; Lindert, Schouler-Ocak, Heinz, Priebe, 2008). Forced migrants often endure pre-migration trauma which can increase the risk of mental health disorders (Silove, Sinnerbrink, Field, Manicavasagar, Steel, 1997; Sinnerbrink, Silove, Field, Steel & Manicavasagar, 1997). A systematic review on the prevalence of mental disorders in 6743 refugees settled in Western countries (twenty studies across seven countries) found that in the larger studies almost one in ten were diagnosed with post-traumatic stress disorder (PTSD) and one in twenty were diagnosed with depression (Fazel, Wheeler, Danesh, 2005). However, three-quarters of refugees included in this study were from Southeast Asia, thus cannot be generalised to all refugees and this study should be interpreted with caution. Additionally, asylum seekers can experience prolonged periods of uncertainty due to their precarious resident status which can lead to psychological stress (Carswell,

Blackburden, Barker, 2011). This trauma and stress can mean migrants are vulnerable before they resettle.

Once migrants resettle, they often experience radical changes in lifestyle and social position (e.g. unemployment, lack of social support, identity struggle, discrimination, stigma). A systematic review of seventeen studies in five different countries found that migrants in Europe often start in a disadvantaged socioeconomic position compared to the majority population (after controlling for age and gender) (Nielsen & Krasnik, 2010). This low income can lead to poorer health outcomes due to inadequate living standards (Marmot, 2005; Benzeval et al., 2014). Additionally, migrants may have a lack of social support which can lead to isolation and have a negative impact on mental health (Kawachi & Berkman, 2001).

Furthermore, cultural differences in explanatory models of illness and language differences among migrants and the majority population mean there is a paucity of culturally appropriate treatment and interventions which can exacerbate poor health outcomes (Saha, Beach, Cooper, 2008). Migrants can also experience stigma and discrimination in healthcare which can also decrease the accessibility of services and increase the likelihood of mental disorders, which is also associated with stigma and discrimination (Derose, Escarce, Lurie, 2007; Davies, Basten, Frattini, 2009; Bhugra, 2004).

These post-migration factors can create a downward cycle of vulnerability and poor wellbeing. Many of these adversities are also linked to substance use and misuse, which are also linked to poor physical and mental health (World Health Organization, 2014).

1.3 Substance use and misuse

A psychoactive substance acts upon the central nervous system, changing a person's mental state by altering brain function, leading to temporary changes in cognition, behaviour, and perception (Seymour & Smith, 2013). A wide range of licit and illicit substances exist: prescribed anti-depressants and anti-psychotics are used to treat neurological and psychiatric illnesses; synthetic opioids are often used to treat severe pain and are available by prescription (codeine, morphine) but also includes the illegal drug heroin; substances may also be used recreationally to alter one's consciousness (e.g. coffee, alcohol, cannabis). Many of these substances can cause chemical dependency and may result in substance misuse (Seymour & Smith, 2013).

Substance use and misuse lies on a continuum. For example, the ICD-10 contains a variety of disorders that differ in severity (WHO, 1996). In its classifications, 'acute intoxication' refers to the administration of psychoactive substances that result in a disturbance in cognition, behaviour, and perception; 'harmful use' is classified as use that is causing damage to health; 'dependence syndrome' is diagnosed when an individual may have a strong desire to take psychoactive substances despite

evidence of clear harmful consequences (e.g. harm to the liver due to excessive drinking) and could go into a withdrawal state when use has ceased or been reduced (WHO, 1996).

These ICD classifications are often measured using tools such as the Alcohol Use Disorders Identification Test (AUDIT) (Babor, Higgins-Biddle, Saunders, Monteiro, 2001), which is used by health professionals to identify persons with hazardous and harmful drinking. This continuum can apply to other psychoactive substances such as cannabis, where recreational use will not necessarily lead to a dependence diagnosis. However, identifying those who display these behaviours mean they can be targeted for interventions to prevent future complications (Jordan & Andersen, 2017).

The global burden of substance use and misuse has been extensively studied. Illicit drug use accounts for 20 million disability-adjusted life years (DALY) (one DALY equating to one lost year of ‘healthy life’) (Degenhardt et al., 2013). Substance misuse has also been associated with unemployment and violence (Boles & Miotto, 2003; Henkel, 2011). Cannabis (the most widely used illicit drug in Europe) has been linked with mental health difficulties and poor educational attainment (Van Ours & Williams, 2009). The injection of illegal drugs such as heroin can also cause blood-borne infections and fatal overdoses (World Health Organization, 2010). Moreover, alcohol misuse increases the likelihood of malignant neoplasms, liver cirrhosis, and cardiovascular deaths (Corrao, Bagnardi, Zambon, La Vecchia, 2004). The World Health Organization (WHO) reported that alcohol-attributable disease accounts for 3.0% of global mortality, 3.8% of global burden of disease, and 37% of total DALYs (Mathers & Ayuso-Mateos, 2003).

Additionally, a large body of evidence has shown co-morbidity exists between substance use and misuse and psychiatric disorders (Regier et al., 1990; Kessler et al., 1997; Swendsen & Merikangas, 2000). A person may use substances to alter their mood if they are in a depressive state (Hall & Farrell, 1997) which can be effective in the short term, but it can also become maladaptive, and via various mechanisms add to rather than alleviate mood states, increasing the risk of psychiatric disorders. This can result in poor treatment outcomes due to a complex presentation of symptoms (Regier et al., 1990; Morisano, Babor, Robaina, 2014). In 2016 it was estimated that the burden of disease for mental disorders accounted for 13.0% of DALYs, level with circulatory and cardiovascular diseases (Vigo, Thornicroft, Atun, 2016). Due to the significant burden of substance misuse, groups who are vulnerable to these behaviours should be identified.

1.4 Migrants and substance use

Research has shown that substances are often used as a self-medicating mechanism by individuals facing life stressors (Sinha, 2008; Wills, 1986). The misuse of substances by migrants can be used to desensitise them to the trauma and stressors related to pre-migration (e.g. loss of family) and post-migration (e.g. unemployment, lack of social support) (Alaniz, 2002). The sole longitudinal study in a previous review on substance use among forced migrants found that alcohol use increased after

migrants were residing in the United States for twelve months (Horyniak, Melo, Farrell, Ojeda, Strathdee, 2016). This suggests that post-migration factors could play a key role in mediating substance use in migrant populations.

An increase in substance use among migrants in western countries could also be influenced by the adherence to western norms by migrants (e.g. the high levels of alcohol consumption) during acculturation (Fosados et al., 2007). Acculturation refers to the phenomenon where cultures merge together within a single society (cultural hybridisation) leading to changes in the minority and majority population (Sam, Jasinskaj-Lahti, Ryder, 2006). This hypothesis suggests that cultural hybridisation can lead to the homogenisation (the process of making things uniform or similar) of lifestyles that will lead to similar behaviour patterns among the majority and minority population. In this framework, migrants who are competent in the native language, socialise with native peers, and reside in the host country for a lengthy period, will be more likely to adopt the substance use patterns of the majority population. Second-generation migrants will have similar substance use patterns to the majority populations in comparison to first-generation migrants due to the longer exposure to cultural norms among second-generation migrants (Buchanan & Smokowski, 2009).

In the United States, some studies have shown that migrants have a similar or higher risk of substance use and misuse than the majority population (Brindis, Wolfe, McCarter, Ball, Starbuck-Morales, 1995; Prado et al., 2009). This is consistent with the acculturation hypothesis. The National Epidemiologic Survey on Alcohol and Related Conditions (NESCARC) found that second-generation migrants risk of substance use was closer to the majority population compared to first-generation migrants, however both groups presented less substance use disorders (SUDs) than the majority population (Hasin, Stinson, Ogburn, Grant, 2007). Salas-Wright and Vaughn (2014) conceptualises this as the ‘immigrant paradox’. The ‘healthy migrant’ hypothesis has been suggested to explain this, which suggests that the positive selection of healthy and capable migrants results in a lower risk of unhealthy behaviours (Markides & Coreil, 1986).

Certain religious beliefs have also been proposed as a protective factor against substance use. Islam is the dominant religion among ethnic minorities in Europe in which the consumption of alcohol is prohibited (Michalak & Trocki, 2006). This religious identification can become a fixed identifier, which can ensure alcohol consumption does not increase in the event of adversity and acculturation post-migration (Michalak & Trocki, 2006).

1.5 Existing reviews of substance use and misuse among migrants

Several recent systematic reviews have investigated substance use among persons forcibly displaced by conflict. Horyniak et al. (2016) conducted a review of 63 articles to identify the prevalence and contextual factors associated with substance use in forced migrant populations. The researchers found that prevalence estimates of hazardous and harmful alcohol use ranged from 17-26% in camp settings

and 4%-7% in community settings. Eight of these studies used multivariate analysis and symptoms of mental illness, male sex, trauma exposure were identified as correlates of substance use. Weaver & Roberts (2010) and Ezard (2012) also reported that a low socioeconomic status was positively associated with substance use in reviews of substance use among displaced persons.

The existing evidence addresses important questions, including the mechanisms and risk factors that may underlie substance use in forced migrant populations. However, important questions remain. For example, post-migration factors such as acculturation have not been investigated thoroughly because most studies in previous reviews were conducted in camp settings where a realistic picture of the effect of the host country cannot be explored. This is an important gap to address because understanding the effect of the host country can help ensure the healthy integration of migrants through policy and services.

A further unanswered question relates to substance use in voluntary migrant populations (as opposed to forced migrants). This is an important area to address as this group of migrants still experience post-migration stressors that may underlie unhealthy substance use patterns. Indeed, Horyniak and colleagues were specifically interested in forced migration and therefore excluded 116 studies as it was unclear whether the migrants included were 'forced' (Horyniak et al., 2016). This suggests that there is a potentially significant body of research surrounding substance use of migrants from various backgrounds that has not been included in previous reviews.

1.6 Summary and aims

Migration to Europe has increased and migrants often experience socioeconomic hardship, pre-migration trauma, post-migration stressors, and psychological stress, making them vulnerable to psychiatric disorders and substance use disorders. There are existing reviews of the available evidence, but these have focused on forced migrant populations.

The aim of the current research is to carry out the first comprehensive systematic review of contemporary research on the prevalence and contextual factors of substance use and misuse among migrant populations in Europe. Narrowing the scope of the review to Europe will ensure specific patterns of prevalence and contextual factors can be established. Indeed, Horyniak et al. (2016) attributed the heterogenous results of their review to regional and national differences.

In this review, contextual factors will be used as an umbrella term for potential mechanisms, risk factors, and protective factors for substance use.¹ Moreover, migrants are not a uniform group with regards to ethnicity, cultural beliefs, and reasons for migration. Identifying differences between

¹ Use of this term is consistent with existing systematic reviews on related topics (e.g. Horyniak et al., 2016)

migration groups may be of benefit to policymakers and health practitioners who rely on in-depth and practical information to ensure interventions are tailored to high-risk groups. This will improve efficiency and may help to reduce social inequality in health.

The research questions are as follows: (1) What is the prevalence of substance use and misuse among migrant populations in Europe? (2) Do these prevalence rates differ compared to the majority population? (3) Do second-generation migrants show a closer prevalence to the majority population than first-generation migrants? (4) What are the contextual factors (potential mechanisms, risk factors, protective factors) that are associated with migrant substance use and misuse?

2. Methods

This review is conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure transparent reporting of the process of data collection (Moher, Liberati, Tetzlaff, Atman, 2009). Research Ethics Committee approval was not needed as no primary data was collected from participants.

2.1 Study eligibility

Peer-reviewed primary studies of any design reported in the English language, which included quantitative and/or qualitative findings of alcohol and illicit drug use within migrant populations (of any age) in Europe were eligible. To cover the spectrum of relevant substance-related behaviours, studies were not limited by type of measurement or assessment, and studies conducted in clinical and community settings were also eligible. Studies reporting on individuals with at least one foreign born parent were eligible to assess potential differences between first-generation, second-generation migrants, and the majority population. Studies published after 1995 were eligible to identify recent high-quality research.

Criteria for exclusion included: review articles, secondary research articles (e.g. primarily theoretical papers), case studies of individual migrants, and studies on cell migration and prescribed drugs.

Consistent with recent reviews (Ezard, 2012; Horyniak et al., 2016), studies that report solely tobacco use were excluded. Intervention studies were also excluded.

2.2 Search Strategy

To identify relevant studies, article abstracts published in electronic databases (MEDLINE, psychoINFO, SocINDEX) were searched. These databases were selected to cover literature in the fields of biomedicine, psychology, and sociology. To cover the key domains relevant synonyms and variations of ‘migrants’ and ‘substance use’ were included in the search. These search terms can be found in Box 1. After piloting search terms, results indicated that as a standalone term ‘migration’

retrieved a substantial number of articles on cell migration (which were not relevant to the review) and was not included in the search.²

Box 1: Terms used in database search

alcohol OR "drug use" OR "drug abuse" OR cocaine OR amphetamine OR khat OR quat OR cannabis OR opiate OR heroin OR "substance use" OR "substance abuse" OR "substance dependence" and refugee OR refugees OR "asylum seeker" OR "asylum seekers" OR "displaced person" OR "displaced population" OR "forced migration" OR migrant OR immigrant OR "post-migration" OR "post migration"

2.3 Study selection

Figure 1 below outlines the identification and screening process. Records were identified from the database search (n=2316) and extracted into endnote. First, duplicate records were removed (n=451). Titles and abstracts were then screened against the inclusion and exclusion criteria. A total of n=150 potentially eligible abstracts were retrieved and screened. Following screening, n=70 articles were eligible for full text retrieval and assessment of eligibility. Of these, twelve were not empirical studies, seven were unavailable in the English language, two were studies on prescribed drugs, two were conducted outside of Europe, one was a non-peer reviewed paper, and one could not be retrieved. Following the full screening and selection process n=45 studies were included in the review.

2.4 Data extraction and quality assessment forms

Standardised templates created specifically for this review were used for data extraction. For studies reporting quantitative methodology, relevant data extracted included: publication details (e.g. authorship, year), sample characteristics (size, ethnicity, age, gender, host/origin country), and methodology (design of study, measurements of substance use/misuse). Relevant findings would include: prevalence rates of substance use and misuse, demand or utilisation of services for substance use and misuse, and contextual factors for substance use (pre-migration trauma, post-migration stressors, risk factors, protective factors). The template for studies reporting qualitative findings included similar sections with respect to contextual factors with the addition of sections dedicated to ethical standards and the setting of the study (rationale behind setting, appropriateness of design for research aims). Templates used can be found in Appendix 1. Included articles were assessed for their methodological and reporting quality. The AXIS quality appraisal tool (Downes, Brennan, Williams,

² Previous systematic reviews also omitted the term (Horyniak et al., 2016; Weaver et al., 2010).

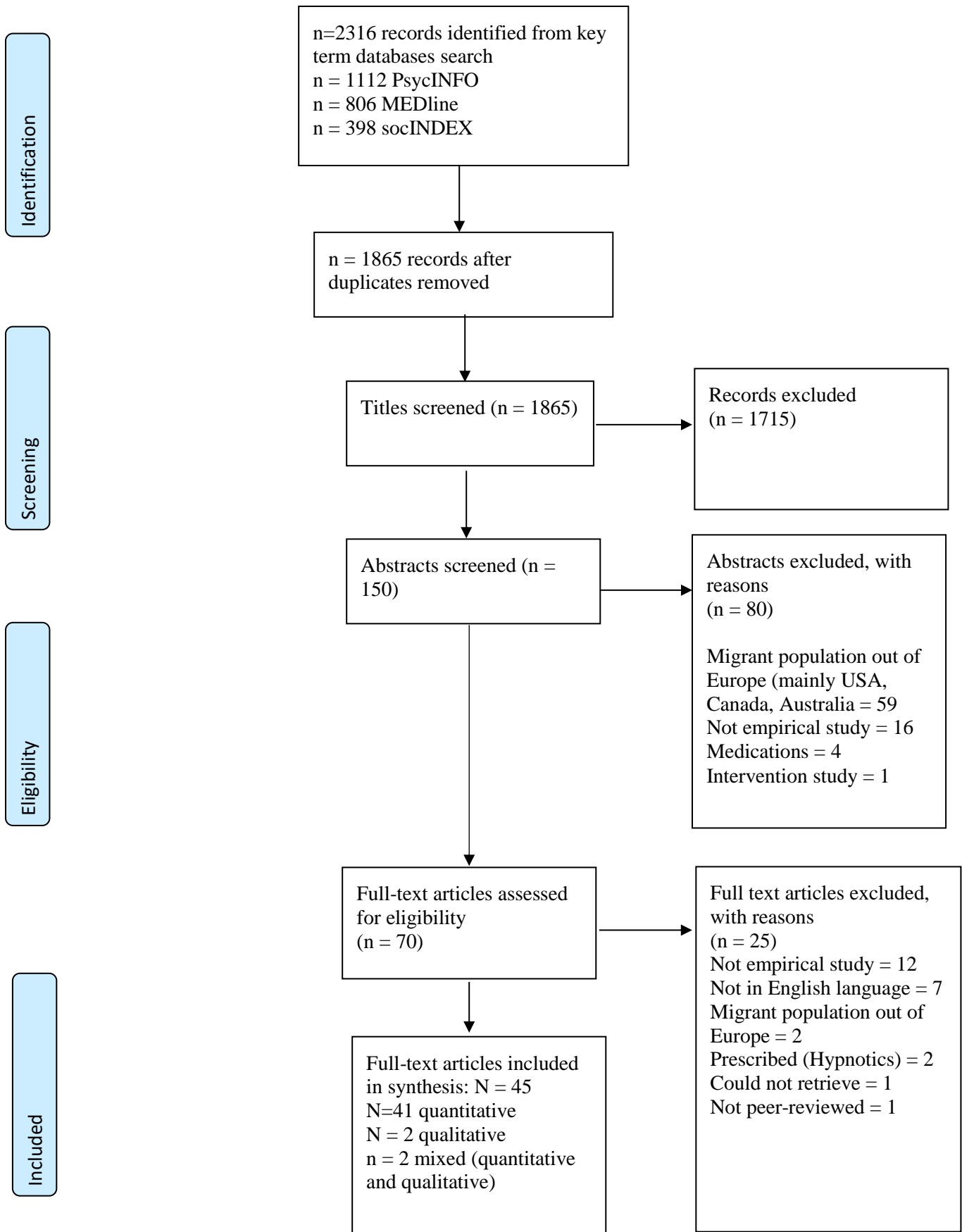


Figure 1: Flow diagram of the article identification and selection process

Dean, 2016) (Appendix 2) was utilised to appraise cross-sectional studies which formed the majority study type in this review (n=35). The AXIS tool includes a comprehensive list of markers on methodology (e.g. sample justification, appropriate population base) and results and discussion (e.g. adequate data description, internal consistency, conclusion justification).

The remaining studies were cohort studies (n=7) and were appraised using The Newcastle-Ottawa Quality Assessment Form (Wells, Shea, O'Connell, Robertson, Peterson, 2018) (Appendix 2) which included markers on the representation of the exposed cohort, measures used, the control of confounding variables, outcome assessment, and follow up attrition.

The Critical Appraisal Skills Programme (CASP) Qualitative Research Checklist (Singh, 2013) (Appendix 2) was used to appraise qualitative studies (n=2) which included points on the appropriateness of recruitment strategy and data collection, the researcher and participant relationship, ethical issues, and the value of results to the general population. Mixed-methods studies (n=2) will be appraised using one of the tools above depending on the primary focus of the study.

For each quality appraisal tool, ratings of individual components will inform judgement on the overall quality of the study. The CASP and AXIS tools utilise a yes/do not know/ unsure system when rating items whilst The Newcastle-Ottawa tool uses a star system. After using the approach endorsed by the tool authors/manual to ensure validity, studies will be appraised as low, medium, or high.

3 Results

3.1 Study characteristics

A total of 45 studies were included in the synthesis. Most (n=41) studies reported quantitative results, with a smaller number of qualitative (n=2), and quantitative and qualitative (n=2) studies. Most of the quantitative studies were a cross-sectional (n=36) design, with the remaining (n=7) studies using cohort designs, some of which also included qualitative components. Most studies were conducted in Sweden (n=9) and Spain (n=7), and participants were mostly migrants in the general population (n=20) and migrant adults in a clinical setting (n=11). Most of the studies reported alcohol use (n=15). More information on study characteristics can be found in Table 1.

3.2 Data synthesis

Given the heterogeneity in study designs, populations, settings, methods (e.g. measurements) and definitions of substance use and misuse, a narrative synthesis was undertaken rather than a meta-analysis. Initially, prevalence will be considered and findings for alcohol, cannabis, and illicit substance use will be presented separately. Due to the comprehensive nature of this review, any prevalence rate will be reported even if it does not provide further statistical tests. When statistical tests were conducted, and findings were statistically significant, this will be stated in the synthesis and

will be indicated with an asterix (*) in the results summary found in Table 2 along with any relevant test results such as risk and odds ratios. Contextual factors will also be described in Table 2.

Table 1: Study characteristics

Country of study	Sweden (n=9), Spain (n=7), Netherlands (n=6), France (n=5), UK (n=4), Norway (n=3), Switzerland (n=3), various (n=3), Germany (n=2), Ireland (n=1), Finland (n=1), Italy (n=1)
Research Population	Migrants in the general population (n=20), adults in a clinical setting (n=11), adolescent school pupils (n=7), refugees/asylum seekers (n=4), and other youth groups (n=3)
Substance Reported	Solely alcohol use (n=15), illicit drug use and alcohol use (n=13), illicit drug use (n=7), alcohol and cannabis (n=6), cannabis (n=2) and khat (n=2).

Important aspects of methodology and study quality (e.g. controlling for confounding variables) will be reported to infer the quality and reliability of the findings. Studies that shed light on, support, or are inconsistent with relevant theoretical accounts of substance use (e.g. acculturation) will be highlighted. As the terminology and definitions of substance use varied across studies, this review will retain the language of the original articles to ensure consistency.

3.3 Quality assessment

When the cross-sectional studies (n=36) in this review were appraised, seven of these were judged to be of high quality, sixteen medium quality, and thirteen low quality.

The higher quality studies had good controls (e.g. adjusting for socioeconomic status), the sampling was random, employed large sample sizes, and there was a comprehensive and accurate discussion of results. The lower quality studies had a low response rate (meaning the sample is unlikely to be representative), a small sample, did not control for confounding variables, had a lack of discussion, had data missing, used different sampling methods across groups, and limitations of the study were not discussed.

When the cohort studies (n=7) in this review were appraised, six of these were judged to be of high quality. These were all register studies investigating SUDs, with large sample sizes, groups were matched on or adjusted by background variables (e.g. gender and age) which are likely to be generalisable and externally valid. The remaining cohort study was of low quality due to a small sample size and lack of control for confounding variables.

Two studies reporting qualitative findings were of high quality, with strong rationales for recruitment strategies and the relationship between the researcher and participants was considered with a thorough

analysis of the results. The quality assessment ratings for all individual studies can be found in Table 2.

3.4. Prevalence rates

This section describes the prevalence rates and risk of substance use and misuse among migrants, including differences between the majority population and migrants, first and second-generation migrants, and ethnic groups.

3.4.1 Alcohol consumption

Sixteen studies reported alcohol consumption and most used self-administered questionnaires assessing weekly, monthly, and yearly consumption.

In studies where differences between migrants and natives were reported, all but one found the native population were more likely to consume alcohol than migrants (Amundsen, 2012; Amundsen, Rossow, Skurtveit, 2005; Delforterie et al., 2016; Hawkins, Lamb, Cole, Law, 2008; Canfield, Worrell, Gilvarry, 2017). Two studies reported this after adjusting for background variables (e.g. age and gender) (Hüsler & Werlen, 2010; Reijneveld, Van Nieuwenhuiizen, Velderman, Paulussen, Junger, 2012). An exception to this was a study where a higher prevalence of alcohol use was reported in Latin American migrants compared to natives in Spain (Marsiglia, Kulis, Luengo, Nieri, Villar, 2008).

Three studies found that second-generation migrants were more likely to consume alcohol than first-generation migrants and had a closer prevalence to the majority population (Hüsler & Werlen, 2010; Lorant et al., 2016; Hawkins et al., 2008). One of these adjusted for background and socioeconomic variables (Hawkins et al., 2008). These findings are consistent with the acculturation hypothesis that the longer exposure to the host country will lead to a similar risk of alcohol consumption to the majority population. However, these studies did not report the differences between ethnic groups, which could provide an alternative explanation of these findings. For example, in Hüsler and Werlen (2010), there was a higher percentage of second-generation compared to first-generation migrants from Europe (53% vs. 20%) and when ethnic differences were reported, studies found non-European migrants (Africa, Middle East, and Asia) were the least likely to consume alcohol (Sordo, Indave, Pulido, 2015; Arsenijevic & Groot, 2015). The differences between alcohol consumption in Middle Eastern migrants and natives living in Belgium and Germany were statistically significant (Arsenijevic & Groot, 2015).

Two studies conducted in Sweden found that Nordic and Finnish migrants were more likely to consume alcohol compared to native Swedes (Holmberg & Hellberg, 2008; Svensson & Hagquist, 2010). In Svensson and Hagquist, this finding was statistically significant in second-generation Nordic migrants compared to natives. The high average number of drinks consumed when drinking by

Table 2: Key characteristics, methods, and main findings of included studies

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
Abebe (2015) Conducted in 2006, Norway	Adolescents N = 10,934 (73% Norwegian; 9.8% FGM, 17% SGM: Europe, Middle East, Asian, Africa; 51.2% females; 14-17y)	Cross-sectional Young in Oslo Study N = 68 schools selected at random Self- administered questionnaire Binge drinking (5+ drinks \geq 1 week in past year); cannabis use (Any use \geq 1 in past year)	-Binge drinking: FGM from Europe and USA highest risk (OR 1.29; 95% CI 0.69-2.40) and FGM from Africa lowest risk (OR 0.30; 95% CI 0.09-0.91)* -Cannabis use: FGM from Europe and USA highest risk (OR 1.29; 95% CI 0.69-2.40) and SGM from Asia (OR 0.29; 95% CI 0.17-0.49) and African FGM (OR 0.30; 95% CI 0.09-0.91)* having a lower risk Adjusted for age, sex, socioeconomic factors, psychological symptoms, and religion in LR	- Controlling for religion in MV analysis meant there was no longer significant difference in prev of binge drinking & cannabis use between FGM from the Middle East and natives - More parental social control in parent-adolescent relationship lowered risk of binge drinking, explaining lower prev of binge drinking in SGM from Asia - Depressed symptoms positively associated with binge drinking & cannabis use, but only accounted for ethnic differences in binge drinking in FGM from Asia and Africa	MED
Adhikary (2008) 2007, UK	Nepalese migrants N = 327; 75% male, 18-74y (66% 30-45y)	Cross-sectional Convenience sample (Recruited via Nepalese community leaders & media) Self-administered questionnaire or phone interview Alcohol use (ever, frequency)	61% consumed alcohol	-Males were ten times at risk of consuming alcohol than females* -<30y had a lower risk of consuming alcohol than >45y * Adjusted for gender, age, education, ethnicity, duration of stay, and locality in MV LR	LOW

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
Ahmed (2011) 2006, Ireland	Psychiatric hospital referrals received in 2006; N = 154 (113 natives, 41 migrants: n=15 new EU accession states, n=9 Western Europe, n=7 Africa, n=3 Balkans, n=2 Asia, n=1 South American n=1 Belarus) 51% males; M = 32.6 (natives), M = 30.1 (migrants)	Retrospective cohort study New referrals in 2006 included Examination of case notes for all new referrals. Mental and behavioural disorders due to psychoactive substance use (ICD-10)	- Of the psychiatric referrals, alcohol diagnosis more likely among non-Irish (39% of cases) than Irish (17% of cases) - 15% Irish needed detoxification/ vs 37% non-Irish		LOW
Amundsen (2012) 2002, Norway	Non-Western immigrants in Oslo (Iranians, Pakistanis, Turkish) N = 18,770: Youth Study (15-16y) n=7343; adult Cohort (30-75a) n=18,770, immigrant group (20-60) n= 3019; 41% females	Cross-sectional The Oslo Health Study (HUBRO) Standardised main questionnaire in post and invitation to attend clinical examination with 2 nd questionnaire (acculturation questions) Alcohol frequency	- Natives had a higher prev than migrants (drinking weekly): Adult group: Norwegians (54%), Iran (18%) Turkish (12%) Pakistan (2%)	- Muslims had a lower drinking frequency; * for migrants from Pakistan (strongest association) and Turkey but not migrants from Iran - Being female was negatively associated with alcohol frequency* - Host culture competence (e.g. Norwegian language skills, reading Norwegian newspaper) was positively associated with drinking* - Own culture competence (e.g. reading newspaper in own language) was negatively associated with drinking* - Living in Norway for a longer time was negatively associated with drinking*; however, this was accredited to Pakistanis having the	MED

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				lowest consumption and living in Norway the longest.	
Amundsen (2005) 2000-2001, Norway	Students 10 th Grade N = 5,840 (n=4627 natives, n=1213 migrants; n=564 Pakistan, n= 105, n=96 Somalia, n=74 Morocco, n=54 Iraq, n=90, Vietnam, n=64 India) 3612 male, 3695 female; 36 NR; 15-16y	Cross-sectional Oslo Health Study Self- Administered Questionnaire: Have you ever drunk alcohol, how often, have you got drunk?	- Migrants had a lower prev compared to natives: Migrants (drank alcohol ever) 36% males; 24% females vs natives 86% males; 89% females Migrants (have been drunk twice+) 34% male, 28% females vs natives 49% males, 63% females	- A large percentage of Muslims in a school had a moderating effect on all student drinking levels (drunk alcohol ever, drunk alcohol ≥ 2 m, being drunk ≥ 2) *for male students of Norwegian background (drunk alcohol ever) - As years living in Norway increased, alcohol use increased in migrants (migrants from Pakistan retained their low level of drinking even after a long stay) Adjusted two level LR (school/person)	MED
Arsenijevic (2017) 2013, 14 European countries	Migrants (50y+); N=792 EU country, N = 239 Africa, N=114 Middle east; overall gender distribution N/A	Cross-sectional Wave 5 Share Data Alcohol consumption coded 1 if individual drinks 2+ glasses of alcohol daily	-Migrants from Africa & Middle East had the lowest prevalence - 0% in Austria, Italy, Estonia, and Czech - The differences between alcohol consumption in Middle East migrants and natives living in Belgium and Germany* Groups matched by age, education level, marital status, work status, income status, body mass index, mobility status and general health status		HIGH

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
Bodenmann (2010) 2004-2005, Switzerland	Patients attending emergency care unit at university hospital N = 400 (41 % native, 59% migrants) ‘Developed countries’ (21.5% EU - France, Portugal, Italy, Spain; US, Canada, Chile) ‘Developing countries’ (15.5% Sub Saharan Africa, 5.7% South America, 4% Eastern Europe, 3.5% North Africa 2.7% Asia, 1.7% Middle East; 218 males; M=35	Cross-sectional AUDIT-C ≥ 3 females, ≥4 males indication of unhealthy use of alcohol	- Natives had the high prev of unhealthy use of alcohol (86.7%) compared to migrants from developing countries (66.2%) and developed countries (78.4%) – this remained after adjustment for religion in a MV - Migrants from developing countries had the lower risk of unhealthy use of alcohol way (OR 0.35; 95% CI 0.22–0.57) Adjusting for age, gender, and education in LR	- Migrants who had mastered the local language, who had been in Switzerland for >5 years, and male led to an increased risk* - Not being Muslim, a lack of family support, and those ≥30y led to an increased risk	HIGH
Bogic (2012) 2005-2006, Germany, Italy, UK	Refugees from Yugoslavia in Germany, Italy and UK; N= 854 (n= 255 Germany; n= 297 Italy; n= 302 UK) 57.3% Bosnia and , 17.6% Kosovo, 12.6% Serbia 9.8% Croatia, 2.7% Macedonia; 51.3% female; 18-65y (M = 41.6)	Cross-Sectional Random/ non-random sampling – resident registers (Germany, Italy) & community organisations, snowball sampling (UK) MINI International Neuropsychiatric Interview (MINI) ICD-10	- SUD among refugees highest in Germany (11.8%) than Italy (0.7%) and the UK (1.7%) - AUD among refugees highest in Germany (4.7%) than Italy (0.3%) and the UK (0.7%)	-Being young (20-40y vs 41-65y), being male, not living with a partner positively associated with SUD - Post-migration factors e.g. separation from family, financial difficulties, unemployment led to an increased variance of 20.7% for SUDs* Adjusting for mental health status and age in LR	LOW
Campisi (2017)	Post-mandatory schools in Fribourg	Cross-Sectional	-Cannabis use (males): Higher risk in FGM & SGM compared to natives		HIGH

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
2014-2015, Switzerland	(n=5 high-school/n=6 professional school; N= 5058 (n=3030 natives, n=496 FGM, n=739 SGM, n=793 mixed-origin; 47% female; 15-24y	<p>Generational – longitudinal study assessing lifestyle of adolescents and young adults</p> <p>Self- Administered Questionnaire: Cannabis use (≥ 1 during past month), use of illegal substances (≥ 1 during the past month), alcohol misuse (≥ 1 episode of drunkenness during the past month)</p>	<p>FGM vs natives (OR 1.24; 95% CI 0.74-2.10)</p> <p>SGM vs natives (OR 1.04; 95% CI 0.65-1.64)</p> <p>-Cannabis use (females): Lower risk in FGM & SGM compared to natives</p> <p>FGM vs natives (OR 0.92; 95% CI 0.55-1.56)</p> <p>SGM vs natives (OR 0.95; 95% CI 0.61-1.48)</p> <p>- Drug use (males) Higher risk in FGM compared to natives but not SGM</p> <p>FGM vs natives (OR 2.27; 95% CI 0.79-6.48); SGM vs natives (OR 0.78; 95% CI 0.30-2.03)</p> <p>- Drug use (females) Higher risk in FGM & SGM compared to natives</p> <p>FGM vs natives (OR 1.72; 95% CI 0.67-4.36); SGM vs natives (OR 1.69; 95% CI 0.49-5.81)</p> <p>- Alcohol misuse (males) Lower risk in FGM & SGM compared to natives</p> <p>FGM vs natives (OR 0.38; 95% CI 0.26-0.56); SGM vs natives (OR 0.34; 95% CI 0.24-0.48)</p> <p>- Alcohol misuse (females) Lower risk in FGM & SGM compared to natives</p> <p>FGM vs natives (OR 0.53; 95% CI 0.36-0.76); SGM vs natives (OR 0.48; 95% CI 0.35-0.64)</p>		

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
			Adjusted for variables which were * at bivariate level (not stated)		
Carta (2001) 1994-1996, Paris & Sardinia	FGM & SGM Sardinians in Paris compared to Parisians and Sardinians in their own country N = 153 Sardinians in Paris, n=2260 Parisians, n= 1040 Sardinians; 47.1% males; 18+y	Cross-Sectional Sardinians in Paris (telephone directories) 1/5 selected at random Sardinian & Parisian population: population registers CIDIS 'drug dependency' having substances 5+ in lifetime	- Drug dependency higher among Sardinians immigrants (3.9%) compared to Parisians (0.8%) and Sardinians (1.2%) 6- month frequency (results standardised by sex and age)		LOW
Chédebois (2009) 2007-2008, France	Adolescents from high schools (Essonne, Midi-Pyrénées) with at least one foreign parent; N = 292 (58.2% Europe, 28.4% North Africa, 9.2% Dom Tom, 3.1% Asian, 1.1% North and South America; 112 females, 170 males, 17y	Cross-Sectional Self-reported questionnaires Cannabis use (9- point scale)	- 33.6% used cannabis at least once in past 3m, 21.3% were occasional users (once/twice a week), 12.3% were regular users (4x a week)	- Integration (positive attitude towards both cultures) and assimilation were negatively associated to cannabis use Adjusting for age, sex, socioeconomic status, alcohol use, psychopathological variables in multiple regression analysis	MED
Delforterie (2014)	5 largest groups of immigrants in Netherlands living in	Cross-sectional	- Past year cannabis use was highest in Surinamese migrants (23.5%) and lowest in Moroccan migrants (11.5%)	- Linguistic acculturation had a positive association to cannabis use e.g. Surinamese speaking Dutch at	MED

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
2010-2013, Netherlands	four major Dutch Cities (Amsterdam, the Hague, Rotterdam, Utrecht N = 771 27.3% Surinamese, 27.1% Morocco, 14.3% Turkey, 14.1% Antilean, 17.3% Asia; 53.8 female, 15-24y	I4culture – recruited from schools, streets, other public areas Schools selected with high percentage of migrants in school Self-administered questionnaire Cannabis use: past year/ no past year use	- SGM highest cannabis use compared to FGM in all groups e.g. Surinamese SGM (78.1%) vs FGM (19.5%); Turkish SGM (88.2%) vs FGM (10.9%)	home (85.2%) with 34.3% cannabis use compared to Turkish (25.5%) with 16.4% cannabis use - There was also a positive association between linguistic acculturation and affiliation with cannabis using peers* Adjusting for age, sex, alcohol/tobacco use and religion in logistic regression	
Delforterie (2016) 2010-2013, Netherlands	Five largest groups of immigrants in Netherlands living in four major Dutch Cities; N = 705 (25.2% migrants); Islamic adolescents omitted from analyses; 47.2% females; 15-17y	Cross sectional Recruited via schools & public areas Self-administered I4culture – migrants & natives RADAR- natives Alcohol use: no use, non-weekly use, weekly use	-Natives more likely to report weekly alcohol use than migrants (29% vs 28%)	- Males reported more weekly alcohol use (29.8%) vs females (26.6%) A higher level of parental control was associated with lower weekly alcohol use Adjusting for gender, age, religion, and cohort in LR	LOW
Marsiglia (2008)	7-10 th Grade students from n= 10 urban secondary schools;	Cross-sectional	- Latin Americans had the highest lifetime prev of alcohol natives (49%) compared to natives (33%) while the		MED

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
2005, Spain	N = 817 (72% natives, 28% migrants: 28% Latin America, 73%, Europe, 14% Africa 10%, other 3%; Gender distribution N/A	Schools selected with high % of migrants Self-administered questionnaire Cannabis and alcohol use intentions (likelihood of accepting offers) and use (lifetime)	opposite was found for cannabis use (6% vs 11%)		
Haasen (2008) 2004, Germany	Afghan migrants that have migrated to Germany after 5 th birthday & been in Germany 12m+ N = 50; 92% males; 22-64y (M=42.6)	Cross-sectional Snowball sampling Migrants asked if they drank any alcohol at all then AUDIT (cut off for high-risk 8 points) Remaining then interviewed	Mean value of AUDIT 17.5	- Positive correlation between severity of mental distress and severity of alcohol use* - Acculturation stress linked to mental distress* but not directly to severity of alcohol use	LOW
Haasen (2004) 1998-2001, Germany	Turkish migrants N= 103; 93.2% males, M=28.1	Cross-sectional Collected from addiction counselling centre (Hamburg) Severity of dependence rated by EuropASI	-Heroin main drug in all interviewees - 40.5% used cocaine, 31.5% cannabis, 19.1% cocaine and cannabis	Positive correlation between severity of addiction and discrimination The severity of dependence was higher for individuals without partners for individuals without previous inpatient treatment Conflicts with family and association with severity of addiction*	LOW

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
Hawkins (2008) 2000-2002, UK	British/Irish (white) mothers and mothers from ethnic minority groups during pregnancy in UK N = 6478 British/Irish, N= 2110 Ethnic (N= 849 Pakistani/Bangladeshi, n=402 Black; n=348 Indian n=207 other white, n=204 other, n=100 mixed; M = 29	Cross-sectional Stratified clustering – overrepresenting children from ethnic minority groups and disadvantaged areas Alcohol consumption during pregnancy (never-every day)	- Migrants groups less likely to consume alcohol (14%) than British/Irish mothers (37%) - Pakistani/Bangladesh migrants least likely to consume alcohol (0%) with ‘other white’ migrants being the most likely (34%) - SGM were at a higher risk (OR 1.96; 95% CI 0.88-4.37) compared to FGM (OR 1.43; 95% CI 0.88-2.33) after adjusting for ethnic group, age, socioeconomic circumstances, family income, single motherhood in LR	- Those who spoke English only were at a higher risk of drinking* than mothers who spoke English language and another language at home who were also at a higher risk than mothers who spoke only another language (1)	MED
Hjern (2004) 1990-1999, Sweden	FGM & SGM - hospital admission for AUDs N= 1.72million n=1.31million Swedish, n=0.41m migrants; Finland, Western Europe (Norway, Denmark, Iceland, Germany, UK, US & Canada, other); Eastern Europe (Poland, Hungary, Other) Southern Europe (Poland, Hungary, Other); Middle East (Turkey, Iran, Iraq); Non-European (Far East,	Cohort study Demographic data from Swedish Population and Housing Census (1985) 2.7m 10-68a 1.2m children/ 1,47m adults Swedish Hospital Discharge Register (1990-1999) Residents included if they’ve lived in Sweden for at least 5yrs Alcohol related disorder – ICD 9	- FGM and SGM from Finland at a higher risk of AUD compared to the native population: Parent group native (RR = 1) Finnish FGM (RR 2.1; 95% CI 2.0-2.3); Youth group natives (RR = 1); Finnish SGM (RR 1.9; 95% CI 1.7-2.1) - FGM migrants from the Middle East (RR 0.1; 95% CI 0.1-0.2) and other non-European (RR 0.2; 95% CI 0.2-0.3) lowest risk; SGM slightly higher risk: Middle East (RR 0.3; 95% CI 0.2-0.5) and non-European (RR 0.6; 95% CI 0.5-0.8) - Intercountry adoptees had the highest risk of (RR 2.5; 95% CI 2.1-3.1) - After adjusting for year of birth, sex, SES, single-parent household, social	- Those on social welfare were five times at risk compared to those who weren’t - Middle East migrants had the lowest SES and highest proportion of social welfare (28.3% received) compared to Sweden (3.9%) - Intercountry adoptees had the lowest social welfare (1.7%) - Males were more likely to have AUDs in all migrant groups	HIGH

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
	South Asia, Chile, other Latin America, Africa); overall gender distribution N/A; 10-68y		welfare, geographical location of home in MV		
Hjern (2004) 1990-1999, Sweden	SGM in Sweden – hospital admissions for illicit drug abuse N = 1.25million (n=1.06 million natives, n=0.19m migrants: Finland, Western, Eastern Europe, Southern Europe, Middle East, Non, European, Intercountry adoptees (no record of biological parents, living in house with all adults Swedish born); 48.9 % male, 10-30y	Cohort study Swedish National Board of Health and Welfare & Statistics Sweden Residents in 1985 census no longer recorded as Swedish residents in 1990 excluded Residents included if they've lived in Sweden for at least 5y ICD-9/ 10 (10 used when analysing ethnic patterns of specific drugs due to more elaborate classification)	- Males were more likely to have a SUD than females (0.55% v 0.32%) - African males were more likely to have a SUD (2.94%) while Middle East females were least likely (0.10%) - Intercountry adoptees had the highest risk of SUD (RR 2.8; 95% CI 2.2- 3.4) compared to natives (1) and all SGM migrants - Finnish migrants had the highest risk (R 1.7; 95% CI 1.5-1.9) Adjusting for age, sex, socioeconomic status in MV	- Migrants from Middle East had the highest social welfare proportion while intercountry adoptees had the lowest - Those receiving social welfare were three times at risk of SUD than those who weren't - When adjusting for socioeconomic factors the risk of SUD for migrants from the Middle East and non-European disappeared - SGM who settled in Sweden while they were 13-17y had a lower risk than SGM settled before 13y who had a similar adjusted risk to natives	HIGH
Holmberg (2008) 2004-2005, Sweden	Turkish, Middle Eastern, Swedish, and Finnish adolescents N = 3,126 (93.6% natives, 2.7% Finland, 3.7% Turkey & Middle East (3.7%), 13-18y	Cross-sectional Compulsory high school (10 schools) Q90 questionnaire	-Finnish males more likely to drink than Turkish and Middle East (38.5% vs 20.0%) but had a similar prevalence to Swedish (37.1%) - Finnish had highest average number of drinks (11.85)* compared to Turkish and Middle East (6.99) and Swedish (8.51)	- Alcohol use in Muslim/ other religions lower (11%) compared to non-religious (31%)	LOW

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
		Alcohol use ≥ 1 a month, Average number of drinks when drinking, cannabis smoking (ever)	<ul style="list-style-type: none"> - Finnish males more likely to have used cannabis (18%) compared to Turkish and Middle East (4.0%) Swedish (5.6%) - Finnish girls more likely to drink than Turkish and Middle East (41.2% vs 12.0) and Swedish (37.0%) - Data missing for average number of drinks and cannabis use for females <p>Adjusted for ‘possible confounding variables’ in LR</p>		
Hüsler (2010) 2005, Switzerland	N = 1352 (51% natives. 49% migrants); FGM: 20% Europe, 39% Balkans, 41% Africa, Near East, US; SGM 53% Europe, 31% Balkans, 31% others; overall gender distribution N/A; 11-20y	<p>Cross-sectional</p> <p>Supra-f study – national secondary prevention program (not well integrated into society: risk of dropping out of school, outside of formal education, unemployed)</p> <p>Referral by schools, social institutions, legal institutions. Parents of youth</p> <p>Alcohol use (6-point scale)</p> <p>CU (5-point scale)</p>	<ul style="list-style-type: none"> - Alcohol consumption highest in 11-15a native males (11-15) (2.85) compared to FGM (2.13) and SGM (2.13) - Cannabis use highest in 11-15a natives (2.02) compared to FGM (1.61) and SGM (1.59) - Alcohol consumption highest in 16-20 natives (3.61) compared to FGM (2.58) and SGM (3.34) - Cannabis use highest in 16-20 natives (2.93) compared to FGM (1.92) and SGM (2.55) - Alcohol consumption highest in 11-15a native females (2.75) compared to FGM (2.23) and SGM (2.10) - Cannabis use highest in 11-15a natives (1.77) compared to FGM (1.33) and SGM (1.40) 	- The relationship between socio-demographic background and substance use stronger for males e.g. a low sociodemographic background in males led to high risk of cannabis use which didn’t apply to females - similar findings for alcohol, however the socio-demographic covariate didn’t increase the risk as much	MED

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
			<p>- Alcohol consumption highest in 16-20a natives (3.28) compared to FGM (2.28) and SGM (2.91)</p> <p>- Cannabis use highest in 16-20a natives (2.64) compared to FGM (1.48) and SGM (2.13)</p> <p>Mean point scale scores</p>		
Leão (2006) 1992-1999, Sweden	FGM & SGM hospitalized due to Alcohol and Drug Abuse; N = 2,243,546 (n= 1.7m natives, 0.54 migrants); FGM (Finns, Labor immigrants, Refugees) SGM (Finns, Labor immigrants, Refugees, Swedes/Finns, Swedes/labor immigrants, Swedes/refugees, Unclassified ; Refugees – all countries except Finland, Labor immigrant countries, Sweden; 1,094,648 females, 20-39y	<p>Cohort study</p> <p>Followed from 1992 to 1999 for first hospital admission to death, emigration, or end of study</p> <p>Immigration register/ Register of Total Population, and Swedish National Hospital Discharge Register</p> <p>Alcohol Abuse (ICD-9/10) Drug abuse (ICD 9/10)</p>	<p>- Highest risk of alcohol abuse in FGM Finnish females (OR 3.61; 95% CI 3.29-3.96) compared to SGM Finnish (OR 2.60; 95% CI 2.19-3.10), and SGM natives/Finnish (OR 1.61; 95% CI 1.39-1.88)</p> <p>- Highest risk of alcohol abuse in FGM Finnish Males (OR 4.38; 95% CI 4.15 – 4.64) compared to SGM Finnish (OR 2.62; 95% CI 2.37-2.91) and SGM natives/Finnish (OR 1.69; 95% CI 1.55-1.85)</p> <p>- FGM female refugees had the lowest risk for alcohol abuse (OR 0.57; 95% CI 0.48-0.67)* (remained after adjustment for income)</p> <p>- Highest risk of drug abuse FGM Finnish females (CI 2.06; 95% 1.86–2.2) compared to SGM Finnish (OR 2.09; 95% CI 1.72–2.56) and natives (1)</p>		HIGH

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
			<p>- Highest risk of drug abuse in FGM Finnish males (OR 2.62; 95% CI 2.38–2.90) compared to SGM Finnish (OR 2.32; 95% CI 2.02–2.66)</p> <p>- FGM female refugees had the lowest risk for drug abuse (OR 0.77; 95% CI 0.65-0.90)* (remained after adjustment for income)</p> <p>Age adjusted hazard ratios</p>		
<p>Lorant (2016)</p> <p>2013, Belgium, Finland, Germany, Italy, Netherlands, Portugal</p>	<p>N = 10,265 (26% immigrant background: n=770 FGM n=1589 SGM n=717 didn't speak local language at home; 50% female, 14-16y</p>	<p>Cross-sectional</p> <p>SILNE study Survey (n=50 schools in cities of similar size, income, & employment rates close to national average)</p> <p>Self-administered survey having drink of alcohol, cannabis use ≥ 2 a month in last 12m</p>	<p>- Migrants drank less alcohol compared to natives (32.4% v 36%)</p> <p>- FGM drank less than SGM (28.8% v 32.1%) and those who didn't speak other language at home (25.4%)</p> <p>- Migrants used cannabis more than natives (18.9% vs 15.1%)</p> <p>- FGM used cannabis more than SGM (10.2% vs 8.8%) and those who spoke other language at home (7.6%)</p>		MED
<p>Lundgren (2012)</p> <p>2002-2008, Sweden</p>	<p>Individuals assessed for drug use disorder in Swedish welfare system 2002-2008 n=13,903: 69% natives, FGM (6% born outside Sweden but within Nordic countries), 10% SGM born</p>	<p>Cross-sectional</p> <p>National ASI database</p> <p>Number of times in outpatient drug use disorder treatment (for narcotics dependence); how many times they had been in</p>	<p>- Parents with parents born outside of Nordic (OR 1.41; 95% CI 1.19- 1.68) had a higher risk of compulsory treatment than individual born in Sweden with Nordic parent (OR 1.04; 95% CI 0.86-1.24), individuals born in Nordic country (OR 0.72; 95% CI 0.56-0.93) and individual born outside Sweden and Nordic countries (OR 0.93; 95% CI 0.78-1.10), and</p>	<p>- Those who been in in-patient treatment for psychological problems had been in compulsory treatment for drug treatment more compared to those who had not*</p> <p>- Those who received outpatient mental health counselling were less likely to report compulsory drug</p>	HIGH

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	outside Nordic countries, 8% born in Sweden with at least one parent in Nordic Country, 7% born in country had at least one parent born outside Nordic countries; 69.1% male; M = 40	residential treatment; and number of times these treatments were compulsory Individuals had been assessed using Addiction Severity Index (1992)	individuals born in Sweden with Nordic parents (OR 1.04; 95% CI 0.86-1.24) Adjusting for age, gender, education, history of inpatient and outpatient psychiatric treatment, history of receiving medications for psychiatric problems, number of times charged for crime, being on parole/probation, being homeless in LR	treatment compared to those who didn't - Those who received medication for psychiatric problems were less likely to have been in compulsory treatment* -Males more likely to have compulsory treatment (16% vs 14.0%) However, the above variables didn't explain differences	
Manhica (2017) 2005-2012 Sweden	Young refugees and hospital admissions due to alcohol related disorders who settled in Sweden as teenagers, n =1,009,027 natives, n = 9776 Former Yugoslavian republics, n=2372 Somalia, n=8062 Middle East; 13-19y settled in Sweden; 19-31a in 2004	Cohort study Swedish national register Refugee population STATIV – longitudinal database At least one register on alcohol related medical care (diagnoses of alcohol related disorder) and alcohol related mortality 2005-2012 Collected from National Patient Register	- Accompanied refugee had a lower risk of AUD than Swedes, Males (OR 0.68; 95% CI 0.55-0.85) Females (OR 0.68; 95% CI 0.51-0.92)* - Unaccompanied had a similar risk of AUD compared to natives: M (OR 0.98; 95% CI 0.71-1.35) F (OR 0.70; 95% CI 0.34-1.39) - Lowest AUDs in Former Yugoslavians (Males) (OR 0.49; 95% CI 0.35-0.69; (females) (OR 0.25; 95% CI 0.13-0.48) and the Middle East (Males) (OR 0.66; 95% CI 0.49-0.88) (females) (OR 0.50; 95% CI 0.29-0.85) compared to native Swedes (1) Adjusted for age and domicile in cox regression	- Somalian males' risk of AUDs decreased considerably after adjusting for income; however, this was not the case for females - There was a decreased risk in Yugoslavians who resided for >10 compared to those who had resided for <10; the opposite effect was found for Middle Eastern migrants	HIGH

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
Markkula (2017) 2010, Finland	N= 185,184 natives, 184,806 immigrants (Finland, Other Nordic countries, Russia & Soviet Union, Other Western Countries, Eastern Europe, North Africa & ME, Sub-Saharan Africa, Asia);15+y	<p>Cohort study</p> <p>Central Population Register and Statistics Finland (doesn't include temporary residents, asylum seekers, undocumented migrants)</p> <p>Immigrants matched with Finish born matched by background (age, residence, gender)</p> <p>Hospital Discharge Register</p> <p>AUDs & SUDs (ICD-10)</p>	<p>-New-onset AUDs Males: Nordic migrants had the closest risk to Native Finns (OR 0.71; 95% CI 0.50-1.01) but migrants overall had the lowest risk (OR 0.42; 95% CI 0.37-0.48)* which was lowest in Eastern Europeans (OR 0.17; 95% CI 0.09-0.33)* North Africa and Middle East (OR 0.23; 95% CI 0.17-0.31)* Sub-Saharan (OR 0.20; 95% CI 0.13-0.31)* Asia (OR 0.14; 95% CI 0.08 – 0.24)*</p> <p>-New-onset SUDs males: Migrants risk was lower than natives (OR 0.73; 95% CI 0.61-0.88)*; Russians (OR 0.94; 95% CI 0.70-1.27) and migrants from Western countries closest risk to natives (OR 0.82; 95% CI 0.60-1.12) while North Africa & Middle East lowest risk (OR 0.75; 95% CI 0.54-1.05) and Asia (OR; 95% CI 0.12-0.54)*</p> <p>- New-onset AUDs females: Highest in Nordics (OR 1; 95% CI 0.63-2.41) – similar to males in all groups*</p> <p>- New onset SUDs females: Similar to males in all groups*</p>	<p>-AUDs higher in males compared to females (0.42% vs 0.40%)</p> <p>-SUDs higher in males compared to females ((0.73% vs 0.44%)</p>	HIGH

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
Melchior (2015) 2011, France	N= 18,014 (35.4% North Africa), 27.3% Sub-Saharan Africa, 20.2% Europe, 10.2% Asian; females; age N/A	Cross-sectional ELFE study 349 maternity units in France (2011) Self-administered questionnaire During pregnancy, alcohol consumption? Yes/no; drinking ≥ 3 drinks on one occasion (binge drinking)	Migrants had a lower alcohol use than migrants (23.4% vs 40.7%) Binge drinking between groups was similar (2.9% vs 3.3%)	- Alcohol use and binge drinking higher in those who did not live with a partner* - Alcohol use higher in those who had psychological difficulties* - Binge drinking and alcohol use in both groups was lower in those whose partner was a migrant (all * apart from migrant binge drinkers) - Single-parenthood mostly associated with alcohol use in North Africans; relationship between psychological difficulties & alcohol use strongest in women born in Sub-Saharan Africa (data not shown for ethnic differences)	LOW
Méjean (2007) 2004-2005 France & Tunisia	Tunisians in France, native French, and Tunisians in Tunisia N = 147 each group (Matched by for age and socio-economic category); 18+y; M= 50.2	Cross-sectional Quota sampling from French National Institute of Statistics WHO-STEPS (alcohol consumption during last year)	Alcohol consumption higher in native French (93.2%) compared to Tunisian migrants (19.1%) and Tunisians (12.9%)		MED
Pavarin (2016) Conducted 2013, Italy	Minors in middle school and high school in fur regions in North; n= 2,095 (88% natives, FGM 7%, 5% SGM; 49% females; 13-16y	Cross-sectional Middle school and high school in four regions in Italy	- Risky consumption lower in natives (14.4%) compared to FGM (21.8%) and SGM (25.8%) - CU (Daily) lower in natives (1.2%) compared to non-natives (2.0%) and SGM (6.2%)	Living with mother alone led to a higher risk of alcohol consumption in SGM compared to natives after; this was also the case in FGM compared to natives, but the risk was lower	MED

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
		Alcohol consumption – no of eps in past year/ CAGE (1984) Risky consumption (Two positive responses to CAGE) 6 units in past month on one occasion (binge drinking) Daily cannabis use: yes/no	- Cannabis risk higher in SGM compared to FGM and natives (OR 3.26; 95% CI 1.09 – 9.74); FGM lower risk compared to natives (OR 0.73; 95% CI 0.20-2.72) - Risky consumption lower risk in FGM compared to natives (OR 0.89; 95% CI 0.55-1.45) Adjusting for gender, age, living situation, parental monitoring in MV		
Perez-Carceles (2014) 2010-2012, Spain	Migrant workers doing routine health examination N = 365 (51.7% Africa, 59.3% undocumented migrants; 54.3% Muslim' Gender N/a 16-62y, M=32	Cross sectional Random sample migrant workers living in Murcia, Spain Self- reported questionnaire AUDIT ≥ 8 (hazardous use)	13.8% 'hazardous drinkers'	- Those who identified as Muslim had a higher risk of hazardous drinking than Catholics - Those who worked in Agriculture and Construction were more likely to be hazardous drinking than those who worked in services* - Those who resided in Spain for ≥ 85 m had a higher risk than those who had been in Spain for 0-36m* - Males were twice as likely to be hazardous drinkers than females* Adjusted with variables in LR considered significant in BV analysis	MED
Reijneveld (2012) 2005-2006, Netherlands	N=2943 (237 immigrants: Turkish, Moroccan, Suriname, Netherlands Antilles) Immigrants	Cross-sectional Random sampling of Dutch residents	- Natives drank more than labour immigrants (OR 0.48; 95% CI 0.28-0.82) and immigrants from former colonies (OR 0.63; 95% CI 0.41-0.96)		NED

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
	that couldn't read Dutch were excluded; 19-40y	Internet-based questionnaire Daily alcohol use Drug abuse: Using cannabis, Amphetamine, XTC, LSD, Cocaine, Hallucinogenic, Heroin, Methadone) never/ last 4w/last 12m,	- Natives more likely to report drug abuse than labour immigrants (OR 0.83; 95% CI 0.38-1.83) and immigrants from former colonies (OR 0.91; 95% CI 0.48-1.73) Adjusted for age and sex in LR		
Rolland (2017) 1999-2003, France	N= 39,617 (25.4% Immigrants: 5.30% FGM, 10.70% SGM, TGM 9.74%; Immigrants 55.5% female, natives 49.1% female; 25-60y Had to speak French	Cross-sectional Mental Health in General Population by WHO-CC Quota sampling Subjects interviewed at n= 47 urban/ peri-urban French sites Mini International Neuropsychiatric Interview (MINI) tool for investigating ICD-10 disorders in general population (AUDs)	- Natives were less likely to have an AUD (3.82%) than migrants (5.84%) - Risk was lowest in FGM (4.67%), compared to SGM (5.71%) and TGI (6.63%) - FGM (OR 1.07; 95% CI 0.84-1.37) and SGM (OR 1.18; 95% CI 1.01-1.39)* at a higher risk of AUDs compared to natives Adjusted for age, gender, income, education, religion in MV LR		MED
Rundberg (2006) 1995-2000, Sweden	N= 6917 (8.7% immigrants: n=1012 Finland, n=109, n=145 Eastern Europe, n=141 Western Europe, n=83 Outside Europe; female; 50-59y	Cross-Sectional Women's Health in Lund Area Study (WHILA)	- Non-European (mainly Iran and Chile) more likely to be non- drinkers (58%) than natives (25%) and Finnish (25%)		LOW

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
		Self-administered questionnaire (received by mail) Quantity of alcohol during week/ none			
Saigí (2014) 2008-2009, Barcelona	Injected drug users in harm reduction programs; n=748 (n=439 natives, n=177 Eastern Europeans, n=132 other; 78.1% natives males; 88.0% migrant males; 20-49y	Cross-sectional Network of Harm Reduction Centres (n=18) Convenience stratified sample Injected illegal drugs 6 months prior to interview Questionnaire adapted from Drug injecting and Risk of HIV infection questionnaire (WHO, 1994)	- Migrants had a higher frequency of drug injection (daily) (57.6%) compared to natives (43.7%)	- Eastern Europeans who started injecting in country origin used heroin on its own (97.1%) but those who started in host country used heroin alone (53.9%) or with cocaine (28.9%) - Other countries those who injected in home country used heroin (76.1%) those who started in host country used cocaine more (alone or with heroin) (43.8%)	HIGH
Sarasa-Renedo (2015) 2006, Spain	N= 75,511 Natives N=12,432 migrants: N=7365 non-mixed FGM, n=561 mixed FGM, n=866 non-mixed SGM, n=3640 mixed SGM; Gender N/A; 14-18y	Cross-sectional Drug surveys (ESTUDES) Two stage cluster sampling Self-administered questionnaire	-Migrants at a higher risk of binge drinking compared to natives (OR 1.09; 95% CI 0.96-1.22) - Migrants at a higher risk of cannabis use (OR 1.21; 95% CI 1.01-1.46) compared to natives - Migrants had a slightly lower risk of stimulant use (OR 0.95; 95% CI 0.66-1.36) compared to natives		HIGH

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
		<p>Binge drinking: having ≥ 3 in 2h interval at least once in last 30d</p> <p>Cannabis use: use at least once last 30d</p> <p>Stimulants: cocaine, ecstasy at least once in 12m</p>	<p>Adjusting for age, gender, area of residence, level of income, education level, parents employment status</p>		
Selten (2007) 1990-1996; 1992-2001 Netherlands	n= N/A (Natives, Surinamese, Dutch Antilles, Morocco, Turkey, Norther Med, Belgium, Germany, UK; 15-54y; Gender distribution N/A	<p>Retrospective cohort study</p> <p>Dutch Psychiatric Registry</p> <p>ICD-9 diagnoses of alcohol/ drug dependence/ non-dependence of alcohol & drugs (1990-96)</p> <p>Rotterdam Psychiatric Registry (1992-2001) ICD-9</p>	<p>- Risk for AUDs highest in male migrants from Belgium (OR 2.18; 95% CI 1.70-2.79) and Germany (OR 1.32; 95% CI 1.10-1.59), Natives (1) - Similar for females</p> <p>-Lowest in migrants from Turkey (OR 0.48; 95% CI 0.39-0.60) & Morocco (OR 0.50; 95% CI 0.39-0.64) - Similar for females but slightly lower</p> <p>- Risk of SUDs (males) highest in Surinamese (OR 4.28; 95% CI 3.90-4.69) & Dutch Antilles (OR 4.59; 95% CI 3.97-5.30) and lowest in Turkey (OR 0.88; 95% CI 0.74-1.06)</p> <p>- Risk of SUDs (females) highest in German females (OR 5.82; 95% CI 4.80-7.06) lowest in Turkey (OR 0.10; 95% CI 0.04-0.28) and Morocco (OR 0.55; 95% CI 0.32-0.92)</p> <p>Age adjusted risks</p>		HIGH
Sordo (2015)	N = 51,148 (n=45618 natives, n=5530	Cross-sectional	Average daily consumption: All origin migrants risk increased from recent (OR	Overall, the linear trend by migrant length of stay and substance was * for	MED

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
2005-2007, Spain	migrants (2562 recent <5y in Spain, 1859 medium, 1109 long term ≥10y) 45.9% Latin-America, 15.1% Muslim area, 13.9% Eastern Europe, 12.0% American South, 13.9% Non- Eastern Europe; Age N/A (oversampled 15-34y)	National household surveys EDADES Random sampling Self-administered questionnaire ≥50cc pure alcohol (males) or ≥30cc (females) in last 30d (Average daily consumption); >5 drinks in 2h interval ≥1 in last 30d (binge drinking); annual cannabis use & other illegal substance use	0.59; 95% CI 0.46-0.77) to long term immigrants (OR 0.83; 95% CI 0.59-1.15) Migrants from Muslim area decreased risk from recent (OR 0.26; 95% CI 0.10-0.69) to long term (OR 0.19; 95% CI 0.05-0.76) -Binge drinking: All origin migrants risk increased from recent (OR 0.94; 95% CI 0.87-1.06) to long-term immigrants (OR 1.06; 95% CI 0.91-1.24) - Migrants from Muslim area increased risk from recent (OR 0.23; 95% CI 0.13-0.39) to long-term immigrants (FIND THIS) - Cannabis: All origin immigrants risk increased from recent (OR 0.46; 95% CI 0.40-0.52) to long term immigrants (OR 1.17; 95% CI 0.99-1.39) -Migrants from Muslim area increased risk from recent (OR 0.04; 95% CI 0.01-0.28) to long term (OR 0.40; 95% CI 0.16-1.01) -Illegal drugs: All origin immigrants risk increased from recent (OR 0.38; 95% CI 0.29-0.50) to long term immigrants (OR 1.16; 95% CI 0.87-1.55) - Migrants from Muslim area increased risk from recent (OR 0.04; 95% CI 0.01-0.28) to long term (OR 0.49; 95% CI 0.16-1.01) - Adjusting for year, age, gender, educational level, employment,	all substances; however, Muslims illegal substance use risk increased seventeen times with length of stay while average daily consumption decreased by nearly four times	

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
			socioeconomic position, cohabitation, area of residence		
Sordo (2015) 2009, Spain	N = 22,118 (3,162 immigrants); Latin America, Central America, Caribbean and Mexico, Africa, other; 16-34y	Cross-sectional European Survey of Health Three stage random sampling Self-administered Excessive consumption, average (EAC) consumption over last 12m >40g/ day (male), >20g/day (female) of pure alcohol Excessive episodic consumption (EEC) (consumption at least once in last month of 6+ alcohol drinks on same occasion)	- All origin migrants had a higher prev than natives for EAC (3.4% vs 3.2%) Africans had the lowest risk of EAC (OR 0.16; 95% CI 0.04-0.67)* and EEC (OR 0.20; 95% CI 0.11-0.37) Adjusting for gender, age, socioeconomic background, and anxiety and depression in regression model	- At a greater risk of EAC if under <35 compared to those 35-54y - Males at a higher risk of EEC than females	HIGH
Svensson (2010) 2005, Sweden	N = 13,070, 78% natives, 8% FGM 14% SGM; 50% females, 13-16y	Cross-sectional Junior high schools in A) Sothern city of Malmo, B) mid-northern country of Vasternorrland, C) Mid country of Varmland	Alcohol use: FGM Nordics had the highest risk (OR 1.10; 95% CI 0.67-1.82) while Non-Europeans had the lowest risk (OR 0.52; 95% CI 0.40-0.68) SGM Nordics had the highest risk (OR 1.22; 95% CI 1.01-1.48)* while Non-Europeans had the lowest risk (OR 0.74; 95% CI 0.60-0.91)		MED

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
		<p>A & B: Young 2005 C: Young in Varmland</p> <p>(not identical)</p> <p>‘alcohol use’: use during current school year (yes/no) ‘frequent binge drinking’: drank large amount of alcohol at least twice a m (17.cl of strong liquor) ‘drug abuse’: marijuana, heroin etc (yes/no)</p>	<p>Binge drinking: FGM Nordics had the highest risk (OR 1.07; 95% CI 0.53-2.15) while Europeans (non-Nordics) had the lowest risk (OR 0.73; 95% CI 0.49-1.09) SGM Nordics had the highest risk (OR 1.63; 95% CI 1.25-2.12) while Non-Europeans had the lowest risk (OR 0.68; 95% CI 0.49-0.96)*</p> <p>Drug use: FGM Nordic had the highest risk (OR 3.15; 95% CI 1.62-6.12) while Europeans (non-Nordics) had the lowest risk (OR 2.02; 95% CI 1.14-2.91) SGM Nordics had the highest risk (OR 1.67; 95% CI 1.21-2.32) while Europeans (non-Nordics) had the lowest risk (OR 1.31; 95% CI 0.94-1.82)</p> <p>Adjusting for immigrant status, sex, school year, single parent, parents smoking habits</p>		
<p>Tulloch (2012)</p> <p>2006-2009, UK</p>	<p>Somali users of mental health services in South London; n=240; 58% male; 18-65y</p>	<p>Cross-sectional</p> <p>Case Register</p> <p>Somalis on review</p> <p>Khat use: yes/no</p>	<p>47% were current users of k hat</p>	<p>- Males were twelve times as likely to use khat than females - Those diagnosed with schizophrenia were more eight times more likely to use khat - Those with harmful/dependent use of alcohol were twice twelve more likely to use khat</p> <p>Adjusted for age in LR</p>	<p>LOW</p>

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
Veen (2002) 1997-1999, Netherlands	N= 181; 23% natives, 17% Moroccans, 27% Surinamese, 30% Turkish, 33% 'other'; Overall gender distribution N/A; 15-54y	Cross-sectional All individuals who made first in lifetime contact with physician for psychotic symptoms referred to study Excluded if diagnosed with a substance induced psychotic disorder SU defined as use of illicit substances at least once a month in y; Substance misuse = daily use for period of least 2w in same year	- Substance misuse was highest in 'other' (OR 1.8; 95% CI 0.7-4.8) whilst Moroccans had the lowest risk (OR 0.4; 95% CI 0.1-1.2) Adjusted for age and sex in LR	-Females were at a lower risk of substance misuse than males	LOW
Mixed-Methods studies					
Study	Sample characteristics	Methods	Main findings: Quantitative findings (prevalence and contextual factors of substance use and misuse)	Main findings: Qualitative findings of substance use and misuse	Quality Assessment
Navarro-Lashayas (2016) 2011-2012, Spain	N= 107 homeless immigrants (65% Baghreb, 21.7% Sub-Saharan Africa, 8.3% Latin America, 3.3% Eastern Europe, 1.7% Asia; M= 32	Recruited at soup kitchens, day-care shelters Self-administered frequency of alcohol/ drug consumption	Lifetime occurrence of binge drinking (45.8%) and drug abuse (27.1%) A longer stay in Spain was found among alcohol abusers Adjusted for age, employment, length of homelessness in LR	-Used drugs to avoid loneliness and negative emotions such as fear and violence -Reasons for drinking: change in personal identity but also the sense of belonging to a community -Easy exposure to drugs and alcohol -Substance abuse can lead to an economic burden	MED

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
Canfield (2016) 2013, UK	n=164 Brazilians residing in London, UK; n=161; Brazilians residing in Brazil (n=161); 18y+ (M=27.83)	Recruited through establishments in Brazilian community in London e.g. churches, associations linked to Brazilian migrants, online forums); in Brazil recruited in city of Porto Alegre Regular drinking (\geq a week) Drug use (consuming \geq 1 a month) poly drug use (use of >1 drug in past month) Binge drinking 4+ females, 5+ males 6 in-depth interviews using thematic analysis	87.8% used substances in UK sample; 84.5% in Brazil sample Brazilians in the UK reported more binge drinking (42.1%) compared to Brazilians in Brazil (32.3%) Drug use associated with high threat to cultural identity* Those who reporting poly drug use 4 times more likely than those who hadn't to work in elementary occupations* Integration led to poly drug use * Adjusted for socio demographic and psychological variables in LR	- Living in the UK described as 'stressful' linked to psychological conflicts due to ambiguities over 'cultural identification' - Excessive use of drugs and binge drinking 'UK norm' which influenced migrants behaviour - Being open to new experiences reason for drug use	MED
Qualitative studies					
Study	Sample characteristics	Methods	Main findings: Qualitative findings of substance use and misuse		
Dupont (2005) 1998-1999, Netherlands	n= 21 asylum seekers (21% Yugoslavians, 16.0% Iraq, 7% Somalia, 7% Iran; 20-52y	Three AZCs Convenience sample Semi-structured interview conducted at places chosen by participants	-Unemployment catalyst for drug use -Findings role models in Dutch people who take drugs and copy their behaviours to fit in -Lack of family support 'In Iran, if you're in trouble, first you go to your family and they will try to solve the problem. Here, single people don't have a family' (male, Iran, 36 years); -Alcohol consumption deemed a taboo due to religious beliefs -The belief that substance use will lead to problematic use -Varying influence of religious e.g. migrants from Iraq having a more liberal attitude towards alcohol		HIGH

Study	Sample characteristics	Methods	Main findings: prevalence (Prev) of substance use and misuse	Main findings: contextual factors associated with substance use and misuse	Quality assessment
			-Drug consumption patterns altering due to accessibility in host country -Migrants coming from country with normalized drinking patterns e.g. former Yugoslavia find their behaviour to be criticized		
Osman (2011) N/A, Sweden	Somali migrants N = 14 (8 male, 6 female); 26-65y	Recruited from Somali associations in Swedish city Purposive sampling 14 interviews - conducted at places chosen by participants (in Somali language)	-The use of khat lead to economic problems for the family - Khat was used to overcome stress		HIGH

Key: Y = years (age); M = mean age; FGM = first - generation migrants; SGM = second - generation migrants; TGM = third- generation migrants; prev = prevalence; LR = logistic regression; BV = bivariate; MV = multivariate; N/A = not available

Finnish migrants compared to Turkish, Middle Eastern migrants, and Swedish natives was also statistically significant (Holmberg & Hellberg, 2010). Although this study should be interpreted cautiously due to the small sample of migrants which means it is unlikely to be generalisable beyond the immediate sample (Holmberg & Hellberg, 2008).

One study of Nepalese migrants in the UK did not include a native comparison group, therefore it is not possible to infer whether the findings for Nepalese migrants are cause for concern (Adhikary, Simkhada, Van Teijlingen, Raja, 2008).

In summary, the majority population were more likely to consume alcohol than migrants. Second-generation migrants had similar consumption patterns to the majority population and higher prevalence rates than first-generation migrants. Migrants from Africa, Middle East, and Asia had the lowest risk of alcohol consumption whilst migrants from Europe, especially Finland, had the highest risk.

3.4.2 Hazardous alcohol use

Findings from studies that reported alcohol consumption considered binge drinking, hazardous use, and unhealthy use predominantly employed self-administered questionnaires, and screening tools such as the AUDIT.

In two studies it was found that natives were more likely to binge drink compared to migrants (Melchior et al., 2015; Canfield et al., 2017). Five studies found that after adjustment for background variables natives had a higher risk of hazardous alcohol use (Abebe, Hafstad, Brunborg, Kumar, Lien, 2015; Bodenmann et al., 2010; Campisi et al., 2017; Sarasa-Renedo, et al 2015; Pavarin, Emiliani, Passini, Mameli, Palareti, 2016).

In contrast, two studies reported that migrants were at a higher risk of excessive alcohol consumption and binge drinking than natives after adjusting for background and socioeconomic variables (Sordo, Indave, Vallejo, 2015; Sordo, Indave, Pulido, 2015).

In studies reporting differences between first and second-generation migrants, one study found that first-generation migrant youths were more likely to report alcohol misuse than second-generation migrants (Campisi, et al., 2017). Whilst two studies found that second-generation migrants had a higher risk of binge drinking compared to first-generation migrants (Pavarin et al., 2016; Svensson & Hagquist, 2010).

Consistent with the findings for alcohol consumption (section 3.4.2), the lowest prevalence of hazardous alcohol use was found in non-European migrants (Africa, Middle East, Asia) (Abebe et al., 2015; Bodenmann et al., 2010; Sordo, Indave, Pulido, 2015). Two of these studies reported this finding to be significant in African migrants and both had a large nationally representative randomly selected sample (Abebe et al., 2015; Sordo, Indave, Pulido, 2015).

Three studies did not report a native comparison group (Perez-Carceles et al., 2014; Haasen et al., 2008; Navarro-Lashayas & Eiroa-Orosa, 2017)

Overall, the prevalence of hazardous alcohol use between natives and migrants were varied. Though, more studies showed natives were at a higher risk and these studies were of a higher quality. Migrants from Africa, Middle East, and Asia were at a lower risk of unhealthy alcohol use. Differences between first and second- generation migrants were contradicting, with some studies showing first-generation migrants were at a higher risk and some reporting the opposite

3.4.3 Alcohol use disorder diagnoses (AUDs)

Nine studies investigated AUDs and hospital admissions for severe alcohol abuse, determined by health professionals and corresponding to the ICD-10 criteria.

Markkula et al. (2017) found that all migrants were at a lower risk of AUDs than natives (matched by age, residence and gender) which was statistically significant. Another study found that natives had a lower risk of AUDs than migrants in France (Rolland et al., 2017). This finding was significant in second-generation migrants. However, the exclusion of individuals who could not speak French and the inclusion of third-generation migrants (who reported the highest risk) may have influenced this pattern of results.

In two studies, migrants from Finland were at a higher risk of AUDs than the native population in Sweden (Hjern & Allebeck, 2004; Leão, Johansson, Sundquist, 2006). Hjern and Allebeck (2004) also reported that unaccompanied refugees had a similar risk to the majority population whilst accompanied refugees had the lowest risk.

Consistent with findings for alcohol consumption and hazardous alcohol use (Sections 3.4.1, 3.4.2) three studies found that migrants from Africa and the Middle East had the lowest risk of AUDs (Hjern & Allebeck, 2004; Manhica et al., 2017; Markkula, Lehti, Gissler, Suvisaari, 2017) which Markkula et al (2017) found to be statistically significant. These studies were large samples from register studies in Sweden and Finland and findings were adjusted for demographic and socioeconomic variables.

One study found migrants from Belgium and Germany had the highest risk of hospital admission for AUDs in the Netherlands after adjusting for age (Selten, Wierdsma, Mulder, Burger, 2007). Alcohol dependence was also highest in refugees from former Yugoslavia residing in Germany compared to those residing in the UK and Italy (Bogic et al., 2012).

In summary, migrants from Africa and the Middle East had the lowest risk of AUDs whilst natives, Finnish migrants, and unaccompanied refugees were at a high risk.

3.4.4 Cannabis use

Twelve studies reported findings on cannabis use. All but one was conducted with adolescents or youth populations and for the most part used self-administered questionnaires.

Four studies found that migrants were more likely to use cannabis than natives (Lorant et al., 2016; Holmberg & Hellberg, 2008; Sordo, Indave, Vallejo, 2015; Sarasa-Renedo et al., 2015). Two of these studies adjusted for background variables (Sordo, Indave, Vallejo, 2015; Sarasa-Renedo et al., 2015). In Holmberg and Hellberg (2008), however, the high proportion of Finnish migrants in the overall sample, who reported a relatively higher prevalence of cannabis use than other migrants, was likely to influence the overall difference.

In contrast, three studies found that natives were more likely to use cannabis than migrants (Hüsler & Werlen, 2010; Campisi et al., 2017; Pavarin et al., 2016). Two of these studies adjusted for background variables (Pavarin et al., 2016; Campisi et al., 2017). Campisi et al. (2017) was a large randomly selected sample of a youth population in Switzerland and the findings are likely to be generalisable (Campisi et al., 2017). The sample in Hüsler and Werlen (2010), however, was from a sample of individuals who are poorly integrated into society (e.g. at risk of dropping out of school, outside of formal education, unemployed); therefore, the findings are unlikely to be generalisable to other more integrated migrant populations.

Four studies reported that second-generation migrants were more likely to use cannabis than first-generation migrants (Hüsler & Werlen, 2010; Campisi et al., 2017; Delforterie et al., 2014; Pavarin et al., 2016). Lorant et al. (2016), which involved six European cities, reported the opposite pattern, though the non-randomly selected sample means there is the possibility of bias.

One study found that across 68 schools in Oslo, Norway, first-generation migrants from Europe and US had the highest risk of cannabis use while first-generation migrants from Africa had a significantly lower risk (Abebe et al., 2015).

In summary, differences in the prevalence of cannabis use between natives and migrants were varied, with some studies showing migrants were at a higher risk of cannabis use and others showing the opposite. Second-generation migrants were more likely to use cannabis use than first-generation migrants.

3.4.5 Use of illicit substances

Ten studies reported findings on illicit substances (e.g. khat, cocaine, ecstasy, cannabis, and heroin). Self-administered questionnaires were utilised for most of these studies.

Three studies found that migrants were at a higher risk of substance use than natives after adjusting for background and/or socioeconomic variables (Campisi et al., 2017; Carta et al., 2000; Svensson & Hagquist, 2010). Two studies reported this finding but did not provide further statistical tests (Saigí et

al., 2014; Canfield et al., 2016). In Carta et al. (2000), however, the criteria used for ‘drug dependency’ was very low (i.e. lifetime use of substances ≥ 5 times) and many people meeting this criteria are unlikely to be classed as dependent based on more conventional criteria. This study also had a small non-randomly selected sample and sampling techniques differed across groups. One study contradicted these findings, as drug use was found to be higher among the native Dutch than migrants (Reijneveld et al., 2012).

Two studies found first-generation migrants to be more likely than second-generation migrants to use illegal substances (Campisi et al., 2017; Svensson & Hagquist 2010). Both studies employed random sampling, ensuring the studies were robust without systematic bias and thus likely to be generalisable.

Two studies did not have a native referral group (Tulloch, Frayn, Craig, Nicholson, 2012; Navarro-Lashayas & Eiroa-Orosa, 2017). Therefore, it is not possible to infer whether the findings are cause for concern.

Overall, migrants were at a higher risk or had similar patterns of illicit substance use compared to natives. First-generation migrants were also at a higher risk than second-generation migrants.

3.4.6 Substance Use Disorders (SUDs) (ICD-10)

Five studies investigated SUDs and hospital admissions for severe drug abuse, determined by health professionals and corresponding to the ICD-10 criteria. Four of these were register studies, three of which were conducted in Sweden.

Two register studies in Sweden found that a higher risk of hospital admissions for drug abuse was found among migrants compared to the Swedish majority; male Africans and first-generation Finns had the highest risk among migrant groups whilst female refugees had the lowest risk (Hjern, 2004; Leão et al., 2006). One register study conducted in Finland reported that native Finns had a significantly higher risk of hospital admissions for SUDs than migrants when matched by age, residence, and gender (Markkula, 2017). The sample sizes of the native and migrant groups were similar; therefore, these findings are likely to reflect the difference across groups in the general population.

Bogic et al. (2012) reported that refugees from former Yugoslavian countries had the highest rate of SUDs in those residing in Germany compared to those in UK and Italy. However, this study used different sampling methods across countries (snowball sampling was used in the UK) and it is possible that these different approaches may account for the differences in prevalence. Selten et al. (2007) also found drug abuse was highest in German females in a register study in Netherlands.

In summary, similarly to the findings from studies of alcohol use and abuse (sections 3.4.1, 3.4.2, 3.4.3), Finnish migrants tended to be at a high risk of SUDs compared to natives in Sweden. Unlike AUDs, however, African male migrants had the highest prevalence of SUDs in Sweden.

3.5. Contextual factors

This section describes the contextual factors (potential mechanisms, risk factors, protective factors) that were associated with substance use and misuse.

3.5.1 Demographic factors

Age: Two studies indicated that being of a younger age was associated with substance use (Bogic et al., 2012; Sordo, Indave, Pulido, 2015). These cross-sectional findings were reported from a nationally representative randomly selected sample providing greater confidence in the generalisability of the findings. Two studies found that being older led to a higher risk of substance use (Adhikary et al., 2008; Bodenmann et al., 2010). This finding was statistically significant in Adhikary et al. (2008), however, a low response rate (51%) lowers confidence in the generalisability of the findings.

Gender: A total of fifteen studies investigated the role of gender, eight finding males were at a higher risk of substance use than females (four of these findings were statistically significant) (Adhikary et al., 2008; Amundsen, 2012; Bodenmann et al., 2010; Perez-Carceles et al., 2014; Sordo, Indave, Pulido 2015; Bogic et al., 2012; Veen et al., 2002; Tulloch et al., 2012). Six other studies also reported that males had a higher prevalence, however, no statistical tests were carried out (Hjern, 2004; Hüsler & Werlen, 2010; Manhica et al., 2017; Amundsen et al., 2005; Markkula, 2017; Hjern, 2004). One study contradicted this. Delforterie et al. (2016) found that female migrants were more likely to use cannabis, although this sample was small (n=132).

3.5.2 Socioeconomic factors

Two studies examined the role of occupation in substance use among migrant populations (Perez-Carceles, 2014; Canfield et al., 2016). Both studies found there to be a significant association between working in agriculture and construction and substance use, while those who worked in services were at a lower risk. Yet, both studies had small sample sizes so should be interpreted with caution.

In two cohort studies a positive association was reported between being on social welfare and AUDs and SUDs (Hjern & Allebeck, 2004; Hjern, 2004). Yet, in Hjern and Allebeck (2004) migrants from the Middle East had the highest proportion of social welfare and the lowest prevalence of AUDs. In a similar dataset, Hjern (2004) found that the elevated risk of SUDs for second-generation Middle Eastern migrants disappeared after adjusting for socioeconomic factors. This suggests that socioeconomic factors may influence SUDs but not AUDs in Middle Eastern migrants, possibly because of Islamic faith (i.e. prohibiting alcohol use) protecting against AUDs (see section 3.5.3). However, several socioeconomic indicators were collected five years before this study was conducted and could have altered during that period; therefore, this study should be interpreted with caution.

One study found that Somalian males had the highest risk of hospital admissions after adjusting for age, gender, and domicile. However, this risk decreased considerably after income was included (Manhica et al., 2017).

Two qualitative studies found that a lack of structured employment was a catalyst for drug use (Dupont, Kaplan, Verbraeck, Braam, Van de Wijngaart, 2005) and drug use was also the cause of economic problems for their family (Osman & Söderbäck, 2011).

One study reported results indicating that a low socioeconomic status was a risk factor for substance use among males but not females (Hüsler & Werlen, 2010).

3.5.3 Religion

Six quantitative studies found a negative association between Islam and substance use (Abebe, et al 2015; Amundsen, 2012; Amundsen et al., 2005; Bodenmann, et al 2010; Sordo, Indave, Vallejo, 2015; Holmberg & Hellberg, 2008). Only one of these findings was not statistically significant (Bodenmann et al., 2010).

One study conducted in Spain found that recently settled Muslim- origin migrants had a low prevalence in all behaviours (binge drinking, illicit substances) except cannabis (Sordo, Indave, Vallejo, 2015). However, illegal substance use increased considerably with an increased length of stay and cannabis use remained high, suggesting that being Muslim is not a protective factor for all substance types, even after lengthy exposure to the host country.

Abebe et al. (2015) found that the higher prevalence of binge drinking and cannabis use reported by native Norwegian adolescents compared to Middle Eastern migrants was no longer significantly different when controlling for religion in a multivariate analysis. This cross-sectional study had a large sample and was conducted across 68 randomly selected schools.

Additionally, in a study conducted on adolescents in Norway, it was reported that a sizeable percentage of Muslims in a school had a moderating effect on all student drinking levels (Amundsen et al., 2005). This result was only statistically significant in boys of a Norwegian background. Yet, this still may suggest that a high proportion of abstinent pupils can be influential in the behaviour of all peers.

In one qualitative study, some asylum seekers described being from a culture that promoted abstinence meant alcohol consumption was considered a taboo whilst others considered alcohol consumption 'normal' (Dupont et al., 2005). One cross-sectional study also reported that the negative association between Islam and alcohol use was significant among migrants from Pakistan and Turkey but not for migrants from Iran (Amundsen, 2012). This suggests the relationship between Islam and alcohol use is varied across Islamic cultures.

One study contradicted these findings and found that migrant workers in Spain were significantly more likely to be hazardous drinking if they were Muslim rather than Catholic (Perez-Carceles et al., 2014). However, the dataset was from a single city in Spain and therefore not nationally representative.

3.5.4 Psychopathology

Six studies found a positive association between psychopathology and substance use (Abebe et al., 2015; Haasen et al., 2004; Haasen, 2008; Lundgren et al., 2012; Melchior et al., 2015; Tulloch et al., 2012). All but two of these findings were statistically significant. In one study, depression was positively associated with binge drinking and cannabis use, but only accounted for the high risk of binge drinking among first-generation migrants from Africa and Asia. Likewise, pregnant migrant mothers in France were more likely to report alcohol consumption if they had psychological difficulties (the association being strongest among migrants from Sub-Saharan Africa) (Melchior et al., 2015). In Lundgren et al. (2012) those receiving inpatient treatment for psychological problems were at a higher risk of compulsory treatment for drug abuse. Those who received medication for psychiatric problems and had outpatient mental health counselling were less likely to report compulsory treatment (the latter being the only finding that was not statistically significant).

3.5.5 Relationships

Six studies examined the effect of relationships on substance use. One study found that a lack of family support led to an increased risk of unhealthy alcohol use (Bodenmann et al., 2010). Haasen et al. (2004) also found that conflicts with family were significantly associated with the severity of drug addiction.

One study found that adolescents living with one parent were at risk of substance use (Pavarin et al., 2015) and two studies reported that not living with a partner led to an elevated risk of substance use (Bogic et al., 2012; Melchior et al., 2015). This finding was significant in Melchoir et al. (2015) which also reported that alcohol use and binge drinking was lower in natives and migrants whose partner was a migrant (this finding was not significant for binge drinking among migrants).

Two studies found that among adolescents a high level of social control in the parental-adolescent relationship led to a decreased risk of binge drinking and weekly alcohol use (Abebe et al., 2015; Delforterie et al., 2016). Abebe et al. (2015) found this to explain the low prevalence of binge drinking among second-generation migrants from Asia.

3.5.6 Polydrug use

Three studies reported findings on the effect of drug availability on polydrug use in migrants. One study found that in Spain, migrants from Eastern Europe who started injecting heroin in their country of origin used heroin on its own. However, migrants who initiated use in Spain were more likely to use heroin with cocaine due to its availability in Spain, thus becoming poly-consumers (Saigí et al.,

2014). In a qualitative study an Iraqi asylum seeker also describes how Iraqis predominantly use opium which is not readily available in Netherlands which has led them to change their drug habits and switch to Heroin (Dupont et al., 2005). Canfield et al (2017) also found that in a sample of Brazilians residing in the UK, integration was significantly associated with a risk of polydrug use.

3.5.7 Acculturation

Thirteen studies investigated the role of acculturation factors on substance use and misuse.

Four studies found a positive association between linguistic acculturation (native language proficiency) and substance use (Amundsen, 2012; Bodenmann et al., 2010; Delforterie & Creemers, Huizink, 2014; Hawkins et al., 2008). Amundsen (2012) also found that migrants in Turkey who reported 'own culture competence' (e.g. reading newspaper in own language) was negatively associated with alcohol use. All but one (Delforterie & Creemers, 2014) of these findings was statistically significant.

Nine studies examined whether length of residency in the host country influenced substance use (Hjern, 2004; Bodenmann et al., 2010; Amundsen et al., 2005; Perez-Carceles et al., 2014; Navarro-Lashayas & Eiroa-Orosa, 2016; Amundsen, 2012; Sordo, Indave, Vallejo, 2015; Manhica et al., 2017; Dupont et al., 2005) with most reporting a positive association between length of stay and substance use. One study reported that the alcohol use and illicit drug use increased in long-term migrants (residing for ≥ 10 years) to a similar risk to that of the Spanish natives (Sordo, Indave, Vallejo, 2015). This is consistent with the acculturation hypothesis. However, in the same study it was reported that migrants who were from Muslim-origin countries found their illegal substance use risk increased seventeen times with length of stay while alcohol consumption decreased.

One study reported that migrants in Norway who had resided for a longer period was negatively associated with alcohol use (Amundsen, 2012). This finding was statistically significant; however, it was accredited to the large number of Pakistani migrants in the sample who reported the lowest alcohol use and had lived in Norway the longest (Amundsen, 2012).

In a qualitative study, asylum seekers from the former Yugoslavia described how their alcohol habits (consuming alcohol during the day) are frowned upon amongst peers (Dupont et al., 2005). Likewise, another study found that there was a lower risk of hospital admissions due to AUDs in migrants from the former Yugoslavia who resided in Sweden for more than 10 years (the opposite occurring for Middle Eastern migrants) (Manhica et al., 2017). This implies the cultural habits of the host country can lead to decreased drinking if the origin country is known to have a high substance use (e.g. excessive alcohol consumption).

One study found that drug use was associated with a short length of residency in a sample of Brazilians residing in the UK (Canfield et al., 2016). This was largely accredited to many Brazilians in the study being open to new experiences.

One study found that integration (positive attitudes towards both cultures) and assimilation were protective factors against cannabis use among adolescents with at least one foreign parent in France (Chédebois et al., 2009). However, this result was not statistically significant. Whilst another study found that Brazilians residing in the UK found that drug use was significantly associated with a threat to their cultural identity (Canfield et al., 2016).

In the two qualitative studies it was also reported that migrants were keen to adopt the substance use patterns of the majority population (e.g. high levels of alcohol consumption) to integrate into society (Dupont et al., 2005; Canfield et al., 2016).

Overall, these studies demonstrate there is an association between acculturation and substance use. This operates via different mechanisms such as linguistic competence, host country and origin-country influence, and length of stay and such factors may be outweighed by religious factors.

4 Discussion

This is the first comprehensive systematic review investigating contemporary research on substance use and misuse among migrant populations in Europe. Electronic databases were searched using relevant key terms to identify research on the prevalence and contextual factors associated with substance use and misuse. This review included research on involuntary and voluntary migrants which previous reviews did not.

4.1 Summary of findings

This review found that the majority population were generally more likely to or were at a higher risk of alcohol consumption, hazardous alcohol use, and AUDs than migrant populations while second-generation migrants were had a similar risk to the majority population compared to first-generation migrants. In the cases where second generation migrants were found to have a higher risk than the majority population this was often due to the large percentages of European migrants (especially Finnish migrants) in the relevant study samples. Migrants from Africa, Middle East, Asia, and refugees were found to have the lowest risk. Prevalence differences between natives and migrants were inconclusive with regards to cannabis use, with some studies showing migrants were at a higher risk of cannabis use, and others showing the reverse. Again, second-generation migrants were more likely to use cannabis than first-generation migrants. In studies of all illicit substance use it was found that migrants were more likely to or had a similar risk to the majority population. Natives were also at

a higher risk of SUDs, with Finnish migrants having the highest risk. Unlike findings for alcohol use and misuse, it was found that Africans also had a high risk of SUDs.

With respect to contextual factors, males, persons who worked as manual workers (compared to those who worked in services) and those with a lower income and/ or were on social welfare had an elevated risk of substance use and misuse. There was also an indication that the negative association between a low socioeconomic status and substance use was stronger among males compared to females. A considerable amount of evidence pointed towards a negative association between Islam and substance use and misuse. Furthermore, it was reported that in schools, a high percentage of individuals who identified as Muslim led to a moderating effect on alcohol consumption in all peers. A positive association was also found between psychological distress and substance use and findings revealed that this relationship was strongest among Africans. Social factors, such as lack of family support and not living with a partner were also risk factors for substance use. Additionally, factors associated with acculturation such as struggling with cultural identity, linguistic acculturation, assimilation, integration, and a lengthy stay in the host country were associated with an increase in substance use. Finally, it was found that the availability of drugs in the host country could have an influence of substance use patterns among migrants and lead to polydrug use.

4.2 Acculturation

The elevated risk of substance use and misuse found in second-generation migrants compared to first-generation migrants supports the acculturation hypothesis proposed by Sam et al. (2016), which proposes that similar behaviour patterns among the majority and minority population will be found with a longer exposure to the host country. It was also found that acculturation factors such as linguistic competence, integration, and longer length of residency in the host country was positively associated with substance use and misuse.

Additionally, a strong negative association was found between Islam and alcohol use and misuse and a low prevalence rate was found among Middle Eastern migrants³ which remained even in those who had resided in their host country for a long duration (this not being the case in other illicit substances). This shows the influence of religion which appeared to outweigh the influence of acculturation factors. Consequently, although the acculturation hypothesis has merit, it is not universally applicable across populations. Additional factors (e.g. religion) which can mediate the effect of acculturation need to be considered in this framework.

4.3 Strengths

There are many strengths to this review. Firstly, the review captured a broad range of recent research on substance use and misuse to ensure that the findings collected were indicative of the contemporary

³ Islam is the dominant religion in the Middle East (Gilsenan, 2002)

patterns of substance use. Secondly, this review included detailed comparative studies, which included varying migrant populations with regards to generation and ethnicity, allowing differences between these groups to be highlighted and compared to the majority population. Previous reviews (Horyniak et al., 2016; Ezard, 2012; Weaver & Roberts, 2010) focused on forced migrants where most of the studies were conducted in camp settings where differences between the migrant and native population was not achievable (only seven studies in the review conducted by Horyniak and colleagues compared substance use to other migrant or native-born samples). This review found risk factors that were consistent with previous reviews (e.g. males were at a higher risk of substance use and misuse), however, a clearer understanding of the effect of post-migration factors such as socioeconomic factors and acculturation was enabled due to the inclusion of all migrant populations. Thirdly, this review included a range of licit and illicit substances, which allowed patterns to be identified by substance type. Lastly, this review considered the methodological quality of included studies. This ensured that attention was drawn to the most reliable evidence.

4.4 Quality of the literature

The quality assessment found that a small number of the included cross-sectional studies were of high quality, indicating that future studies of this design must ensure that they are more robust (e.g. use more representative samples, control for confounding variables) to improve the external validity of the findings. The cohort studies were of higher quality and most of these studies were investigating clinical diagnosis of SUDs (this was due to clinical diagnoses being available in nationally representative hospital registers). Additionally, as most of the studies included in this review utilised cross-sectional designs, direct causation in relation to contextual factors cannot be established. More prospective studies and longitudinal studies should be conducted in the future to provide evidence of a higher methodological quality. This is crucial as longitudinal studies would allow migrants to be followed pre-migration to post-migration, which could illuminate differences in their substance use behaviours during acculturation more accurately. Moreover, only four of forty-five studies in this review included qualitative data. Quantitative measures alone do not have the ability to deepen the understanding of the influence of specific mechanisms that underlie substance use and misuse. Qualitative and ethnographic studies are needed to explore attitudes towards substance use across varying populations and how variables such as low income, mental health, and substance use are influenced by one another. In turn, this type of qualitative work can inform quantitative research.

Furthermore, many of the studies used self-report measures which could have led to response bias. For example, some individuals may be inclined to overstate their substance use to impress their peers (especially in adolescents) (Harris, Griffin, McCaffrey, Morral, 2008); on the other hand, some may underestimate their unhealthy behaviours. This could occur, for example, among asylum seekers who may believe admitting to certain behaviours could jeopardise their application process. It is not clear if this bias existed in this review. Future work should therefore seek to address the reliability of self-

report measures in migrant populations with regards to substance use. Additionally, studies that used self-report measures often used different measures for substance use. For example, three studies that measured binge drinking had indicators that ranged from five or more drinks in a week in the past year, six units of alcohol in past month on one occasion, and having at least three drinks in a two-hour interval at least once in last thirty days. This makes clear comparisons between studies difficult. Standardised measures to address these behaviours should be established for future epidemiological research. There was also a lack of information of the validity of measurements to the varied populations under review.

4.5 Implications

Although this review generally found that migrants were less likely to use and misuse substances, high-risk individuals have been identified which has implications for those working in health and social care. Migrants who are blue-collar workers, male, have a low socioeconomic status, and do not live with a partner, were found to be at a high risk of substance use and misuse. These high-risk persons should be at the core of intervention-oriented research and be targeted in selective interventions. Additionally, providing information on substance use and misuse to these high-risk groups in general health practices setting via patient information leaflets could also prove useful in promoting the reduction of unhealthy behaviours in these groups (Dixie-Woods, 2001). This will ensure the burden of substance use and mental health disorders are reduced.

Furthermore, one of the key findings of this study was that migrants who had integrated in their society country for a lengthy period had a higher risk of substance use, suggesting that vulnerability to substance may increase after exposure to the host country. Monitoring changes in substance use during the early post-migration period could reduce the likelihood of substance use dependency later in life and ensure healthy integration. Furthermore, in clinical settings, practitioners should avoid dogmatic approaches to addressing substance use in migrant populations as country of origin, ethnicity, and other variables (e.g. religion) may mediate substance use and misuse.

At a community level, one study indicated that having the high proportion of Muslims in a school reduced the drinking levels of all peers (Amundsen et al., 2005). This could have implications for community-level alcohol reduction programs, as the socialisation of abstainers and high-risk individuals in such a program could lead to positive outcomes.

4.6 Further research directions

A large body of evidence indicated that migrant males were more vulnerable to substance use than females. Lower socioeconomic status also was found to have a stronger positive association with substance use among males than females. Males also tend to be a greater risk of substance use in the general population which has been accredited to various factors (males being prone to take more risks, expose themselves to risky behaviours, and the stigma of taking drugs in females) (Becker & Hu,

2008). Further research on why male migrants specifically appear to be at greater risk than female migrants should be conducted.

The review found surprisingly few studies investigating the co-morbidity of substance use and psychological disorders in migrant populations. Due to the burden that this co-morbidity creates (Kessler et al., 1997) and the vulnerability of psychological disorders among migrants due to pre-migration trauma and post-migration stressors (Lindert, von Ehrenstein, Priebe, Mielck, Brähler, 2009), future research must address this relationship.

Additionally, this review found that Islam was a protective factor against alcohol use but not illicit substances. There was also the indication from qualitative and quantitative findings that the relationship between alcohol use and Islam varied depending on country of origin. Research to clarify the relationship between Islam and substance use depending on substance type and country of origin is important to understand the Islamic perspective which may shape the behaviour patterns of many migrants residing in Europe. Lastly, evidence that polydrug use and the accessibility of different drugs available to migrants increased due after integration into the host country could have implications for drug markets and could possibly create a change in consumption patterns for all the population.

4.7 Limitations

Limitations of this review must be noted. Grey literature (conference papers, reports) was initially going to be included in this review. However, due to time and resources, this was not achievable. Grey literature may have provided key information which was unattainable from electronic databases. For instance, the delay in publication between data collection and publication in peer-reviewed journals could have meant consulting grey literature would have presented recent relevant data (Benzies, Premji, Hayden, Serrett, 2006). Furthermore, reference lists of included studies were not searched as it was felt that the search captured the scope of the study sufficiently with forty-five studies included in the review. However, there is the possibility that relevant studies were missed. Moreover, included studies varied in focus, with some investigating risky behaviours in general, some reporting sole substance use (e.g. alcohol use), and some reporting licit and illicit substances. Some of these also provided a stronger analysis with statistical tests and adjustments. This range of study focus and tests meant it was hard to extract and synthesis data in a consistent manner. Lastly, as this review was conducted by a lone researcher, decision making regarding certain aspects of the review (e.g. assessing the quality of studies) was not discussed with another researcher which could reduce the reliability of judgements made.

4.8 Conclusion

This systematic review draws attention to the limited understanding of substance use among migrant populations from various backgrounds. Overall, it was found that natives were more likely to use and misuse substances than migrants with second-generation migrants having a closer prevalence to the

majority population compared to first-generation migrants. Migrants from Europe (especially those from Finland) were at a particularly high risk and had a similar prevalence to the majority population compared to migrants from Africa, The Middle East and refugees who had a low risk. The review indicated several risk factors (low socioeconomic status, psychological distress, being male, living without a partner) were positively associated with substance use and misuse. It was also found that acculturation plays a key role in mediating substance use and misuse, where consumption patterns increased or decreased closer to the majority population. This was not always the case, however, as protective factors such as religion (Islam) prevented some migrants to adopt certain behaviours (primarily alcohol use). There is a need, however, to improve the quality of research to understand the complexity of the issue and inform appropriate response strategies.

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⁴ References marked with an Asterix (*) indicate the studies that have been included in this review

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Appendices

Appendix 1: Data extraction forms

Data Extraction Form: Quantitative studies

Paper Title:

Author/s:

Year:

Design

Study design:

Comparison:

NA

Details:

Study Aims:

Sample Characteristics (Participants/ Population)

Size of Sample:

Ethnicity

Religion:

Gender:

Age:

Residing Country:

Home Country:

How was this determined? (ID)

Specific Location of Study: (Urban, Rural, Camp Setting, Medical Centre)

Substance use and misuse Type:

Assessment/measurement (including reliability/validity of approach):

Main findings

Prevalence of substance use and misuse:

Contextual factors:

Risk Factors:

Protective Factors

Pre-Migration Trauma:

Post-Migration Stressors:

Psychopathology: YES / NO

Details (Assessment/ diagnosis/ medication)

Other relevant Findings:

Additional notes

Data Extraction Form: qualitative studies

Paper Title:

Author/s:

Year:

Sample Characteristics (Participants/ Population)

Gender:

Size of Sample:

Age:

Residing Country:

Home Country:

Study aims and purpose *(have they been clearly stated?)*

Evaluative summary *(draw together brief comments on the study as a whole and its strengths and weaknesses? Is further work required? What are its implications for policy, practice and theory, if any?)*

Strengths:

Weaknesses:

Ethical standards

Was ethical approval obtained?

Was informed consent obtained?

Does the study address ethical issues adequately?

Has confidentiality been maintained?

Setting

What is the geographical area, care setting or environment?

What is the rationale and appropriateness for this choice?

Is there sufficient detail given?

When did the data collection take place?

Sample

What are the inclusion/exclusion criteria?

How was the sample selected? Did any factors influence this?

What is the size of the sample/groups?

Is the sample appropriate to meet the study aims?

Data collection

Methods

What is the role of researcher? Are there any conflicts?

Is the fieldwork adequately described?

What data collection methods were used? (Interview, Focus Groups, Observation)

How are the data analysed? Is the description adequate? Are the analyses supported by data? Is the study set in context in terms of findings and relevant theory?

Are the researcher's assumptions/potential biases outlined?

Reflexivity – are the findings substantiated by the data and have analytical and interpretation limitations been considered?

When did the data collection take place?

Findings

What are the key themes?

Pre-Migration Trauma:

Post-Migration Stressors:

Mental Health Problems:

What are the conclusions?

Policy and practice

To what extent are the study findings generalisable?

What are the implications for practice?

Additional notes

Appendix 2: Quality Assessment tools

The AXIS and Newcastle Ottawa Quality Assessment Form are show below. The Critical Appraisal Skills Programme (CASP) Qualitative Research Checklist can be found [here](#)

Appraisal of Cross-sectional Studies

	Question	Yes	No	Don't know/ Comment
Introduction				
1	Were the aims/objectives of the study clear?			
Methods				
2	Was the study design appropriate for the stated aim(s)?			
3	Was the sample size justified?			
4	Was the target/reference population clearly defined? (Is it clear who the research was about?)			
5	Was the sample frame taken from an appropriate population base so that it closely represented the target/reference population under investigation?			
6	Was the selection process likely to select subjects/participants that were representative of the target/reference population under investigation?			
7	Were measures undertaken to address and categorise non-responders?			
8	Were the risk factor and outcome variables measured appropriate to the aims of the study?			
9	Were the risk factor and outcome variables measured correctly using instruments/measurements that had been trialled, piloted or published previously?			
10	Is it clear what was used to determined statistical significance and/or precision estimates? (e.g. p-values, confidence intervals)			
11	Were the methods (including statistical methods) sufficiently described to enable them to be repeated?			
Results				
12	Were the basic data adequately described?			
13	Does the response rate raise concerns about non-response bias?			
14	If appropriate, was information about non-responders described?			
15	Were the results internally consistent?			
16	Were the results presented for all the analyses described in the methods?			
Discussion				
17	Were the authors' discussions and conclusions justified by the results?			
18	Were the limitations of the study discussed?			
Other				
19	Were there any funding sources or conflicts of interest that may affect the authors' interpretation of the results?			
20	Was ethical approval or consent of participants attained?			

Newcastle-Ottawa Quality Assessment Form for Cohort Studies

Note: A study can be given a maximum of one star for each numbered item within the Selection and Outcome categories. A maximum of two stars can be given for Comparability.

Selection

- 1) Representativeness of the exposed cohort
 - a) Truly representative (*one star*)
 - b) Somewhat representative (*one star*)
 - c) Selected group
 - d) No description of the derivation of the cohort
- 2) Selection of the non-exposed cohort
 - a) Drawn from the same community as the exposed cohort (*one star*)
 - b) Drawn from a different source
 - c) No description of the derivation of the non exposed cohort
- 3) Ascertainment of exposure
 - a) Secure record (e.g., surgical record) (*one star*)
 - b) Structured interview (*one star*)
 - c) Written self report
 - d) No description
 - e) Other
- 4) Demonstration that outcome of interest was not present at start of study
 - a) Yes (*one star*)
 - b) No

Comparability

- 1) Comparability of cohorts on the basis of the design or analysis controlled for confounders
 - a) The study controls for age, sex and marital status (*one star*)
 - b) Study controls for other factors (list) _____ (*one star*)
 - c) Cohorts are not comparable on the basis of the design or analysis controlled for confounders

Outcome

- 1) Assessment of outcome
 - a) Independent blind assessment (*one star*)
 - b) Record linkage (*one star*)
 - c) Self report
 - d) No description
 - e) Other
- 2) Was follow-up long enough for outcomes to occur
 - a) Yes (*one star*)
 - b) No

Indicate the median duration of follow-up and a brief rationale for the assessment above: _____

- 3) Adequacy of follow-up of cohorts
 - a) Complete follow up- all subject accounted for (*one star*)
 - b) Subjects lost to follow up unlikely to introduce bias- number lost less than or equal to 20% or description of those lost suggested no different from those followed. (*one star*)
 - c) Follow up rate less than 80% and no description of those lost
 - d) No statement

Appendix 3: Research Project Outline

Project Title: Substance abuse among migrant populations in Europe: A systematic review

Student matriculation number: XXXXXXXX

Research supervisor: Ambrose Melson

Summary of existing literature

- Ezard (2012)
 - Populations recovering from conflict only and until 2010
 - ‘There is (weak) evidence that substance use is excessive or increased among some populations displaced by conflict compared with undisplaced populations.’
 - ‘weak evidence around individual risk factors’

- Horyniak et al (2016)
 - Estimates of hazardous/harmful alcohol use ranged from 17%-36% in camp settings and 4%-7% in community settings
 - Also focuses on forced migrants
 - ‘understanding’ remain limited; reasons come under ‘other notable findings’

- Weaver (2010)
 - Indicated a number of risk factors of harmful alcohol use amongst forcibly displaced persons, but the evidence was extremely weak

Rationale

It would be useful to conduct a systematic review of migrants residing in Europe due to dramatic increase in forcible displacement in the last couple of years: a record one million refugees arrived in Europe in 2015, four times more than in 2014 (IOM, 2015). Unlike previous reviews, I will aim to Include all migrants including economic migrants (voluntary migrants) as they still experience post-migration stressors not related to pre-trauma which have a significant effect on well-being (Carswell et al (2011). Consequently, this will help illuminate differences between migrant groups with regards to substance abuse which may increase the relevance of factors and increase their significance.

The systematic review will address the following specific research questions:

- What is the prevalence of substance abuse in migrant populations in Europe?
- Do voluntary and forced migrant populations differ in the prevalence of substance abuse?
- What are the contextual factors (risk factors, pre-migration trauma, post-migration stressors) that lead to substance use?

I aim is to get a complete picture including prevalence and contextual/ risk factors to produce a review which would help deliver better policy regarding forced migrants and substance abuse but also to develop an understand of how minority peoples in communities who struggle to assimilate and are struggling with post-migration stressors may be vulnerable to substance use.

Methodology

Search Terms: alcohol or inject(ing)(ion) drug use or cocaine or amphetamine or khat or qat or cannabis or opiate or heroin or (psychoactive) substance (ab)use or substance-related disorders AND refugee or displaced person/population or conflict or war or forced migration or complex emergency or internally displaced person or IDP or migrant or immigrant

Inclusion/ Exclusion criteria: English texts only; studies conducted in Europe; qualitative and quantitative; all studies types eligible; 1990-present

Databases: Ovid Medline, CINAHL, PsycINFO, Ovid Embase, Sociological Abstracts, International Bibliography of the Social Sciences, SocINDEX, Anthropology Plus, Chicano Database, Cinahl, ELDIS, Embase, FRANCIS, Global Health, IBSS, LILACS, MSF Field Research, Ovid Medline, PsychInfo, PubMed, and Web of Science.

Grey Literature: ReliefWeb, Forced Migration Online, Internal Displacement Monitoring Centre, World Health Organisation, United Nations High Commissioner for Refugees, International Committee for the Red Cross, International Rescue Committee, International Medical Corps, American Refugee Committee, the International Organisation for Migration

Timetable

- End of Feb – identify relevant works
- Start of Feb - Quality assessment of data
- End of Feb - End of April – Data/ information extracted; summarise evidence and interpret findings
- April- July – Write and edit

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Appendix 4: Author guidelines for targeted journal

Guidelines for the targeted journal (Substance Use & Misuse) can be found [here](#).