**Title:**

The Prevalence of Non-Affective Psychosis in Refugee Populations: A Systematic Review.

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**Abstract:**

**Background:** As we face the largest refugee crisis since World War Two, research is increasingly examining the impact of forced displacement. The risk of non-affective psychosis in refugees is evidenced to be significantly greater than non-refugees, and the role of pre-, peri- and post-migratory trauma and dissociation is increasingly implicated. **Aims:** To determine the prevalence of non-affective psychosis in refugee populations. **Method:** PRISMA guidelines were followed. Three key databases (PubMed, PsychINFO and Web of Science), google scholar and study references were searched. The full-text of 62 studies were screened and 23 studies were eligible for inclusion. A narrative synthesis was undertaken and the Quality Assessment Tool for Quantitative Studies was used to assess methodological quality. (PROSPERO registration CRD42019152170). **Results:** The results were widely heterogeneous. The combined weighted average prevalence of non-affective psychosis in refugee populations was 0.9%. Psychosis prevalence for individual psychotic symptoms was 28.4%; 0.5% for schizophrenia; 1.0% for psychosis; 0.6% for mixed psychotic disorders and 2.9% for psychotic episodes. **Conclusions:** Variations in examined populations, diagnostic and prevalence classifications, and study designs and methodologies likely contributed to heterogeneity across the data. The findings highlight a greater need to provide more specialist mental health services and trauma-focused interventions, as well as transculturally sensitive assessment and treatment to address refugee vulnerability to psychosis. Future research should examine psychosis prevalence longitudinally and in refugees-only, address methodological bias and further examine the role of trauma and dissociation in refugee psychosis prevalence.

**Keywords:**

Psychosis; Schizophrenia; Refugee; Prevalence; Systematic Review

1. **Introduction**

The United Nation’s Convention established post-Second World War standards for international refugee protection (United Nations High Commissioner for Refugees, UNHCR, 2010). Designed to respond to mass displacement across Europe during World War Two, a refugee is defined as: “a person who has fled their country of origin and is unable or unwilling to return owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group, or political opinion” (The Geneva Convention, 1951, p.3). Whilst also forcibly displaced, asylum seekers continue to await formal international protection, and internally displaced persons (IDPs) remain within the borders of their native countries (Amnesty International, AI, 2006).Economic migrants however are understood to migrate in pursuit of a better economic standard of life (AI, 2006; Dapunt et al., 2017). When referring to ‘refugee populations’ in the current review, we include refugees, asylum seekers, IDPs and migrants.

The prevalence of psychotic disorders and psychotic episodes within the United States has been estimated as 0.25-0.64% and 3% respectively (Kessler et al., 2005).The current refugee crisis involves an unprecedented 70.8 million people who have been forcibly displaced worldwide, and 37,000 people flee their homes daily (AI, 2006; Bourque et al., 2011; Brandt et al., 2019; Cantor-Graae and Selten, 2005; Dapunt et al., 2017). It is reported that the risk of non-affective psychosis is significantly increased in refugees compared to economic migrants and natives (Brandt et al., 2019) and non-refugees (Wylie et al., 2018), and trauma is increasingly implicated as one contributing and explanatory factor (Van den Berg et al., 2022). Refugees are evidenced to endure significant pre- and peri-migratory traumas including conflict, discrimination, persecution and violence (Dapunt et al., 2017), as well as trauma and psychosocial disadvantage post-migration such as economic hardship, discrimination and marginalisation (Brandt et al., 2019). A trauma dose-response (i.e. cumulative trauma exposure) is one model proposed to explain this population’s heightened vulnerability to psychosis (Dillon et al., 2014; Gibson et al., 2016; McGrath et al., 2017),whilst cognitive theory captures how traumatic appraisals fuel voice-hearing beliefs and distress (Ross and Keyes, 2004). Further, dissociation is argued to be a key psychological mechanism linking trauma and psychosis (Perona-Garcelán et al., 2012; Ross and Keyes, 2004; Schafer et al., 2008; Steel, 2016).For refugee populations, in response to severe cumulative trauma, pervasive stress-induced dissociation post-trauma likely amplifies the risk of psychosis (Dapunt et al., 2017; Dillon et al., 2014; Schauer and Elbert, 2010; Schroeder et al., 2016).

To date, prevalence reviews have commonly examined those diagnosed with schizophrenia only within migrant populations (Fazel et al., 2005; Morina et al., 2018; Saha et al., 2005).However, research commonly fails to define its use of the term ‘refugee’; and incorporate ‘migrants’ generally without acknowledging important distinctions between forcibly displaced and economically-motivated populations. Drawing comparisons between studies is thus challenging and has resulted in a lack of clarity for host nations in forecasting psychosis prevalence in refugees, which compromises the planning of polices and provisions required to effectively respond to their needs. In this review, we examine the question: what is the prevalence of non-affective psychosis in refugee populations? We take a broader approach by including those studies which examine all non-affective psychotic disorders and symptoms, not just schizophrenia, and further examine a wider population in our definition of refugee populations to include refugees, asylum seekers, IDPs and migrants more broadly. We embed this review within the trauma literature and thus draw upon a trauma-dose response lens, although we recognise that other factors such as substance use and co-morbidities play a role in elevating the prevalence of psychosis in this population

1. **Method**

*2.1. Protocol Registration*

This review’s protocol was registered with PROSPERO on 03/12/2019 (PROSPERO registration CRD42019152170).

*2.2. Search Strategy*

PRISMA guidelines informed the search strategy via use of a 27-item checklist to ensure essential items were transparently reported (Moher et al., 2009). A 4-phase flowchart summarises the process of identifying studies; screening and assessing their eligibility and to summarise the number of studies included and excluded across stages (Fig.1).

*2.3. Inclusion & Exclusion Criteria*

Inclusion criteria:

1. Refugees, asylum seekers, IDPs and migrants;
2. Non-affective psychotic disorders and symptoms identified via standardised diagnostic tools;
3. Up to 65-years old;
4. International studies;
5. All dates of publication;
6. Available in English;
7. Cross-sectional, cohort, national and community longitudinal designs and surveys;
8. Peer-reviewed articles.

Exclusion criteria:

1. Older adult (65-years old+)
2. Case studies, case series and qualitative designs;
3. Systematic and narrative reviews.

*2.4. Study Selection*

Three electronic databases were searched in October 2020: PsychINFO, PubMed and Web of Science. The following Boolean terms were used to identify potentially relevant papers: (psychotic OR psychosis OR schizophrenia\*) AND (refugee\* OR “asylum seeker\*” OR migrant\*) AND (prevalence). Additional peer-reviewed papers were identified via manual searches of Google Scholar and the references of included studies. Grey literature was excluded.

Six hundred and sixteen studies were identified in total and 23 studies were included in the final review. Figure 1 diagrammatically demonstrates how the search strategy and study selection process was undertaken using PRISMA to identify eligible studies (Moher et al., 2009). An independent rater repeated the full-text screening process for 10% of the identified studies (*n* = 6). One study was subsequently excluded.

*2.5. Data Extraction*

The main characteristics of each study and their samples are reported in Table 1 and the extracted prevalence data in Table 2. The data was organised by both psychosis classification and prevalence proportion to enable comparison across and within these factors.

*2.6. Data Synthesis*

The data was widely heterogeneous. Weighted averages were calculated to synthesise the data and enable greater understanding and comparison. Table 3 outlines this data. Weighted averages were calculated by psychosis classification which included varying psychotic disorders and symptoms; by prevalence proportion which included point, period and lifetime prevalence; and overall to capture the combined prevalence of non-affective psychosis in refugee populations.

*2.7. Quality Appraisal*

The Quality Assessment Tool for Quantitative Studies was used to assess the methodological quality of the 23 included studies (Effective Public Health Practice Project**,** EPHPP, 2005),which is widely used across systematic reviews investigating prevalence (e.g. Basha et al., 2019). The global and component ratings for each study are reported in Table 4. An independent rater assessed the quality of 20% of these studies (*n* = 5). No further studies were excluded.

1. **Results**

*3.1. Study & Sample Characteristics*

Table 1 summarises the characteristics of 23 studies and samples examined in this review. In total, 1,293,415 refugees, asylum seekers, IDPs and migrants were sampled. The number of economic migrants included was not reported across studies and thus could not be calculated. Various non-affective psychosis classifications were examined including individual psychotic symptoms (*n* = 4); schizophrenia (*n* = 6), psychosis (*n* = 6); mixed psychotic disorders (*n* = 6); and psychotic episodes (*n* = 1). ‘Mixed psychotic disorders’ included schizophrenia, schizophreniform and schizoaffective disorder, which were commonly sampled together. Schizoaffective disorder, an affective psychotic disorder, could therefore not be entirely excluded.

*3.2. Methodological Quality*

The global and component methodological quality ratings of each study are outlined in Table 4. Eight studies were assessed globally as ‘weak’, five as ‘moderate’, and ten as ‘strong’. No studies were excluded due to quality, and independent ratings served to reduce experimenter bias (Campbell and Stanley, 1963; Graziano and Raulin, 1997).

*3.3. Main Results*

Table 3 presents the synthesised data for the primary findings: weighted averages calculated by sample size for psychosis classification, prevalence proportion and overall combined prevalence.

*3.3.1 Psychosis Classification*

Individual Psychotic Symptoms:Four studies examined the prevalence of individual psychotic symptoms in refugees-only (Akinyemi et al., 2012; Khaled et al., 2020; Nygaard et al., 2017; Rathke et al., 2020). The point prevalence of psychotic symptoms ranged between 24.4 – 40.9% and the weighted average was 28.4%.

Schizophrenia:The point prevalence of schizophrenia-only was examined by six studies in refugees-only (Hvidtfeldt et al., 2019; Sethi et al., 1972), refugees and asylum seekers (Iversen and Morken, 2004), and migrants generally (Schrier et al., 2001; Weingarten and Orron, 1983; Wijesinghe and Clancy, 1991). The point prevalence of schizophrenia for refugees and asylum seekers was 0.3 – 34.9% (Hvidtfeldt et al., 2019; Iversen and Morken, 2004; Sethi et al., 1972), and 0.3 – 2.5% for migrants (Schrier et al., 2001; Weingarten and Orron, 1983; Wijesinghe and Clancy, 1991).When combined, the prevalence of schizophrenia ranged between 0.3 – 34.9% and the weighted average was 0.5%.

Psychosis:Mixed prevalence proportions of psychosis were examined by six studies. Samples included refugees-only (Kamau et al., 2004; Llosa et al., 2014), refugees and asylum seekers (Pfortmueller et al., 2016), IDPs-only, (Salah et al., 2012)and migrants generally (Dykxhoorn et al., 2020; Markkula et al., 2017).Overall, the point, period and lifetime prevalence of psychosis ranged between 1.0 – 12.3% in refugees, asylum seekers and IDPs (Kamau et al., 2004; Llosa et al., 2014; Pfortmueller et al., 2016; Salah et al., 2012),and the point and period prevalence of psychosis in migrants ranged between 0.9 – 1.0% (Dykxhoorn et al., 2020; Markkula et al., 2017).Together, the combined prevalence of psychosis ranged between 0.9 – 12.3% and the weighted average was 1.0%.

Mixed Psychotic Disorders:The period prevalence of mixed psychotic disorders was examined by five studies (Dykxhoorn et al., 2018; Haasen et al., 1997; Haasen et al., 1998; Hauff and Vaglum, 1995; Selten et al., 2012),and one study examined lifetime prevalence (Pignon et al., 2017).One study examined refugees-only (Hauff and Vaglum, 1995),whilst the remaining studies examined migrants which may have included economic migrants. Overall, the combined period and lifetime prevalence of mixed psychotic disorders was 2.3% in refugees-only, and 0.3 – 41.4% in migrants. The combined prevalence of mixed psychotic disorders ranged between 0.3 – 41.4% and the weighted average was 0.6%.

Psychotic Episodes:Finally, one study investigated the point prevalence of single psychotic episodes (SPE) and recurrent psychotic disorders (RPD) in migrants generally (Amad et al., 2013). The prevalence of SPE and RPD in migrants was 1.0% and 2.9% respectively and the combined prevalence was 2.0%. The weighted average was 2.9%.

*3.3.2. Prevalence Classification*

The combined point prevalence of non-affective psychosis in refugee populations ranged between 0.3 – 40.9% and the weighted average was 1.1%. Period prevalence, which was examined between 1 – 22.5 years ranged between 0.3 – 41.4%, and the weighted average was 0.5%. Lifetime prevalence ranged between 3.3 – 24.35% and the weighted average was 13.2%.

*3.3.3. Overall Combined Prevalence of Non-Affective Psychosis*

The overall combined prevalence of non-affective psychosis in refugee populations was 0.3 – 41.4% and the weighted average was 0.9%.

1. **Discussion**

We examined the prevalence of non-affective psychosis in refugee populations. Twenty-three studies were eligible for inclusion, and weighted averages were calculated to address heterogeneity across the data. The overall combined prevalence of non-affective psychosis in refugee populations was 0.9%, which can be compared to 0.6% in native populations (Hollander et al., 2016; Norredam et al., 2009).

*4.1. Psychosis Classification*

The findings of this review are similar to those reported across other systematic reviews (e.g. Fazel et al., 2005).A number of studies included in this review examined migrants more broadly however,which likely included economic migrants, and no efforts were made to distinguish them from forcibly displaced populations. Research suggests that higher cumulative exposure to severe pre-, peri-, and post-migratory trauma and higher rates of dissociation evidenced in forcibly displaced populations, likely increases their vulnerability to serious mental health disorders such as schizophrenia (Brewin and Patel, 2010; Neuner et al., 2004).Furthermore, it is proposed that the risk of non-affective psychosis in refugees is 39% higher than non-refugee migrants (Dubovsky, 2019).Thus, inclusion of those studies comparing migrant data more broadly to those examining forcibly displaced populations-only, likely contributed to wide heterogeneity across the data. The prevalence of non-affective psychotic disorders in refugee populations may therefore have been underestimated as a result of including migrant studies.

The weighted average prevalence of psychotic symptoms in refugee populations was greater overall than the prevalence of psychotic disorders.These findings are consistent with emerging research in refugee and non-refugee samples, which suggests that psychotic symptoms are increasingly being identified across disorders (McCarthy-Jones et al., 2014),and thus are not entirely exclusive to psychotic disorders. This challenges the traditional use of diagnostic classifications, and provides further support for the psychosis continuum theory. That is, psychotic symptoms are more common than psychotic disorders and occur across diagnoses.

*4.2. Prevalence Classification*

The weighted average prevalence of psychosis in refugee populations varied according to the prevalence classification examined. By definition, we would expect the lifetime prevalence of non-affective psychosis to be greater than other proportions as was evidenced within this review, as a result of the greater time duration examined (Carroll, 2013). Comparing point and period prevalence however, this trend was not evidenced: point prevalence of psychosis was greater than period prevalence. This may be explained by more studies in this review examining point prevalence (*n* = 12) than period prevalence (*n* = 9), which enabled a wider range of data to be compared.

*4.3. Combined Prevalence*

The overall combined weighted average prevalence of non-affective psychosis in refugee populations was lower than that reported by other systematic reviews, which reported that 2% of refugees were diagnosed with a psychotic illness. This comparable review however only screened two studies with a total sample of 226 adults, and the results are thus not representative of the wider refugee population. The findings of this review may further be underestimated for reasons already outlined above, and notably, are greater than those studies examining psychosis in non-refugee populations, where the prevalence of psychotic disorders in the US for example is estimated to be 0.25-0.64% (Kessler et al., 2005).

*4.4. Methodological Quality*

Methodological bias was introduced by the examined studies where retrospective data, and small, non-randomised samples were employed, which introduced selection bias and limited the generalisability of the findings to wider populations; when confounding factors were not controlled for or acknowledged, such as differences in age, marital status, and language and cultural differences; when small or limited recruitment sites were examined which affected ecological validity; and when limited or no mental health training was provided to professionals administering screening measures. Furthermore, failure to report research designs or recruitment methods across some studies prevents replication and comparison across studies. Methodological limitations such as these are commonly reported and observed across the literature and are evidenced to affect prevalence estimates. Namely, it is reported that studies of higher methodological quality in fact result in higher prevalence estimates (McGrath et al., 2017).Prevalence of non-affective psychosis may therefore have been underestimated in this review as a result of bias across the included studies. The findings should therefore be interpreted with caution.

*4.5. Implications*

Given the current international refugee crisis, host nations should seek to improve access to mental health interventions for refugee populations, which take into account the high prevalence of trauma and psychosis in this group (Dapunt et al., 2017; Gibson et al., 2016; McGrath et al., 2017).This is consistent with recent clinical trials examining the effectiveness of trauma-focused interventions for psychosis (Keen et al., 2017).The use of transcultural approaches to diagnosis are also required to consider cultural differences and diversity, given that refugees are more likely to receive a diagnosis of non-affective psychosis than non-refugees (Wylie et al., 2018). Furthermore, the findings highlight the importance of screening for psychotic symptoms across disorders (e.g. PTSD and depression), in order to better estimate psychosis prevalence in refugee populations. Lastly, at a wider policy and governmental level, the promotion of more positive narratives about refugees aimed at reducing negative public perceptions may help to reduce post-migratory stressors evidenced to compound psychosis vulnerability and risk. For example, social inferiority and discrimination (Janssen et al., 2003; Van Os et al., 2009).

*4.6. Limitations*

This review had several limitations, which should be considered when interpreting the findings. Firstly, grey literature was omitted in favour of studies published in peer-reviewed journals to ensure their validity. A number of relevant studies may have therefore been excluded. Furthermore, fourteen studies employed cross-sectional and retrospective designs, and recruited samples in limited settings (e.g. A&E). Next, we adopted a broad approach to the definition of refugee populations by including studies using samples of refugees, asylum seekers, IDPs and migrants, though the review is silent about any potential differences in prevalence rates between these groups. Economic migrants were likely included across studies and no attempts were made to distinguish them from forcibly displaced populations, who have likely experienced greater levels of pre-, peri- and post-migratory trauma. Given that trauma and dissociation have been linked to higher psychosis prevalence, this may have resulted in the review underestimating psychosis prevalence in refugee populations. Similarly, five studies combined schizoaffective disorder with other non-affective psychotic disorders in spite of it being a distinct affective psychotic disorder. The effect of its inclusion on non-affective psychosis prevalence is unclear. Finally, we did not consider substance misuse, PTSD or any other co-morbidities in the review.

*4.7. Future Research*

Future research should address the limitations identified within this review, with particular focus on addressing the observed variability across studies in terms of the methodologies, scales and tools utilised, which resulted in widely heterogeneous findings. For example, greater efforts are required to define and distinguish economic migrants from refugees, asylum seekers and IDPs when examining non-affective psychosis, in order to better understand and compare variations in psychosis prevalence across these distinct populations. Studies should further be encouraged to utilise longitudinal or period prevalence classifications over point-prevalence, in order to assess how psychosis prevalence changes over time. Next, future studies should consider examining psychotic symptoms more broadly than those exclusive to formal diagnostic classifications, in line with the growing evidence that supports the psychosis continuum theory (McCarthy-Jones et al., 2014). Consistent use of more recent tools such as the DSM-5 and PSYRATS would support this and offer more accurate reporting of psychosis prevalence data. Furthermore, greater methodological rigour is required within future research to improve the validity and reliability of prevalence data. For example, more prospective studies examining prevalence at a wider community and/or national level to improve representativeness and ecological validity; and greater use of randomisation in recruiting samples and in selecting regions to examine would reduce selection bias. Lastly, more research is required to evidence the mechanisms that increase psychosis vulnerability in refugees, such as trauma and dissociation.

1. **Conclusion**

We estimated that the combined weighted average prevalence of non-affective psychosis in refugee populations was 0.9%. The findings indicate that the prevalence of non-affective psychosis in refugee populations is significant, and there is evidence to suggest that psychosis prevalence is higher in refugees than non-refugees, and likely economic migrants too.

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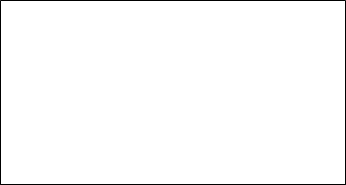
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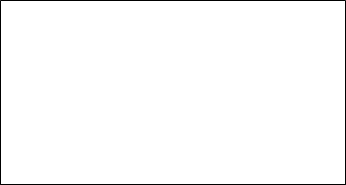
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**Studies identified via database searching**

**(*n* = 585)**

*(Psych Info = 269; PubMed = 184; Web of Science = 132)*

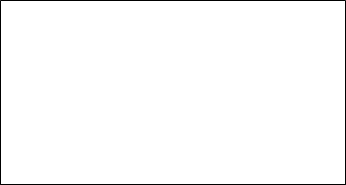
Identification

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**Additional studies identified via bibliographies & internet**

**search**

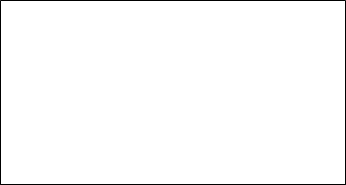
**(*n* = 31)**



**Non-duplicate studies**

**(*n* = 299)**

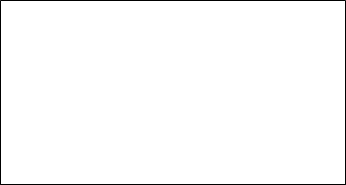
*(Duplicates Excluded = 317)*



Screening

**Articles excluded after Title & Abstract screen**

**(*n* = 237)**



F**ull-text studies reviewed for eligibility**

**(*n* = 62)**

**Studies excluded after full-text screen**

**(*n* = 38)**

*Not available in English = 4*

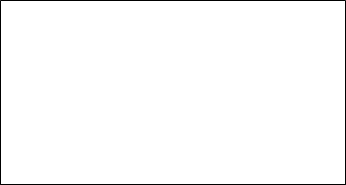
*Not on prevalence = 11*

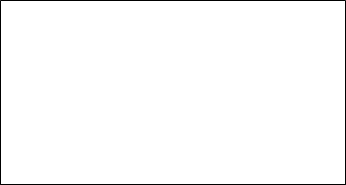
*Systematic / Narrative review = 13*

*Inappropriate design = 2*

*Qualitative design = 1*

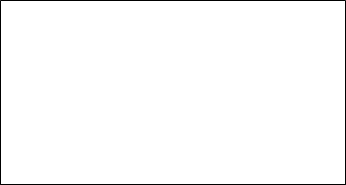
*Not relevant to question = 7*





**Full-text studies screened as eligible**

**(*n* = 24)**

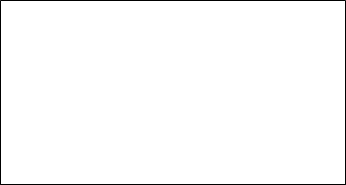


Eligibility

**Studies excluded after second-rater screening (10%)**

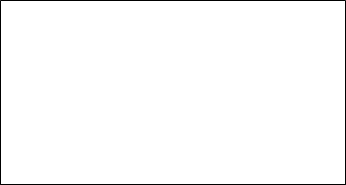
**(*n* = *1)***

*Design unclear & measures unspecified*



**Studies assessed for data quality eligibility**

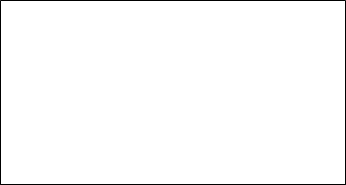
**(*n* = 23)**



**Studies excluded after second-rater assessment (20%)**

**(*n* = 0)**

Included



**Studies included**

**(*n* = 23)**

**Figure 1: PRISMA Flowchart**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Table 1  *Study & Sample Characteristics* | | | | | | |
| Author (name & year) | **Sample Characteristics** | **Study Design** | **Recruitment Location & Site** | **Diagnosis/Symptoms** | **Refugee Definition** | **Primary Assessment Method** |
| Akinyemi et al. (2012) | Total Sample (*N = 971*);  Refugees *(n = 444);* Natives *(n = 527);*  18-years+. | Cross-sectional survey. | Southwest Nigeria;  Community & refugee camp. | Auditory & Visual Hallucinations. | Long-term refugees (housed in camp for 1+ year). | MINI. |
| Amad et al. (2013) | Total sample (*N = 37,063)*;  Migrants *(n = 9,821)*;  18-years+. | General population survey. | France;  World Health Organisation Collaborating Centre (WHO-CC); 47 sites. | Single Psychotic Episode (SPE) & Recurrent Psychotic Disorder (RPD). | First, second, third-generation migrants vs. natives;  Does not distinguish refugees from migrants. | MINI. |
| Dykxhoorn et al. (2018) | Total sample *(N = 1,796,257);*  First-generation Migrants *(n = 320,102)*;  Second-generation Migrants *(n = 200,407);*  Swedish-natives *(n = 1,275,748)*;  15-years+. | National cohort longitudinal study. | Sweden;  Multiple national registers & the National Patient Register;  Inpatient/outpatient settings. | Schizophrenia; Schizoaffective Disorder & Other Non-Affective Psychotic Disorders. | First & Second-generation migrants vs. natives;  Does not distinguish refugees from migrants. | ICD-10. |
| Dykxhoorn et al. (2020) | Total sample (*N = 486,405);*  First-generation Migrants *(n = 268,868)*;  Second-generation Migrants *(n = 199,537);*  15-years+. | National cohort longitudinal study. | Sweden; Psychiatry Sweden Register;  9,208 Small neighbourhoods | Non-Affective Psychosis | First & Second-generation migrants; Does not distinguish refugees from migrants. | ICD-10. |
| Haasen et al. (1997) | Total hospital admissions (*N = 3,248);*  Migrants *(n = 263);*  18-years+. | Retrospective survey study. | Germany;  Psychiatric Clinic, University Hospital of Hamburg (1993-1994). | Schizophrenia, Schizophreniform episodes & Schizoaffective Disorder. | Migrants;  Does not distinguish refugees from migrants. | ICD-10. |
| Haasen et al. (1998) | Total hospital admissions *(N = 5,035);*  Migrants *(n = 408);*  18-years+. | Retrospective survey study. | Germany;  Psychiatric Clinic, University Hospital of Hamburg (1993-1995). | Schizophrenia, Schizophreniform episodes & Schizoaffective Disorder. | Migrants;  Does not distinguish refugees from migrants. | ICD-10. |
| Hauff & Vaglum (1995) | Vietnamese boat refugees *(N = 145)*;  15-years+. | Community cohort longitudinal study. | Norway;  3-year assessment. | Schizophrenic Psychoses & Paranoid Psychoses. | Refugees from Vietnam, rescued in South China Sea | ICD-8. |
| Hvidfeldt et al. (2019) | Resettled refugees (*N = 46,104);*  All ages. | Cohort longitudinal study. | Denmark; Danish Civil Registration System. | Schizophrenia. | Refugees. | ICD-10. |
| Iversen & Morken (2004) | Total sample *(N = 98);*  Asylum seekers *(n = 53)*;  Refugees *(n = 45);*  18-years+. | Retrospective survey study. | Trondheim, Norway;  Østmarka psychiatric hospital (1995-2001). | Schizophrenia. | Refugees & Asylum Seekers. | ICD-10. |
| Kamau et al. (2004) | Refugees *(N = 1,852);*  Age: unspecified. | Community cohort longitudinal study. | North-West Kenya;  Kakuma refugee camp; | Psychosis. | Refugees. | DSM-IV. |
| Khaled et al. (2020) | Total sample (*N = 1,353);* Arab migrants (*n = 373*); Non-Arab migrants (*n = 298);* Arab non-migrants (*n = 612);*  18-years+. | General population survey. | Qatar University (2016). | Psychotic Symptoms. | Migrants | CIDI. |
| Llosa et al. (2014) | Total sample *(N = 748);*  18-years+. | Cross-sectional survey. | Lebanon;  Burj el-Barajneh Refugee Camp; | Psychosis. | Refugees. | MINI. |
| Markkula et al. (2017) | Total sample *(N = 371,210);*  Migrants *(n = 184,806);*  Finnish-natives *(n = 185,184);*  15-years+. | Register-based cohort study. | Finland;  Hospital Discharge Register of public health care use; | Psychosis. | Migrants;  Does not distinguish refugees from migrants; | ICD-10. |
| Nygaard et al. (2017) | Total sample *(N = 181)*;  PTSD-SP (*n = 74*);  18-years+. | Retrospective cohort study. | Denmark;  Competence centre for transcultural psychiatry (CTP) . | PTSD with Secondary Psychotic Symptoms (Auditory Hallucinations & Persecutory Delusions) | Refugees. | ICD-10. |
| Pfortmueller et al. (2016) | Total sample *(N = 880)*;  16-years+. | Retrospective survey. | Switzerland;  A&E | Physical Health Problems & Co-Morbid Psychosis. | Refugees & Asylum Seekers;  Syrian vs. non-Syrian. | CCI. |
| Pignon et al. (2017) | Total sample (*N = 38,694*);  Migrants (*n = 9,959*);  Age: unspecified. | General population survey. | France;  47 study sites (WHO-CC). | Psychotic Disorders & Psychotic Disorders with Comorbid with Depression. | Migrants;  Does not distinguish refugees from migrants. | MINI. |
| Rathke et al. (2020) | Refugees (*N = 627);* 18-years+. | Cross-sectional study. | Denmark; Denmark Database on Refugees with Trauma (DART) | PTSD with Secondary Psychotic Symptoms (Auditory Hallucinations, Visual Hallucinations & Persecutory Delusions) | Refugees. | ICD-10. |
| Salah et al. (2012) | Total sample *(N = 1,876)*;  18-years+. | Cross-sectional study. | Central Sudan;  Two areas: Mayo (urban) & Mobi (rural). | Psychosis. | Internally displaced persons. | MINI. |
| Schrier et al. (2001) | Total sample *(N = 713);*  Migrants *(n = 248);*  20-years+. | Retrospective cohort study. | Rotterdam, The Netherlands;  Outpatient mental health services. | Schizophrenia & Non-Affective Psychoses. | Migrants;  Does not distinguish refugees from migrants. | DSM-III-R. |
| Selten et al. (2012) | Total sample (*N = 167,841);*  Migrants (*n = 24,340*);  Natives (*n = 143,501*);  15-years+. | Cross-sectional cohort study. | Utrecht, The Netherlands;  Inpatient and outpatient psychiatric facilities; Psychiatric Case Register Middle-Netherlands (PCR-MN). | Schizophrenia; Schizophreniform & Schizoaffective Disorder. | First-generation migrants vs. Dutch natives;  Does not distinguish refugees from migrants. | DSM-IV. |
| Sethi et al. (1972) | Total sample (*N = 2,957*);  Refugees *(n = 1,547);*  Native (*n = 1,410*);  Age: unspecified. | Cross-sectional cohort study. | India; University of Lucknow, Babuganj. | Schizophrenia. | Refugee vs. natives. | Unspecified. |
| Weingarten & Orron (1983) | Total sample *(N = 1185)*;  Age = 20-years+. | Cross-sectional cohort survey. | Israel; GP. | Schizophrenia. | Yemenite migrants. | Unspecified. |
| Wijesinghe & Clancy (1991) | Total sample *(N = 574)*;  Migrants *(n = 332)*;  Australian-natives *(n = 242)*;  15-years+. | Cross-sectional cohort survey. | Australia;  Outpatient department, Footscray Psychiatric Hospital. | Schizophrenia. | Does not distinguish refugees from migrants. | ICD-9. |

**Table 2**

***Extracted Prevalence Data***

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Author (name & year) | Participant Response Rate | Psychotic Symptoms | Psychotic Diagnosis | Point Prevalence, Refugees, Asylum Seekers, Internally Displaced Persons (IDPs) or Migrants | Point Prevalence, Natives | Period Prevalence, Refugees, Asylum Seekers, Internally Displaced Persons (IDPs) or Migrants | Period Prevalence, Natives | Lifetime Prevalence, Refugees, Asylum Seekers, Internally Displaced Persons (IDPs) or Migrants | Lifetime Prevalence, Natives |
| Akinyemi et al. (2012) | 98.9% | Auditory  & Visual Hallucinations. | – | Refugees, Symptoms:  Auditory = 27.1%;  Visual = 25.6%. | Nigerian-natives, Symptoms:  Auditory = 20.9%;  Visual = 13.1%. | – | – | – | – |
| Amad et al. (2013) | Not stated | – | Single Psychotic Episode (SPE) &  Recurrent Psychotic Disorder (RPD). | Migrants, by generation:  SPE:  First-gen = 1.1%; Second-gen = 1.0%; Third-gen = 0.9%. Average = 1.0%.  RPD:  First-gen = 2.7%; Second-gen = 2.7%; Third-gen = 3.4%. Average = 2.9%. | French-natives:  SPE = 0.6%;  RPD = 1.6%. | – | – | – | – |
| Dykxhoorn et al. (2018) | Not stated | – | Schizophrenia, Schizoaffective Disorder & Other Non-Affective Psychotic Disorders. | – | – | 15-year period, Migrants:  Schizophrenia & Schizoaffective, by generation:  First-gen = 0.2%; Second-gen = 0.2%.  Other non-affective:  First-gen = 0.3%; Second-gen = 0.3%.  Average = 0.3%. | 15-year period, Swedish-natives:  Schizophrenia & Schizoaffective = 0.1%;  Other non-affective: 0.2%.  Average = 0.2%. | – | – |
| Dykxhoorn et al. (2018) | Not states |  | Non-Affective Psychotic Disorder. | Migrants by Generation: First-gen = 0.9%, Second-gen = 1.1%. Average = 1.0%.  First-gen by Country: Nordic = 4.2%; Europe = 28.1%; Asia = 12%; Oceania = 0.1%; middle east/north Africa = 28.1%; Sub-Saharan Africa = 22.3%; north America = 2.0%; south America = 3.2%. Second-gen by Country: Nordic = 30.5%; Europe = 12.8%; Asia = 2.9%; Oceania = 0.0%; middle east/north Africa = 16.5%; Sub-Saharan Africa = 6.0%; north America = 0.3%; south America = 3.1%; Swedish = 18.4%; Mixed = 9.5%. | - | - | - | - | - |
| Haasen et al. (1997) | Not stated | – | Schizophrenia, Schizophreniform Episodes & Schizoaffective Disorder. | – | – | Two-year period, Migrants:  41.4%. | – | – | – |
| Haasen et al. (1998) | Not stated | – | Schizophrenia, Schizophreniform Episodes & Schizoaffective Disorder. | – | – | Three-year period, Migrants:  38.7%. | – | – | – |
| Hauff & Vaglum (1995) | 90% | – | Schizophrenic Psychoses & Paranoid Psychoses. | – | – | Three-year period, Refugees:  2.3%.  males = 2.9%; females = ‘-‘%. | – | – | – |
| Hvidtfeldt et al. (2019) | Not states. |  | Schizophrenia. |  |  | 22-year period, Refugeesby Length of Asylum Claim: 0-2.9 years = 0.5%; 3-5.9 years = 0.3%; 6-11.9 years = 0.4%; 12-22.5 years = 0.3%. Average = 0.4%. | - | - | - |
| Iversen & Morken (2004) | Not stated | – | Schizophrenia. | Refugees & Asylum Seekers:  Refugees = 55.2%.  By Region:  Asia = 47.0%; Africa = 80.0%; Europe = 45.4%.  Asylum Seekers = 14.6%.  By Region:  Asia = 4.7%; Africa = 50.0%; Europe = 14.0%. | – | – | – | – | – |
| Kamau et al. (2004) | Not stated | – | Psychosis. | – | – | Two-year period, Refugees:  12.3%. | – | – | – |
| Khaled et al. (2020) | 64%. | Symptoms. | - | - | - | - | - | Arab Migrants = 32.2%; Non-Arab Migrants = 16.4%.  Average = 24.4% | - |
| Llosa et al. (2014) | Not stated | – | Psychosis. | Refugees:  1.0% (95% CI, 0.0-2.1). | – | – | – | Refugees:  3.3% (95% CI, 1.0-5.5). | – |
| Markkula et al. (2017) | Not stated | – | Psychosis. | – | – | Four-year period, Migrants:  Average = 0.9%.  Males = 0.9% (95% CI, 0.8-0.9).  Males by Region:  Nordic Countries = 0.7% (0.5-1.1); Russia/Soviet Union = 0.9% (0.8-1.1); Western Countries = 0.5% (0.4-0.6); Eastern Europe = 0.9% (0.7-1.3%); North Africa = 1.2% (1.0-1.5); Sub-Saharan Africa = 1.4% (1.1-1.7); Asia = 0.8% (0.6-1.0).  Females = 0.9% (95% CI, 0.8-0.9).  Females by Region:  Nordic countries = 0.9% (0.7-1.3); Russia/Soviet Union = 0.9% (0.8-1.0); Western Countries = 0.7% (0.5-0.8); Eastern Europe = 0.7% (0.5-1.1); North Africa = 0.8% (0.8-1.1); Sub-Saharan Africa = 1.4% (1.1-1.8); Asia = 0.8% (0.6-1.0). | Four-year period, Finnish-natives:  Average = 1.2%  Males = 1.2% (1.2-1.3);  Females = 1.1% (1.0-1.2). | – | – |
| Nygaard et al. (2017) | 82% | Auditory Hallucinations  & Persecutory Delusions | PTSD with/without Secondary Psychotic Symptoms (PTSD-SP) | Refugees:  PTSD-SP = 40.9% (95% CI, 33.7-48.1).  Includes:  Auditory hallucinations = 66.2%; Persecutory delusions = 50.0%.  PTSD-Only = 50.1%. | – | – | – | – | – |
| Pfortmueller et al. (2016) | 93% | – | Physical Health Problems & Co-Morbid Psychosis. | – | – | Three-year period, Refugees & Asylum Seekers:  Syrian = 4.4%; Non-Syrian = 13.2%. | – | – | – |
| Pignon et al. (2017) | Not stated | – | Psychotic Disorders & Psychotic Disorders Comorbid with Depression. | – | – | – | – | Migrants: 10.2%.  Comorbid with Depression = 16.2%.  Average = 13.2%. | French-natives: 7.5%.  Comorbid with Depression = 15.5%.  Average = 11.5%. |
| Rathke et al. (2020) | Not states. | Symptoms (Auditory & Visual Hallucination, and Delusions). |  | Refugees: PTSD-SP = 30.2%.  Auditory hallucinations = 22.4%; Visual hallucinations = 13.2%; Delusions = 16.1%. | - | - | - | - | - |
| Salah et al. (2012) | 97% | – | Psychosis. | IDPs:  1.0%.  By Region:  Urban= 0.5%; Rural = 1.5%. | – | – | – | – | – |
| Schrier et al. (2001) | Not stated | – | Non-Affective Psychosis & Schizophrenia. | Migrants:  Non-affective psychoses = 0.3%.  Males = 0.4%; Females = 0.3%.  Schizophrenia = 0.2%;  Males = 0.3%; Females = 0.2%. | – | – | – | – | – |
| Selten et al. (2012) | 79.6% | – | Schizophrenia; Schizophreniform or Schizoaffective Disorder. | – | – | One-year period, Migrants:  Average = 0.8%.  Males by Region:  Turkish = 0.6% (95% CI, 0.4-1.0); Moroccan = 1.2% (0.9-1.5); Surinamese = 2.1% (95% CI, 1.5-2.9); West European = 0.5% (95% CI, 0.2-1.0)  Females by Region:  Turkish = 0.3% (95% CI, 0.1-0.5); Moroccan = 0.3% (0.2-0.5); Surinamese = 0.9% (95% CI, 0.5-1.4); West European = 0.3% (95% CI, 0.2-0.8). | One-year period, Dutch-natives:  Average = 0.5%  Males = 0.5% (95% CI, 0.4-0.5); Females = 0.4% (95% CI, 0.4-0.5). | – | – |
| Sethi et al. (1972) | Not stated | – | Schizophrenia. | Refugees: 0.3% | Indian-natives: 0.1%. | – | – | – | – |
| Weingarten & Orron (1983) | Not stated | – | Schizophrenia. | Migrants:  2.5% | – | – | – | – | – |
| Wijesinghe & Clancy (1991) | Not Stated | – | Schizophrenia. | Migrants:  By Region:  Average = 0.3%.  UK/Ireland = 0.1%; Yugoslavia = 0.4%; Italy = 0.3%; Malta = 0.3%; Greece = 0.4%; Other = 0.3%  Males by Region:  UK/Ireland = 0.1%; Yugoslavia = 0.2%; Italy = 0.2%; Malta = 0.2%; Greece = 0.3%; Other = 0.2%.  Females by Region:  UK/Ireland = 0.1%; Yugoslavia = 0.4%; Italy = 0.3%; Malta = 0.2%; Greece = 0.2%; Other = 0.23%. | Australian-natives:  0.1%.  Males = 0.2%; Females = 0.1%. | – | – | – | – |

**Table 3**

***Psychosis Prevalence, Weighted Averages***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Weighted Averages, Prevalence of Psychosis (%) | | | | |
| By Psychosis  Classification | | **By Prevalence**  **Proportion** | | **Combined Prevalence** |
| Psychotic Symptoms | 28.4 | Point Prevalence | 1.1 | **0.9** |
| Schizophrenia | 0.5 | Period Prevalence | 0.5 |  |
| Psychosis | 1.0 | Lifetime Prevalence | 13.2 |  |
| Mixed Psychotic Diagnoses | 0.6 | | | |
| Psychotic Episodes | 2.9 | | | |

**Table 4**

***Component and Global Methodological Quality Ratings***

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Author (name & year) | Selection Bias | Study Design | Confounders | Blinding | Data collection method | Withdrawals & dropouts | Global Quality Rating |
| Akinyemi et al. (2012) | Moderate | Moderate | Weak | Moderate | Strong | Strong | **Moderate** |
| Amad et al. (2013) | Strong | Moderate | Strong | Moderate | Strong | Strong | **Strong** |
| \*Dykxhoorn et al. (2018) | Moderate | Moderate | Strong | Moderate | Strong | Moderate | **Strong** |
| Dykxhoorn et al. (2020) | Strong | Moderate | Strong | Moderate | Strong | Strong | **Strong** |
| Haasen et al. (1997) | Weak | Weak | Weak | Moderate | Strong | Moderate | **Weak** |
| Haasen et al. (1998) | Weak | Weak | Weak | Moderate | Moderate | Moderate | **Weak** |
| Hauff & Vaglum (1995) | Weak | Moderate | Moderate | Moderate | Moderate | Strong | **Moderate** |
| Hvidtfeldt et al. (2019) | Strong | Moderate | Moderate | Moderate | Moderate | Strong | **Strong** |
| Iversen & Morken (2004) | Weak | Moderate | Weak | Moderate | Moderate | Moderate | **Weak** |
| Kamau et al. (2004) | Weak | Weak | Weak | Moderate | Moderate | Moderate | **Weak** |
| Khaled et al. (2020) | Moderate | Moderate | Weak | Moderate | Strong | Moderate | **Moderate** |
| \*Llosa et al. (2014) | Moderate | Moderate | Strong | Moderate | Strong | Moderate | **Strong** |
| Markkula et al. (2017) | Strong | Moderate | Strong | Moderate | Moderate | Strong | **Strong** |
| Nygaard et al. (2017) | Moderate | Moderate | Moderate | Moderate | Strong | Strong | **Strong** |
| Pfortmueller et al. (2016) | Weak | Moderate | Weak | Moderate | Strong | Moderate | **Weak** |
| \*Pignon et al. (2017) | Moderate | Moderate | Strong | Moderate | Strong | Moderate | **Strong** |
| Rathke et al. (2020) | Moderate | Moderate | Strong | Moderate | Strong | Weak | **Moderate** |
| \*Salah et al. (2012) | Moderate | Moderate | Strong | Moderate | Strong | Moderate | **Strong** |
| Schrier et al. (2001) | Weak | Moderate | Weak | Moderate | Strong | Strong | **Weak** |
| Selten at al. (2012) | Moderate | Moderate | Moderate | Moderate | Moderate | Strong | **Strong** |
| Sethi et al. (1972) | Weak | Moderate | Weak | Moderate | Weak | Moderate | **Weak** |
| \*Weingarten & Orron (1983) | Weak | Weak | Weak | Moderate | Weak | Weak | **Weak** |
| Wijesinghe & Clancy (1991) | Moderate | Moderate | Weak | Moderate | Strong | Moderate | **Moderate** |

*\*Studies selected at random to be independently rated.*

**Vitae**

**Dr Emily Smyth**

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Emily Smyth is a Clinical Psychologist in the NHS and cofounder of the Fitzrovia Psychology Clinic. She has previously contributed to research publications in the field of neuropsychology. She has a specialist clinical interest in working with refugee survivors of torture with Complex Post-Traumatic Stress Disorder and individuals with Emotionally Unstable Personality Disorder. Current research includes examining the relationship between trauma and voice-hearing in refugees compared to non-refugees.

**Professor Craig Steel**

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Craig Steel has been Academic Director at OXICPT since November 2018. His work has focused on the development and evaluation of psychological treatments for psychosis. He has a particular interest in developing models that enable us to ‘make sense’ of psychotic symptoms within the context of the reaction to traumatic life events. Current research includes developing a ‘voice dialogue’ approach to working with distressing voice hearing experiences, working with a London refugee service to help evaluate trauma interventions and evaluating an imagery-based intervention aimed at helping people diagnosed with bipolar disorder better regulate their mood.

**Dr Lyn Ellett**

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Lyn Ellett is a Reader in Clinical Psychology at Royal Holloway, University of London, and a qualified Clinical Psychologist. Her work focuses on understanding the aetiology and maintenance of psychotic symptoms, particularly persecutory delusions, and in developing and evaluating psychological interventions, particularly mindfulness and third wave approaches.

**Twitter**

A systematic review by Drs. Emily Smyth, Craig Steel and Lyn Ellett on the prevalence of psychosis in refugees. @royalholloway @uniofoxford @schizres