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Continuity of antipsychotic medication use among migrant and Finnish-born populations with a psychotic disorder: a register-based study

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Abstract

Background. Higher incidence of psychotic disorders and underuse of mental health services have been reported among many migrant populations. This study examines the initiation and continuity of antipsychotic treatment among migrants and non-migrants with a non-affective psychosis during a new treatment episode.

Methods. This study is based on a nationwide sample of migrants and Finnish-born controls. Participants who were diagnosed with a psychotic disorder in 2011–2014 were identified from the Care Register for Health Care (n = 1693). Information on purchases of antipsychotic drugs in 2011–2015 was collected from the National Prescription Register. The duration of antipsychotic treatment since diagnosis was estimated using the PRE2DUP model. Cox regression analysis was used to study factors that are associated with discontinuing the use of medication.

Results. There were fewer initiators of antipsychotic treatment after being diagnosed with psychosis among migrants (68.1%) than among Finnish-born patients (73.6%). After controlling for sociodemographic background and factors related to the type of disorder and treatment, migrants were more likely to discontinue medication (adjusted hazard ratio 1.28, 95% confidence interval 1.08–1.52). The risk of discontinuation was highest among migrants from North Africa and the Middle East and Sub-Saharan Africa and among recent migrants. Non-use of antipsychotic treatment before being diagnosed with psychosis, involuntary hospitalization and diagnosis other than schizophrenia were associated with earlier discontinuation both among migrants and non-migrants.

Conclusions. Migrants with a psychotic disorder are less likely to continue antipsychotic treatment than non-migrants. The needs of migrant patients have to be addressed to improve adherence.

Introduction

Antipsychotic medication is usually essential in the treatment of psychotic disorders. It is associated with reduced psychotic, especially positive, symptoms (Leucht et al., 2017; McCutcheon, Reis Marques, & Howes, 2020) and less relapses (Leucht et al., 2003; McCutcheon et al., 2020). There are different estimates of the optimal length of antipsychotic medication after the first psychotic episode. Antipsychotics may have problematic side effects, which would be minimized if we could identify patients whose medication can be reduced or discontinued without significant risk of relapse. Most guidelines recommend continuing the treatment in the maintenance phase for 1–5 years (Shimomura et al., 2020), but Finnish studies following patients with schizophrenia up to 20 years have shown that a longer duration of medication is associated with less relapses and lower mortality (Taipale et al., 2020; Tiihonen, Tanskanen, & Taipale, 2018). Many patients use antipsychotic medication irregularly or discontinue it earlier than recommended. It has been estimated that the rate of partial adherence or non-adherence to medication is as high as 40–50% among those with schizophrenia (Lacro, Dunn, Dolder, Leckband, & Jeste, 2002). Factors that are associated with non-adherence to antipsychotic medication include young age, low socioeconomic status (SES) or level of education, poor

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insight, negative attitude toward medication, medication side effects, substance use and cognitive impairments (García et al., 2016; Velligan, Sajatovic, Hatch, Kramata, & Docherty, 2017).

In many countries, the proportion of migrants in the population and therefore in the mental health services is increasing. It is important to identify possible disparities in care in different migrant groups and to develop services that equally address the needs of migrant and non-migrant patients. Many studies have shown an increased risk of psychotic disorders (Radua et al., 2018; Selten, van der Ven, & Termorshuizen, 2020), underuse of services at ultra-high risk for psychosis phase (Geros et al., 2020), longer duration of untreated psychosis (Boonstra et al., 2012) and more coercive pathways to care (Anderson, Flora, Archie, Morgan, & McKenzie, 2014) among migrants and ethnic minorities. Contrary to studies conducted in many other countries, a Finnish study showed that the incidence of psychotic disorders is lower among migrant women than non-migrant women and no difference was found between migrant and non-migrant men (Markkula, Lehti, Gissler, & Suvisaari, 2017), but this may partially reflect underdiagnosis or lower use of services.

Little is known about the patterns of antipsychotic treatment among migrants. Lower rates of antipsychotic drug purchases among migrants than non-migrants were found in Finland (Bosqui et al., 2020; Lehti, Suvisaari, Gissler, & Markkula, 2020) and in Spain (Cruz et al., 2012). Higher rates were found among the Moroccan-Dutch and Turkish-Dutch populations in the Netherlands (Termorshuizen, Selten, & Heerdink, 2017). However, these studies have not included information on adherence to medication or on psychotic disorders among participants. In a Greek study, the focus was on patients with schizophrenia, but the use of antipsychotic drugs was studied only during voluntary hospitalization (Douzenis et al., 2011). Migrants and non-migrants did not differ in their use of medication (Douzenis et al., 2011). Adherence among migrants has been addressed in two studies. A small sample of patients with a psychotic disorder was studied in Spain (Forcada et al., 2013). A low ratio of prescribed and dispensed packs of antipsychotic drugs was used as an indicator of poor adherence. One year after hospitalization, only 19% of migrants and 40% of non-migrants were adherents (Forcada et al., 2013). In Canada, both first- and second-generation migrants with first-episode psychosis were less adherent to early intervention services than non-migrants, but among those who remained in the intervention programs, no association was found between migration status and adherence to medication (Ouellet-Plamondon, Rousseau, Nicole, & Abdel-Baki, 2015). At 2 years, 82% of first-generation migrants, 97% of second-generation migrants and 86% of non-migrants were adherents to medication (Ouellet-Plamondon et al., 2015).

The current knowledge on the antipsychotic treatment of migrants with a psychotic disorder is insufficient both for clinicians and policymakers. There is a need to better identify the migrant groups that do not have the optimal antipsychotic treatment and to identify factors that are associated with not initiating or discontinuing the medication. The aim of this study is to examine the continuity of antipsychotic treatment among migrants and non-migrants with a psychotic disorder and to identify factors that are associated with discontinuation during a new treatment episode.

Methods

This study was based on a register-based cohort that covers the whole adult migrant population in Finland and a non-migrant comparison cohort. The duration of antipsychotic treatment was studied among migrants and non-migrants with a psychotic disorder. The study protocol was approved by the Ethics Committee of the Finnish Institute for Health and Welfare (THL) in Finland (589/2013 and 798/2018), and the data-keeping organizations authorized the use of register data.

Participants

Participants were identified from the Population Information System (PIS), a national register that contains information about Finnish citizens and permanent residents in Finland. Migrants were defined as those who were born abroad and whose mother tongue is not Finnish. Participants had to be at least 15 years old, alive, and resident in Finland on 31 December 2010. To collect a control group of Finnish-born participants, one Finnish-born person matched by age, sex, and place of residence was originally identified from the PIS for each migrant. The number of both migrants and their Finnish-born controls was originally 185 605. The sample was followed until 31 December 2015, date of death or emigration from Finland. This sample has been described in more detail earlier (Lehti, Gissler, Markkula, & Suvisaari, 2017).

The Care Register for Health Care (CRHC) was used to identify participants who had been diagnosed with a non-affective psychotic disorder in specialized psychiatric services in 2011–2014. CRHC is a nationwide register maintained by THL. It covers the days of admission and discharge in all inpatient care units and visits in all public outpatient care units in Finland. Both inpatient and outpatient care were included. All diagnoses in the ICD-10 category schizophrenia, schizotypal and delusional disorders (F20–F29) except for schizotypal personality disorder (F21) were included. The focus was on new treatment episodes and therefore persons who had service use with a diagnosis of psychotic disorder in 2007–2010 were excluded. The number of participants who fulfilled the criteria and were included in the analysis was 1693 (770 migrants, 923 Finnish-born). The comparison was made between the groups of migrants and Finnish-born persons and not between individual matched pairs.

Information on drug purchases and periods of drug use

All residents (excluding those staying temporarily in Finland and whose place of domicile is elsewhere) are covered by the National Health Insurance and all purchases of reimbursed prescription drugs are recorded in the National Prescription Register, which is maintained by the Social Insurance Institution of Finland (Kela) (Furu et al., 2010; Haukka, Suvisaari, Tuulio-Henriksson, & Lönnqvist, 2007). The register covers information on the patient, prescriber, and the prescribed drug, including the date of purchase and defined daily doses (DDDs). The use of drugs administered during hospital stays is not included. In this study, we included the purchases of antipsychotics (Anatomic Therapeutic Chemical class N05A excluding lithium N05AN01) in 2011–2015. Antipsychotics are reimbursed to a high extent and only very few exceptions are not reimbursed (some small, low-dose packages of antipsychotics).

The duration of drug use periods was estimated using the PRE2DUP method (Taipale et al., 2016; Tanskanen et al., 2015). Sliding averages of DDDs were calculated according to individual drug use patterns. Hospital care periods, stockpiling of drugs, variation in purchase events and changing dose were

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considered. Duration of 'any antipsychotic' use was calculated by combining overlapping periods of all antipsychotic drugs.

The main outcome in this study was the duration of antipsychotic use since the psychotic disorder was first registered during the follow-up. A period started from the date of diagnosis (the date of discharge if the diagnosis was given during hospitalization) if the person already used antipsychotics at that time or date of first purchase within 60 days after diagnosis if the first purchase was recorded after diagnosis. Those who did not use or purchase a drug within 60 days were defined as non-initiators. We chose 60 days, because some of the patients may not purchase the medication immediately after being diagnosed even if they get the prescription. Some have to wait for the granted special reimbursement of the expenses or for social assistance before the first purchase. Duration was defined as days until discontinuation of drug use or censoring. Causes of censoring included death (n = 22), emigration from Finland (n = 6), hospitalization for more than 90 days (n = 44), or end of the study (31 December 2015) (n = 428).

Sensitivity analyses were conducted for those who had not used antipsychotic medication during the year preceding diagnosis to have a more homogeneous group of patients who initiated treatment either for the first time or after a long break.

Migration-related factors

The migrant participants were classified by their region of origin and the time they had lived in Finland. Those whose country of origin was unknown and could not be classified based on their language and those who came from regions with very few participants were not included in the regional analyses. The regional categories were: (1) Finland, (2) EU/European Free Trade Association (EFTA), North America and Australia, (3) Russia, the former Soviet Union and Eastern Europe (former Eastern European countries not members of the EU), (4) North Africa and the Middle East, (5) Sub-Saharan Africa, and (6) Asia. The classification of the time lived in Finland before the study start (1 January 2011) included the following categories: (1) Finnish, (2) Migrant, moved to Finland less than 5 years ago, (3) Migrant, moved to Finland 5–15 years ago, and (4) Migrant, moved to Finland more than 15 years ago.

Other sociodemographic factors

Data on sex, age, and marital status at the beginning of the study were retrieved from the PIS. Age was categorized into four categories: 15–29, 30–44, 45–59, and 60 years or more. There were three categories for marital status: unmarried, married or in a registered partnership, and widowed, separated or divorced. Information on SES, provided by Statistics Finland, was primarily based on occupation in 2010 (Statistics Finland, 1989). A five-categorical variable was used: entrepreneurs, upper white-collar workers, lower white-collar workers, blue-collar workers, and others (people not in employment).

Factors related to psychiatric treatment

When studying factors that are associated with discontinuation, five variables related to the type of disorder and psychiatric treatment were included: antipsychotic treatment during the year preceding diagnosis, a first antipsychotic drug, type of unit in which the diagnosis was received, involuntary hospitalization, and type of psychotic disorder.

The data related to medication were collected from the National Prescription Register and the rest of the variables from the CRHC. A two-categorical variable was used for the preceding antipsychotic treatment. Any use of an antipsychotic drug for any duration during the year preceding the diagnosis of a psychotic disorder was the reference category. The first antipsychotic drug was defined as the drug that was in use when diagnosed or the one that was initiated during 60 days after the diagnosis. The categories were olanzapine, quetiapine, risperidone, aripiprazole, and other monotherapy and polytherapy. Olanzapine was the most common drug used and was chosen as the reference category.

Type of unit, when diagnosed with a psychotic disorder, was categorized as outpatient or inpatient unit and the outpatient unit was the reference category. Involuntary treatment can be ordered according to the Finnish Mental Health Act if the person suffers from mental illness, which necessitates treatment and all other services are inapplicable or inadequate. In this study, involuntary hospitalization was defined as at least 1 day of involuntary treatment during the first year after diagnosis. A two-categorical variable was used and no involuntary hospitalization was the reference. Type of psychotic disorder was defined as schizophrenia (ICD-10 code F20) including schizoaffective disorder (F25), or other (F22, F23, F24, F28, F29) during the first year after the first diagnosis. Schizophrenia was the reference category.

Statistical analysis

Duration of antipsychotic treatment was compared between migrants and Finnish-born controls using the t test. The distribution of those who did not initiate treatment during the first year after diagnosis, those who initiated, but discontinued, and those who continued treatment at least for the first year since diagnosis were studied by different background variables using the chi-square test. Cox regression analysis was used for studying the time to discontinuation of the treatment among the initiators by different background variables. Both unadjusted and adjusted hazard ratios are reported. The covariates for multivariate analyses were entered in two steps: sociodemographic variables and sociodemographic variables together with treatment-related variables. The selection of covariates was based on previous knowledge and on the results of the univariate analysis. Cox regression analyses were conducted for all participants and for migrants and Finnish-born controls separately. Additionally, similar analyses were conducted for those without antipsychotic treatment during the year preceding diagnosis. A p value <0.05 was considered statistically significant in all analyses. All analyses were conducted by using SPSS version 26.

Results

Of the 1693 participants diagnosed with a psychotic disorder, 1203 (71.1%) initiated antipsychotic treatment within 60 days from diagnosis. The proportion was 68.1% among migrants and 73.6% among Finnish-born patients. Among initiators, the mean duration of antipsychotic treatment during the first year after diagnosis was 257.4 days [standard deviation (S.D.) 129.5 days]. The mean duration was 240.8 days (S.D. 132.2) among migrants (n = 524) and 270.2 days (S.D. 126.0) among Finnish-born (n = 679, p < 0.001).

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Table 1 shows that one-third of migrants did not initiate antipsychotic treatment, one-third discontinued it during the first year and one-third continued after first year. Among Finnish-born participants, the largest group was those who continued for 1 year (44.3%), whereas there were smaller proportions of both non-initiators and first year discontinuers ($p < 0.001$). The highest proportion of non-initiators (44.4%) was found among migrants from Sub-Saharan Africa and the lowest among migrants from EU/EFTA, North America or Australia (25.1%). In addition, significantly more non-initiators and discontinuers were found among recent migrants than among Finnish-born participants or migrants who had migrated earlier. Only 28.0% of recent migrants continued treatment for 1 year. It was also found that the proportion of non-initiators was higher among men than women, among the youngest age group and among entrepreneurs compared with other socioeconomic groups. A significantly higher proportion of non-initiators (32.3%) was found among those who were first diagnosed in outpatient care compared with those who were diagnosed in hospital (24.9%). Among those who had been involuntary hospitalized, the proportion of non-initiators as high as 41.8% and only 22.6% continued antipsychotic treatment for a year. Significantly fewer non-initiators were found among those who had not been involuntarily treated. Participants who had been diagnosed with schizophrenia were less likely to be non-initiators (19.0%) than those with other types of psychotic disorder (31.6%). Comparison between migrant and Finnish-born first-year discontinuers by background variables is shown in online Supplementary Table S1.

The results of the Cox regression analysis are shown in Table 2 for all participants who initiated antipsychotic medication. The outcome of interest was the discontinuation of the medication. In the unadjusted analysis, being a migrant was associated with the risk of discontinuation (hazard ratio 1.53, 95% confidence interval 1.32–1.77). The likelihood of discontinuation was significantly increased for migrants from all studied regions and for all migrants regardless of the time since migration. In addition, young age, non-use of antipsychotic treatment before diagnosis, involuntary hospitalization and not being diagnosed with schizophrenia were associated with an increased likelihood of discontinuation. Being unmarried was associated with a decreased likelihood. Of the specific drugs, clozapine, other monotherapy and polytherapy were associated with a decreased likelihood of discontinuation when compared with olanzapine.

Adjustment for covariates was first made for sex, age, and marital status. SES was not included, because no significant association was shown in the unadjusted analysis and it is known that its data quality may be poor among migrants, which makes interpretation complicated for migrants. Second, relevant treatment-related factors were entered together with sociodemographic factors. When only sociodemographic factors were entered, being a migrant was significantly associated with discontinuation. The likelihood of discontinuation was increased for migrants from North Africa and the Middle East and Sub-Saharan Africa when compared with Finnish-born participants. Time since migration remained significantly associated. When the treatment-related variables were also entered, migration status was still significantly associated with discontinuation (adjusted HR (aHR) 1.28, 95% CI 1.08–1.52). Migrants from North Africa and the Middle East and Sub-Saharan Africa discontinued medication earlier than Finnish-born participants. Having migrated less than 5 years or 5–15 years before study start was significantly associated with discontinuation. Of sociodemographic variables, young age was associated with an increased likelihood of discontinuation and being unmarried was associated with decreased likelihood. Of the treatment-related factors, no use of antipsychotic medication before diagnosis, involuntary hospitalization, and other than schizophrenia diagnosis were associated with an increased likelihood of discontinuation. The use of clozapine, other monotherapy or polytherapy was associated with a lower likelihood of discontinuation.

Separate results for migrant and Finnish-born participants are shown in Table 3. Factors which were significantly associated with discontinuation of treatment were very similar in both groups. No use of antipsychotic medication before diagnosis, involuntary hospitalization and diagnosis other than schizophrenia were associated with an increased likelihood of discontinuation. The use of clozapine as the first drug was associated with a decreased likelihood of discontinuation in both groups. In addition, young age was associated with increased likelihood and use of other monotherapy was associated with a lower likelihood of discontinuation among Finnish-born participants. Being unmarried was associated with a decreased likelihood of discontinuation among migrants. The regional analysis was conducted among migrants using EU/EFTA, North America or Australia as a reference. Migrants from North Africa or the Middle East had an increased risk of discontinuing the medication. When migrants were studied by the time since migration, and having migrated more than 15 years ago was used as a reference, no significant associations were found with discontinuation.

Additionally, adjusted analyses were conducted including the use of antipsychotic treatment before diagnosis among the covariates (online Supplementary Tables S2 and S3). Migrant status was associated with earlier discontinuation (aHR 1.19, 95% CI 1.00–1.41), but North Africa and the Middle East was the only region of origin which remained statistically significant. Time since migration was not significantly associated with discontinuation.

We also conducted analyses restricted only to participants who had not used antipsychotic medication during the year before diagnosis ($n = 912$). Results for all participants without preceding use of antipsychotic medication are shown in online Supplementary Table S4. Being a migrant was significantly associated with earlier discontinuation both in unadjusted and adjusted analyses. aHR was 1.23 (95% CI 1.03–1.48) when controlled for both sociodemographic and treatment-related factors. The regions of origin that were significantly associated with discontinuation were North Africa and the Middle East and Sub-Saharan Africa. In addition, young age, involuntary hospitalization and other than schizophrenia diagnosis were associated with an increased likelihood of discontinuation, while being unmarried and the use of clozapine were associated with decreased likelihood. Separate results for migrants and Finnish-born participants without preceding the use of antipsychotic medication are shown in online Supplementary Table S5. Among migrants, migration from North Africa or the Middle East was associated with an increased risk of discontinuation and use of clozapine with decreased risk. Involuntary hospitalization and diagnosis other than schizophrenia were associated with an increased risk of discontinuation in both groups.

Discussion

This study showed that there are migrant populations in Finland who are less likely to continue antipsychotic treatment after being

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Table 1. Proportions of participants who did not initiate, initiated but discontinued, or continued antipsychotic medication during the first year after being diagnosed with a psychotic disorder

	Did not initiate % (*n*) (total *n* = 490)	Discontinued <1 year % (*n*) (total *n* = 535)	Continued for 1 year % (*n*) (total *n* = 668)	
Migrant status				<0.001
Finnish-born (*n* = 923)	26.4 (244)	29.3 (270)	44.3 (409)	
Migrant (*n* = 770)	31.9 (246)	34.4 (265)	33.6 (259)	
Region of origin				<0.001
Finland (*n* = 923)	26.4 (244)	29.3 (270)	44.3 (409)	
EU/EFTA, North America or Australia (*n* = 179)	25.1 (45)	38.0 (68)	36.9 (66)	
Russia and Eastern Europe (*n* = 251)	28.7 (72)	31.1 (78)	40.2 (101)	
North Africa and Middle East (*n* = 122)	37.7 (46)	36.9 (45)	25.4 (31)	
Sub-Saharan Africa (*n* = 108)	44.4 (48)	31.5 (34)	24.1 (26)	
Asia (*n* = 99)	31.3 (31)	35.4 (35)	33.3 (33)	
Time since migration				<0.001
Finnish-born (*n* = 923)	26.4 (244)	29.3 (270)	44.3 (409)	
Less than 5 years (*n* = 236)	34.7 (82)	37.3 (88)	28.0 (66)	
5–15 years (*n* = 273)	29.3 (80)	35.9 (98)	34.8 (95)	
More than 15 years (*n* = 207)	30.4 (63)	29.5 (61)	40.1 (83)	
Sex				0.026
Male (*n* = 904)	31.6 (286)	29.8 (269)	38.6 (349)	
Female (*n* = 789)	25.9 (204)	33.7 (266)	40.4 (319)	
Age				<0.001
15–29 (*n* = 675)	34.5 (233)	36.0 (243)	29.5 (199)	
30–44 (*n* = 574)	25.6 (147)	29.4 (169)	44.9 (258)	
45–59 (*n* = 349)	25.2 (88)	26.9 (94)	47.9 (167)	
60 or more (*n* = 81)	22.2 (18)	32.1 (26)	45.7 (37)	
SES				0.001
Entrepreneurs (*n* = 68)	41.2 (28)	25.0 (17)	33.8 (23)	
Higher white collar (*n* = 89)	28.1 (25)	29.2 (26)	42.7 (38)	
Lower white collar (*n* = 176)	22.2 (39)	44.9 (79)	33.0 (58)	
Blue collar (*n* = 247)	30.8 (76)	30.4 (75)	38.9 (96)	
Others (*n* = 942)	27.2 (256)	29.4 (277)	43.4 (409)	
Marital status				0.046
Married/registered (*n* = 389)	24.4 (95)	37.5 (146)	38.0 (148)	
Unmarried (*n* = 925)	30.1 (278)	29.6 (274)	40.3 (373)	
Widowed/divorced/separated (*n* = 379)	30.9 (117)	30.3 (115)	38.8 (147)	
Antipsychotic treatment before diagnosis (1 year)				<0.001
Yes (*n* = 295)	1.4 (4)	17.3 (51)	81.4 (240)	
No (*n* = 1398)	34.8 (486)	34.6 (484)	30.6 (428)	
First antipsychotic				<0.001
Olanzapine (*n* = 297)	–	50.2 (149)	49.8 (148)	
Quetiapine (*n* = 315)	–	47.6 (150)	52.4 (165)	
Risperidone (*n* = 271)	–	49.8 (135)	50.2 (136)	
Aripiprazole (*n* = 30)	–	36.7 (11)	63.3 (19)	

(*Continued*)

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Table 1. (*Continued.*)

	Did not initiate % (*n*) (total *n* = 490)	Discontinued <1 year % (*n*) (total *n* = 535)	Continued for 1 year % (*n*) (total *n* = 668)	
Clozapine (*n* = 68)	–	13.2 (9)	86.8 (59)	
Other monotherapy (*n* = 147)[a]	–	27.0 (58)	73.0 (157)	
Polytherapy (*n* = 74)	–	43.2 (32)	56.8 (42)	
First diagnosed				0.002
In outpatient care (*n* = 922)	32.3 (298)	29.2 (269)	38.5 (355)	
In hospital (*n* = 771)	24.9 (192)	34.5 (266)	40.6 (313)	
Involuntary hospitalization				<0.001
No (*n* = 1339)	25.5 (342)	30.5 (409)	43.9 (588)	
Yes (*n* = 354)	41.8 (148)	35.6 (126)	22.6 (80)	
Diagnosis during first year				<0.001
Schizophrenia (*n* = 385)	19.0 (68)	26.0 (93)	55.0 (197)	
Other (*n* = 1335)	31.6 (422)	33.1 (442)	35.3 (471)	

[a]Chlorpromazine (*n* = 3), levomepromazine (*n* = 10), perphenazine (*n* = 60), periciazine (*n* = 2), haloperidol (*n* = 17), sertindole (*n* = 6), ziprasidone (*n* = 5), flupentixol (*n* = 7), chlorprothixene (*n* = 20), zuclopenthixol (*n* = 11), sulpiride (*n* = 2), paliperidone (*n* = 4).

diagnosed with a psychotic disorder. Only every fourth migrant from North Africa, the Middle East and Sub-Saharan Africa used antipsychotic medication 1 year after diagnosis. Recent migrants are more likely to discontinue antipsychotic treatment than those who have migrated earlier. Factors associated with discontinuation were very similar among migrants and non-migrants. No antipsychotic treatment before being diagnosed with psychosis, involuntary hospitalization during the first year since diagnosis and diagnosis other than schizophrenia were associated with earlier discontinuation of medication in both groups.

A possible explanation for our findings is that migrants actually do have less need for long-term antipsychotic medication. It is possible that patients who first receive a diagnosis of a psychotic disorder, are re-diagnosed as non-psychotic when cultural factors are taken into account (Adeponle, Thombs, Groleau, Jarvis, & Kirmayer, 2012). In addition, among refugees and others with increased risk for traumatic experiences, there might be psychotic symptoms that are secondary to post-traumatic stress disorder (Compean & Hamner, 2019; Nygaard, Sonne, & Carlsson, 2017), but are registered as unspecified psychosis. The benefit of antipsychotic treatment for this kind of symptom is less clear than for schizophrenia spectrum psychosis (Compean & Hamner, 2019).

The continuity of antipsychotic treatment may reflect the continuity of care in general. As mentioned earlier, adherence to antipsychotic medication did not differ between migrant and non-migrant patients, who adhered to early intervention programs in Canada (Ouellet-Plamondon et al., 2015). Our earlier studies have shown that migrants use less specialized psychiatric services than Finnish-born people and migrants, who receive specialized services, have fewer visits than Finnish-born people (Kieseppä et al., 2020; Markkula et al., 2017). Low-intensity treatment is particularly common among migrants from North Africa and the Middle East, Sub-Saharan Africa and Eastern Europe and among recent migrants (Kieseppä et al., 2020). This suggests that the Finnish psychiatric service system is not able to equally address the needs of migrants in general. In addition, the stigma related to psychotic symptoms may create additional barriers to help-seeking in many migrant communities. A qualitative study conducted among Somali migrants in Finland showed that mental disorders are seen as incurable 'madness' that have a spiritual or social origin (Mölsä, Hjelde, & Tiilikainen, 2010). Because of severe social stigma, families often attempt to care for the mentally ill person at home and prefer consulting religious healers instead of Finnish health professionals (Mölsä et al., 2010). Mistrust in health professionals prevents help-seeking particularly among migrants with past traumatic events (Schubert, Punamäki, Suvisaari, Koponen, & Castaneda, 2019), and low trust may be even more common among those with psychotic symptoms.

There can also be specific problems in using medication among migrants. There may be negative beliefs toward psychotropic medication. For example, among a group of hospitalized patients in Switzerland, migrant patients were less positive about taking psychotropic medication, they relied more on other patients as a source of information and significant others had an opinion about medication more often compared with Swiss patients (Thorens, Gex-Fabry, Zullino, & Eytan, 2008). Practical issues such as problems in understanding instructions or inability to pay for the treatment may be barriers to regular treatment, particularly for refugees (UNHCR, 2019). Language difficulties, other communication problems with health-care providers and differing cultural beliefs may decrease adherence (Mourão & Bernardes, 2014). Recent migrants may have particular barriers in accessing services. In Finland, migrants less often apply for special reimbursement than Finnish-born people (Aaltonen, Lekander, Ahola, & Hiilamo, 2018). It is possible that not all migrants are aware that people with a psychotic disorder are entitled to full reimbursement for antipsychotic medication or they have problems applying it.

There may also be prescribing differences. In studies conducted mostly in the USA, it has been shown that ethnic minorities are less likely than non-ethnic minorities to be treated with newer antipsychotics (Puyat et al., 2013). In the UK, black service users with schizophrenia were more likely prescribed injectable

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Table 2. Risk of antipsychotic medication discontinuation assessed with Cox regression analysis

	HR (95% CI)	aHR[a] (95% CI)	aHR[b]
Migrant status (ref Finnish)			
Migrant	**1.53 (1.32–1.77)**	**1.37 (1.16–1.61)**	**1.28 (1.08–1.52)**
Region of origin (ref Finland)			
EU/EFTA, North America or Australia	**1.29 (1.02–1.65)**	1.23 (0.96–1.57)	1.16 (0.90–1.49)
Russia and Eastern Europe	**1.36 (1.10–1.68)**	1.22 (0.98–1.53)	1.14 (0.91–1.43)
North Africa and Middle East	**2.01 (1.53–2.65)**	**1.94 (1.45–2.59)**	**1.71 (1.28–2.29)**
Sub-Saharan Africa	**2.05 (1.51–2.80)**	**1.70 (1.23–2.35)**	**1.57 (1.13–2.18)**
Asia	**1.58 (1.16–2.14)**	1.31 (0.94–1.82)	1.25 (0.90–1.73)
Time since migration (ref Finnish)			
Less than 5 years	**1.80 (1.46–2.23)**	**1.42 (1.11–1.81)**	**1.30 (1.02–1.66)**
5–15 years	**1.57 (1.28–1.91)**	**1.40 (1.13–1.73)**	**1.29 (1.04–1.60)**
More than 15 years	**1.36 (1.09–1.71)**	**1.33 (1.05–1.69)**	1.26 (0.99–1.61)
Sex (ref male)			
Female	1.11 (0.96–1.29)	1.08 (0.93–1.25)	1.02 (0.88–1.19)
Age (ref 60 or more)			
15–29	**1.60 (1.13–2.29)**	**2.06 (1.43–2.97)**	**1.93 (1.33–2.81)**
30–44	0.99 (0.69–1.42)	1.11 (0.77–1.60)	1.20 (0.83–1.73)
45–59	0.83 (0.57–1.22)	0.87 (0.60–1.27)	0.95 (0.65–1.40)
Marital status (ref widowed/divorced/separated)			
Married/registered	1.13 (0.92–1.39)	1.09 (0.88–1.34)	1.02 (0.83–1.27)
Unmarried	0.85 (0.70–1.02)	**0.66 (0.53–0.81)**	**0.69 (0.56–0.85)**
SES (ref entrepreneurs)			
Higher white collar	0.91 (0.55–1.50)	0.83 (0.50–1.38)	0.91 (0.55–1.51)
Lower white collar	1.19 (0.76–1.84)	1.16 (0.74–1.82)	1.29 (0.82–2.03)
Blue collar	0.99 (0.64–1.53)	0.92 (0.59–1.42)	1.12 (0.72–1.75)
Others	0.75 (0.50–1.13)	0.81 (0.54–1.23)	1.04 (0.68–1.58)
Antipsychotic treatment before diagnosis (ref yes)			
No treatment	**4.85 (3.79–6.21)**	**4.19 (3.25–5.40)**	**3.31 (2.54–4.30)**
First antipsychotic (ref olanzapine)			
Quetiapine	0.97 (0.80–1.18)	1.00 (0.82–1.22)	1.03 (0.84–1.25)
Risperidone	0.99 (0.81–1.21)	1.11 (0.90–1.36)	1.11 (0.91–1.37)
Aripiprazole	0.82 (0.51–1.32)	0.86 (0.53–1.37)	0.91 (0.57–1.45)
Clozapine	**0.18 (0.10–0.31)**	**0.22 (0.13–0.39)**	**0.29 (0.16–0.51)**
Other monotherapy	**0.52 (0.39–0.68)**	**0.65 (0.49–0.87)**	**0.71 (0.53–0.95)**
Polytherapy	**0.55 (0.38–0.80)**	**0.61 (0.42–0.88)**	**0.63 (0.44–0.91)**
First diagnosed (ref in hospital)			
In outpatient care	0.90 (0.78–1.05)	0.98 (0.84–1.14)	0.97 (0.84–1.13)
Involuntary hospitalization (ref no)			
Yes	**1.67 (1.39–2.01)**	**1.67 (1.38–2.01)**	**1.67 (1.39–2.02)**
Diagnosis during first year (ref F20/F25)			
Other	**2.08 (1.71–2.54)**	**1.84 (1.50–2.25)**	**1.66 (1.36–2.04)**

[a]Adjusted for sex, age and marital status.
[b]Adjusted for sex, age, marital status, first antipsychotic, involuntary hospitalization and diagnosis during first year
Unadjusted and adjusted hazard ratios (HRs).
Bold font indicates statistical significance ($p < 0.05$).

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Table 3. Risk of antipsychotic medication discontinuation assessed with Cox regression analysis

	Migrants			Finnish-born participants		
	HR (95% CI)	aHR[a] (95% CI)	aHR[b]	HR (95% CI)	aHR[a] (95% CI)	aHR[b]
Region of origin (ref EU/EFTA, North America or Australia)						
Russia and Eastern Europe	1.06 (0.80–1.41)	0.99 (0.74–1.32)	0.99 (0.74–1.32)			
North Africa and Middle East	**1.56 (1.12–2.18)**	**1.61 (1.14–2.26)**	**1.56 (1.11–2.21)**			
Sub-Saharan Africa	**1.63 (1.12–2.35)**	1.45 (1.00–2.11)	1.41 (0.97–2.06)			
Asia	1.23 (0.86–1.77)	1.09 (0.75–1.59)	1.11 (0.77–1.62)			
Time since migration (ref more than 15 years)						
Less than 5 years	**1.33 (1.01–1.75)**	1.12 (0.83–1.51)	1.07 (0.79–1.45)			
5–15 years	1.15 (0.88–1.50)	1.06 (0.81–1.40)	1.03 (0.78–1.35)			
Sex (ref male)						
Female	1.12 (0.91–1.38)	1.14 (0.92–1.41)	1.08 (0.87–1.34)	1.04 (0.84–1.28)	1.02 (0.82–1.26)	0.96 (0.77–1.19)
Age (ref 60 or more)						
15–29	1.41 (0.86–2.30)	1.66 (1.00–2.75)	1.67 (0.99–2.81)	**1.84 (1.10–3.08)**	**2.16 (1.26–3.70)**	**1.97 (1.14–3.42)**
30–44	0.98 (0.60–1.62)	1.03 (0.62–1.70)	1.07 (0.64–1.80)	1.04 (0.62–1.75)	1.12 (0.66–1.91)	1.27 (0.74–2.18)
45–59	0.80 (0.48–1.33)	0.80 (0.48–1.34)	0.81 (0.48–1.36)	0.79 (0.45–1.39)	0.83 (0.47–1.47)	1.04 (0.59–1.86)
SES (ref entrepreneurs)						
Higher white collar	0.85 (0.42–1.70)	0.78 (0.39–1.56)	0.81 (0.40–1.66)	0.98 (0.47–2.08)	0.88 (0.42–1.88)	0.93 (0.43–1.98)
Lower white collar	1.17 (0.63–2.20)	1.12 (0.59–2.13)	1.23 (0.64–2.36)	1.25 (0.64–2.43)	1.18 (0.60–2.32)	1.24 (0.62–2.46)
Blue collar	1.15 (0.65–2.02)	1.10 (0.62–1.94)	1.23 (0.69–2.20)	0.86 (0.44–1.70)	0.77 (0.39–1.52)	1.00 (0.50–2.01)
Others	0.99 (0.58–1.67)	0.99 (0.57–1.69)	1.14 (0.65–1.99)	0.63 (0.33–1.20)	0.67 (0.35–1.29)	0.89 (0.46–1.72)
Marital status (ref widowed/divorced/separated)						
Married/registered	1.02 (0.80–1.30)	0.99 (0.77–1.28)	0.90 (0.70–1.16)	1.43 (0.96–2.13)	1.39 (0.92–2.10)	1.43 (0.94–2.16)
Unmarried	0.94 (0.72–1.23)	**0.74 (0.55–0.99)**	**0.74 (0.54–1.00)**	1.16 (0.83–1.62)	0.86 (0.60–1.25)	0.88 (0.61–1.27)
Antipsychotic treatment before diagnosis (ref yes)						
No treatment	**4.24 (2.81–6.38)**	**3.96 (2.57–6.09)**	**3.64 (2.33–5.68)**	**4.81 (3.53–6.57)**	**4.16 (3.03–5.72)**	**3.14 (2.26–4.37)**
First antipsychotic (ref olanzapine)						
Quetiapine	0.87 (0.65–1.15)	0.94 (0.70–1.25)	0.95 (0.71–1.27)	1.15 (0.87–1.52)	1.09 (0.83–1.45)	1.15 (0.87–1.53)
Risperidone	0.87 (0.66–1.14)	0.96 (0.72–1.28)	0.96 (0.72–1.28)	1.14 (0.84–1.53)	1.27 (0.93–1.72)	1.28 (0.94–1.73)
Aripiprazole	0.88 (0.41–1.88)	0.88 (0.41–1.90)	0.86 (0.40–1.86)	0.91 (0.50–1.67)	0.90 (0.49–1.65)	1.01 (0.55–1.86)
Clozapine	**0.25 (1.12–0.55)**	**0.31 (0.14–0.67)**	**0.37 (1.12–0.82)**	**0.15 (0.06–0.34)**	**0.17 (0.07–0.39)**	**0.23 (0.10–0.52)**
Other monotherapy	0.71 (0.49–1.03)	0.88 (0.60–1.29)	0.93 (0.63–1.37)	**0.42 (0.28–0.65)**	**0.52 (0.33–0.80)**	**0.57 (0.37–0.90)**
Polytherapy	0.62 (0.35–1.11)	0.63 (0.36–1.12)	0.63 (0.35–1.11)	**0.59 (0.36–0.96)**	0.64 (0.39–1.04)	0.67 (0.41–1.09)
First diagnosed (ref in hospital)						
In outpatient care	0.95 (0.77–1.17)	1.05 (0.85–1.31)	1.03 (0.83–1.28)	0.93 (0.75–1.14)	0.98 (0.79–1.21)	0.99 (0.80–1.23)
Involuntary hospitalization (ref no)						
Yes	**1.45 (1.12–1.87)**	**1.52 (1.17–1.97)**	**1.57 (1.21–2.04)**	**1.84 (1.40–2.40)**	**1.80 (1.37–2.36)**	**1.82 (1.38–2.41)**
Diagnosis during first year (ref F20/F25)						
Other	**1.65 (1.24–2.21)**	**1.62 (1.21–2.18)**	**1.62 (1.20–2.18)**	**2.28 (1.74–3.00)**	**1.99 (1.51–2.62)**	**1.67 (1.26–2.21)**

[a]Adjusted for sex, age and marital status.
[b]Adjusted for sex, age, marital status, first antipsychotic, involuntary hospitalization and diagnosis during 1st year.
Stratified analysis for migrants and Finnish-born participants. Unadjusted and adjusted hazard ratios.
Bold font indicates statistical significance ($p < 0.05$).

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antipsychotics compared with white service users (Das-Munshi, Bhugra, & Crawford, 2018). However, black service users with treatment resistance were less likely to be prescribed clozapine (Das-Munshi et al., 2018). More use of injectable antipsychotics and less use of clozapine was also used for immigrant patients than non-immigrant patients in a sample of hospitalized patients in Spain (Alda Díez, García Campayo, & Sobradiel, 2010).

Furthermore, there are pharmacological factors that may lead to poorer response or increased prevalence of side effects among migrants. Because of pharmacogenetic differences, there may be a higher proportion of slow or rapid metabolizers in certain migrant populations than in the Finnish general population (Bertilsson, 2007). There can also be ethnic variation in environmental factors, such as dietary habits and the use of herbal medications that have pharmacological effects (Chaudhry, Neelam, Duddu, & Husain, 2008). Non-optimal responses or side effects are likely to increase the risk of discontinuation.

Particular attention should be paid to patients who have been involuntarily treated. A large majority of involuntarily hospitalized patients in this study did not initiate antipsychotic medication or discontinued it during the first year. They probably experience less need for treatment and are therefore less adherent both to outpatient care and medication. Even though not all studies have shown a difference in adherence between voluntarily and involuntarily hospitalized patients (Jaeger et al., 2013), it is possible that traumatic experiences related to involuntary hospitalization decrease the motivation to use the medication (Tessier et al., 2017). Migrant groups, which were compulsorily admitted at first-episode psychosis in Sweden (Terhune et al., 2020), were similar to groups that had a higher discontinuation risk in our study. In our study, participants, who had used antipsychotic medication before being diagnosed, were more likely to continue care after diagnosis. Early intervention without the use of coercion should be a priority among migrant as well as non-migrant patients.

Even though the differences in the continuity of antipsychotic medication were rather small when all migrants were studied together, there was great variation by the region of origin. Lower continuity of antipsychotic medication in certain migrant populations raises concern about worse outcomes of psychotic disorders in these groups. Approaches that are generally recommended for improving adherence, such as fostering therapeutic alliance, optimizing care effectiveness, involving patient's support system (Phan, 2016) and individually identifying the factors that may decrease adherence for each patient (Velligan et al., 2017) should be implemented regardless of patient's origin. Additionally, it would be worth studying the cultural adaption of interventions. Studies conducted among migrants are lacking, but in the USA, cultural adaptations of skills training intervention (Mausbach et al., 2008) and multifamily group therapy (Kopelowicz, 2012) for Latino patients with a psychotic disorder have shown better medication adherence and management compared with standard interventions. Motivational interviewing is often included in interventions to improve adherence (Kane, Kishimoto, & Correll, 2013) and there have been efforts to culturally adapt it mostly for Latino and American Indian populations (Oh & Lee, 2016). Motivational pharmacotherapy has been developed to improve antidepressant adherence among Latino patients with depression (Lewis-Fernández et al., 2013). However, no studies exist on cultural adaption of motivational interviewing for migrants with a psychotic disorder.

Strengths of this study include the large sample that covers the whole adult migrant population in Finland and comprehensive information on drug purchases that allows the study of the continuity of treatment. There are also several limitations. We did not have information on diagnoses given before the year 2007 and therefore we could not study first-episode psychosis. The number of patients with clozapine as their first antipsychotic drug suggests that our sample included patients who have been treated earlier and have re-entered specialized services after some years. The follow-up time was also relatively short. We studied all types of non-affective psychotic disorders together. It could be possible that there are more brief psychotic disorders that require shorter antipsychotic treatment among migrants. Being diagnosed with schizophrenia, however, was controlled for in adjusted analyses. Furthermore, there was no information on all possible predictors of low adherence such as substance use or medication side effects. The indicator of SES may be less reliable among migrants than among non-migrants. Information on the reason for migration was lacking.

Conclusions

Early discontinuation of antipsychotic treatment is common among all patients diagnosed with a psychotic disorder in Finland. It is more common among migrants than among the Finnish-born population. Efforts to improve early access to mental health services and continuity of care are needed for all patients, but social and cultural factors should be considered in service development.

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/S003329172100218X

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