

Prevalence and risk factors of psychological distress among foreign-born population in Finland: a population-based study comparing nine regions of origin

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Abstract

Aims Previous research indicates that foreign-born populations experience more psychological distress than general populations. However, it remains unclear how prevalence vary between regions of origin. The role of socio-demographic and migration-related factors also needs to be further investigated. We aim to 1) compare the prevalence of psychological distress in foreign-born and general Finnish population, 2) investigate differences in prevalence between nine regions of origin and 3) examine which socio-demographic and migration-related factors are associated with distress among foreign-born population.

Methods The present study used data from Survey on Well-Being among Foreign Born Population (FinMonik), a population-based survey of foreign-born population living in Finland collected between 2018–2019 by the Finnish Institute for Health and Welfare. Psychological distress was measured using the Mental Health Inventory-5 (MHI-5) with a cut-off point of 52. Logistic regression was used to adjust analyses by age and gender to determine the prevalence of psychological distress and the socio-demographic factors associated with it.

Results Psychological distress was more prevalent among foreign-born (17.4%) than general population (12.9%). Migrants from Middle East and North Africa had the highest prevalence (29.7%) compared to any other region of origin. Unemployment or economical inactivity, international protection as a reason for migration and beginner-level language proficiency were the main factors increasing the odds for distress among foreign-born population.

Conclusions Foreign-born population experiences more psychological distress than general population but prevalence vary between different regions of origin. Future efforts should aim at better understanding of these subpopulations and improving their mental health by diverse interventions.

words: 250

Key words: foreign-born population, migrant, migration, psychological distress, depression, anxiety, mental health, population-based study, prevalence

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Background

Despite migration has been found to be a risk factor for psychological distress in many studies, it does not inevitably lead to mental health problems [1]. In general, majority of studies comparing native and migrant populations indicate more depressive and anxiety symptoms among migrant populations [2,3]. Studies conducted in Nordic countries have reported similar results [4,5]. In contrast, especially North American studies demonstrate the 'healthy immigrant effect' which indicates better mental health for recently arrived migrants compared to native population [6]. At the same time, a recent systematic review found no significant differences between depression prevalence of migrant and native populations [7]. Globally, the research findings of depressive and anxiety symptoms between migrant and native or general populations remain inconsistent.

One reason for inconsistent results may be the lack of population-based studies examining migrants as heterogeneous subpopulations. The migrant subpopulations in studies are often diverse for instance in terms of socio-demographic and migration-related factors which complicates the comparison of studies [5]. Different socio-demographic and psychological characteristics e.g. optimism, personal resilience, self-esteem and socio-economic factors can have an influence on the mental health of migrants similarly to general populations [8]. Additionally, mental health is dependent on experiences prior to migration [9], perceived discrimination [8,10,11] acculturation stress [8,12] as well as entry and integration policies in the host country [13]. Moreover, different migration-related factors have found to be associated with mental health such as region of origin [14], reason for migration [1,15], length of stay in host country [7] and language competency [5]. However, the findings of the relation between migration-related factors and psychological distress remain inconsistent.

Aims

This study aims to 1) compare the prevalence of psychological distress in foreign-born and general Finnish population, 2) investigate differences in prevalence between nine regions of origin and 3) examine which socio-demographic and migration-related factors are associated with psychological distress among foreign-born population.

Methods

The present study used data from the Survey on Well-Being among Foreign Born Population (FinMonik) which is a population-based survey of foreign-born population living in Finland conducted by the Finnish Institute for Health and Welfare [16]. Data from the FinSote National Survey of Health, Well-Being and Service Use (FinSote 2018) was used as a reference group giving information on the health and well-being of the general Finnish population.

The FinMonik data were collected between March 2018 and January 2019 primarily by an electronic questionnaire. Additionally, individuals who had not responded to the electronic survey were given a chance to participate by paper questionnaire and telephone interview. The questionnaire was translated into 17 most common languages spoken in Finland and telephone interviews were conducted in ten languages. More detailed information of the FinMonik study is provided elsewhere [16].

Sample and study participants

The target population of the FinMonik study consisted of working aged (18–64-year-olds) foreign-born population currently living in all regions of mainland Finland (thus Finland excluding Åland) who had lived in Finland at least for 12 months and whose parents were also born abroad. A random sample was obtained from the population register maintained by the Digital and Population Data Service Agency in March 2018. In the study, Finland was divided into 18 counties and six largest cities and at least 600 target population individuals were selected from each of them. After removing the over-coverage ($n=774$), the sample size in total was 12,877. Of them, 6,836 responded in the survey. In the present study, the responses of 20–64-year-olds were included ($n=6,312$) to match the age range of FinSote data. Altogether, the overall response rate was 53.1 per cent. Examinees responded to either electronic survey (35.9%, $n=4,618$), paper questionnaire (14.6%, $n=1,878$) or telephone interview (2.6%, $n=340$). The reference group dataset National Study of Health, Well-being and Service Use (FinSote) was collected between 2017 and 2018 by an online questionnaire or by post. Sample size in this survey was 59,440 with a sample size of 3,300 persons selected in each county. The study was conducted in Finnish adult population of at least 20 years of age. The overall response rate in this study was 43 per cents ($n=26,422$) of which the responds of 20–64-year-olds were used in the present study ($n=11,378$).

Measures

Psychological distress

Psychological distress may involve a broad spectrum of psychological suffering, such as symptoms of depression and anxiety. In the present study psychological distress was measured by the five-item Mental Health Inventory (MHI-5) which is a subscale of the Medical Outcomes Study (MOS) Short Form Health Survey [17]. Originally Mental Health Index was developed by Veit and Ware in 1983 [18] involving 38 items.

MHI-5 includes five questions about the occurrence of depressive and anxiety symptoms during the past four weeks. Out of the five questions, two are aimed at depressive symptoms (feeling down, downhearted and blue), two at anxiety symptoms (feeling nervous, calm and

peaceful) and one at more general psychological well-being (happiness). Each of the five questions are answered on a scale from 1 (all of the time) to 6 (none of the time) and responses are combined to lie on a range of 0 (poor mental health) and 100 (good mental health). The cut-off point for clinically significant symptoms was 52 points so that the ones scoring under 52 were defined as psychologically distressed [19].

Sosio-demographic and migration-related variables

The chosen background variables were age, gender, marital status, geographical regions, educational level and employment status. To enable regional comparison, the classification of "catchment areas for highly specialized medical care" was used. This classification divides Finland into five regions in which university hospitals are located. To ensure readability, abbreviations such as Helsinki region and Turku region were used. The migration-related variables in this study were region of origin, age at moving to Finland, years lived in Finland, reason for moving to Finland and Finnish or Swedish language proficiency. Unlike other background variables, these migration-related questions were only asked from foreign-born population. All questions asked in FinMonik study can be found elsewhere in Finnish [19].

Statistical analysis

The analyses were carried out using SAS 9.4 and SUDAAN 11.0.3 statistical software. Weights were used in all analyses, reducing non-response bias and accounting for the unequal sampling probabilities. The calculation of the weights is described in more detail elsewhere [16]. The stratification of the sample was accounted for in the variance estimates using Taylor linearization method. Finite population correction was also applied because a large proportion of the total population was included in the sample in some regions [20]. In Tables 2 and 3, logistic regression was used to adjust analyses by age and sex. In table 2, model-adjusted estimates were calculated using predicted marginals [21]. Statistical significance was assessed with 95% confidence intervals and Satterthwaite-adjusted F-value.

Ethical consideration

The FinMonik study was approved by the Institutional Review Board (IRB) of the Finnish Institute for Health and Welfare (THL). Informed consent was obtained from the respondents to participate in the survey.

Results

Table I shows the main characteristics of the study population. Prevalence rates of psychological distress among different subpopulations are presented in Table II. The

prevalence was significantly higher in foreign-born (17.4%) than in general population (12.9%). Similar result was found for both men (17.9% vs. 12.8%) and women (16.9% vs. 13.1%). Comparing the age groups of foreign-born and general populations, distress was significantly more prevalent among foreign-born population in the age groups of 40–49 and 50–64-year-olds. In younger age groups prevalence rates were similar between the populations. Compared to the general population, distress was more prevalent in foreign-born population in all five geographical regions.

Table 1 here

Among the different regions of origin, the highest prevalence of distress was observed in migrants from Middle East and North Africa (MENA) (29.7%). Additionally, East Asian migrants had significantly higher prevalence compared to the general population (20.5%). In men, distress was more prevalent for migrants from MENA and East Asia and less prevalent for migrants from Latin America compared with the general population. In women, only migrants from MENA had significantly higher prevalence than women in the general population. Between genders, difference was found only in Latin American migrants in which men had significantly lower prevalence than women.

Migrants from MENA had higher prevalence of distress in every age group compared to the general population. In addition, significantly higher prevalence rates were found among 30–39-year-old migrants from East Asia, 40–49-year-old migrants from “other parts of Europe, North America and Oceania” and 50–64-year-old migrants from Russia or former Soviet Union. Instead, lower prevalence rates were found in 20–29-year-old migrants from Africa (excluding North Africa) and Latin America. Among migrants from MENA, distress was more prevalent in all geographical regions compared with the general population. Otherwise, prevalence rates varied widely between geographical regions.

Table 2 here

Married men had increased odds for distress (odds ratio OR 1.42, 95% confidence interval CI 1.06–2.00) compared with single, divorced, or widowed men. In women, there was no association found between marital status and distress. Being unemployed or economically inactive (meaning other employment status than employed or unemployed) increased the odds for distress in both men (OR 1.81, 95% CI 1.25–.62) and women (OR 2.06, 95% CI 1.48–2.87). Additionally, women with the lowest educational level had significantly increased odds for distress (OR 1.65, 95% CI 1.05–2.62) compared to women with higher educational level.

Migrants whose reason for migrating to Finland was international protection, demonstrated a significantly higher likelihood for distress in both men (OR 1.59, 95% CI 1.03–2.46) and women

(OR 1.79, 95% CI 1.07–2.99) compared to those who had moved to Finland due to work or studies. Men who had migrated at the age of 30 or older had increased odds for distress (OR 2.15, 95% CI 1.14–4.08) compared with men migrated at the age of 15 or younger. This association was not found among women. For both genders, there was no association found between distress and years lived in Finland. Compared with those speaking Finnish or Swedish on an excellent level, migrants with a language proficiency of a beginner had significantly higher odds for distress in both men (OR 1.96, 95% CI 1.26–3.05) and women (OR 1.97, 95% CI 1.32–2.94). The odd ratios of different associated factors can be seen in detail in Table III.

Table 3 here

Discussion

Findings from our study are largely consistent with previous research from Nordic countries suggesting that migrant population experiences more psychological distress than general or native populations [4,5]. This finding is somewhat contradictory to a Finnish register-based study suggesting that depressive disorders are less common in migrants than Finns [22]. Therefore, future work should aim at prevention and low-threshold treatment targeted at migrants since it seems that foreign-born population is more often distressed but diagnoses remain lower than in native population.

Our study extends the knowledge about mental health of migrants from different regions of origin. Among migrants from MENA, distress was more prevalent in both genders, all age groups and geographical regions compared to the general population. This corresponds with previous studies conducted in Nordic countries [5,14,23]. We also demonstrate heterogeneity in the distress of migrants from different regions of origin which highlights the need for further investigation of these subpopulations. Additionally, these differences should be taken into consideration in the implementation of mental health interventions targeted at migrant. Previous studies have reported higher risk of depression and anxiety for migrants from low-income countries [4] and for Russian and other Eastern European migrant women [5,14] and higher risk of depression for migrants arriving outside Europe [2]. Several factors may make these migrant subpopulations vulnerable to psychological distress. Traumatic experiences prior to migration, different cultural perceptions about mental health and low levels of acculturation are found to be important factors explaining this result [23]. In addition, cultural differences can influence the experience and expressions of mental health problems [24]. Also, in Finland discrimination experiences have found to be associated with mental health symptoms among Kurdish, Somalian, and Russian migrants [10,11].

In our study, female gender was not found to be a risk factor for psychological distress in foreign-born population which is opposite to previous findings [3,4,23]. Reasons underlying the differences may be high disparity between cultures in gender roles [23] or family values or different risk factors affecting their mental health [8]. Additionally, men may be less likely to report less severe depressive symptoms [25] which can explain the absence of a gender gap in our study.

In Finland, a half of all migrants live within the metropolitan area and a quarter in the capital city, Helsinki [26]. In our study, the prevalence of distress among foreign-born and general populations in Helsinki region was similar to other regions. Overall, prevalence rates varied widely between geographical regions. To enable conclusions on the regional differences in migrant mental health, future research should continue investigating the different regions of Finland.

The suggestion that being single, divorced, or widowed is a risk factor for mental health was not supported in our study since we found that married men had increased odds for psychological distress. This is not in line with previous migrant studies [3,8] and is contrary to the general notion of marriage being a protective factor against poor mental health. However, a Swedish study also found that unmarried Iraqis and Iranians had better mental health than those who were married [23]. This may be explained by family separation and the lack of social support since men are usually the first ones to reside in a new country and family reunification may appear as a difficult and prolonged process [27]. In general, social support has found to be a protective factor against mental health problems [3,8].

Our study adds to the existing evidence on the role of socio-economic and migration-related factors in the prevalence of psychological distress [3,4,23]. Unemployment or economical inactivity were associated with psychological distress among both genders and low educational level among women. Sidorchuk and colleagues [28] assumed that the role of unemployment in mental health is more significant than gender-specific and migration-related factors. Additionally, Foo and colleagues [7] suggested that unemployment leads to social and financial instability which in turn exacerbates the acculturative stress migrants already face. The role of educational level in the literature has remained unclear since many studies demonstrate that highly educated migrants suffer more often from depression and anxiety compared to migrants with lower educational level because the lack of job corresponding to education due to for example language difficulties [3,7].

The mental health of refugees has been widely investigated. As reported previously [1,29], refugee-background was observed to be associated with psychological distress in our study. Interestingly, Lindert and colleagues [1] suggest that in affluent host countries distress

symptoms may remain lower among labor migrants but not among refugees compared to less affluent countries. Henkelmann and colleagues [29] suggested that it is not only the exposure to conflict or war itself but also post-migration factors such as life-threatening journeys to a new host country, long asylum procedures, family separation and discrimination that underlie the poor mental health of refugees. The importance of awareness of the post-migration factors are highlighted since they can be influenced in host societies [29].

We observed that foreign-born men who had migrated to Finland at the age of 30 or older had increased odds for psychological distress. Abebe and colleagues [4] mentioned age at migration to be an important moderator between social status and mental health. However, this factor has not been widely investigated and it remains unclear whether it has an influence on the levels of distress. Our study revealed no association between years lived in Finland and distress which is similar to a finding from Norway [14]. In contrast, a recent review reported that the acculturative stress of migrants may peak in the early post-migration state following mental health improvements over time [7]. Conversely, Blackmore and colleagues [15] found in their review that the prevalence of depression among refugees and asylum seekers was persistent many years after displacement. However, anxiety symptoms were more prevalent in refugees and asylum seekers whose residency had been less than four years [15]. These findings are contrary to the 'healthy immigrant effect' that is recognized and investigated widely in North America [6] but may not be generalizable to the Nordic countries. Similar to the results reported previously in a Finnish study [5], our study revealed beginner-level Finnish or Swedish language proficiency to be associated with psychological distress. Also, a recent review found that language barriers are associated with acculturation stress [30] which in turn can affect the mental health of migrants [12].

Strengths and limitations

Population-based approach with a register-based random sample and relatively high participation rate are important strengths of our study. Also, we analyzed as many as nine regions of origin and compared their results with the general population to receive information about different migrant subpopulations. Moreover, we included various socio-demographic and migration-related factors to identify the migrant subpopulations vulnerable to poor mental health. To improve the response rate and to ensure a representative foreign-born population sample, respondents were given a chance to participate by online survey, paper questionnaire or telephone interview. Questionnaires and interviews were translated into numerous languages. Also, MHI-5 has been found to be a valid tool in detecting depressive and anxiety symptoms in population-based studies [17].

The results should be interpreted with caution considering several limitations. Cross-sectional nature of the study did not allow us to establish causality between migration and psychological distress. Additionally, the cross-cultural validity of the MHI-5 remains unclear. Despite that the analysis weights had been taken into account, it needs to be acknowledged that the response rate may have been lower in certain population segments. We also did not investigate the mental health of newly arrived or foreign-background population so conclusions about their mental health cannot be drawn.

Conclusions

Our finding that foreign-born population, especially migrants from MENA, has significantly higher prevalence of psychological distress than the general population, underlines the importance of public health interventions targeted at them. These interventions should not only concentrate on the mental health aspect but also aim at improving the overall integration of migrants by addressing issues such as acculturation, language skills and employment. Future research should focus on identifying the mental health risk factors of different migrant subpopulations to achieve better understanding of these diverse populations.

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Conflict of interest

The Authors declare that there is no conflict of interest.

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Primary level	40.1 (4442)	18.1 (908)	9.5 (157)	22.6 (85)	14.2 (135)	31.0 (245)	23.1 (52)	30.9 (180)	7.9 (28)	6.3 (11)	9.3 (15)
Secondary level	31.5 (3513)	38.0 (2179)	42.2 (767)	54.1 (330)	30.9 (343)	38.9 (284)	38.2 (83)	35.2 (222)	17.9 (60)	18.7 (45)	38.6 (45)
Higher level	28.44 (3166)	43.9 (2923)	48.3 (934)	23.4 (168)	54.8 (675)	30.1 (298)	38.9 (139)	33.9 (202)	74.2 (201)	74.9 (214)	52.1 (92)
Employment											
Employed	65.1 (7018)	66.4 (3733)	66.5 (1139)	80.1 (470)	70.3 (814)	52.0 (345)	58.7 (146)	63.6 (365)	68.6 (184)	72.0 (183)	65.0 (87)
Other	34.9 (4138)	33.6 (2229)	33.5 (715)	19.9 (113)	29.7 (341)	48.0 (445)	41.3 (118)	36.4 (241)	31.4 (108)	28.0 (88)	35.0 (60)
Age at migration											
15 or younger	.	9.7 (409)	14.1 (180)	5.9 (45)	8.6 (54)	12.2 (53)	9.1 (12)	10.3 (38)	8.0 (14)	2.9 (9)	3.0 (4)
15–19 years	.	10.1 (461)	12.4 (157)	8.4 (40)	7.6 (48)	9.9 (81)	9.6 (21)	13.4 (66)	10.1 (17)	11.9 (26)	7.9 (5)
20–29 years	.	44.2 (2590)	34.6 (584)	34.0 (167)	49.7 (603)	45.6 (376)	56.6 (167)	45.6 (276)	46.9 (138)	64.3 (190)	44.3 (79)
30+ years	.	35.9 (2852)	38.8 (992)	51.7 (351)	34.1 (478)	32.3 (385)	24.7 (99)	30.7 (282)	34.9 (128)	20.9 (69)	44.8 (78)
Lived in Finland											
1–4 years	.	18.6 (1748)	9.8 (326)	14.8 (86)	18.7 (307)	20.9 (402)	24.9 (108)	24.1 (229)	22.0 (95)	37.0 (135)	20.9 (60)
5–10 years	.	32.6 (2097)	23.3 (551)	50.9 (287)	32.5 (408)	29.1 (237)	30.5 (109)	30.8 (242)	35.4 (106)	43.6 (111)	31.0 (46)
over 10 years	.	48.8 (2467)	66.8 (1036)	34.2 (230)	48.7 (478)	50.0 (256)	44.6 (82)	45.1 (191)	42.6 (96)	19.4 (48)	48.1 (50)
Reason for migration											
Working or studying	.	39.7 (2251)	29.5 (501)	68.8 (381)	41.7 (521)	18.8 (138)	37.3 (118)	34.3 (180)	63.8 (170)	76.9 (199)	24.1 (43)
Family reasons	.	37.7 (2498)	37.6 (811)	20.7 (136)	45.5 (557)	35.4 (230)	31.0 (81)	53.1 (398)	36.1 (117)	21.5 (64)	71.1 (104)
International protection	.	13.9 (686)	2.2 (22)	.	11.0 (53)	46.4 (461)	31.7 (80)	12.6 (55)	0.1 (2)	1.6 (7)	4.9 (6)
Finnish origin returnee	.	8.7 (595)	30.6 (523)	10.5 (56)	1.8 (13)	0.1 (3)
Finnish language proficiency											
Beginner	.	34.2 (2304)	24.5 (521)	17.4 (80)	37.6 (453)	34.1 (385)	34.5 (117)	50.2 (340)	61.8 (185)	61.7 (164)	37.4 (59)
Average	.	33.0 (1982)	32.6 (672)	44.9 (214)	25.7 (325)	35.2 (272)	33.9 (93)	34.7 (205)	23.6 (72)	27.3 (75)	34.2 (54)
Excellent	.	32.8 (1796)	42.9 (680)	37.7 (291)	36.7 (377)	30.7 (188)	31.6 (68)	15.1 (87)	14.6 (35)	11.1 (31)	28.4 (39)

¹ Weighted prevalence

TABLE 2. Prevalence rates of psychological distress.

Region of origin	General population	Foreign-born population	Russia or former Soviet Union	Estonia	Other parts of Europe, North America, Oceania	Middle East and North Africa	Africa (excl. North Africa)	Southeast Asia	East Asia	South and West Asia	Latin America
	% ¹ (95 % CI)	% ¹ (95 % CI)	% ¹ (95 % CI)	% ¹ (95 % CI)	% ¹ (95 % CI)	% ¹ (95 % CI)	% ¹ (95 % CI)	% ¹ (95 % CI)	% ¹ (95 % CI)	% ¹ (95 % CI)	% ¹ (95 % CI)
All	12.9 (11.8–14.2)	17.4 (15.9–19.2)***	15.6 (12.9–18.8)	15.9 (11.8–21.1)	16.1 (13.0–19.9)	29.7 (24.8–35.1)***	10.3 (5.8–17.7)	14.9 (10.9–20.1)	20.5 (13.8–29.5)*	14.3 (8.4–23.2)	9.1 (4.3–18.3)
Gender											
Male	12.8 (11.1–14.7)	17.9 (15.7–20.4)**	16.5 (12.0–22.3)	17.0 (10.9–25.5)	15.0 (11.1–20.0)	28.4 (23.0–34.6)***	12.2 (6.1–22.9)	16.8 (9.5–28.0)	27.3 (14.4–45.5)*	14.8 (7.4–27.4)	2.9 (1.4–6.1)***
Female	13.1 (11.7–14.7)	16.9 (14.8–19.3)**	13.9 (11.1–17.3)	13.7 (9.1–20.1)	17.8 (13.0–24.0)	33.8 (24.9–43.9)***	8.8 (3.3–21.9)	15.5 (10.7–21.9)	17.9 (11.3–27.3)	18.2 (8.6–34.4)	15.0 (6.4–31.6)
Age											
20–29 years	19.2 (16.1–22.8)	19.1 (15.6–23.2)	19.8 (13.4–28.4)	18.8 (8.9–35.3)	15.1 (9.2–23.7)	30.9 (22.0–41.5)*	1.7 (0.4–6.6)***	19.4 (11.3–31.3)	11.3 (3.0–34.8)	24.5 (10.9–46.4)	4.0 (1.2–12.6)**
30–39 years	13.3 (10.8–16.3)	15.6 (13.1–18.5)	8.1 (4.8–13.5)	19.2 (11.1–31.1)	15.1 (9.8–22.7)	22.3 (16.8–29.1)**	14.4 (6.7–28.2)	12.4 (6.3–22.7)	31.6 (19.7–46.5)**	11.3 (6.1–19.9)	10.6 (3.7–26.8)
40–49 years	10.3 (8.4–12.6)	17.4 (14.2–21.2)***	15.2 (9.7–23.1)	14.8 (8.6–24.3)	19.0 (12.9–27.2)**	38.1 (25.5–52.6)***	7.6 (2.4–21.5)	13.4 (7.2–23.7)	6.8 (2.3–18.6)	11.9 (3.1–36.5)	6.2 (2.5–14.4)
50–64 years	10.4 (9.0–11.9)	19.2 (16.0–22.8)***	20.7 (15.9–26.4)***	11.0 (6.1–19.2)	14.3 (9.5–21.0)	36.0 (24.5–49.4)***	15.6 (4.0–44.9)	18.4 (8.9–34.3)	19.8 (6.1–48.3)	2.1 (0.3–13.7)	11.0 (2.2–40.1)
Region											
Helsinki	13.8 (11.4–16.6)	17.2 (15.0–19.7)*	15.0 (11.2–19.9)	16.5 (11.5–23.2)	16.2 (11.6–22.1)	29.9 (22.6–38.4)***	12.3 (6.3–22.8)	13.7 (8.0–22.3)	21.2 (12.0–34.7)	13.9 (6.6–27.2)	7.5 (2.0–24.5)
Turku	12.5 (10.7–14.5)	16.3 (13.3–19.8)*	13.4 (8.3–21.0)	12.5 (6.1–23.9)	13.4 (8.5–20.5)	29.3 (20.7–39.7)***	2.1 (0.5–8.9)*	16.7 (9.0–28.8)	28.2 (13.4–49.9)*	11.9 (4.9–26.2)	7.9 (2.2–24.9)
Tampere	12.9 (11.1–15.0)	18.9 (15.5–22.9)**	22.0 (14.8–31.5)*	15.3 (7.7–28.2)	19.7 (13.1–28.4)	31.7 (21.4–44.1)***	1.4 (0.4–5.5)**	9.9 (4.6–20.0)	9.9 (4.5–20.5)	19.5 (9.5–35.9)	7.1 (2.1–21.6)
Kuopio	12.0 (10.5–13.6)	19.4 (16.8–22.4)***	17.4 (13.7–21.8)*	18.5 (10.4–30.7)	19.4 (13.8–26.7)*	20.9 (14.6–28.9)*	20.2 (7.9–42.8)	24.2 (14.1–38.4)*	23.0 (11.3–41.0)	22.8 (12.7–37.6)	12.3 (3.2–37.6)

Oulu	12.0 (10.2– 14.0)	17.9 (15.1– 21.1)**	13.4 (9.5– 18.5)	7.5 (2.6– 19.5)	15.9 (11.3– 21.9)	36.6 (27.5– 46.8)***	7.8 (3.0– 18.6)	15.7 (9.7– 24.5)	18.1 (7.3– 38.2)	6.8 (3.0– 15.0)	29.6 (15.0– 50.1)*
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All models adjusted for age and gender

¹ Weighted prevalence

95% CI = 95% confidence interval.

Statistical significance for the difference between general population and foreign-born population or region of origin:

* = p-value < 0.05

** = p-value < 0.01

*** = p-value < 0.001

Bolded prevalence rates and p-values represent statistically significant differences between the country of origin and the general population.

TABLE 3. Socio-economic and migration-related factors associated with psychological distress among foreign-born population.

	Total ¹	Men ²	Women ²
	OR (95 % CI)	OR (95 % CI)	OR (95 % CI)
Marital status			
Single, divorced, widow	1.00	1.00	1.00
Married	1.30 (1.02–1.66)	1.42 (1.06–2.00)	1.15 (0.82–1.61)
Education			
Primary level or less	1.43 (1.04–1.96)	1.30 (0.84–2.00)	1.65 (1.05–2.62)
Secondary level	0.92 (0.71–1.20)	0.98 (0.67–1.44)	0.85 (0.60–1.20)
Higher level	1.00	1.00	1.00
Employment			
Employed	1.00	1.00	1.00
Unemployed or economically inactive	1.90 (1.49–2.43)	1.81 (1.25–2.62)	2.06 (1.48–2.87)
Reason for moving to Finland			
Working or studying	1.00	1.00	1.00
Family reasons	0.92 (0.70–1.22)	1.03 (0.68–1.55)	0.86 (0.59–1.23)
International protection	1.67 (1.20–2.33)	1.59 (1.03–2.46)	1.79 (1.07–2.99)
Finnish origin returnee	1.04 (0.69–1.56)	0.98 (0.53–1.82)	1.08 (0.63–1.85)
Age at migrating to Finland			
15 or younger	1.00	1.00	1.00
15–19	0.97 (0.56–1.66)	1.30 (0.62–2.74)	0.83 (0.3–1.77)
20–29	1.01 (0.65–1.58)	1.76 (0.98–3.17)	0.65 (0.35–1.18)
30 or older	1.47 (0.91–2.40)	2.15 (1.14–4.08)	1.14 (0.57–2.26)
Years lived in Finland			
1–4 years	1.00	1.00	1.00
5–10 years	1.12 (0.84–1.50)	1.13 (0.76–1.69)	1.10 (0.73–1.66)
over 10 years	0.93 (0.69–1.24)	0.90 (0.61–1.34)	0.96 (0.61–1.49)
Finnish or Swedish language proficiency			
Beginner	1.96 (1.46–2.63)	1.96 (1.26–3.05)	1.97 (1.32–2.94)

Average	1.33 (0.99–1.81)	1.43 (0.89–2.30)	1.23 (0.84–1.82)
Excellent	1.00	1.00	1.00
<small>1 Adjusted for age and gender</small>	<small>2 Adjusted for age</small>		

OR = odds ratio, bolded ORs represent significant associations. 95% CI = 95% confidence interval.