Pre-migration traumatic experiences, post-migration perceived discrimination and substance use among Russian and Kurdish migrants—a population-based study

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ABSTRACT

Background and aims   The associations between traumatic events, substance use and perceived discrimination have been rarely studied among migrants in host countries. We examined whether pre-migration potentially traumatic experiences (PTEs) or perceived discrimination (PD) are associated with substance use among migrants with voluntary (Russians) and forced (Kurds) migration backgrounds. **Design**   Cross-sectional interview and health examination data from the Finnish Migrant Health and Wellbeing Study were used. The target sample ($n = 1000$ for each group) was drawn from the national population register using stratified random sampling by participants' country of birth and native language. **Setting**   Population-based data were collected from six cities in Finland during 2010–12. **Participants**   The participation rates were 68% (Russians) and 59% (Kurds). The analytical sample size varied (Russians $n = 442–687$, Kurds $n = 459–613$), as some participants completed only interview, health examination or short interview. The majority of Kurds had a refugee background (75%) while Russians had mainly migrated for other reasons (99%). **Measurements**   The three main outcomes were self-reported binge drinking, daily smoking and life-time cannabis use. PTEs and PD were self-reported in the interview. Socio-demographic background, migration-related factors and current affective symptoms were adjusted for. **Findings**   Among Kurds, PTEs were associated with binge drinking [adjusted odds ratio (aOR) = 2.65, 95% confidence interval (CI) = 1.30–5.42] and PD was associated with life-time cannabis use (aOR = 3.89, 95% CI = 1.38–10.97) after adjusting for contextual factors. Among Russians, PTEs were associated with life-time cannabis use adjusting for contextual factors (aOR = 2.17, 95% CI = 1.12–4.18). **Conclusions**   In Finland, pre-migration traumatic experiences appear to be associated with life-time cannabis use among the Russian migrant population (voluntary migration) and binge drinking among the Kurdish migrant population (forced migration). Perceived discrimination in Finland appears to be associated with life-time cannabis use among Kurdish migrants.

Keywords   Alcohol, binge drinking, cannabis, daily smoking, discrimination, forced migration, migrant, substance use, tobacco, traumatic experiences.

INTRODUCTION

Knowledge concerning substance use and associating risk factors among forced migrant populations remains limited [1–4], despite the increasing number of people on the move globally [5]. The prevalence of substance use depends on the migrant population under study and measures of substance use employed [6–15].

Variations in cultures, social acceptability of substance use, availability of substances and gender may contribute to migrants' substance use habits, which may change over time in new host countries [14,16–19]. For example, alcohol use is widely prohibited in the Middle East and North Africa [20–24], while in eastern Europe and Nordic countries, including Finland, a high number of drinks consumed per drinking occasion is common

[25,26] and intoxication by alcohol is relatively accepted as a drinking habit [27].

Research on conflict-affected populations, i.e. general populations and internal migrants, has indicated associations between traumatic experiences and alcohol use disorder (AUD) [28–30], nicotine dependence [31], cannabis use disorder [32] and other illicit drug abuse [31,33]. Among migrants, substance use may be influenced by pre-migration traumatic experiences, duration of displacement, hardship and discrimination in new host countries [14,34,35]. Among forced migrants, traumatic experiences may also have a negative impact on health and mental health [36–38]. However, knowledge concerning substance use and traumatic experiences among migrant populations is scarce [2,4,39], and we found no previous studies on the association between traumatic pre-migration experiences and substance use among migrants in their new host countries.

A growing body of literature demonstrates the harmful effects of discrimination on the mental health of migrant and general populations [40–51]. Previous studies, mostly conducted among general populations in North America, have shown associations between perceived discrimination and alcohol use [52–59], smoking [53,54,59–62] and illicit substance use [54,57,58,63]. So far, only Visser *et al.* [64] from the Netherlands have studied substance use and perceived discrimination among migrants in Europe. They reported that perceived discrimination was associated with substance use among Ghanaian and African Surinamese but not among South Asian Surinamese, Turkish or Moroccan participants. Nevertheless, information on substance use and discrimination among migrants, particularly in the European context, remains very limited.

Aim

We aim to study associations between substance use (binge drinking, daily smoking and life-time cannabis use) and (i) exposure to pre-migration potentially traumatic experiences (PTEs) and (ii) perceived discrimination (PD) in the host country (Finland). Socio-demographic factors, migration-related factors and current affective symptoms are considered confounding variables.

Data from a population-based study [65] are analysed separately for two migrant populations: the Russians and the Kurds. These groups have dissimilar reasons for migration: Russians have migrated voluntarily, whereas Kurds are mainly a forced migrant population group [65]. These groups also have divergent substance use habits in the new host country [66]. For example, in our previous study 11% of Russian men and 51% of Kurdish men reported abstaining from alcohol use [66]. Furthermore, we have indicated that comorbid affective symptoms are more common among substance using Kurds in particular [67].

This study will expand previous knowledge on pre-migration traumatic experiences, post-migration perceived discrimination and substance use [50,68].

METHODS

Design

The data originate from a comprehensive cross-sectional survey, the Finnish Migrant Health and Wellbeing Study (Maamu) [65], carried out by the Finnish National Institute for Health and Welfare (THL) during 2010–12 among Russian, Somali and Kurdish origin populations. A detailed description of the Maamu Study has been reported elsewhere [65,69] . As the prevalence of substance use among Somali participants was very low [66], further analyses of the present study could not be performed among them (binge drinking prevalence 1%, $n = 2$; daily smoking prevalence 5%, $n = 30$; life-time cannabis use 0%, $n = 0$).

The Maamu Study consisted of a health examination and a structured face-to-face interview, conducted by trained bilingual field staff in the participants' native language or in Finnish. A short interview including the most essential items of the interview and health examination was offered to those who were unable to participate in the interview and health examination, and it was conducted face-to-face, by telephone or mail. Ethical approval was granted by the Coordinating Ethics Committee of the Hospital District of Helsinki and Uusimaa. Each participant gave their written informed consent prior to participation.

Participants

The Maamu Study sample is a stratified random sample consisting of 3000 migrants (1 thousand from each of the defined groups) aged 18–64 years from six cities in Finland. The sample was drawn from the National Population Register. The sample did not include individuals resident in Finland for less than 1 year, living in reception centres or still seeking for asylum. Russian origin was defined by the native language being Russian or Finnish and the country of birth being Russia or the Former Soviet Union. Kurdish origin was defined by the native language being Kurdish and the country of birth being Iraq or Iran. Russian and Kurdish populations were selected based on being among the largest migrant groups in Finland and their prominence in the international context of migration [65]. The participation rate was 68 % for the Russian and 59 % for the Kurdish migrants. The majority of the Russian participants (99%) had migrated due to personal reasons (e.g. work, family ties) representing voluntary migration, whereas the majority of the Kurdish participants had arrived as asylum seekers or quota refugees representing forced migration (75%).

Measures

Outcome variables

Binge drinking, daily smoking and life-time cannabis use were defined as primary outcome variables.

Binge drinking, i.e. having six or more alcohol units on one occasion, was selected to indicate a risky drinking occasion and a hazardous pattern of alcohol use [70–72]. Binge drinking was measured with the third question from the Alcohol Use Disorder Identification Test for Consumption (AUDIT-C) [73–76]: 'How often do you have six or more alcohol units on one occasion?', with response categories 'never', 'less than monthly', 'monthly', 'weekly' and 'daily or almost daily'. The variable was dichotomized: 'no binge drinking'/'yes', i.e. binge drinking less than monthly or more often. AUDIT-C screens for risky drinking with three items [73–75]. The total score was used as a continuous variable and as an outcome measure in *post-hoc* analyses.

Daily smoking was asked as: 'Do you smoke currently (cigarettes, cigars, pipe)?', with response categories 'yes, daily', 'yes, occasionally' and 'not at all'. The variable was dichotomized: 'no' included 'not at all' and 'yes, occasionally'; 'yes' included 'yes, daily'. Daily smoking indicates a frequent and more hazardous smoking pattern. The answer 'yes, occasionally' was pooled with 'not at all', as detailed information on frequency or quantity of occasional smoking was not available.

Life-time cannabis use was asked as: 'Have you ever used cannabis?', with responses 'no'/'yes'.

Explanatory variables

Pre-migration potentially traumatic experiences (PTEs) were measured with items: 'Have you experienced the following unpleasant events in your former home country? (1) Experienced a combat situation in war? (2) Been the victim of a natural disaster, e.g. earthquake, flood or fire? (3) Witnessed violent death or serious injury? (4) Experienced sexual violence? (5) Been a target of a serious physical attack or harm? (6) Been detained or kidnapped? (7) Been tortured? (8) Experienced some other form of horrible violence?', with answer options 'yes'/'no' [68]. These items were selected from the Harvard Trauma Questionnaire (HTQ), a validated instrument for measuring exposure to severe traumatic events [68,77–81]. A dichotomous combination variable was formed: 'yes' included answer 'yes' to any of the eight items [68].

Perceived discrimination (PD) was measured with four items from the Everyday Discrimination Scale (EDS) [82]. The selected items were: (1) 'You are not treated as politely as other people'; (2) 'You are not treated as respectfully as other people'; (3) 'You have been called names or insulted verbally'; and (4) 'You have been threatened or harassed'.

The answer categories were 'yes'/'no'. A dichotomous combination variable was formed: 'yes' included response 'yes' to any of the four items [51].

Confounding variables

Affective symptoms are defined here as a mixture of depressive and anxiety symptoms, and measured with the validated and widely used Hopkins Symptoms Checklist-25 (HSCL-25) [79,83–87]. It includes 25 items on depressive and anxiety symptoms during the preceding week, rated on a scale from 1, 'not at all bothered' to 4, 'extremely bothered'. Mean scores for the HSCL-25 were calculated, and a cut-off point of 1.75 was applied to create a dichotomized variable for clinically significant symptoms (no/yes), as previously used [50,67,79,88–90].

Socio-demographic factors examined were gender, age (as a continuous variable), marital status (married or cohabitating versus other), level of basic education (secondary school or less versus higher), employment status (employed versus other) and a subjective evaluation of one's economic situation (satisfactory versus unsatisfactory).

Migration-related variables included were age at migration to Finland (as a continuous variable), self-reported language proficiency in one of the official languages of Finland (good versus fair or less) and refugee background (arrival to Finland as a quota refugee or an asylum seeker versus other reasons for migration).

Analyses

The associations of potentially traumatic experiences (PTEs) and perceived discrimination (PD) and substance use were examined separately for both subpopulations using multivariate logistic regression analysis. The analyses were not pre-registered. Confounding variables were added to the multivariate models stepwise in blocks. The variables were selected to the multivariate models based on association with substance use in cross-tabulation ($P < 0.1$), previous results [66] and identified from literature [50,51,68]. Logistic regression was used in all analyses and the sampling design was taken into account. Finite population correction was applied because of the inclusion of a significant proportion of the total population in the sample [91]. Predictive margins were used in calculation of the age- and gender-adjusted prevalence rates of descriptive statistics [92]. The odds ratios (OR), adjusted odds ratios (aOR), beta coefficients (β) and 95% confidence intervals (CI) are reported as age-adjusted figures. A *p*-value < 0.05 was considered statistically significant.

Post-hoc analyses, suggested by reviewers, were performed using the AUDIT-C score as a continuous outcome variable in regression analyses, using pooled data including both the Kurds and the Russians with age and gender as

covariates. Interactions between migrant group and PTEs/PD and gender and PTEs/PD were analysed.

All analyses included complete cases in each model, and missing data were not included in the analytical sample. The analytical sample size varied from analysis to analysis (Russians *n* = 442–687, Kurds *n* = 459–613), as some participants completed only the interview, the health examination or the short interview. Inverse probability weights [93] determined by main predictive factors of non-response (migrant group, gender, age, municipality and marital status) were used to reduce the effects of missing data (Russian 30%, Kurdish 37%). Separate analyses weights were calculated and used for items included in the short interview, the interview and the health examination.

The linearity of continuous independent variables (age and age at migration) were examined with fractional polynomials [94]. The effects were linear, except for the association of cannabis use and age among Russians, where the power of 2 was found significant. Thus, a cubic transformation of age was used in the cannabis use models of Russians.

Statistical significance was assessed with the Satterthwaite-adjusted *F*-statistic. The statistical analyses were performed with SAS version 9.3, SUDAAN version 11.0.1 and Stata version 15 software versions.

Results

Descriptive statistics highlighting the divergent backgrounds of the study populations are reported in Table 1. The analyses were not pre-registered and the results should be considered exploratory.

The comparison between potentially traumatic experiences (PTEs) versus no PTEs in relation to prevalence of substance use is illustrated in Fig. 1. The associations between PTEs and substance use are reported in Table 2. Among Kurds, PTEs were associated with binge drinking, and the association remained significant after adjusting for contextual factors (aOR = 2.65, 95% CI = 1.30–5.42) and affective symptoms (aOR = 2.35, 95% CI = 1.17–4.73). A similar association was observed when alcohol use was measured using AUDIT-C score as a continuous variable (β = 0.51, 95% CI = 0.13–0.89). Among Russians, PTEs increased the odds for daily smoking (OR = 1.88, 95% CI = 1.06–3.33) and life-time cannabis use (OR = 2.08, 95% CI = 1.11–3.92), but only the findings on life-time cannabis use remained significant after adjusting for contextual factors (aOR = 2.17, 95% CI = 1.12–4.18).

The comparison between perceived discrimination (PD) versus no PD in relation to prevalence of substance use is illustrated in Fig. 2, and the associations between PD and substance use are reported in Table 3. Among Kurds, PD was associated with life-time cannabis use (OR = 3.74, 95% CI = 1.28–10.91), remaining significant when both contextual factors and affective symptoms were adjusted for (aOR = 3.52, 95% CI = 1.16–10.71). PD also correlated with higher AUDIT-C score among Kurds (β = 0.46, 95% CI = 0.12–0.79). Among Russians, PD increased the odds for daily smoking (OR = 1.60, 95% CI = 1.01–2.54), but adjusting for contextual factors and affective symptoms reduced the association to non-significant.

In *post-hoc* analyses comparing the study populations and genders, no statistically significant differences between

Table 1 Descriptive statistics on the study population.

	Russian % (95% CI)	n	Kurdish % (95% CI)	n	P-value[a]
Gender: men	37 (33.0–40.9)	687	56 (52.2–59.4)	613	< 0.001
Mean age[b]	39 (38.4–40.5)	687	35 (34.1–35.7)	613	< 0.001
Mean age at migration[b]	27 (26.2–28.4)	687	24 (23.2–24.7)	613	< 0.001
Migration background: refugee	1 (0.3–3.1)	519	75 (71.1–78.2)	508	< 0.001
Marital status: married or cohabiting	61 (56.5–64.6)	687	66 (62.0–69.1)	612	0.066
Education: high school graduate	77 (73.5–80.4)	670	43 (39.4–46.6)	606	< 0.001
Employment: employed	55 (50.5–56.8)	686	40 (36.4–43.5)	610	< 0.001
Economic situation: unsatisfactory	48 (43.4–52.9)	527	66 (62.1–69.9)	500	< 0.001
Language proficiency: fair or less	42 (37.9–47.2)	528	51 (47.5–55.7)	507	0.004
Potentially traumatic experiences (PTEs)[c]	24 (19.9–27.9)	529	77 (73.0–80.0)	507	< 0.001
Perceived discrimination (PD)[d]	41 (36.7–44.8)	685	39 (35.1–42.2)	613	0.424
Binge drinking[c]	42 (37.0–46.6)	526	18 (15.1–21.5)	508	< 0.001
Daily smoking[d]	16 (13.2–19.2)	687	19 (16.2–22.0)	613	0.173
Life-time cannabis use[c]	17 (13.7–21.2)	528	4 (2.6–6.2)	507	< 0.001
Affective symptoms[a]	18 (14.7–22.5)	459	35 (30.9–38.7)	496	< 0.001

[a]Comparison between Russian and Kurdish migrants. [b]Age presented as mean, not percentage. [c]Collected in the interview. [d]Collected in the interview and short interview. [e]Collected in health examination primarily as self-administered questionnaire or by interview with the small number of illiterate participants. CI = confidence interval.
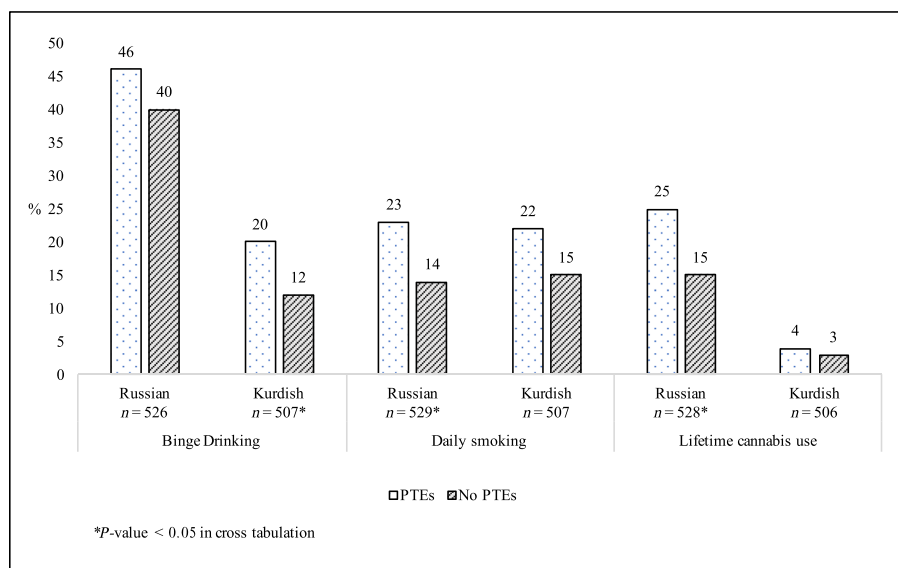
Figure I Prevalence of substance use among participants with pre-migration potentially traumatic experiences (PTEs) versus no PTEs [Colour figure can be viewed at wileyonlinelibrary.com]

Table 2 The associations between potentially traumatic experiences (PTEs) and substance use.

		Russian				Kurdish			
		OR	95% CI	P-value	n	OR	95% CI	P-value	n
Binge drinking									
	Model 1	1.30	0.78–2.17	0.315	526	**2.05**	**1.08–3.89**	**0.029**	507
	Model 2	1.28	0.76–2.14	0.352	523	**2.37**	**1.24–4.56**	**0.009**	496
	Model 3	1.25	0.75–2.08	0.397	523	**2.65**	**1.30–5.42**	**0.008**	496
	Model 4	1.02	0.59–1.78	0.993	443	**2.35**	**1.17–4.73**	**0.016**	460
AUDIT-C score[a]		[b]				[b]			
	Model 1	0.44	−0.015-0.89	0.058	521	**0.53**	**0.14–0.93**	**0.008**	495
	Model 2	0.44	−0.018-0.89	0.060	521	**0.52**	**0.14–0.89**	**0.007**	495
	Model 3	0.44	−0.020-0.90	0.061	521	**0.51**	**0.13–0.89**	**0.009**	495
	Model 4	0.25	−0.27-0.77	0.348	442	**0.45**	**0.056–0.84**	**0.025**	459
Daily smoking									
	Model 1	**1.88**	**1.06–3.33**	**0.030**	529	1.73	0.91–3.29	0.097	507
	Model 2	1.70	0.96–3.01	0.071	526	1.56	0.81–2.99	0.185	496
	Model 3	1.64	0.93–2.89	0.088	526	1.73	0.90–3.35	0.103	496
	Model 4	1.55	0.84–2.88	0.163	449	1.46	0.73–2.92	0.278	496
Life-time cannabis use									
	Model 1	**2.08**	**1.11–3.92**	**0.023**	528	1.41	0.47–4.19	0.540	506
	Model 2	**2.17**	**1.13–4.16**	**0.020**	525	1.26	0.43–3.71	0.679	495
	Model 3	**2.17**	**1.12–4.18**	**0.021**	525	1.40	0.39–4.97	0.604	495
	Model 4	1.81	0.90–3.61	0.094	445	0.85	0.28–2.54	0.769	459

Statistically significant findings (*P* < 0.05) shown in bold type. Model 1: univariate logistic regression, adjusted for age and gender. Model 2: adjusted for age, gender, socio-demographic background (marital status, education, employment, economic situation). Model 3: adjusted for age, gender, socio-demographic background (marital status, education, employment, economic situation) and migration related variables (refugee status (for Kurdish), age at migration, language proficiency). Model 4: adjusted for age, gender, current affective symptoms (HSCL-25 > 1.75) [a]AUDIT-C total score as a continuous variable; [b]beta coefficient (β) instead of OR. OR =odds ratio; CI = confidence interval; HSCL = Hopkins Symptoms Checklist.

the Kurds and the Russians or between men and women were detected (see Supporting information, Tables S1, S2). Some differences between the groups might remain undetected due to the lack of statistical power.

DISCUSSION

To our knowledge, this is the first European population-based migrant study examining the associations between
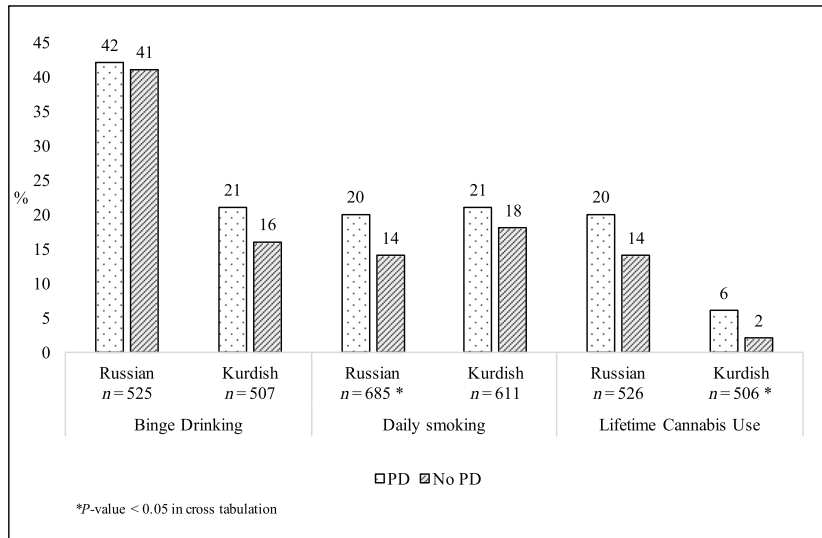
Figure 2 Prevalence of substance use among participants with post-migration perceived discrimination (PD) versus no PD

Table 3 The associations between perceived discrimination (PD) and substance use.

		Russian				Kurdish			
		OR	95% CI	P-value	n	OR	95% CI	P-value	n
Binge drinking									
	Model 1	1.07	0.69–1.66	0.775	525	1.53	0.96–2.44	0.073	507
	Model 2	0.96	0.61–1.51	0.864	522	1.59	0.96–2.64	0.073	496
	Model 3	0.92	0.59–1.45	0.731	522	1.63	0.98–2.70	0.059	496
	Model 4	1.15	0.72–1.84	0.557	442	1.45	0.89–2.35	0.137	460
AUDIT-C score[a]		b				b			
	Model 1	−0.17	−0.55-0.22	0.399	520	**0.42**	**0.088–0.75**	**0.013**	495
	Model 2	−0.17	−0.56-0.22	0.388	520	**0.41**	**0.085–0.74**	**0.014**	495
	Model 3	−0.20	−0.60-0.20	0.325	520	**0.46**	**0.12–0.79**	**0.007**	495
	Model 4	−0.15	−0.57-0.28	0.493	442	**0.36**	**0.020–0.70**	**0.038**	470
Daily smoking									
	Model 1	**1.60**	**1.01–2.54**	**0.046**	685	1.27	0.85–1.91	0.247	611
	Model 2	1.31	0.75–2.27	0.339	524	1.32	0.83–2.08	0.241	496
	Model 3	1.23	0.71–2.12	0.462	524	1.36	0.86–2.14	0.190	496
	Model 4	1.63	0.91–2.93	0.100	450	1.20	0.75–1.91	0.454	460
Life-time cannabis use									
	Model 1	1.66	0.94–2.96	0.083	526	**3.74**	**1.28–10.91**	**0.016**	506
	Model 2	1.68	0.94–3.00	0.079	523	**3.90**	**1.37–11.12**	**0.011**	495
	Model 3	1.59	0.89–2.84	0.121	523	**3.89**	**1.38–10.97**	**0.010**	495
	Model 4	1.60	0.85–3.01	0.142	443	**3.52**	**1.16–10.71**	**0.026**	459

Statistically significant findings ($P < 0.05$) shown in bold type. Model 1: univariate logistic regression, adjusted for age and gender. Model 2: adjusted for age, gender, socio-demographic background (marital status, education, employment, economic situation). Model 3: adjusted for age, gender, socio-demographic background (marital status, education, employment, economic situation) and migration related variables (refugee status (for Kurdish), age at migration, language proficiency). Model 4: adjusted for age, gender, current affective symptoms (HSCL-25 > 1.75). [a]AUDIT-C total score as a continuous variable; [b]beta coefficient (β) instead of OR. OR =odds ratio; CI = confidence interval; HSCL = Hopkins Symptoms Checklist.

substance use and both pre- and post-migration severe psychosocial stressors. In this population-based study of Russian and Kurdish migrants, we found that pre-migration potentially traumatic experiences (PTEs) as well as perceived discrimination (PD) in the new host country were associated with substance use, but the associations did not occur consistently between these populations and with regard to the substances examined.

Among Kurds, a predominantly forced migrant population, binge drinking, i.e. having more than six drinks on one occasion, and AUDIT-C total score were associated with pre-migration PTEs. This is mainly in line with

previous studies including forced migrants [28–30], but contradictory results have also been reported [95,96]. The previous studies have examined alcohol use disorder (AUD) among internally displaced people, e.g. in Uganda [29], Georgia [30] and Croatia [28], and AUD [96] or hazardous drinking [95] among conflict-affected general populations. We found no previous comparable research concerning forced migrants in their new host countries. It is possible that previous results among general populations or internally displaced people may not be comparable to international migrants facing specific challenges in new host countries [50,51]. Our study makes a relevant contribution to the existing literature demonstrating an association between a hazardous pattern of alcohol use and traumatic experiences among Kurds, a forced migrant population.

A possible explanation for the association between PTEs and alcohol use among Kurds could be the 'self-medication theory', according to which an individual may engage in alcohol use to eliminate the uncomfortable symptoms and displeasing sensations (e.g. insomnia, flashbacks, hypervigilance) related to traumatic experiences [31,97–99]. Alternatively, explanations could include the differences in cultural norms and social acceptability of alcohol use between region of origin and the new host country. Alcohol use is widely prohibited in the Middle East [20–22], whereas it is socially acceptable in Finnish society. Therefore, our results may also reflect a change in alcohol use habits over time spent in the new host country, especially among traumatized individuals [14,17–19,34,66]. Previous results from this sample have shown that the most severe PTEs (e.g. torture) were more common among Kurds compared with other migrant groups [68]. Thus, the severity of traumatization could be another explanation for associations particularly among Kurds. In the future, it would be important to evaluate the change of substance use habits before and after migration, and the effects of severity of traumatic experiences or cumulative traumatization on individuals with migrant backgrounds.

In line with previous findings among general populations [31,97,98], daily smoking and life-time cannabis use were associated with PTEs only among the Russians in the unadjusted analyses. This could be explained by the limitations of cross-sectional study design or the differences in prevalence rates. However, it is also possible that the patterns of associations among Russian migrants in Finland (mainly voluntary migrants) might be more similar and comparable to the general population than the associations among Kurds (mainly forced migrants).

Perceived discrimination (PD) was associated with life-time cannabis use and AUDIT-C score, but not with binge drinking among Kurds, and only with daily smoking in the unadjusted analyses among Russians. Our findings are in line with previous findings among general populations mainly in North America [52–63,100–103]. In the European context, Visser *et al.* [64] have reported associations between PD, alcohol use and smoking among African Surinamese and Ghanaians but not among Turkish and Moroccan participants. Illicit substance use was not examined. It is possible that PD affects other aspects of self-rated health [50] rather than exacerbating drinking behaviour among certain migrant groups [101]. Our contradicting results concerning alcohol use and perceived discrimination indicate a need for more detailed research on this topic.

There are theories about psychological distress being the mediating factor between perceived discrimination and substance use [82], and about substance use being a response or coping mechanism to the negative emotional states caused by discrimination and other post-migration stressors [34,53,55,82]. Our results of the association between life-time cannabis use, alcohol use and PD among the Kurds, after adjusting for markers of distress caused by poorer socio-economic situation and current affective symptoms, could be interpreted as highlighting the importance of discrimination as a separate risk factor for substance use independent of other post-migration stressors. This is in line with previous results demonstrating the impacts of discrimination on health of migrants [50]. Discrimination could be a considerable risk factor among Kurds, a stateless group who have also been frequently discriminated against in their regions of origin [104]. Our findings on PTEs, PD and substance use among Kurds highlight the impacts of cumulative adversities and that this population could be in a particularly vulnerable situation. From a public health perspective, our results highlight the need to assess and identify protective factors and resilience in future research.

Strengths and limitations

This study is based on population-based migrant data that are collected from several cities in Finland and has a relatively high response rate. Despite the satisfying overall response rate, non-response may have caused selection bias, especially concerning people with problematic substance use. Analysis weights were used to address this, but the effects of under-reporting and attrition are difficult to estimate. The effects of under-reporting or misreporting need to be considered concerning, e.g. the possible negative cultural connotations of substance use among Muslim participants [105,106].

The strengths of this study include the use of population-based data with two divergent migrant groups and bilingual field personnel who conducted the interviews either in participants' native language or in Finnish. Using population-based data reduces observation biases as, e.g.

cultural variation between the populations can be recognized, in comparison with studies where migrants are analysed as a single population [107]. Cross-sectional data do not allow for deducing causality, and information on the substance use in the country of origin or change of substance use habits after migration, were not available.

Dichotomization of the selected outcome variables (binge drinking, daily smoking, life-time cannabis use) is a limitation. This was, however, approached by *post-hoc* analyses using AUDIT-C as a continuous variable. In addition, life-time cannabis use could be considered a weak measure, and disorder-level substance use could not be evaluated with this study design and methodology. Exploring the use of other substances, such as khat, might have also provided the possibility to investigate these associations among the Somali participants. Another important limitation was that we were not able to perform the analyses separately for both genders due to the low prevalence of substance use among Kurdish women [66]. This limitation was approached by adjusting for gender in the analyses, but it is likely that this does not account for the gendered nature of substance use, especially among Kurdish migrants [66]. Regardless, our study adds to the very limited body of population-based research on substance use among migrants and its association with severe pre- and post-migration psychosocial stressors. Information on the substance use of Kurds is especially scant, and this study aims to reduce these gaps.

Other limitations include the adaptation of HTQ and EDS from their original versions. However, the measures have been used in several previous studies examining Russian and Kurdish origin populations [50,51,68]. Additionally, the cut-off point of the HSCL-25 scale has not been validated among the populations under study, despite its good cross-cultural reliability and validity [85,87,108,109]. Nevertheless, one of the strengths of our study is that current affective symptoms were considered when assessing the associations between PTEs, PD and substance use. To our knowledge, this approach has not been taken before.

Conclusion

Pre-migration traumatic experiences and perceived discrimination in the new country of residence are associated with substance use among a forced and a voluntary migrant population. However, the associations did not occur consistently among these populations and with regard to the substances examined. In clinical practice, psychosocial risk factors, including substance use, traumatic experiences and perceived discrimination, should be screened for individuals with various migration backgrounds. Ultimately, our results demonstrate the negative health effects of discrimination and highlight that zero tolerance of discrimination is needed to reduce health disparities.

Declaration of interests

Acknowledgements

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Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Table S1 Comparison between the study populations (post-hoc analyses).

Table S2 Comparison between the genders (post-hoc analyses).