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ORIGINAL PAPER

Relationships Between Integration and Drug Use Among Deported Migrants in Tijuana, Mexico

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Abstract Deported migrants face numerous challenges which may elevate their risk for drug use. We examined relationships between integration and drug use among deported migrants in Tijuana, Mexico. A cross-sectional survey conducted at a free health clinic included 255 deported Mexican-born migrants residing in Tijuana ≥6 months. Multivariable logistic regression examined associations between variables across four integration domains (public participation, social connections, macro-level facilitators and foundations) and recent (past 6-month) drug use. The prevalence of recent drug use was 46%. Having sought work in Tijuana in the past 6 months, greater household affluence, lifetime history of incarceration in both US and Mexico, and lacking health insurance were independently associated with recent drug use. Policies that support access to employment, adequate housing and healthcare in Mexico, particularly for justice-involved deportees, may facilitate successful integration and reduce potential stressors that may contribute to drug use.

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Background

Successful settlement of migrants, often termed 'integration', incorporates elements of participation in economic, social, cultural and political spheres, and is linked to feelings of identity, belonging, and inclusion [1–5]. Integration is a bi-directional process influenced by both migrants' willingness and agency to participate in their new community and the host community's acceptance of migrants [3]. Importantly, not only is migration itself increasingly recognised as a social determinant of health [6], but poor post-migration integration can also increase health vulnerabilities [7–9].

Forced repatriation of migrants from the United States (US) has increased dramatically over the past decade, with over 430,000 non-citizens deported in 2013 [10]. The majority of deported migrants are Mexican nationals, many of whom have lived in the US for decades and have little connection to their birth country [11, 12]. Deported migrants face a range of (re)integration challenges upon their return to Mexico, including social isolation, unemployment, homelessness, economic marginalisation, stigmatisation and exposure to violence [13–16]. Furthermore, emerging research suggests that deported Mexican migrants experience poor physical and psychosocial health, and face significant barriers to health insurance and care [17, 18].

Use of illicit drugs, particularly amphetamines, cocaine, and heroin, cause significant morbidity and mortality globally [19]. Tijuana, Baja California, a primary receiving community for deported Mexican migrants [20, 21], presents a significant risk environment for illicit drug use [22]. The city is located on a prominent

drug-trafficking route [23, 24], illicit drugs are readily available, and rates of drug use are above the national average [25]. Although studies have consistently shown that Mexicans with a history of travelling or migrating to the US report higher levels of drug use and dependence compared with those with no such history [26–29], fewer studies have specifically examined drug use among deported migrants. Recent research has estimated prevalence of past-year drug use among deported Mexican migrants at 20–26 % [30, 31] and found that this group are significantly more likely to report illicit drug use compared with voluntary return migrants and non-migrants [30]. Evidence also suggests that deported migrants may increase drug use and try new drugs following deportation, with changes in patterns of drug use linked to social and economic exclusion and post-deportation stressors [32–35]. Given the drug use risk environment in Tijuana and the evidence that deported migrants face extensive (re)integration challenges, we aimed to examine relationships between integration and drug use among deported migrants in this setting.

Conceptual Framework

This analysis was guided by Ager and Strang's conceptual framework for integration [5], which outlines four domains considered central to successful integration: *'Markers and Means'*, which encapsulates key areas of participation in the public arena—employment, housing, education and health; *'Social Connections'*, which assesses relationships with members of a migrant's community of origin and with the local host community, and links with government structures and services indicating equality with other residents; '*Facilitators'*, which refers to macro-level facilitators of inclusion, specifically language and cultural knowledge, and safety and stability; and *'Foundations'*, which relates to rights and citizenship.

To adapt this framework to the local context, stigmatised characteristics were incorporated as a specific aspect of the 'Safety and stability' sub-domain of the '*Facilitators'* domain. Stigma, which can be enacted through labelling, negative stereotyping, exclusion and discrimination [36] has been identified as a key issue faced by deported migrants [13, 34, 35, 37, 38]. Host communities are often concerned about migrants bringing crime and disorder to their neighbourhoods [39–41]. Deported migrants may be perceived as gang members and drug users, and are vulnerable to being stigmatised, excluded and discriminated against, potentially impacting their sense of safety and stability. As stigma is known to impact social and labour participation and health inequities [42, 43], we hypothesised that stigmatised characteristics may be key markers of integration associated with drug use in this setting.

Methods

Study Methods

This study was conducted at Health Frontiers in Tijuana (HFiT), a free primary care clinic providing care (e.g. HIV and sexually transmitted infection testing and care, wound cleaning, mental health services, screenings for diabetes and high blood pressure) for structurally vulnerable populations, including migrants, homeless and unstably housed populations, female sex workers, and people who use drugs [44].

Interviewer-administered surveys were administered to a convenience sample attending HFiT between January and June 2013. Eligibility criteria were: seeking care at HFiT, age 18 years or older, speaking Spanish or English, and able to provide informed consent. All clinic patients who met the criteria were invited to participate in the study regardless of the clinic services they sought, thus we expect our sample to be fairly representative of the clinic population. The survey elicited information on participants' socio-demographic characteristics, migration and deportation experiences, social, economic and civic participation in Tijuana, sexual and drug-related behaviours, health status, and health service access and utilisation. Participants received refreshments, condoms, and $US10 for their time. The study was approved by ethics boards at University of California San Diego and the HFiT clinic.

The total sample included 339 Mexican-born participants who reported ever being deported from the US. Our survey measured lifetime and past 6-month drug use. To accurately assess drug use post-deportation, analysis was limited to those who had resided in Tijuana for at least 6 months (n = 255, 75 % of deported migrants) as among recent arrivals (<6 months) we could not discriminate between pre- and post-deportation drug use.

Measures

The outcome of interest was recent (past 6-month) use of any illicit drugs, excluding marijuana (yes vs. no).

From available data, we selected all variables which mapped to the four domains of Ager and Strang's integration framework [5]. Except where indicated, all were measured as binary variables (yes vs. no) and refer to the past 6 months.

Markers and Means

With respect to employment, included variables were: worked in the formal economy, sought work, experienced barriers to obtaining work, and denied a job. Housing variables were: having ever been denied housing/shelter, mostly lived in unstable housing (defined as anything other than

having one's own home/room/apartment, or living in a family or friend's home) and household affluence. We generated a variable to assess household affluence based on participants' responses to a series of yes/no questions describing which goods and facilities they had in their primary residence (e.g. electricity, running water, television); questions were derived from the 2010 Mexican census [45]. From these questions a continuous measure was constructed (range 1–9, higher scores indicate greater affluence). Health variables were: self-rated health (good, very good or excellent vs. fair or poor), and depressive symptoms (NIH PROMIS depression scale score ≥15 [46]). Information on highest level of education attained was collected, but we could not differentiate between education completed in the US and education completed following deportation, so this variable was considered as a socio-demographic covariate rather than an indicator of integration.

Social Connections

Variables were: currently have any family or friends in Tijuana, separated from family in the US due to deportation, banned from returning to the US, feeling rejected in Tijuana, and visited a doctor. "Being banned from returning to the US" was included as we hypothesised that inability to return to the US may be an important motivator promoting integration.

Facilitators

Included variables were: low Spanish proficiency, country identify most strongly with (USA vs. Mexico/identify with both countries equally), been threatened or harassed in Tijuana, and been threatened or harassed by police or military in Tijuana. For the stigmatised characteristics sub-domain, variables were: having a visible tattoo and lifetime incarceration history (categorised as never incarcerated, incarcerated in Mexico only, incarcerated in US only, or incarcerated in both Mexico and US). Tattoos have long been considered a marker of social undesirability and engagement in deviant behaviours, such as crime and drug use [47–49]; previous research among deported migrants has found that tattoos are considered a marker of 'Americanisation' and deportation history [37]. Similarly, reports suggest that incarceration history is associated with being perceived by local communities as a drug user, gang member and 'dangerous' outsider [13, 35, 50].

Foundations

Variables mapped to this domain were: have any form of Mexican identification [birth certificate, driver's licence, passport, consular identification card, Instituto Federal Electoral voting card, or Clave Única de Registro de Población population registry card (equivalent to the US Social Security Number)], and have health insurance.

Additional socio-demographic and migration-related variables included in analysis were: age, sex, birth state, highest level of education completed, duration of residence in Tijuana, total time spent in the US, number of times deported and time since last deportation.

Data Analysis

To characterise the sample, socio-demographic, migration and drug use variables were analysed descriptively and using bivariate logistic regression. To examine the associations between integration and recent drug use we first constructed separate multivariable logistic regression models for each of the four integration domains. We then constructed a final multivariable model to adjust for socio-demographic and migration variables, and relationships between integration variables across domains. We first assessed the data for multicollinearity. We then incorporated integration variables from each domain which were statistically significant ($p < 0.05$) within that domain's multivariable analysis, in order to create the most parsimonious model. Blocks of variables were added sequentially beginning with socio-demographic and migration variables. Integration domains were added in the order presented in Ager and Strang's framework which reflects a social-ecological model of health: Markers and Means (individual-level), Social Connections, Facilitators (social/environmental-level), Foundations (structural-level). Likelihood-ratio tests were used to compare models following addition of each domain. We also conducted a sensitivity analysis including all integration variables regardless of significance within individual models and found that the direction and magnitude of results were largely unchanged (data not shown). Analyses were performed using Stata 13.1 (Statacorp LP, Texas, USA).

Results

Socio-Demographic and Migration Characteristics of the Sample

Participants' socio-demographic and migration characteristics are presented in Table 1. In brief, the sample was predominantly male (88%), with a median age of 43 years [Interquartile Range (IQR) 35–50 years]. Twelve per cent of participants were born in Baja California and 10% reported that they or a family member spoke an Indigenous language. Fifty-four per cent had completed high school or higher education. Participants had lived in the US for a median of 15 years (IQR

Table 1 Socio-demographic and migration characteristics of deported migrants attending a free health clinic in Tijuana, Mexico and bivariate associations with recent drug use, 2013

Variable	Total (N = 255), n (%)	Drug use (past 6 months)		Odds ratio (95 % CI)	p value
		Yes (N = 117), n (%)	No (N = 138), n (%)		
Socio-demographics					
Median age (IQR)	43 (35–50)	40 (34–47)	45 (39–52)	**0.94 (0.91–0.97)**	**<0.001**
Male sex	225 (88)	105 (90)	120 (87)	1.43 (0.65–3.17)	0.376
Born in Baja California	31 (12)	23 (20)	8 (6)	**3.97 (1.70–9.26)**	**0.001**
Completed high school or higher education	137 (54)	79 (68)	58 (42)	**2.87 (1.72–4.79)**	**<0.001**
Migration					
Total time spent in the US					
<1 year	14 (6)	9 (8)	5 (4)	1	
1–5 years	28 (11)	16 (14)	12 (9)	0.74 (0.20–2.79)	0.657
5–10 years	38 (15)	17 (15)	21 (15)	0.45 (0.13–1.60)	0.216
≥10 years	173 (68)	74 (63)	99 (72)	0.42 (0.13–1.29)	0.129
Not reported	2 (1)	1 (1)	1 (1)	–	
Deported more than once	153 (60)	77 (66)	76 (55)	1.53 (0.92–2.56)	0.103
Time since last deportation					
<1 year	7 (3)	2 (2)	5 (4)	1	
1–5 years	127 (50)	48 (41)	79 (57)	1.52 (0.28–8.14)	0.625
5–10 years	44 (17)	25 (21)	19 (14)	3.29 (0.57–18.83)	0.181
≥10 years	63 (25)	41 (35)	22 (16)	4.66 (0.83–26.01)	0.079
Not reported	14 (6)	1 (1)	13 (9)	–	
Duration of residence in Tijuana					
6–12 months	33 (13)	6 (5)	27 (20)	1	
1–3 years	77 (30)	24 (21)	53 (38)	2.04 (0.74–5.58)	0.166
≥3 years	145 (57)	87 (74)	58 (42)	**6.75 (2.62–17.37)**	**<0.001**

Missing data excluded

Bold values indicate statistically significant results

7–23 years). Sixty per cent had been deported more than once, among whom a median of three deportations (IQR 2–5) were reported. Fifty-three per cent of the participants experienced their most recent deportation within the past 5 years. Most participants (72 %) reported that they were banned from returning to the US, among whom 25 % reported a lifetime ban (data not shown). Thirty-eight per cent of participants reported that they planned to return to the US in the 6 months following interview.

Post-Migration Integration Characteristics of the Sample

Post-migration integration characteristics are presented in Table 2. Within the *'Means and Markers'* domain, although 59 % of participants had worked in the formal economy in the past 6 months, seeking work (57 %) and experiencing barriers to obtaining work (62 %) were common. Fifty-eight per cent of participants reported living in unstable accommodation in the past 6 months, with poor housing amenity reported (median score 5, IQR 3–6).

Within the *'Facilitators'* domain, 20 % of participants reported being harassed or threatened in Tijuana in the past 6 months, and 45 % had been harassed or threatened by police/military. Stigmatising characteristics were prevalent; 44 % of participants reporting having a visible tattoo, and 78 % had a history of incarceration.

Within the *'Foundations'* domain, 56 % of participants possessed any form of Mexican identification, and 40 % had health insurance at the time of interview.

Within the *'Social Connections'* domain, despite family separation being common (74 %), most participants reported having family and/or friends in Tijuana (65 %).

Recent Drug Use

The prevalence of recent illicit drug use was 46 %. Injecting was a common route of administration (88 % of recent drug users; Table 3), with crystal methamphetamine and heroin the most commonly used drugs. Among those who had used illicit drugs in the past 6 months, 61 % reported they lived in

Table 2 Integration characteristics of deported migrants attending a free health clinic in Tijuana, Mexico, and bivariate associations with recent drug use, 2013

Variable	Total N = 255 n (%)	Drug use (past 6 months)		Odds ratio (95 % CI)	p value
		Yes N = 117 n (%)	No N = 138 n (%)		
Means and markers					
Worked in formal economy last 6 months	151 (59)	70 (60)	81 (59)	1.05 (0.63–1.73)	0.854
Sought work in Tijuana last 6 months	145 (57)	54 (46)	91 (66)	**0.44 (0.27–0.73)**	**0.002**
Experienced barriers to obtaining work last 6 months	159 (62)	70 (59)	89 (65)	0.82 (0.49–1.36)	0.444
Denied a job in Tijuana last 6 months	105 (41)	47 (40)	58 (42)	0.93 (0.56–1.53)	0.764
Mostly lived in unstable accommodation last 6 months	148 (58)	72 (62)	76 (55)	1.31 (0.79–2.15)	0.298
Household affluence score[a]	5 (3–6)	4 (0–5)	5 (4–6)	**0.78 (0.70–0.87)**	**<0.001**
Denied housing/shelter in Tijuana last 6 months	43 (17)	21 (18)	22 (16)	1.15 (0.60–2.22)	0.670
Good/very good/excellent self-rated health	134 (53)	55 (47)	79 (57)	0.67 (0.41–1.11)	0.121
Depressive symptoms (≥15 on NIH PROMIS scale)	139 (55)	72 (62)	67 (49)	**1.70 (1.03–2.80)**	**0.039**
Social connection					
Has family or friends in Tijuana	165 (65)	83 (71)	82 (59)	1.67 (0.99–2.82)	0.056
Separated from family due to deportation	189 (74)	93 (79)	96 (70)	1.70 (0.95–3.02)	0.073
Banned from returning to USA	183 (72)	91 (78)	92 (67)	**1.78 (1.00-3.14)**	**0.047**
Felt rejected in Tijuana last 6 months	92 (36)	45 (38)	47 (34)	1.21 (0.72–2.02)	0.466
Visited a doctor in the last 6 months	115 (45)	40 (34)	75 (54)	**0.44 (0.26–0.73)**	**0.002**
Facilitators					
Low Spanish proficiency	4 (2)	2 (2)	2 (2)	1.18 (0.16–8.53)	0.868
Identify most strongly with USA	68 (27)	27 (23)	41 (30)	0.72 (0.41–1.26)	0.252
Threatened/harassed in Tijuana last 6 months	50 (20)	26 (22)	24 (17)	1.36 (0.73–2.52)	0.334
Threatened/harassed by police/military in Tijuana	115 (45)	61 (52)	54 (39)	**1.69 (1.03–2.79)**	**0.038**
Have a visible tattoo	111 (44)	66 (56)	45 (33)	**2.67 (1.61–4.45)**	**<0.001**
Ever incarcerated, in Mexico only	67 (26)	37 (32)	30 (22)	**4.52 (2.03–10.06)**	**<0.001**
Ever incarcerated, in US only	71 (28)	28 (24)	43 (31)	**2.39 (1.08–5.29)**	**0.032**
Ever incarcerated, in both Mexico and US	60 (24)	40 (34)	20 (14)	**7.33 (3.18–16.88)**	**<0.001**
Foundation					
Has any form of Mexican ID	142 (56)	55 (47)	87 (63)	**0.52 (0.32–0.86)**	**0.011**
Has any form of health insurance	101 (40)	31 (27)	70 (51)	**0.35 (0.21–0.59)**	**<0.001**

Missing data excluded

Bold values indicate statistically significant results

[a]Median (interquartile range)

Mexico when they initiated illicit drug use. Sixty-eight per cent of recent drug users reported being in need of help to control their drug use at the time of interview.

Associations Between Integration and Recent Drug Use

Table 4 displays the results from multivariable logistic regression analyses examining associations between each individual integration domain and drug use. Within the *'Means and Markers'* domain (Model 1), having sought work in Tijuana and higher household affluence were both negatively associated with recent drug use. Within the *'Social Connections'* domain (Model 2) having family or friends in Tijuana was positively associated with recent drug use and having recently visited a doctor was negatively associated. Within the *'Facilitators'* domain (Model 3) having a visible tattoo and lifetime incarceration in Mexico and in both Mexico and the US were all positively associated with recent drug use. Within the *'Foundations'* domain (Model 4), having any form of health insurance was negatively associated with recent drug use. All individual domain models were statistically significant and fit the data well.

In the final model incorporating integration variables from across all domains (Table 5) and adjusting for sociodemographic and migration variables, two variables from the *'Means and Markers'* domain were negatively associated with recent drug use: having sought work in Tijuana

in the past 6 months [adjusted odds ratio (AOR) 0.37, 95% confidence interval (CI) 0.18–0.77], and household affluence (AOR 0.82, 95% CI 0.69–0.96). No *'Social Connections'* variables were associated with recent drug use. Within the *'Facilitators'* domain, history of incarceration in both US and Mexico (AOR 3.30, 95% CI 1.09–9.96) was positively associated with recent drug use, but no association was observed with history of incarceration in Mexico alone (AOR 2.08, 95% CI 0.71–6.10) or history of incarceration in the U.S. alone (AOR 2.66, 95% CI 0.92–7.68). Within the *'Foundations'* domain, having health insurance was negatively associated with recent drug use (AOR 0.37, 95% CI 0.17–0.78). Likelihood-ratio tests indicated statistically significant improvement of the model with the addition of each block of variables with the exception of 'Social Connections' (p = 0.16).

Discussion

In this study of structurally vulnerable deported migrants in Tijuana, Mexico, illicit drug use was pervasive; 46% of participants reported past 6-month drug use, almost double the prevalence of past-year drug use reported among general samples of deported Mexican migrants [30, 31]. Factors which may have contributed to the high prevalence of recent drug use recorded include the location of the clinic where the study was conducted (in Tijuana's red light district, where cheap drugs are readily available and drug use is prevalent), and that some participants may have accessed harm reduction services (e.g. needle exchange) provided by the clinic's collaborator. Importantly, over half our sample reported initiating drug use in Mexico. Injecting drug use and use of heroin and crystal methamphetamine were common among our sample, characteristics associated with high risk of harms including HIV transmission and overdose [51, 52]. Substantial public health effort is already in place to address epidemics of drug use and HIV in Tijuana [53, 54]; our findings suggest that targeted efforts to ensure inclusion of deported migrants in prevention and treatment services may be warranted. Potential strategies include collaboration with government and non-government organisations to incorporate drug use screening, brief intervention and referrals into services provided to deported migrants. Similarly, ensuring deported migrants know about programs to prevent and reduce drug-related harms and can access HIV testing services will benefit the community and help to reduce the HIV epidemic in the region.

Supporting our hypothesis that integration challenges would be associated with drug use, we found that each individual-domain level analysis was significant, and in the final model, the addition of each domain with the exception the *'Social Connections'* domain significantly improved the model.

Table 3 Drug use characteristics of deported migrants attending a free health clinic in Tijuana, Mexico, who reported recent drug use, 2013

Variable	N = 117 n (%)
Country lived in most of the time when first started using drugs	
Mexico	71 (61)
USA	42 (36)
Other	4 (3)
Drug/s used in past 6 months	
Marijuana	37 (32)
Heroin	47 (42)
Cocaine (powder)	7 (6)
Crack cocaine	7 (6)
Heroin and cocaine together	14 (12)
Crystal methamphetamine	66 (60)
Crystal methamphetamine and heroin together	39 (33)
Crystal methamphetamine and cocaine together	1 (1)
Other[a]	16 (13)
Number of drug types used in past 6 months	
One	72 (62)
Two or more	41 (35)
Not reported	4 (3)
Injected drugs in the past 6 months	
No	9 (11)
Yes	70 (88)
Currently need help controlling drug use	
Don't require help	38 (32)
Require some help	31 (27)
In great need of help	34 (29)
Urgently need help	14 (12)

[a]Includes hallucinogens, inhalants, prescription opioids and benzodiazepines

In the final multivariable model, within the *'Means and Markers'* domain seeking work in Tijuana and greater household affluence were both negatively associated with drug use. This is an interesting finding given that neither obtaining work nor housing was significantly associated with illicit drug use. A possible explanation for this finding is that the process of establishing housing and job prospects (rather than the outcome itself) may facilitate feelings of agency and belonging which may be protective against drug use. The relationship between seeking work and drug use may also reflect that some people may not use drugs while seeking employment if they feel their chances of obtaining employment may be compromised by drug use.

No independent associations were detected between any *'Social Connections'* variables and drug use. This is surprising, given that qualitative research has shown social exclusion to be a key issue faced by deported migrants as well as shaping mental health [34, 35]. Recent research described the familial relationships and sense of belonging

Table 4 Multivariable logistic regression models examining associations between integration and recent drug use among deported migrants attending a free health clinic in Tijuana, Mexico, 2013

Variable	Model 1 *Means and Markers* N = 250	Model 2 *Social Connection* N = 246	Model 3 *Facilitators* N = 251	Model 4 *Foundation* N = 255
Worked in formal economy last 6 months	1.54 (0.87–2.73)			
Sought work in Tijuana last 6 months	**0.38 (0.21–0.69)****			
Experienced barriers to obtaining work last 6 months	0.81 (0.44–1.48)			
Denied a job in Tijuana last 6 months	1.19 (0.63–2.25)			
Mostly lived in unstable accommodation last 6 months	0.87 (0.48–1.56)			
Household affluence score	**0.77 (0.68–0.87)****			
Denied housing/shelter in Tijuana last 6 months	0.93 (0.42–2.03)			
Good/very good/excellent self-rated health	0.82 (0.47–1.43)			
Depressive symptoms (≥15 on NIH PROMIS scale)	1.53 (0.87–2.68)			
Has family or friends in Tijuana		**1.86 (1.06–3.26)***		
Separated from family due to deportation		1.53 (0.83–2.83)		
Banned from returning to USA		1.74 (0.95–3.16)		
Felt rejected in Tijuana last 6 months		1.14 (0.66–1.98)		
Visited a doctor in the last 6 months		**0.41 (0.24–0.71)****		
Low Spanish proficiency			1.71 (0.21–13.87)	
Identify most strongly with USA			0.68 (0.36–1.30)	
Threatened/harassed in Tijuana last 6 months			1.04 (0.52–2.10)	
Threatened/harassed by police/military in Tijuana			1.31 (0.74–2.31)	
Have a visible tattoo			**2.24 (1.30–3.86)****	
Ever incarcerated, in Mexico only			**3.90 (1.71–8.92)****	
Ever incarcerated, in US only			2.02 (0.86–4.65)	
Ever incarcerated, in both Mexico and US			**6.01 (2.49–14.52)****	
Has any form of Mexican ID				0.77 (0.44–1.35)
Has any form of health insurance				**0.39 (0.22–0.71)****
Model statistics				
Model significance p value	<0.001	0.001	<0.001	<0.001
Hosmer and Lemeshow goodness-of-fit p value	0.304	0.619	0.576	0.562

Bold values indicate statistically significant results

*p < 0.05, **p < 0.01

cultivated among deported migrants employed in a call centre in Mexico City despite exclusion from the broader community [14], suggesting that the type and quality of social relationships may have variable impacts on drug use risk. The lack of association seen in our study may be due to limitations in the data collected; it would be useful to capture more detailed information about the nature and quality of deported migrants' social connections, for example with family, friends and other deported migrants, in future studies.

Within the *'Facilitators'* domain, recent drug use was positively associated with a history of incarceration in both US and Mexico, but not with a history of incarceration in the US or Mexico alone. This finding is relatively unsurprising given that prisons have been identified as risk environments for drug use [55]. US incarceration may be indicative of a history of drug use, including drug-related behaviours which precipitated deportation [33]. Incarceration in the US has also been associated with changing patterns of drug use post-deportation [32]. Deported migrants with a history of incarceration face multiple markers of stigma [14, 35], potentially increasing vulnerability to drug use. The temporal relationships between incarceration, deportation and drug use remain unclear however, indicating a need for longitudinal research. Importantly, our survey did not capture information about reasons for incarceration, so we cannot differentiate between incarceration in immigration detention prior to deportation and incarceration in prison for other reasons. It would be useful in future research to collect detailed information to enable examination of the possible

Table 5 Multivariate logistic regression model identifying individual integration variables significantly associated with recent drug use among deported migrants attending a free health clinic in Tijuana, Mexico, 2013

Integration domain and variable	Adjusted odds ratio[a,b,c] (95 % CI)	p value
Means and markers		
Sought work in Tijuana last 6 months	**0.37 (0.18–0.77)**	**0.008**
Household affluence score	**0.82 (0.69–0.96)**	**0.025**
Social connection		
Has family or friends in Tijuana	1.04 (0.46–2.37)	0.922
Visited a doctor in the last 6 months	0.65 (0.26–1.37)	0.255
Facilitators		
Threatened/harassed by police/military in Tijuana	1.18 (0.56–2.49)	0.667
Have a visible tattoo	1.65 (0.80–3.40)	0.171
Ever incarcerated, in Mexico only	2.04 (0.68–6.07)	0.201
Ever incarcerated, in US only	2.66 (0.92–7.68)	0.070
Ever incarcerated, in both Mexico and US	**3.30 (1.09–9.96)**	**0.034**
Foundation		
Has any form of health insurance	**0.37 (0.17–0.78)**	**0.009**

Bold values indicate statistically significant results

[a]Adjusted for age, sex, birth state, education, total time spent in the US, number of deportations, time since last deportation and duration of residence in Tijuana;

[b]N = 229 (missing data excluded)

[c]Hosmer–Lemeshow goodness of fit p = 0.062

differences in relationships between drug use and incarceration across these different settings.

Despite the implementation of universal public health insurance ('Seguro Popular'), which has increased coverage in the general Mexican population [56], a significant proportion of our sample was uninsured. This finding is consistent with previous research among deported migrants [18]. Within the *'Foundations'* domain, having health insurance was strongly negatively associated with drug use. A possible explanation for this finding is that uninsured participants may have limited access to appropriate care for mental health conditions, and may turn to substance use as a coping mechanism, as has been reported among other migrant samples [e.g. 57, 58]. Documentation status was not independently associated with drug use, but it is likely that this underpins the health insurance findings. Proof of Mexican citizenship is required for enrolment in 'Seguro Popular'. For those lacking documentation, obtaining it may require travel to a person's city of origin to obtain original copies of birth documents, a journey some migrants do not have the resources to undertake or may not wish to undertake if they hope to return to the US.

Our findings reflect the complex nature of the integration process, and highlight the need for comprehensive responses to facilitate social, economic and civic participation and reduce health inequalities. Our findings suggest that policies that support access to employment, adequate housing and healthcare are integral to preventing drug use by addressing potential stressors which may contribute to this behaviour. In particular, we highlight the need for policies to enable deported migrants to obtain identification documents and gain access to health insurance. In a promising move, the governments of the states of Guerrero and Nayarit recently signed agreements with the city of Tijuana to help facilitate access to birth certificates for deported migrants from those states [59]. Coordinated binational efforts to provide copies of birth certificates prior to deportation (e.g. via Mexican consulates in the US) may also ease (re)integration challenges.

It is worthwhile reflecting on the assumption that integration is an inherently positive outcome. Acculturation to US culture has been associated with declines in health status and uptake of health-damaging behaviours for Mexican migrants to the US [60–62]. Likewise, it is possible that integration in Tijuana may have unanticipated negative impacts due to the risk environment for drug use; qualitative research has suggested that exposure to the drug use environment is a facilitator of drug use for deported migrants [33]. Our analysis detected increased odds of drug use with longer duration of residence in Tijuana providing further support for this relationship. Longitudinal research which examines both exposure to the drug use risk environment and changes over time in post-migration integration will be essential in understanding drug use and reducing drug-related harms among deported migrants in Tijuana. Such research could have important implications for policy and practice. For example, if evidence supports a relationship between exposure to the drug use risk environment and subsequent drug use this would highlight an urgent need for early intervention with deported migrants upon arrival in Tijuana. In 2007, Mexico's Federal Institute of Migration established the 'Repatración Humana' ('Humane Repatriation') program in

11 border cities including Tijuana, which offers basic services (e.g. resettlement information, referrals to shelters, medical consultations) to deportees [63]. Access to this program is, however, limited to newly-arrived deportees. Making such a program more widely availably to deportees (e.g. throughout the first 6–12 months post-deportation) may aid them during the transition and resettlement phase. The 'Repatración Humana' also provides assistance to deported migrants in returning to their cities of origin, including provision of transportation [64]. Providing deported migrants with resources to return home, *if desired*, is important, and may be protective for some migrants. This should however be optional, as each deportee's circumstances are unique, and return to their city of origin may not be desirable or feasible. For example, a recent community report notes that social factors (e.g. unemployment in sending communities, desire to stay close to the border to maintain contact with U.S.-based family and friends) dampen deportees' interest in returning to sending communities [65]. Continued access to support programs which harness the human capital of returning migrants and promotes meaningful participation may reduce the stressors associated with deportation and thus potentially reduce drug use.

Limitations

The study used convenience sampling methods, drawing on a structurally vulnerable sample accessing free healthcare. Deported migrants who were less disadvantaged may have been excluded, resulting in an overestimate of drug use prevalence, and possibly inflating relationships between integration and drug use. Thus, our findings may not be generalizable to the overall population of deported migrants in Tijuana or more broadly.

This secondary analysis leveraged existing data to explore the relationship between integration vis-à-vis drug use, consequently, some components of Ager and Strang's framework were unable to be measured (for example, we lacked variables which mapped to the education sub-domain, and our measures of social connections were only general and did not measure sources of social support in great detail).

Importantly, the integration framework was developed within a refugee resettlement context, thus it may not fully capture the integration experiences of deported migrants or the Tijuana context. Resettled refugee populations are often unfamiliar with their new host country; they may truly initiate the process of integration into a new environment. By contrast, many deportees have ties to their country of origin, including familiarity with the cultural context, language and values. Yet, they may feel, and are often treated, as outsiders [13, 35]. An important limitation of this integration framework in its application to the deported migrant context is that it is not designed to capture the nuances of re-integration and re-acculturation challenges. Future research would benefit from utilising a combination of integration and risk environment frameworks (e.g. [22, 66]), and considering both individual and contextual-level factors influencing acculturation to assess drug use risk.

As this study was cross-sectional, we cannot ignore the potential for reverse causality, that is, that drug use leads to poor integration outcomes. Irrespective of the direction of this relationship, our findings highlight the importance of program and policy response to address both drug use and social and economic integration among this population. We also cannot draw conclusions about the temporal relationships between deportation and drug use initiation; although over 60% of recent drug users in our study reported initiating drug use in Mexico, it is possible that initiation occurred prior to migration to the US rather than following deportation.

Conclusion

Recent illicit drug use is pervasive among deported migrants in Tijuana, and is associated with a range of negative integration experiences. Policies that support access to employment, housing and healthcare in Mexico, particularly for justice-involved deportees, may facilitate successful integration and reduce potential stressors that may contribute to drug use.

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Author Contributions VO and JLB developed and implemented the overall study that produced the data. VO and DH conceptualised this manuscript. DH performed data analysis and drafted the manuscript. All authors commented and contributed text, and gave approval for the manuscript to be submitted.

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