Research paper

Mexicans' use of illicit drugs in an era of drug reform: National comparative analysis by migrant status

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ABSTRACT

Background: Although rates of illicit drug use are considerably lower in Mexico than in the United States, rates in Mexico have risen significantly. This increase has particular implications for Mexican women and US migrants, who are considered at increased risk of drug use. Due to drug reforms enacted in Mexico in 2008, it is critical to evaluate patterns of drug use among migrants who reside in both regions.

Methods: We analysed a sample of Mexicans (N = 16,249) surveyed during a national household survey in 2011, the Encuesta Nacional de Adicciones (National Survey of Addictions). Comparative analyses based on Mexicans' migrant status – (1) never in the United States, (2) visited the United States, or (3) lived in the United States (transnationals) – featured analysis of variance and Chi-square global tests. Two multilevel regressions were conducted to determine the relationships among migrant status, women, and illicit drug use.

Results: Comparative findings showed significant differences in type and number of drugs used among Mexicans by migrant status. The regression models showed that compared with Mexicans who had never visited the United States, Mexican transnationals were more likely to report having used drugs (OR = 2.453, 95% CI = 1.933, 3.113) and using more illicit drugs (IRR = 2.061, 95% CI = 1.626, 2.613). Women were less likely than men to report having used drugs (OR = 0.187, 95% CI = 0.146, 0.239) and using more illicit drugs (IRR = 0.153, 95% CI = 0.116, 0.202).

Conclusions: Overall, the findings support further exploration of risk factors for illicit drug use among Mexican transnationals, who exhibit greater drug use behaviours than Mexicans never in the United States. Because drug reform mandates referrals to treatment for those with recurrent issues of drug use, it is critical for the Mexican government and civic society to develop the capacity to offer evidence-based substance abuse treatment for returning migrants with high-risk drug behaviours.

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Introduction

Recent statistics have shown that rates of illicit drug use in Mexico increased 87% between 2002 and 2011, from 0.8% to 1.5% (Villatoro et al., 2012). In particular, women reported significant increases from 2008 to 2011 in the use of illicit drugs (cannabis and cocaine; Villatoro et al., 2012). Drug trafficking, violence and political turmoil have contributed to greater availability of drugs and increased drug-related illicit activities, placing transnational communities (Mexican migrants residing in both the United States and Mexico) at higher risk (Alegría, Sribney, Woo, Torres, & Guarnaccia, 2007; Borges et al., 2009; Rhodes, 2002; Strathdee et al., 2010). Because an estimated 22% of Mexicans are considered transnational, their drug use risk behaviours directly affect US communities (Borges, Medina-Mora, Breslau, & Aguilar-Gaxiola, 2007; Garcia, 2007). Yet there is limited understanding of this elusive population's drug use patterns and drugs of choice.

Emerging evidence has suggested that Mexican migrants to the United States increase their drug use while in the country, and returning migrants have greater rates of drug use than

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the nonmigrant population (Borges et al., 2007, 2011). Returning migrants, referred as transnationals in this study, accounted for 1.4 million adults and children between 2005 and 2010 (Passel, Cohn, & Gonzalez-Barrera, 2012). Their significant population size, exposure to Mexican and American drug policies, and potential risk of illegal drug use underscore the importance of examining their drug use patterns.

Although Mexican drug policies do not consider drug use as an offense, drug reforms enacted in 2008 defined threshold amounts for personal use and mandated treatment referral for those in possession of larger amounts (Comisión Nacional contra las Adicciones, 2009). It is therefore critical to identify the US migrant population's risk of using illegal drugs using data collected in 2011 to inform evidence-based policies that reduce the effect of drug use in Mexico–US communities. The current study used national household data from Mexico on drug use to investigate differences in drug use among Mexicans by migration status and understand consumption patterns. As such, this paper is designed to inform comprehensive Mexico–US health care policies to develop interventions that reduce the effect of drug use on migrant populations.

Transnational Mexicans at a high risk of drug use are highly mobile across the Mexico–US border and have significant potential to negatively affect the health and well-being of Mexico–US communities. This risk is particularly significant among transnationals living in Mexico. Illicit substance abuse in Mexico increased 87% between 2002 and 2011, whereas in the United States, where abuse was 45% higher, it remained stable during the same period (Villagran, 2013). Furthermore, Mexican migration to the United States has been associated with the transformation of substance-use norms and pathology, particularly in border towns and northern metropolitan areas such as Tijuana, Ciudad Juárez, and Monterrey (Borges et al., 2009). It has been established that migration patterns predict drug use and abuse among Latinos (Alegría et al., 2007). Yet there is limited knowledge about national drug use patterns among Mexicans with varying degrees of residence in or exposure to the United States. Considering changes in drug policy in Mexico and the United States during the past 5 years (Babor et al., 2010; Shirk, 2010), this knowledge is critical for public health policy.

Drug use in Mexico and the United States has become a critical binational public health concern. The significant level of return migration to Mexico from the United States between 2009 and 2013 and the current flow of more than 670,000 migrants between the two countries every year (Passel et al., 2012) highlight the need for enhanced understanding of this elusive population's substance-use patterns. Mexico and the United States have reported significant social and economic costs related to drug use. Yearly substance abuse costs the United States $8.7 billion in federal spending for treatment and research, whereas in Mexico this cost has been estimated at $4.3 billion (US Centers for Disease Control and Prevention, 2009). Previous research has identified individual factors associated with illicit drug use in Mexico. These factors include age, gender, marital status, educational level, employment history, and income (Borges et al., 2009; Garcia, 2007). These individual factors also correlate to predisposing factors for abuse of illicit drugs, such as a history of drug use and mental health issues (Borges et al., 2011). The current study is unique because it relies on recent data from 2011 and a comprehensive conceptualization of migrant status that includes Mexicans experiencing the United States as travellers. Although policies governing illicit drug use in the United States differ across regions, these policies for the most part mandate abstinence from the majority of illicit drugs (Friedman et al., 2007). This is in contrast with policies in Mexico, which generally endorse nonproblematic use (Comisión Nacional contra las Adicciones, 2009). The different enforcement of these drug policies in the United States and Mexico may have a differential effect on transnational Mexicans who are exposed to policies in both countries.

Emerging research has identified drug-use risk factors associated with Mexican migrants, including migrant status, poverty, social isolation, and living situation (Mora, 2002; Valdez, Kaplan, & Cepeda, 2000). Transnational migrants spend years away from home, resulting in a lack of ties with either US or Mexican communities. Therefore, these individuals experience social isolation that may lead to drug use, especially alcohol abuse (Ojeda et al., 2009). As a result, their status as migrants may place them at a higher risk of substance abuse and social isolation. The presence of kin-based authority figures helps protect migrants against potential drug use (Mora, 2002). When Mexican migrants return home, studies have reported that greater exposure to the United States is related to greater transformation of drug use norms and increased pathology influencing their original community networks (Borges et al., 2007). In Mexico, community norms regarding drug use and the availability of drugs are also factors associated with substance abuse problems. Although drug use is not pardoned, in some communities in Mexico it is tolerated as long as it does not significantly disrupt community norms (Borges et al., 2007).

Conceptual framework

The underlying framework that best characterizes our perspective on the intersection between Mexicans' substance use and their migration context is that of risk environments (Rhodes & Simic, 2005). Risk environment is conceptualized as "the space – whether social or physical – in which a variety of factors interact to increase the chances of drug-related harm" (Rhodes, 2002, p. 88). These exogenous factors can be categorized in terms of type (i.e., physical, social, economic, policy) and interact at the micro and macro levels of environmental influence (Strathdee et al., 2010). Hence, illegal substance use is a function of individual and community factors that act as risk regulators to present constraints or opportunities that shape individual behaviour (Strathdee et al., 2010). As these constraints or opportunities are experienced by certain subpopulations (e.g., women, transnationals) in certain regions (e.g., Mexico–US border), they may elevate or reduce individual risk of substance use and spread within a network (Strathdee et al., 2012). The migratory pattern of transnational Mexicans may place them at high risk of substance abuse due to social isolation related to spending years away from home and not developing roots in either US or Mexican communities once the migration pattern starts (Garcia, 2007).

Drug use among Mexicans

Mexicans may have differential risk factors for drug use, in part related to their geographic mobility. Emerging evidence has suggested that Mexican migrants to the United States are at higher risk of drug use (Borges et al., 2007, 2009, 2011). Disconnection with their local communities, a lack of supervisory figures, and distance from their families may predispose Mexican migrants to increase the quantity and frequency of alcohol and illicit drug use or experimentation. Migrants are more likely to experience emotional and physical vulnerabilities related to separation from their families and extended social networks, potentially leading to increased substance abuse and sexual risk behaviours (Ojeda et al., 2009). These behaviours among migrant men have been strongly correlated with the absence of traditional living arrangements and normative community patterns of socialising (Garcia, 2007). Migration is associated with high stress and exposure to drug-using environments.

Mexicans travelling to the United States for temporary visits (e.g., vacation, short educational courses, etc.) may have a reduced

Table 1
Individual characteristics by migrant status using 2011 ENA survey data ($N = 16,249$).

Variable	Mexicans $n = 12,617$ %	Travelling Mexicans $n = 2117$ %	Transnational Mexicans $n = 1515$ %
Female[b]	58.5	55.0	30.6
Age[a]	31.0 (14.9)	36.6 (15.0)	39.3 (12.8)
Married[b]	35.1	44.6	50.5
With high school education[b]	88.5	67.3	85.9
Dependents[a,b]	4.3 (3.4)	3.6 (2.5)	3.9 (3.0)
Have insurance[b]	74.0	79.0	67.7
Public insurance[b]	36.1	14.0	32.5
Private insurance[b]	1.8	8.1	3.3
Ever received drug treatment[b]	6.5	4.2	6.3
Lifetime illicit drug use[b]	5.7	7.9	16.9
Cannabis[b]	4.2	5.5	13.1
Sedatives[b]	0.1	< 0.1	0.5
Cocaine[b]	2.0	3.2	7.5
Crack	0.6	0.7	1.8
Opiates[b]	0.1	0.2	0.4
Hallucinogens	0.3	0.8	0.8
Inhalants	0.7	0.4	1.3
Heroin[b]	0.1	0.2	0.6
Methamphetamines[b]	0.4	0.6	1.3
Number of illicit drugs used ever[a,b]	0.08 (0.4)	0.11 (0.5)	0.27 (0.7)
Depressed mood[a,b]	1.6 (0.7)	1.5 (0.6)	1.6 (0.7)
Someone can be HIV positive and look healthy[b]	84.9	92.5	88.7
Someone can contract HIV by sharing needles[b]	94.1	97.5	95.3
Region			
North central	15.2	40.1	29.0
Northwest	10.0	26.5	12.9
Northeast	9.1	10.7	10.6
East	13.1	9.4	15.2
Central	13.1	2.9	10.3
Mexico City	9.9	6.0	4.0
South central	13.7	2.2	12.7
South	15.9	2.2	5.4

[a] Figures represent M (SD).
[b] Means or frequencies are statistically significantly different across groups at $p < .05$.

risk of drug use compared with transnational Mexicans who have significant exposure to American communities. This type of exposure to the United States (Mexicans travelling to the United States) has not been considered in most studies on Mexican migration. Travelling Mexicans may have an increased risk compared with the average nontravelling Mexican. Mexicans travelling to the United States generally represent individuals with financial and educational resources that enable travelling to a country with strict visa guidelines. These individuals have to justify to the US Department of Homeland Security that they have significant resources in Mexico that would discourage attempts to illegally migrate to the United States, including residents of border communities (Rosenblum, Kandel, Seelke, & Wasem, 2012). Their increased risk of experimenting with drugs compared with average Mexicans depends on their exposure to different international environments. In particular, individuals travelling to US cities with high availability of drugs (e.g., border cities and major metropolitan areas) may be at highest risk of drug use.

Hypotheses

Hypothesis 1. Compared with nontravelling Mexicans, Mexican transnationals would be more likely to report having used drugs.

Hypothesis 2. Compared with nontravelling Mexicans, Mexican transnationals would report using more illicit drugs.

Hypothesis 3. Compared with women, men would be more likely to report having used drugs and using more illicit drugs.

Methods

Data collection and procedures

This study analysed a subset of data collected via the Encuesta Nacional de Adicciones (ENA; Villatoro et al., 2012), or the National Survey of Addictions. The ENA was a nationally representative survey collected by Mexico's National Institute of Psychiatry from households in Mexico in 2011. Although a previous wave of data was collected in 2008, our sample included only data from 2011 from rural (fewer than 2500 residents), urban (2500–99,999 residents), and metropolitan (more than 100,000 residents) areas. Exclusion criteria included localities where more than half of the population's native language was not Spanish (e.g., dialect) because of possible inadequacies stemming from the use of interpreters to explore sensitive issues of addiction. As with other nationally representative surveys in Mexico, and due to noted differences in substance use and utilisation of services by size of municipalities, the sample was stratified by rural, urban, and metropolitan areas.

Analytic sample and sampling procedures

We examined the full sample ($N = 16,249$) to determine lifetime prevalence, reported in Tables 1 and 2. We later excluded subjects who had not used drugs, creating an analytic sample of 1143 individuals for our analysis of number of illegal drugs used reported in Table 3.

Researchers from Mexico's National Institute of Psychiatry applied a probability, multiphase, and stratified sampling procedure to all primary sampling units. These units, which represent municipalities within states, were drawn from the equivalent of

Table 2

Logistic regression of lifetime illicit drug use on migrant status using 2011 ENA survey data (N = 16,249).

Variable	Lifetime illicit drug use		
	OR	SE	95% CI
Migrant status[a]			
Travelled to US	1.797[**]	0.339	1.241, 2.601
Transnational	2.453[***]	0.298	1.933, 3.113
Female	0.187[***]	0.024	0.146, 0.239
Age	0.973[***]	0.004	0.965, 0.980
Married	0.697[***]	0.076	0.562, 0.864
High school education	1.271	0.173	0.973, 1.661
Depressed mood	1.824[***]	0.119	1.605, 2.072
Region[b]			
North central	0.711[*]	0.114	0.519, 0.973
Northwest	0.844	0.130	0.623, 1.141
Northeast	0.935	0.160	0.668, 1.307
East	1.012	0.174	0.722, 1.419
Central	0.628[*]	0.114	0.440, 0.895
South central	0.682[*]	0.113	0.493, 0.944
South	0.511[**]	0.111	0.333, 0.782

Note: OR, odds ratio; SE, standard errors; CI, confidence interval.

[a] Reference category was Mexicans with no experience visiting or residing in United States (US).

[b] Reference category was Mexico City.

[*] p < .05.

[**] p < .01.

[***] p < .001.

census tracts in Mexico's census data collected in 2010. During the first phase, state, municipality, and urbanicity (rural, urban, or metro) were considered as sampling units. This led to the selection of eight main strata, one per region (north central, northwest, northeast, west, central, Mexico City, south central, and south). Border states were included in the north central (Coahuila, Chihuahua, and Durango) and northwest (Baja California, Baja California Sur, Sonora, Sinaloa) regions. Other states were included in the remaining regions: northeast (Nuevo León, Tamaulipas, and San Luis Potosí), west (Zacatecas, Aguascalientes, Jalisco, Colima, and Nayarit), central (Puebla, Tlaxcala, Morelos, Estado de México, Hidalgo, Querétaro, and Guanajuato), Mexico city (Distrito Federal),

Table 3

Negative binomial regression of number of illicit drugs used ever on migrant status using 2011 ENA survey data (N = 1143).

Variable	Number of illicit drugs used ever		
	IRR	SE	95% CI
Migrant status[a]			
Travelled to US	2.197[**]	0.650	1.229, 3.928
Transnational	2.061[***]	0.249	1.626, 2.613
Female	0.153[***]	0.022	0.116, 0.202
Age	0.965[***]	0.005	0.956, 0.974
Married	0.657[**]	0.088	0.506, 0.854
High school education	1.419	0.308	0.928, 2.172
Depressed mood	1.663[***]	0.135	1.419, 1.950
Have Insurance	0.941	0.113	0.743, 1.192
Region[b]			
North central	0.705	0.130	0.491, 1.012
Northwest	0.871	0.146	0.626, 1.211
Northeast	1.102	0.215	0.752, 1.616
East	0.912	0.169	0.635, 1.311
Central	0.760	0.162	0.500, 1.155
South central	0.688	0.140	0.462, 1.026
South	0.606[*]	0.142	0.382, 0.962

Note: IRR, incidence rate ratio; SE, standard error; CI, confidence interval.

[a] Reference category was Mexicans with no experience visiting or residing in United States (US).

[b] Reference category was Mexico City.

[*] p < .05.

[**] p < .01.

[***] p < .001.

south central (Veracruz, Oaxaca, Guerrero, and Michoacán), and south (Yucatán, Quintana Roo, Campeche, Chiapas, and Tabasco).

Sampling units included municipalities, blocks, households, and residents in each household. Three phases were conducted in urban and metropolitan areas using a probability-proportion-to-size (number of households) sampling procedure. These phases included (1) random selection using primary units of census tracts; (2) random selection of six blocks for each selected tract; and (3) random selection of six households for each block, using systematic random sampling based on geographic mapping. The selection of household strata for rural regions followed the same procedure. Because blocks were not well defined in rural settings, in the third phase a cluster of 50 households was randomly selected, followed by a random selection of 12 households for the final sample. This same procedure was applied to recently defined areas.

The survey process was mainly based on earlier surveys conducted by the National Institute of Psychiatry from 1988 to 2008, with data collected through face-to-face interviews in households using a laptop computer. Adults (18–65 years of age) and adolescents (12–17 years of age) in each household were eligible to participate. To select adult and household members in each house, laptops included a selection algorithm that randomly identified the head of household and an adolescent after interviewers entered all household members in the system. This system asked interviewers to select one adult and one adolescent. To achieve representativeness and to follow the framework of the ENA survey collected in 2008 for comparative purposes, efforts were made to estimate regional proportions close to 2%, with a relative error of 47% for regional estimates. The national response rate across all regions was 73.3%, and the average response per household was 1.29 individuals.

Measures

Dependent variables

The main dependent variables in this study were (1) whether or not respondents had ever used illicit drugs and (2) the number of illicit drugs they had ever used. Illicit drugs included substances such as opiates, tranquilizers, sedatives, amphetamines used without a prescription, cannabis, cocaine, crack, hallucinogens, inhalants, heroin, and methamphetamines. Although these drugs were not considered illicit in Mexico when the data were collected in 2011, interviewers described the drugs included above to avoid confusion. We used these main dependent variables to identify differences in drug use risk factors among groups by migration status.

Explanatory variables

Our main explanatory variable was migration status, which was assessed using three categories: (1) Mexicans with no history of migration or travel to the United States; (2) Mexicans who had travelled to the United States at least one time; and (3) Mexicans who had lived in the United States. These three categories were created based on individual responses to quantitative and qualitative survey items. The quantitative item determined whether each respondent had ever been in the United States, whereas qualitative items assessed the reason for their visit to the United States. Qualitative responses were coded by three raters (coauthors), who systematically classified individuals based on their survey responses to travelling (as a tourist) vs. residing in the United States for an undetermined period of time.

The second variable of interest was gender. Other demographic variables included as controls were age, marital status, education (completed high school or not) and youth status (15–18 years of age). We also adjusted the analysis based on several key factors related to drug use. To assess psychological distress related to depressed mood, we relied on the K-6 scale (Kessler et al.,

2002). This scale has six Likert scale items that measure depressed mood during the previous 30 days, namely nervousness, hopelessness, worthlessness, restlessness, depressed mood and feelings that everything was an effort. Overall scores range from 0 to 24 points, with higher scores representing higher depressed mood. A score of 13 was established as a cut-off point consistent with other studies using similar community samples (Manea, Gilbody, & McMillan, 2012; Singer et al., 2009).

Two dichotomous measures related to knowledge of the impact of HIV were included considering our framework on risk environment: (1) Can someone be HIV positive and look healthy? (2) Can someone contract HIV by sharing needles? Finally, we included control variables to adjust for factors associated with access to drugs, such as whether each respondent had insurance and their region of residence. We used Mexico City as the reference category.

Data analysis

Initial analyses relied on analysis of variance and Chi-square global tests to compare drug-use rates and demographic characteristics across Mexican groups by migration status. To test the association between explanatory variables and the two outcomes, having used illicit drugs and the number of illicit drugs used, two separate multilevel regressions were conducted to assess Hypothesis 1 and Hypothesis 2.

Because the first outcome (having used illicit drugs) was a dichotomous measure, we relied on multilevel logistic regression and checked its appropriateness using Wald Chi-square tests and analysis of quadrature points. The second outcome (number of illicit drugs used) was a count variable with overdispersion, also referred to as a positively skewed distribution. We relied on negative binomial regression to address this issue.

During preliminary analysis, we tested the rigor of our models and differences across subpopulations. No statistically significant difference was identified between adults and adolescents regarding the two outcomes. In addition, we removed the insurance variable from Model 1 because it was a confounder with gender in the association with lifetime drug use.

Results

Table 1 shows the comparative analysis of the three Mexican subgroups. Statistically significant differences were clear in terms of demographics, insurance, drug use, depression, and other variables. Marginally lower rates of depressed mood were reported by travelling Mexicans compared with Mexicans. In addition, compared with the other two groups, the sample of Mexican transnationals included fewer women (30.6% compared to 58.5% Mexicans and 55.0% travelling Mexicans). The transnational group also reported a lower proportion of respondents with health insurance (67.7% compared to 74.0% Mexicans and 79.0%, travelling Mexicans) but a higher proportion of public insurance compared to Mexicans who had travelled to the United States (32.5% vs. 14.0%, respectively).

The most significant findings emerged in terms of drug use and type of drug. Transnationals reported the highest proportion of lifetime drug use (16.9%), which was more than double the other two groups (5.7% Mexicans and 7.9% travelling Mexicans). In particular, transnationals were more likely than the other two groups to report using almost all reported drugs (i.e., cannabis, cocaine, opiates, inhalants, heroin, and methamphetamines). Although minimal drug use was reported for the full sample, transnationals reported using more illicit drugs (0.27) compared to Mexicans (0.08) and travelling Mexicans (0.11). Depression was slightly higher among Mexicans and transnationals compared with

travelling Mexicans, whereas travelling Mexicans reported the lowest rate of drug treatment (4.2% compared to 6.5% Mexicans and 6.3% travelling Mexicans).

Findings supported Hypothesis 1, which posited that compared with nontravelling Mexicans, Mexican transnationals would be more likely to report having used drugs. Table 2 summarises the results of the logistic regression model regarding the association of migration status and gender with having used illicit drugs. The odds of lifetime drug use for Mexican transnationals was more than twice that of Mexicans (odds ratio [OR] = 2.453, 95% confidence interval [CI] = 1.933, 3.113) after adjusting for other variables.

Findings also supported Hypothesis 2, which posited that compared with nontravelling Mexicans, Mexican transnationals would report using more illicit drugs. In the second model, the incidence rate of number of illicit drugs for Mexican transnationals was 2 times greater than that of Mexicans (incidence rate ratio [IRR] = 2.061, 95% CI = 1.626, 2.613). Notably, the incidence rate of number of illicit drugs for Mexicans travelling to the United States compared with Mexicans was almost double (IRR = 2.197, 95% CI = 1.229, 3.928) after adjusting for other explanatory variables. See Table 3.

Support was found for Hypothesis 3, which posited that compared with women, men would be more likely to report having used drugs and using more illicit drugs. The odds of lifetime drug use among women were significantly lower than among men (OR = 0.187, 95% CI = 0.146, 0.239), as expected (see Table 2). Women also had a significantly lower incidence rate of using more illicit drugs relative to men's use (IRR = 0.153, 95% CI = 0.116, 0.202; see Table 3).

As expected, several control variables were associated with both the likelihood of using illicit drugs and the number of drugs used. Older and married individuals were less likely to use drugs and used fewer drugs, whereas people reporting depressed mood were more likely to use drugs and to use more drugs. Finally, compared to Mexico City, respondents from north central, central, south and south central regions reported an increased likelihood of using illicit drugs, whereas those in the south reported fewer drugs used.

Discussion

The results of this study showed that distinct individual characteristics play an important role in the use of illicit drugs among Mexicans based on migrant status. The large difference in prevalence of illicit drug use among nontravelling Mexicans (5.7%) compared with transnationals (16.9%) is a significant finding. Furthermore, transnationals reported significant differences in the use of both softer drugs (e.g., cannabis) and harder drugs (e.g., cocaine, opiates, heroin, and methamphetamines). Based on our categorisation of migrant status, transnationals also reported using more than 3 times the number of drugs (0.27) than non-travelling Mexicans (0.08). Consistent with Rhodes' (2002) risk environment framework, which highlights the individual and community risk factors that may promote or inhibit risk behaviours, findings underscore the increased risk of illicit drug use among men and transnationals, who compared to women and nontravelling Mexicans may experience higher risk of illicit drug use due to social isolation related to spending years away from home and not developing roots in either US or Mexican communities once the migration pattern starts (Garcia, 2007).

Unlike other studies that have categorised Mexicans as migrants or not (Borges et al., 2011), this study further categorised Mexicans to include those who simply travelled to the United States. By adding this category, this study captured diversity of exposure to the United States and its associated risk with drug use. Travelling Mexicans also were more likely to use illicit drugs and to use more

illicit drugs than nontravelling Mexicans. These findings are consistent with other studies showing that exposure to the United States has the strongest relationship with risk of drug use and number of drugs used (Borges et al., 2007, 2011). However, the relationship between US exposure and risk of illicit drug use and using more drugs was strongest among individuals who lived in the United States before returning to Mexico.

These findings have significant implications for transnational Mexicans who are highly mobile across the Mexico–US border and may exhibit high-risk drug use behaviours. Although Mexico has historically been a transit country for illicit drugs, there has been a recent increase in the availability of these drugs in the country (Syvertsen et al., 2010). This may have a significant effect on Mexican migrants, whose access to illicit drugs may facilitate the transformation of drug use norms in their communities affecting their local social networks (Borges et al., 2007). Because Mexico's drug policies are more liberal than US policies in terms of criminalising drug use, Mexican migrants, who are at the highest risk of illicit drug use, face significant ambiguity when responding to policies that seek to promote a healthy lifestyle.

Limitations

The limitations and strengths of this study were associated with characteristics of the ENA dataset. The representation of Mexicans in the ENA national household survey was an important strength of this study. However, the ENA survey data were limited in terms of information collected on income and acculturation experiences. These factors could have helped us further examine heterogeneity among Mexicans with different norms and exposure to life in the United States. Another shortcoming of these data was the limited number of individual characteristics regarding history of drug use, mental health spectrum, and community risk factors including social norms. In particular, questions about previous drug use included experimentation with illicit drugs and lifetime prevalence, and depressed mood rates were marginally different despite the higher prevalence exhibited in other national studies on Mexican migrants (Alegría et al., 2008). Findings should be interpreted with caution because these measures described the characteristics and experiences of people surveyed in a household sample, which may not reflect the demographics of all Mexicans in Mexico or transnationals living in the United States. Despite these limitations, this study was one of the few studies using national household survey data from Mexico to explore the current disparities among Mexicans by migration status in an era of binational collaboration to reduce drug use and its social, economic, and health consequences.

Conclusions

Overall, findings support the further exploration of issues faced by Mexican transnationals who are more likely than Mexicans and those travelling to the United States to exhibit illicit drug use behaviours. Transnationals are highly mobile and have the potential to influence peers in Mexico and the United States to engage in drug use and other potentially unhealthy risk behaviours. Because the legality of using many harder drugs (e.g., cocaine, heroin, and amphetamines) differs by country, transnationals may not only be at highest risk of drug use and its consequences but also may influence the use behaviours of their Mexican or US peers and communities.

Future research on drug use prevalence and treatment interventions could focus on transnational Mexicans, a group that has grown significantly (Passel et al., 2012) and whose drug use severity service needs require specialised interventions (Syvertsen et al., 2010). Additionally, knowledge about the challenges faced by transnationals in terms of reintegrating into the Mexican system of health care to access, engage, and benefit from substance abuse treatment should be explored as well. This is particularly important in high-risk environments, such as communities in Mexico City where both the likelihood of illicit drug use and number of illicit drugs used is higher than in other sampled regions.

Because drug reform has mandated referrals to treatment for those with recurrent issues of drug use, it is critical for the Mexican government and civic society to develop the capacity to offer evidence-based substance abuse treatment on demand. Although the current Mexican treatment infrastructure features more than 450 treatment centres, these centres are primarily designed to treat chronic cases requiring detoxification or interventions for dependence on harder drugs (Centro Nacional para la Prevención y el Control de las Adicciones, 2013). Further investments in health care, particularly increasing access to integrated addiction, mental health, and primary care, are warranted.

Finally, binational Mexico–US drug reform policies should consider interventions to reduce the impact of exposure to inconsistent drug use enforcement policies. In particular, policy interventions should consider how high risk of drug use among migrants affects social networks in Mexico and the United States and how to improve access to intensive integrated care, particularly for harder drugs associated with high-risk health care conditions (e.g., HIV and other viral infections).

Competing interest

The authors declare that they have no competing interest of any kind.

Authors' contribution

Dr. Erick Guerrero designed the study, managed the literature searches and summaries of previous related work, contributed to the design and interpretation of the analysis, and worked with Drs. Villatoro, Kong and Maricarmen Bustos Gamino to draft the manuscript. Yinfei Kong conducted the statistical analysis and drafted the results section. Dr. William Vega and Medina-Mora revised all full drafts and with everyone approved the final manuscript.

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