# Mental Disorders Among Undocumented Mexican Immigrants in High-Risk Neighborhoods: Prevalence, Comorbidity, and Vulnerabilities

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*Objective:* This study aimed to: (a) provide population-based estimates for the prevalence of mental disorders, including substance use, among undocumented Mexican immigrants; (b) assess for relevant comorbidities; and (c) identify sociodemographic, immigration and contextual vulnerabilities associated with meeting criteria for a disorder. *Method:* This cross-sectional study used Respondent Driven Sampling (RDS) to collect and analyze data from clinical interviews with 248 undocumented Mexican immigrants residing near the California–Mexico border. The M.I.N.I. Mini International Neuropsychiatric Interview was used as the primary outcome of interest. For all analyses, inferential statistics accounted for design effects and sample weights to produce weighted estimates. Logistic regression was used in multivariate analyses. *Results:* Overall, 23% of participants met criteria for a disorder (95% CI = 17.1; 29.0). The most prevalent disorders were Major Depressive Disorder (14%, 95% CI = 10.2; 18.6), Panic Disorder (8%, 95% CI = 5.0; 11.9) and Generalized Anxiety Disorder (7%, 95% CI = 3.4; 9.8). Approximately 4% of participants met criteria for a substance use disorder (95% CI = 1.2; 6.1). After controlling for covariates, being 18 to 25 years and experiencing distress from postmigration living difficulties were significantly associated with meeting criteria for a disorder. *Conclusion:* Undocumented Mexican immigrants are an at-risk population for mental disorders, particularly depression and anxiety disorders. Given that distress from postmigration living difficulties is associated with meeting criteria for a disorder, revisiting policies and developing new alternatives to facilitate access and provision of context-sensitive mental health services for this population is necessary to protect the human rights of these immigrants and that of their U.S. families.

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*What is the public health significance of this article?*
To our knowledge, this is the first study to provide population-based estimates for the prevalence of current mental and substance use disorders among undocumented Mexican immigrants residing in high-risk neighborhoods. This information is essential to inform advocacy efforts, break down existing stereotypes, and inform the development and provision of contextually and culturally sensitive mental health interventions for this at-risk immigrant population.

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*Keywords:* mental illness, mental disorders, undocumented, Latinx, Mexican

A controversial issue at the forefront of the United States (U.S.) political agenda is that of undocumented immigration; that is, the movement of people across international boundaries without proper documentation. Although undocumented immigration to the United States has remained fairly stable since 2009, there are approximately 11 million undocumented immigrants in the United States, with the majority being of Mexican origin (Passel & D'Vera, 2016). Also, there are approximately 4.5 million U.S.-born children whose parents are undocumented, and at least 9 million Latinxs living in "mixed-status" families, where at least one member is undocumented (Taylor, Lopez, Passel, & Motel, 2011). In this study and consistent with linguistic trends, we used the term *Latinxs* as a gender-inclusive alternative to refer to men and women of Latin American descent (Ramirez & Zeba, 2016). Also, important to note is that although some undocumented immigrants eventually return to their home country, many establish permanent residence in the United States (Passel & D'Vera, 2016).

Undocumented immigration to the United States often presents with multiple stressors and contextual challenges, which may increase risk for mental disorders (Garcini et al., 2016). For instance, physical, verbal, psychological and sexual violence is widespread among undocumented immigrants (Garcini et al., 2016). Also, common to the undocumented experience is discrimination, stigmatization, marginalization, isolation, fear of deportation, exploitability, victimization, living in unsafe neighborhoods, and socioeconomic disadvantage (Abrego, 2006; Garcini et al., 2016; Infante, Idrovo, Sánchez-Domínguez, Vinhas, & González-Vázquez, 2012). In addition to the aforementioned stressors, undocumented immigrants often face intrapersonal and interpersonal stressors (e.g., identity shift, deception, distancing from family) and acculturative stress, which over time increases the risk for mental disorders (Garcini et al., 2016). According to the acculturation literature, the health advantage that is often observed among foreign-born Latinxs, often dissipates with longer time living in the United States, and this may be particularly true for undocumented Latinx immigrants given the chronic exposure that these immigrants face to the aforementioned stressors (Garcini et al., 2016).

Research to inform the mental health of undocumented immigrants is limited and existing studies often lack scientific rigor (Garcini et al., 2016). Overreliance on nonprobability sampling, the use of self-report, imprecise measurement, and the limited analysis of mental health outcomes by immigration legal status have made it challenging to identify the prevalence of mental disorders among undocumented Latinx immigrants. Nevertheless, qualitative research shows depression to be a relevant concern in this population, as well as anxiety and somatization (Garcini et al., 2016). Quantitative studies to document the prevalence of the aforementioned disorders among undocumented Latinx immigrants are needed to inform policy efforts and the development of interventions.

## Purpose of Study

This study aimed to: (a) provide population-based estimates for the current prevalence of mental disorders, including substance use, among undocumented Mexican immigrants residing near the California–Mexico border; (b) assess for relevant comorbidities; and (c) identify sociodemographic, immigration and contextual

vulnerabilities associated with meeting criteria for a disorder (including substance use).

## Method

### Design and Sample

This cross-sectional study used Respondent Driven Sampling (RDS) as a sampling and data analysis method. RDS is a methodology based on a mathematical model of the social networks that connect participants in a study, and is currently the most effective method to study hidden populations (Heckathorn, 1997). RDS relies on a structured referral system that uses successive waves of participant recruitment to achieve diversity so that initial samples no longer mirror later samples, which is referred to as *equilibrium*. To reduce biased estimates, RDS modifies commonly used chain-referral methods in three ways: (a) to increase the breadth of the social network captured by the sample, recruitment is limited by the use of coupons so participants are only allowed a fixed number of referrals (maximum of three); (b) in using referral coupons, participants do not personally identify referrals to the researcher so that anonymity is maintained; and (c) to make results representative of the target population (and not just respondents with large social networks), a systematic weighting scheme is built into the RDS model. Specifically, weights are based on the respondent's social network size; that is, based on their probability of being captured by this survey technique as well as other features of their social network, which can affect the referral process. In other words, the probability of selection is based on each participant's probability proportional to the size of his or her social network, which is carefully assessed using specific questions during data collection. In this way, each participant is weighted by the inverse of its probability of selection so that units with small chance of being selected (those with smaller social networks) have more weight, whereas those with larger social networks are assigned less weight in the analyses (Tyldum & Johnston, 2014). Thus, although RDS begins with a convenience sample of undocumented immigrants, a structured process is used in recruitment to obtain unbiased estimates of the undocumented population in the study location. RDS has been previously used to obtain prevalence estimates to inform the health needs of migrant populations, including undocumented immigrants in the United States (Tyldum & Johnston, 2014; Zhang, 2012).

Inclusion criteria for this study was being 18 years or older, Latinx, Spanish-speaking, and undocumented, and not exhibiting acute psychotic symptoms (i.e., hallucinations, delusions, disorganized speech/thought) given questionable capacity to provide adequate informed consent for participation. Only participants of Mexican origin were included in this study. Each respondent was compensated $30 for participation in the assessment and received $10 (for a maximum total of $30) for each recruited peer who met eligibility criteria and participated in the study. Informed consent was obtained prior to participation, and the study received approval by the SDSU/UCSD Institutional Review Board.

### Data Collection

Data were collected from November 2014 to January 2015. Recruitment began with three previously selected undocumented

Latinx immigrants or *seeds*. Seeds are nonrandomly selected members of the survey population who initiate the RDS recruitment process (Tyldum & Johnston, 2014). No additional seeds were used in this study. Seeds were selected based on information gathered during formative research, which included focus groups and in-depth interviews with key informants working the target community (Tyldum & Johnston, 2014). Seeds were selected to represent the diversity of the community, including gender, age, place of residence, and relevant immigration characteristics. From each seed, a recruitment chain began so that each seed was provided with three referral coupons to recruit other undocumented Latinx immigrants for participation. The next waves of recruits were provided with another set of three referral coupons to recruit additional participants. Each referral coupon was coded to match the recruiter to the respondent and collected by the interviewer from each respondent in order to link respondent to seeds and referral chains. Sampling continued until the desired sample size was reached and equilibrium achieved. Equilibrium was verified empirically through the use of RDS Analyst (Handcock, Fellows, & Gile, 2014), which showed that the final subjects recruited no longer had identical characteristics to the initial seeds. Figure 1 illustrates the recruitment tree.

To collect the data, face-to-face semistructured clinical interviews in Spanish were conducted by native Spanish-speaking psychology trainees working under direct supervision of mental health clinicians. In addition to completing comprehensive training for conducting the aforementioned interviews, all interviewers had extensive personal experience and background knowledge working with undocumented immigrants. Interview duration ranged from 1 to 3 hours depending on the extent of psychological distress reported. To minimize error and increase efficiency, data were collected using a computer assisted personal interviewing system (CAPI; Questionnaire Development System V. 3.0, Nova Research, Silver Spring, MD). All interviews were conducted at a convenient and private location identified during formative research. Participants included 257 undocumented immigrants; however, six participants were not of Mexican origin and three participants had missing data—thus, they were not included in this study. This study is based on data from 248 undocumented Mexican immigrants residing in a medium-size city located in North San Diego County, relatively near the California–Mexico border.

The target area for this study was chosen based on results from formative research. Given that the target area is listed among the most conservative U.S. cities with strong opposition and punitive actions against undocumented immigrants, this area is considered a high-risk area for undocumented immigrants (Bay Area Center for Voting Research, 2005). Of 147,095 individuals residing in the target area, it is estimated that more than 15% are undocumented (Hill & Johnson, 2011). To provide the most conservative estimates, analyses in this study were conducted using the 15% population estimate as reference ($N = 22,000$).

## Measures

**Mental and substance use disorders.** Current prevalence of mental and substance use disorders was assessed using the M.I.N.I. Mini International Neuropsychiatric Interview V. 6.0 (Lecrubier et al., 1997; Sheehan et al., 1998). The M.I.N.I. is a short, structured diagnostic interview used widely in clinical and research settings to assess for DSM and ICD psychiatric disorders. In this study, specific modules of the M.I.N.I. included: (a) Somatization Disorder; (b) Major Depressive Disorder (MDD); (c) Panic Disorder;
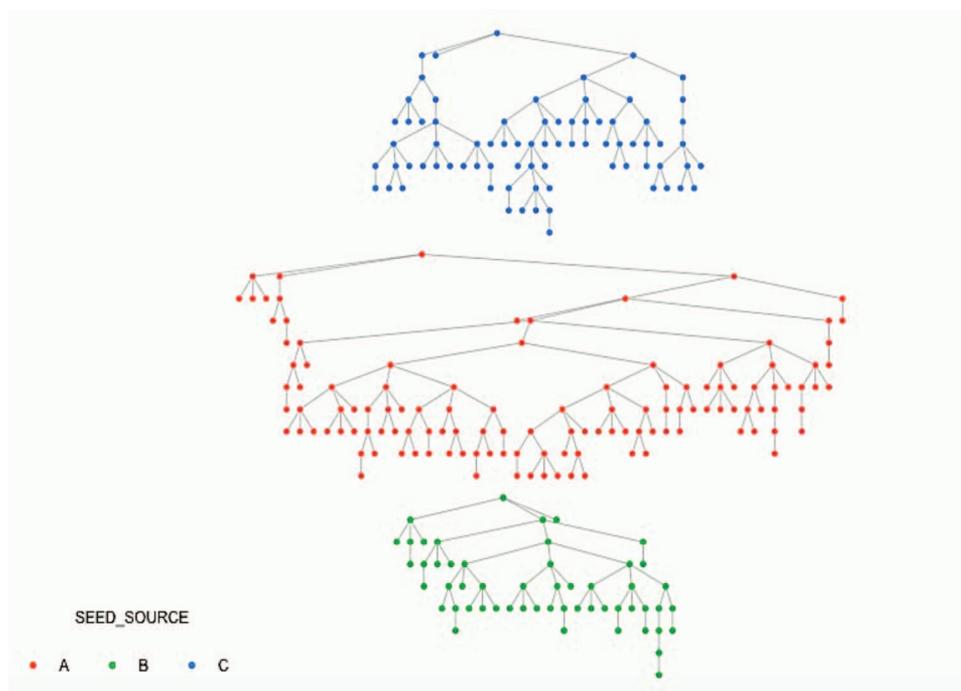


*Figure 1.* Recruitment tree. See the online article for the color version of this figure.

(d) Generalized Anxiety Disorder (GAD); and (e) Posttraumatic Stress Disorder (PTSD). Two additional modules were used to assess for current substance use disorders, including alcohol and drug dependence/abuse. At the beginning of each module, screening questions using a dichotomous format (yes/no) corresponding to the main criteria of a disorder were assessed and presented in a gray box. If the participant met the screening criteria, the interviewer proceeded to ask subsequent questions to assess for the disorder using dichotomous responses (yes/no). At the end of each module, a diagnostic box permitted the interviewer to indicate whether diagnostic criteria for a disorder was met. The M.I.N.I. has been previously validated against the Structured Clinical Interview for DSM diagnosis (SCID) and the Composite International Diagnostic Interview (CIDI) for IDC diagnosis (Lecrubier et al., 1997; Sheehan et al., 1998). The M.I.N.I. was selected for use in this study because it has been identified as a more time-efficient alternative to the SCID and CIDI given that the interview can be completed in approximately 15 min. The Spanish version of the M.I.N.I. was used in this study, which is considered to have adequate psychometric properties and is recommended for use with Latinx populations, including those of Mexican origin (Mestre, Rossi, & Torrens, 2013). To further ensure appropriateness of the Spanish language, facilitate comprehension, and to assess for clinical relevance, all modules used were adapted based on results from pilot testing (Peña, Garcini, Gutierrez, Ulibarri, & Klonoff, 2017).

**Sociodemographics.** Questions were previously translated and validated in Spanish for use with the target population from the 2009 San Diego Prevention Research Center (SDPRC) and the San Diego Labor Trafficking Survey Questionnaire (Zhang, 2012). Categorical demographic questions included sex (0 = *male*; 1 = *female*), age (0 = *18 to 25 years*; 1 = *26 to 35 years*; 2 = *36 to 45 years*; 3 = *46 and older*), marital status (0 = *single*; 1 = *married/living as married*), educational attainment (0 = *lower than high school*; 1 = *some high school and above*), and monthly household income (0 = *less than $2,000*; 1 = *$2,000 or greater*).

**Immigration characteristics.** Questions were previously translated and validated in Spanish for use with the target population from the 2009 San Diego Prevention Research Center (SDPRC) and the San Diego Labor Trafficking Survey Questionnaire (Zhang, 2012). These included living in a mixed status family (0 = *No*; 1 = *Yes*), place where the immigrant has lived the most (0 = *Mexico*; 1 = *United States*; 2 = *equally in both*) and time in the United States (0 = *less than 10 years*; 1 = *10 to 20 years*; 2 = *more than 20 years*).

**Contextual influences.** Questions were comprised of traumatic events and distress from postmigration living difficulties. History of traumatic events was assessed using an adapted version in Spanish of the traumatic events inventory of the Harvard Trauma Questionnaire (HTQ; Beaton, Bombardier, Guillemin, & Ferraz, 2000; Mollica, McDonald, Massagli, & Silove, 2004). This adapted version consisted of a 25-item inventory assessing traumatic events across seven domains: (a) material deprivation; (b) war-like conditions; (c) bodily injury; (d) forced confinement/coercion; (e) forced to harm others; (f) disappearance/death/injury of loved ones; and (g) witnessing violence to others (Mollica et al., 2004). Based on results from pilot testing, two additional items were added to the inventory (i.e., history of deportation and domestic violence). Responses to each of the traumatic events were dichotomous (0 = *no*; 1 = *yes*). In our study, the Cronbach's alpha for the HTQ was 0.83.

Distress from postmigration living difficulties was assessed using the Post-Migration Living Difficulties (PMLD) Questionnaire (Aragona, Pucci, Mazzetti, & Geraci, 2012). The PMLD is a 27-item inventory used to assess recent adverse life experiences related to immigration, as well as distress associated with such experiences. The PMLD measures postmigration difficulties along six domains: (a) finances/employment; (b) family and relationships; (c) access to health care; (d) discrimination/marginalization; (e) acculturation; and (f) stressors unique to undocumented status (e.g., fear of deportation, inability to go to Mexico in case of emergency, trouble with immigration officials). Participants rated their distress associated with each PMLD using a 4-point Likert scale from 0 = *not stressful* to 3 = *extremely stressful*. The PMLD renders a total PMLD mean distress score, as well as a mean distress score for each of the PMLD domains. For this study, the total PMLD mean distress score was used. In our study, the Cronbach's alpha for the PMLD was 0.86. The HTQ and the PMLD were previously translated and validated in Spanish for use with Latinx populations, and were adapted for linguistic accuracy with the target population based on results from pilot testing (Peña et al., 2017).

**RDS questions.** Three questions were used for mapping recruitment and to calculate RDS weights: (a) the estimated size of the respondent's personal network that is undocumented; (b) relationship to the referral source; and (c) length of time knowing the referral source. These questions were previously translated and validated in Spanish for use with the target population from the San Diego Labor Trafficking Survey Questionnaire (Zhang, 2012).

## Statistical Analyses

To estimate the sample size needed, a priori power analysis was conducted using OpenEpi, Version 3.01 (Dean, Sullivan, & Soe, 2013). Based on the prevalence of mental disorders among Mexican-origin foreign-born immigrants (Alegría et al., 2008) and to detect prevalence at 14% within a 95% confidence interval at 7% precision and with a design effect of 2 (Salganik, 2006), a sample size of 190 participants was needed, which was exceeded. For all analyses, inferential statistics accounted for design effects and sample weights to produce weighted estimates. Descriptive statistics and weighted frequencies along with 95% confidence intervals were calculated to assess for the current prevalence of mental disorders, including substance use. Chi-square statistics and analysis of variance were used in bivariate analyses ($p < .05$). Standardized residuals were used in post hoc comparisons for variables with more than two categories (Siegel, 1988). To identify vulnerabilities associated with meeting criteria for a disorder, logistic regression was used. For parsimony and to meet recommendations for the minimum number of events per variable (EPV) required in multivariate analysis (Peduzzi, Concato, Kemper, Holford, & Feinstein, 1996), only variables significantly associated with the outcome of interest in bivariate analyses were included in the multivariate model. All tests were set at $p < .05$.

**RDS assumptions and weights.** For the testing of RDS assumptions, generation of RDS weights, and analysis of population estimates, RDS Analyst was used (Handcock et al., 2014). A diagnostic testing for RDS assumptions showed that the sample reached equilibrium at the 11th wave of recruitment, met basic RDS assumptions, and showed little homophily bias. Homophily

refers to the tendency of individuals to associate with similar people at a higher rate than between dissimilar people (Volz & Heckathorn, 2008). Thus, an evaluation of RDS assumptions in this study suggested that the characteristics of the recruited, weighted sample approximate the characteristics of the larger networks of undocumented Mexican immigrants in the target area (midsize population estimate $N = 22,000$).

## Results

### Population Characteristics

The average age was 38 years ($SD = 11.2$). Most participants were female (69%), married (68%), had lower than a high school education (65%), and lived on a monthly household income of less than 2,000 USD (66%). The majority of participants had lived in the United States for more than 10 years ($M = 16$ years; $SD = 7.9$), most had lived most of their life in Mexico (66%), and the majority lived in mixed status families (73%). Also, most reported

a history of trauma (83%) and have faced several postmigration living difficulties ($M = 14$; $SD = 5.6$; see Table 1).

### Current Prevalence of Mental and Substance Use Disorders

Overall, 23.1% of participants met criteria for one or more of the assessed disorders, (95% CI = 17.1; 29.0). Specifically, 21.6% of immigrants met criteria for a current mental disorder (95% CI = 16.0; 27.2). The most prevalent mental disorders were MDD (14.4%, 95% CI = 10.2; 18.6), panic disorder (8.4%, 95% CI = 5.0; 11.9) and GAD (6.6%, 95% CI = 3.4; 9.8; see Table 2). Moreover, 3.7% (95% CI = 1.2; 6.1) of immigrants met criteria for a substance use disorder (See Table 3).

### Comorbidity of Mental and Substance Use Disorders

The highest comorbidity reported were between MDD and panic disorder (81.2%), PTSD and MDD (62.5%), PTSD and panic

Table 1

*Demographic, Immigration, and Contextual Characteristics by History of Meeting Criteria for Any Disorder*

| | Sample | | Population | | | History of current disorder[a] | | | | |
| | | | | | | Sample ($n = 58$) 23.4% | Population ($N = 5,072$) 23.1% | Test statistic[b] | Effect size[c] | $p$ |
| Factor | $n$ | % | % | SE | 95% CI | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Sex | | | | | | | | .01 | .01 | .94 |
| Men (Ref) | 76 | 30.6 | 30.7 | .04 | 24.5; 36.8 | 23.7 | 23.8 | | | |
| Women | 172 | 69.4 | 69.4 | .04 | 63.2; 75.5 | 23.3 | 22.8 | | | |
| Age (years) | | | | | | | | 9.32 | .19 | .03 |
| 18–25 (Ref) | 35 | 14.1 | 14.1 | .03 | 8.9; 19.3 | 40.0 | 37.1 | | | |
| 26–35 | 61 | 24.6 | 25.5 | .03 | 19.3; 31.8 | 13.1 | 12.2 | | | |
| 36–45 | 103 | 41.5 | 40.2 | .04 | 31.9; 48.2 | 22.3 | 22.5 | | | |
| ≥46 | 49 | 19.8 | 20.3 | .03 | 14.6; 26.0 | 26.5 | 28.1 | | | |
| Education | | | | | | | | 2.14 | .09 | .14 |
| Below HS (Ref) | 161 | 64.9 | 63.3 | .04 | 56.1; 70.6 | 20.5 | 20.2 | | | |
| HS and above | 87 | 35.1 | 36.7 | .04 | 29.4; 44.0 | 28.7 | 28.0 | | | |
| Income | | | | | | | | .27 | .03 | .60 |
| <than $,2000 (Ref) | 164 | 66.1 | 67.0 | .04 | 58.8; 75.4 | 24.4 | 24.1 | | | |
| $2,000 or more | 84 | 33.9 | 33.0 | .04 | 24.6; 41.2 | 21.4 | 21.0 | | | |
| Marital status | | | | | | | | 5.87 | .15 | .02 |
| Single (Ref) | 79 | 31.9 | 32.0 | .03 | 25.2; 38.9 | 32.9 | 31.4 | | | |
| Married | 169 | 68.1 | 68.0 | .03 | 61.1; 74.8 | 18.9 | 19.1 | | | |
| Mixed status family | | | | | | | | .14 | .12 | .71 |
| No (Ref) | 68 | 27.4 | 28.7 | .04 | 20.9; 36.6 | 23.8 | 25.0 | | | |
| Yes | 180 | 72.6 | 71.3 | .04 | 63.4; 79.1 | 22.8 | 22.8 | | | |
| Time in United States | | | | | | | | .51 | .05 | .78 |
| <than 10 yrs (Ref) | 55 | 22.4 | 21.8 | .03 | 15.7; 27.8 | 20.0 | 19.6 | | | |
| 10 to 20 years | 125 | 50.8 | 50.9 | .03 | 44.5; 57.2 | 24.8 | 23.9 | | | |
| >than 20 years | 66 | 26.8 | 27.4 | .04 | 20.3; 34.5 | 24.2 | 24.9 | | | |
| Place spent most life | | | | | | | | 4.04 | .13 | .13 |
| Mexico (Ref) | 162 | 65.6 | 65.5 | .02 | 60.6; 70.3 | 19.8 | 19.6 | | | |
| United States | 76 | 30.8 | 30.6 | .02 | 26.4; 34.8 | 31.6 | 31.1 | | | |
| Both | 9 | 3.6 | 4.0 | .01 | 1.2; 6.6 | 22.2 | 22.4 | | | |
| History of traumatic events | | | | | | | | 7.82 | .18 | .01 |
| No (Ref) | 43 | 17.3 | 17.9 | .03 | 11.1; 24.7 | 7.0 | 6.6 | | | |
| Yes | 205 | 82.7 | 82.1 | .03 | 75.3; 88.9 | 26.8 | 26.6 | | | |
| Distress from PMLD | | | | | | | | 25.38 | .76 | <.01 |
| Mean | 248 | 1.1 | 1.1 | .06 | 1.1; 1.2 | 1.5 | 1.5 | | | |
| SD | | .6 | .6 | | | .6 | .6 | | | |

$SD$ = Standard deviation; $SE$ = Standard error; $CI$ = Confidence interval.
[a] Includes any current mental and/or substance use disorder. [b] Pearson Chi-Square used for categorical variables; ANOVA $F$ test used for continuous variables. [c] Cramer's $V$ used for categorical variables; Cohen's $d$ used for continuous variables.

Table 2

*Population-Base Estimates for Current Prevalence of Relevant Mental Disorders (Not Including Substance Use) Among Undocumented Mexican Immigrants by Demographic, Immigration, and Contextual Vulnerabilities*

| Factor | Any mental disorder (%) | MDD (%) | SOM (%) | PD (%) | GAD (%) | PTSD (%) |
|---|---|---|---|---|---|---|
| Total | 21.6 | 14.4 | .3 | 8.4 | 6.6 | 3.0 |
| Sex | | | | | | |
| Men (Ref) | 20.2 | 16.8 | .4 | 5.2 | 6.2 | 3.6 |
| Women | 22.2 | 8.9 | .0 | 9.8 | 7.5 | 1.5 |
| Age (years) | | | | | | |
| 18–25 (Ref) | 34.3* | 18.7 | .0 | 21.1* | 7.0 | 7.8 |
| 26–35 | 10.5 | 6.3 | .0 | 6.4 | 4.6 | .0 |
| 36–45 | 21.9 | 17.9 | .7 | 6.9 | 6.0 | 2.8 |
| ≥46 | 26.3 | 14.6 | .0 | 5.0 | 9.9 | 3.6 |
| Education | | | | | | |
| Below HS (Ref) | 17.9 | 12.7 | .4 | 5.2** | 5.6 | 2.9 |
| HS and above | 28.0 | 17.3 | .0 | 13.9 | 8.2 | 3.0 |
| Income | | | | | | |
| Less than $2,000 (Ref) | 23.5 | 15.9 | .4 | 7.6 | 8.6 | 3.8 |
| $2,000 or more | 17.7 | 11.3 | .0 | 10.2 | 2.5 | 1.1 |
| Marital status | | | | | | |
| Single (Ref) | 31.3* | 15.0 | .8 | 13.7* | 12.0** | 5.3 |
| Married | 17.1 | 14.1 | .0 | 5.9 | 4.0 | 1.8 |
| Mixed status family | | | | | | |
| No (Ref) | 22.4 | 9.3 | .0 | 8.9 | 9.2 | 4.1 |
| Yes | 21.3 | 16.4 | .4 | 8.2 | 5.5 | 2.5 |
| Time in United States | | | | | | |
| Less than 10 years (Ref) | 17.7 | 9.3 | .0 | 12.6 | 7.1 | 2.1 |
| 10 to 20 years | 23.4 | 16.3 | .5 | 6.8 | 6.4 | 1.9 |
| More than 20 years | 22.9 | 15.3 | .0 | 8.6 | .0 | 5.8 |
| Place spent most life | | | | | | |
| Mexico (Ref) | 18.5 | 11.9 | .4 | 6.7 | 5.3 | 1.6 |
| United States | 26.4 | 19.9 | .0 | 10.8 | 9.0 | 6.3 |
| Both | 22.4 | 13.0 | .0 | 10.5 | 3.5 | .0 |
| History of traumatic events | | | | | | |
| No (Ref) | 6.6** | 2.8** | .0 | 6.1 | .0 | .0 |
| Yes | 24.9 | 16.9 | .3 | 9.0 | 8.0 | 3.6 |
| Distress from PMLD | | | | | | |
| M | 1.5*** | 1.6*** | 2.3 | 1.5** | 1.5* | 1.7** |
| SD | .6 | .6 | | .5 | .6 | .5 |

*Note.* MDD = Major depressive disorder; SOM = Somatization; PD = Panic disorder; GAD = Generalized anxiety disorder; PTSD = Posttraumatic stress disorder.
* $p < .05$.  ** $p < .01$.  *** $p < .001$.

disorder (50.0%), GAD and MDD (43.8%), PTSD and GAD (37.5%), and panic disorder and GAD (27.3%). Pertaining to substance use, the highest comorbidity reported were between having a substance use disorder and MDD (30.0%), and having a substance use disorder and GAD (10.0%).

## Vulnerabilities Associated With Current Prevalence of a Disorder

Bivariate analyses showed that significant differences in meeting criteria for having a current disorder were found across age groups, marital status, history of traumatic events, and distress associated with PMLD. Specifically, when compared to other age groups, a higher proportion of immigrants ages 18 to 25 and those ages 46 and older met criteria for a disorder ($p < .05$). When compared to their married or living as married counterparts, a higher proportion of single participants met criteria for a disorder ($p < .05$). Meeting criteria for a disorder was more prevalent among those with a history of traumatic events ($p < .01$) and those with greater distress from PMLD ($p < .001$; see Table 2).

In multivariate analyses, the full model containing age, marital status, history of trauma, and mean distress from PMLD was statistically significant, $\chi^2(6, N = 246) = 42.54, p < .001$. The model fit using Cox and Snell *R* square was 0.16 and 0.24 when using Nagelkerke *R* squared. The model correctly classified 80.1% of cases. As shown in Table 4, age and mean distress from PMLD made a statistically significant contribution to the model. Specifically, after controlling for all other factors in the model, younger immigrants (18 to 25 years) were 3.7 and 2.7 times more likely to meet criteria for a disorder than their 26 to 35 years and 36 to 45-year-old counterparts, respectively ($p = .03; p = .04$). No significant difference in meeting criteria for a disorder was observed between the younger group (18–25 years) and the oldest group (46 years and older). Also, for each unit increase in mean distress from PMLD, participants were 4.0 times more likely to meet criteria for a disorder ($p < .01$; see Table 4).

Post hoc analyses were conducted to identify specific sources of distress across PMLD domains associated with meeting criteria for a disorder. Results showed that distress from perceived discrimi-

Table 3

*Population-Base Estimates for Current Prevalence of Substance Use Disorders Among Undocumented Mexican Immigrants by Demographic, Immigration, and Contextual Vulnerabilities*

| Factor | Any SU disorder (%) | ALC-A (%) | ALC-D (%) | DRG-A (%) | DRG-D (%) |
|---|---|---|---|---|---|
| Total | 3.7 | 1.6 | 1.3 | .8 | .4 |
| Sex | | | | | |
| Men (Ref) | 7.9 | 1.7 | 3.0 | 2.6 | 1.3 |
| Women | 2.3* | 1.3 | .6* | .0* | .0 |
| Age (years) | | | | | |
| 18–25 (Ref) | 11.4 | 2.8 | 5.5 | 5.7** | .0 |
| 26–35 | 4.5 | 2.9 | .0 | .0 | 1.5 |
| 36–45 | 1.4 | .0 | 1.4 | .0 | .0 |
| ≥46 | 1.9 | 1.9 | .0 | .0 | .0 |
| Education | | | | | |
| Below HS (Ref) | 2.9 | 1.8 | .4 | .0* | .6 |
| HS and above | 5.2 | 1.1 | 2.9 | 2.2 | .0 |
| Income | | | | | |
| Less than $2,000 (Ref) | 1.7** | 1.7 | .0** | .0* | .0 |
| $2,000 or more | 7.8 | 1.2 | 4.0 | 2.4 | 1.2 |
| Marital status | | | | | |
| Single (Ref) | 4.7 | .0 | 3.3 | 2.5* | .0 |
| Married | 3.2 | 2.3 | .4 | .0 | .6 |
| Mixed status family | | | | | |
| No (Ref) | 5.6 | 1.4 | 2.7 | 2.8* | .0 |
| Yes | 2.9 | 1.6 | .8 | .0 | .5 |
| Time in United States | | | | | |
| Less than 10 years (Ref) | 3.8 | 1.8 | 1.9 | .0 | .0 |
| 10 to 20 years | 4.2 | 1.5 | 1.8 | 1.6 | .0 |
| More than 20 years | 2.9 | 1.5 | .0 | .0 | 1.5 |
| Place spent most life | | | | | |
| Mexico (Ref) | 2.1 | .6 | 1.5 | .0 | .0 |
| United States | 7.7 | 3.8 | 1.2 | 2.6 | 1.3 |
| Both | .0 | .0 | .0 | .0 | .0 |
| History of traumatic events | | | | | |
| No (Ref) | .0 | .0 | .0 | .0 | .0 |
| Yes | 4.5 | 1.9 | 1.6 | 1.9 | .5 |
| Distress from PMLD | | | | | |
| *M* | 1.3 | 1.1 | 1.6 | 1.4 | 1.4[a] |
| *SD* | .6 | .6 | .7 | 1.2 | |

*Note.* SU = Substance use; ALC-A = Alcohol abuse; ALC-D = Alcohol dependence; DRG-A = Drug abuse; DRG-D = Drug dependence.
[a] No *SD* is reported given that only a single case was found.
* $p < .05$.  ** $p < .01$.

nation was significantly associated with meeting criteria for a disorder ($p < .01$). More specifically, for each unit increase in mean distress from discrimination, participants were 2.7 times more likely to meet criteria for a disorder, particularly MDD (*OR*-2.57, $p = .012$).

## Discussion

To our knowledge, this is the first study to provide population-based estimates for the prevalence of current mental and substance use disorders among undocumented Mexican immigrants residing near the California–Mexico border. Overall, about a quarter of undocumented Mexican immigrants in our study met criteria for one or more of the assessed disorders, with the most prevalent disorders being MDD and anxiety disorders. Based on results from the National Comorbidity Survey Replication (NCSR), the estimates obtained in our study for MDD, GAD, and panic disorder were considerably higher in this immigrant community when compared to those for the general U.S. population (Kessler, Chiu, Demler, Merikangas, & Walters, 2005). For instance, the current

prevalence of MDD in the NCSR was approximately 7%, whereas it was 14% in our study. Likewise, prevalence of panic disorder and GAD in the NCSR were approximately 3%, whereas it was 8% and 7%, respectively, in our study. Although the "immigrant paradox" suggests that despite the stressful experiences and socioeconomic disadvantage associated with immigration, foreign-born status protects against mental disorders (Burnam, Hough, Karno, Escobar, & Telles, 1987), the aforementioned findings suggests that this may not hold truth for undocumented Mexican immigrants.

Another important finding in our study was the low prevalence of PTSD in this immigrant population, which is comparable to the prevalence of PTSD in the general U.S. population (3.5% in the NCRS vs. 3.0% in our study; Burnam et al., 1987). This is surprising given the high prevalence of traumatic events reported in our study (83%). Although underreporting may provide a possible explanation for the low prevalence of PTSD found in our study, previous research suggests that traditional criteria for PTSD may not entirely capture psychological distress and symptom

Table 4

*Multivariate Logistic Regression Predicting Likelihood for Meeting Criteria for a Current Disorder*

| Factor | B | SE | Wald | p | OR | 95 % CI Lower | Upper |
|---|---|---|---|---|---|---|---|
| Age (years) | | | | | | | |
| 18–25 (Ref) | | | | | | | |
| 26–35 | −1.31 | .59 | 5.03 | **.03** | .27 | .09 | .85 |
| 36–45 | −1.01 | .49 | 4.17 | **.04** | .37 | .14 | .96 |
| 46 and older | −.99 | .54 | 3.33 | .07 | .37 | .13 | 1.08 |
| Marital status | | | | | | | |
| Single (Ref) | | | | | | | |
| Married | −.57 | .37 | 2.35 | .13 | .57 | .28 | 1.17 |
| History of traumatic events | | | | | | | |
| No (Ref) | | | | | | | |
| Yes | .86 | .65 | 1.74 | .19 | 2.36 | .66 | 8.48 |
| Distress from PMLD | 1.39 | .31 | 20.9 | <.01 | 4.02 | 2.22 | 7.31 |
| Constant | −2.42 | .74 | 10.7 | <.01 | .09 | | |

*Note.* PMLD = Post-migration living difficulties; *SE* = Standard error; *OR* = Odd ratio; CI = Confidence interval. Bolded value denote *p* < .05.

presentation associated to trauma among nonwestern cultures (Hinton & Kirmayer, 2013; Hobfoll, 2014). Additional studies are needed to facilitate an understanding as to how meeting criteria for PTSD may or may not adequately capture distress associated to trauma among undocumented Mexican immigrants.

Pertaining to substance use disorders, the prevalence for having a substance use disorder in this immigrant population was comparable to that of the U.S. general household population (3.8% in the NCRS vs. 3.7% in our study). The prevalence of substance use disorders found in our study is consistent with previous qualitative research showing that undocumented immigrants are unlikely to engage in substance use given that it increases risk for deportation and it interferes with productivity at work (Garcini et al., 2014). This finding is important given that it defies existing stereotypes that contribute to stigmatization and discrimination of undocumented Mexican immigrants as a population with high prevalence of substance use (Cohen & Chavez, 2013; Niles et al., 2015).

Another aim of our study was to identify vulnerabilities associated with having a disorder in this immigrant population. An important finding was that significant differences in the prevalence of having a disorder were observed across age groups, with younger immigrants (18 to 25 years) being more likely to meet criteria for a disorder than their 26–46-year-old counterparts, but not those ages 46 and older. Post hoc analyses showed that the majority of this younger age group was brought to the United States as children (92.3%); thus, it is possible that this age group is most representative of undocumented immigrants that are often referred to as DREAMers, who are educated, undocumented young adults that were brought to the United States as children, and who may qualify for the requirements of the Development Relief and Education for Alien Minors (DREAM) Act. Under this act, DREAMers are given a time-limited conditional permit to remain in the United States and pursue an education, with the caveat of facing constant institutional and societal exclusion and rejection due to their undocumented status (Abrego, 2006; Ellis & Chen, 2013). Research shows that this "double standard" of living increases risk for psychological distress in this younger subgroup

(Pérez, Cortés, Ramos, & Coronado, 2010). Similarly, a high prevalence of meeting criteria for a disorder was observed among those 46 years and older. This is not surprising given that older undocumented immigrants may be susceptible to distress from age-related illnesses and disability without access to health care, difficulties finding and keeping employment, and longer time away from their families in Mexico, which in turn may increase risk for a mental disorder. Additional studies are needed to identify vulnerabilities associated with risk for mental disorders among younger and older undocumented immigrants to inform policy and intervention efforts.

Postmigration difficulties, particularly discrimination, were associated with meeting criteria for a disorder. Conflicting political views and growing animosity among people of different backgrounds have recently brought discrimination against undocumented immigrants to the forefront of the U.S. political, economic, and social landscape (Pew Research Center, 2016). The negative effects of discrimination on mental health are well documented, with discrimination being consistently associated with a greater risk for mental disorders including depression and anxiety (Pascoe & Smart Richman, 2009). Very little is known about the effects of discrimination on the well-being of undocumented immigrants, as well as protective factors and ways for coping that could ameliorate its undesirable effects (Abraído-Lanza, Echeverría, & Flórez, 2016; Berkel et al., 2010). Thus, our findings highlight the relevance of studying the complex cultural and sociopolitical realities faced by undocumented Mexican immigrants, including experiences of discrimination, as to inform context-sensitive mental health interventions and policies (Abraído-Lanza et al., 2016; Berkel et al., 2010).

## Limitations

Our study makes a timely and significant contribution to identify the prevalence of relevant mental health disorders in this hard-to-reach population. Regardless, this study has limitations. First, RDS has been identified as the most effective method to

study hidden populations (Heckathorn, 1997); however, it is not free from methodological limitations (Goel & Salganik, 2010). Nevertheless, several steps were taken in this study to aim for collecting data from a representative sample (i.e., formative research, preselection of diverse seeds, long recruitment chains, use of weighted estimates based on size of social network, accurate assessment of social network size). Also, it is possible that distress and mental health disorders in this community may be different than those experienced by undocumented immigrants from other countries (e.g., Central America) and who reside in other parts of the United States. Follow-up studies with different populations of undocumented immigrants and with undocumented immigrants residing in other regions of the United States, including other regions across the U.S–Mexico border, are warranted. In addition, our sample was predominately female and on average had lived in the United States for more than 10 years. Thus, our data is most representative of undocumented Mexican women who have made the United States their home and most of which are living in mixed status families, where some family members are U.S. citizens. Moreover, individuals with certain serious mental illnesses (e.g., schizophrenia) were excluded from participation; thus, estimates for certain disorders such as substance use, may be higher among undocumented immigrants with such disorders. Also, the information gathered was based on retrospective reporting, which may lead to biases and lower estimates than contemporaneous reporting (Brewin, Andrews, & Gotlib, 1993). Thus, it is likely that underreporting may have occurred and that the estimates provided in this study may be higher. Finally, this study was cross-sectional; thus, causation cannot be inferred.

## Conclusion

Overall, our findings have important public health and clinical implications, including the need for the development and provision of context- and culture-sensitive interventions. Unfortunately, there are many barriers to mental health service use for undocumented immigrants including stigma, fear of deportation, cost, limited information, and restricted access to health care (Garcini et al., 2016). Debates on programs and policies pertaining to undocumented immigrants are complex and multifaceted, and divisiveness on immigration and welfare reform in the United States is long-standing. Revisiting policies to devise solutions grounded in evidence and developing new alternatives to facilitate access and provision of mental health services to this at-risk population is critical to protect their human rights and reduce mental health disparities in this community.

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