

The Prevalence and Types of Gambling Among Undocumented Mexican Immigrants in New York City

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Abstract *Objectives* To examine the prevalence of gambling and types of gambling activities in a sample of undocumented Mexican immigrants. *Design* Non-probability cross-sectional design. *Setting* New York City. *Sample* The 431 respondents ranged in age from 18 to 80 (mean age 32), 69.7% were male. *Results* More than half (53.8%) reported gambling in their lifetime and of those most (43.9%) played scratch and win tickets or the lottery. In multivariate analyses men reported gambling more than women [2.13, 95% CI = (1.03, 4.38)]. The odds of gambling in their lifetime were higher among those reporting sending money to family or friends in the home country [2.65, 95% CI = 1.10, 6.38], and those who reported 1–5 days as compared to no days of poor mental health in the past 30 days [2.44, 95% CI = 1.22, 4.89)]. Conversely, those who reported entering the U.S. to live after 1996 were less likely to report gambling [0.44, 95% CI = (0.22, 0.89)] as compared to those who had lived in the U.S. longer. *Conclusion* There is a need to further explore both the prevalence and the severity of gambling amongst the growing population of undocumented Mexican immigrants in the U.S.

Keywords Undocumented Mexicans · Illegal immigrants · Minorities · Prevalence and types of gambling · Problem gambling

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Introduction

The prevalence of problem or pathological gambling appears to be greater among racial/ethnic minorities than it is among whites in the United States (U.S.) (Murray 1993; Raylu and Oei 2004; Volberg 1994, 1996; Wardman et al. 2001). However, there is a paucity of research about gambling behaviors among minority groups, specifically undocumented and lower socioeconomic status (SES) populations. The lack of knowledge about gambling behaviors among minority groups in general, and undocumented groups, specifically, and especially those of lower SES, is of concern given that these populations may be at higher risk of experiencing problem or pathological gambling disorders (Cunningham-Williams et al. 2007; Welte et al. 2004b). Minorities of lower SES are at greater risk of developing gambling problems as it is believed that the increased availability of gambling venues in low SES areas has led to a shift in the demographics of gamblers, who were traditionally high SES White males, to low SES gamblers and minorities who now view gambling as entertainment, a way to win money quickly, and thereby may be at risk of developing more gambling problems (Gill et al. 2006; Welte et al. 2002). Studies are needed to investigate how undocumented Mexican immigrants are affected by this shift in gambling demographics. To date no studies exist that specifically study the gambling behaviors of undocumented Mexican immigrants. Undocumented immigrants are a vulnerable, and understudied, minority population that may be at higher risk of experiencing gambling problems given their immigration status and low SES. One study of Anglo and Hispanic callers to a Gambling Hotline noted a marked difference in calls for assistance between the groups (96.2% Anglo and 3.8% Hispanic) (Cuadrado 1999). Another study of older and younger adult problem gamblers found that the younger adult group had more Hispanic and “other” problem gamblers and fewer Caucasian problem gamblers (Potenza et al. 2006a). Westermeyer et al. 2005 found that among Hispanic American veterans lifetime pathological gambling rates were 1% higher than general population samples (4.3%). None of the studies specifically noted nativities or immigration status. Studies that specifically look at the gambling practices among undocumented Mexicans are non-existent and are further challenged by the difficulties of accessing and identifying undocumented Mexican immigrants.

There has been a 30% increase in undocumented individuals in the U.S. since 2000 (8.4 million to 11 million) (Passel 2005). Six million of these undocumented individuals are Mexican. Extant research suggests that undocumented immigrants may be at greater risk of disease and injury than documented immigrants and native-born populations (Loue and Mendez 2005), making this group of high interest from a population health point of view. Gambling, especially excessive gambling behaviors are associated with diminished health related quality of life. (Scherrer et al. 2005). However, to date no studies exist that specifically study the gambling behaviors of undocumented Mexicans resulting in an important gap in our understanding of the extent of gambling, gambling-related problems, and service needs in this vulnerable population.

To contribute to the understanding of gambling behaviors among undocumented immigrants, findings are presented from a larger study of Mexicans living in New York City (NYC), where the foreign born Mexican population increased by 275% between 1990 and 2000 (The Newest New Yorkers 2004). The objectives of this analysis were to: (1) estimate the prevalence of gambling in a sample of undocumented Mexican immigrants; (2) examine the extent to which demographic, social, economic, and cultural variables are associated with gambling; and (3) examine the types of gambling activities that undocumented Mexican immigrants are engaged in.

Methods

Subjects and Study Design

The data for the current analyses are drawn from a larger 2004 study of 505 persons who were born in Mexico but were living in New York City (NYC) (see Nandi et al. 2008; Hadley et al. 2008). For this particular study, the sample is restricted to the 431 respondents who reported undocumented immigration status. The purpose of the larger study was to conduct a comprehensive assessment of the determinants of access to and utilization of health services among undocumented Mexican immigrants living in NYC. We utilized venue based sampling and the sampling frame consisted of adults (age 18 and older) from five boroughs of NYC who reported being born in Mexico. Specifically, participants (age 18 years and older) were recruited from venues in NYC communities with large populations of Mexican immigrants. Venues were selected using a two phase procedure. In phase one; data were used from the 2000 U.S. Census to identify the 12 neighborhoods in NYC, as defined by the NYC Department of Planning, with the highest reported clusters of Mexican immigrants (U.S. Census 2003; *The Newest New Yorkers* 2004). The neighborhoods were Sunset Park, East Harlem, North Corona, Elmhurst, Jackson Heights, Astoria, Bushwick, Williamsburg, South Bronx, Chelsea, Lower East Side and Port Richmond. In phase two, a systematic assessment of all the streets in the 12 neighborhoods was conducted on differing days and times to identify busy neighborhood venues that would be receptive to conducting interviews. For the present study, only illegal residents were included in analyses.

Outreach workers trained in data collection methods recruited participants between October 8, 2004 and December 5, 2004 using outreach techniques that have been utilized extensively in research on immigrant populations (Loue et al. 2000; Marshall et al. 2005) and other hard to access populations (Anthony et al. 1991; Vlahov et al. 1991). For example, the workers distributed flyers about the study at the venues and engaged interested potential participants in conversations about the objectives, the criteria for inclusion, and the voluntary and anonymous nature of the study.

Eligible participants were 18 years of age or older, self-reported to be Mexican, not born in the U.S., and current residents of NYC. If interested the participants later returned and participated in a 20 minute interview in English (less than 2%) or Spanish with translated and back-translated structured questionnaires. Institutional Review Board approval was received at the New York Academy of Medicine and New York University. To preserve anonymity oral consent was obtained and no identifying information was collected.

Measures

An adapted version of the South Oaks Gambling Screen (SOGS) (LeSieur and Blume 1987) was used to estimate prevalence of gambling behaviors and types of gambling activities. Due to space limitations, given that the gambling questions were part of a larger study/survey, only 7 of the 20 SOGS items were included in the study. Lifetime prevalence was assessed by asking the respondent if he/she had ever undertaken any of the following types of gambling: (1) “played scratch and win tickets or the lottery,” (2) “played card games for money,” (3) “played dice games for money,” (4) “played pool or darts for money,” (5) “bet money on horse races, dog fights, or cockfights,” and (6) “bet money on

sports, bingo, or going to a casino.” If they responded “Yes” to any of the items, respondents were asked an additional question to assess how often they participated in this type of gambling in the past six months [Response options were 1 (not at all), 2 (less than once a week) and 3 (once a week or more)]. The seventh question was as follows: “What is the largest amount of money you have ever gambled with on any one day?” [Response options ranged from 1 (never have gambled) to 7 (more than \$10,000)].

Socio-demographic characteristics included age (18–24, 25–34, 35–44, and greater than 44 years of age); gender (male or female); educational attainment (less than high school, high school diploma or equivalent, and at least some college); marital status (single, married, divorced, and other); and residency status. Respondents were asked if they were a legal resident of the U.S. and what year they first entered the U.S. to live. In analyses, to reflect the changes in U.S. legislation that took place in 1996, we dichotomized the year of entry as before or after January 1, 1997 (Kullgren 2003). In 1996, the Personal Responsibility Work Opportunity Reconciliation Act of 1996 (PRWORA) was passed by Congress. One of the objectives of this legislation was to restrict federal, state, and local public services among undocumented immigrants (Kullgren).

We asked respondents about social and economic factors. To assess social support we included 5 items from the Medical Outcomes Study (MOS) social support survey (Sherbourne and Stewart 1991). We asked about tangible support (e.g., “someone available to help you if you were confined to bed”), emotional support (e.g., “someone available to give you good advice about a crisis”), and “someone available to confide in or talk to about your problems”), positive social interaction (e.g., “someone available to get together for relaxation”), and affectionate support (e.g., “someone available to love you and make you feel wanted”) [Response options ranged from 1 (none of the time) to 4 (all of the time)]. Responses were summed and divided into categories for analysis: none/low, medium and high social support. We asked respondents to report on their economic situation by asking about their ‘legal income’ (i.e., “on the books” taxed income, including public assistance), and ‘off the books’ income (i.e., non-taxed income). We categorized both sources of income into 3 categories: no income, \$1–\$9,999, and greater than \$10,000. In addition respondents were asked if they received money from social services in the past 6 months.

Levels of linguistic and social acculturation were assessed using an adapted version of the twelve item Welfare Reform Baseline Interview acculturation module, developed specifically for Hispanic peoples (Marin et al. 1987). Linguistic acculturation was assessed using seven items that asked about the preference for other languages when compared to English (e. g., “what was the language you used as a child?”). Respondents indicated on a 5-point scale ranging from 1 (Only English) to 5 (Only Not English). Responses were reverse coded so that higher scores indicated a preference for English. Social acculturation was assessed with four items that asked about preference for Mexican, Latino, or Hispanic groups as compared to other groups in different social milieu (e.g., “you prefer going to social gatherings/parties where people are...?”). Response categories for each item were on a 5-point scale ranging from 1 (Almost all Mexican, Latino, Hispanic) to 5 (Almost all not Mexican, Latino, Hispanic). Higher scores indicated a preference for interaction with “almost all not Mexicans, Latinos, and Hispanics.” The scores of linguistic and social acculturation were summed and categorized into 3 categories of acculturation: lowest, moderate, and highest. In this study the Cronbach’s alpha for items used in both scales was 0.92.

We measured overall health, physical, and mental health with 3 items. Respondents rated their overall health (excellent, very good, good, fair, or poor), and then their perception of their physical health in the past 30 days, specifically how many days (0 days,

1–5 days, greater than 5 days) they viewed their health as ‘not good’, and then respondents rated their mental health using the 30 days indicator and the ‘not good’ categories as well. These 3 measures have been reported to be valid and reliable (Andresen et al. 2000, 2003).

Statistical Analyses

To measure prevalence of gambling we calculated the number and percentage of respondents who reported “Yes” to any of the types of gambling. Spearman’s correlation and Chi Square tests were used to measure bivariate associations between the study variables. We used multivariate logistic regression models to identify variables independently associated with having ever gambled. For covariates included in the model see Table 1. Multivariate analyses were conducted with predictor variables that were significantly associated with the dependent variable at a significance level of <0.2 in the bivariate tests. Odds ratios were tested for significance using a two-tailed Wald chi-square test whose null hypothesis is that the odds ratio is equal to one, or no association. SAS software version 9.1 (SAS Institute, Cary, NC) was used for all statistical analyses.

Results

A total of 431 individuals indicated undocumented status. Of those, the majority had lived in the U.S. for less than 10 years (65%). Respondents ranged in age from 18 to 80, with a mean age of 31.7 (SD = 9.0), and 69.7% were male. Eighty-three percent of the respondents reported less than a high school education, 10% having a high school diploma or equivalent, and 7% some college. Half of the sample was married, 41% were single, 1.7% were divorced, and 7.3% were in an ‘other’ category. Yearly legal income of between \$1 and 1 and \$10,000 was reported by 16% of the respondents, and 12% reported income of more than \$10,000. In the ‘legal’ income category 57% of the respondents reported no income and missing responses were 15%. For the ‘off the books’ income, 31% had income between \$1 and \$10,000, 21% had income of more than \$10,000, 26% reported no income, and 22% did not respond. In the past 6 months 24% of the respondents reported working as a day laborer. A large percentage (85%) of the respondents reported sending money to their home country to family and friends. Of the total sample 53.8% were gamblers ($N = 232$) and 46.2% were non-gamblers ($N = 199$) (Table 1). When compared to non-gamblers, a greater percent of gamblers were male, had legal incomes greater than \$10,000, lived in the U.S. longer, had not received money from social services in the past 6 months, had sent more money to family and friends in the home country, had higher levels of linguistic and social acculturation, and reported more days of poor physical and mental health.

Of the respondents who reported gambling in their lifetime, the largest percentage of gambling activity engaged in ever in their lifetime was scratch and win tickets or the lottery (43.9%) (Table 2). Interestingly, among those who reported gambling, 46.1% did not gamble on any of the activities in the past 6 months, 38.4% gambled on 1 activity, 11.2% gambled on 2 activities, 2.6% gambled on 3 activities and 1.9% gambled on 4 activities. For gamblers the amount of money they gambled in one day was \$1–\$10 (19.8%), \$10–\$100 (15.6%), \$1 or less (7.2%), \$100–\$1,000 (6.2%), and over \$1,000 (0.8%). Of those who reported playing scratch and win tickets or the lottery, 44.7%

Table 1 Socio-demographic characteristics and bivariate associations between covariates of interest and lifetime gamblers and non-gamblers among undocumented Mexican immigrants of NYC ($N = 431$)

Variable	N	Lifetime gambling, % $N = 232$ (53.8%)	Lifetime non-gambling, % $N = 199$ (46.2%)	χ^2 (df)
Legal income				7.28* (2)
No income	246	65.7	68.8	
\$1–10,000	70	16.4	22.5	
>10 K	51	17.9	8.8	
Off the books				5.47 (2)
No income	112	30.1	37.3	
\$1–10,000	135	38.3	42.3	
>10 K	91	31.6	20.4	
Age categories				1.58 (3)
18–24	104	26.3	21.7	
25–34	177	39.2	43.4	
35–44	112	25.4	26.8	
>44	37	9.1	8.1	
Gender				14.89*** (1)
Female	130	22.4	39.6	
Marital status				3.54 (3)
Single	177	44.0	37.7	
Married	218	47.0	54.8	
Divorced	9	1.7	2.5	
Other	27	7.3	5.0	
Years in the USA—categories				9.55 (4)
1978–1991	78	23.0	13.3	
1992–1996	64	16.5	13.8	
1997–1999	88	17.4	25.5	
2000–2001	80	17.8	20.7	
>2001	108	25.2	26.6	
Year entered USA				7.13** (1)
1996 or earlier	142	39.6	27.1	
After 1996	276	60.4	72.9	
Worked as day laborer (past 6 months)				0.12 (1)
Yes	103	24.6	23.1	
No	328	75.4	76.9	
Social support				1.27 (2)
Low	187	43.8	48.1	
Medium	154	38.0	37.3	
High	68	18.3	14.6	
Last 6 months, received money from social services				5.55* (1)
Yes	39	6.0	12.6	
No	392	94.0	87.4	

Table 1 continued

Variable	<i>N</i>	Lifetime gambling, % <i>N</i> = 232 (53.8%)	Lifetime non-gambling, % <i>N</i> = 199 (46.2%)	χ^2 (df)
Send money to family/friends in home country				13.53*** (1)
Yes	366	91.0	78.3	
No	64	9.1	21.7	
Education (highest level completed)				2.68 (2)
Less than high school	358	80.6	85.9	
High school or GED	43	10.8	9.1	
At least some college	30	8.6	5.0	
Linguistic acculturation/preference				19.54*** (2)
Lowest level of acculturation	106	19.5	35.1	
Moderate acculturation	122	28.6	33.5	
Highest level of acculturation	167	51.9	31.4	
Social acculturation/preference				22.16*** (2)
Lowest level of acculturation	172	32.7	56.3	
Moderate acculturation	106	32.2	20.8	
Highest level of acculturation	116	35.1	23.0	
Overall health				3.75 (4)
Excellent	46	10.8	10.6	
Very good	64	13.8	16.2	
Good	192	42.7	47.0	
Fair	99	24.1	21.7	
Poor	29	8.6	4.6	
Poor mental health				19.19*** (2)
0 days	227	43.9	64.8	
1–5 days	119	35.1	19.9	
>5 days	78	21.1	15.3	
Poor physical health				10.06** (2)
0 days	253	52.6	67.7	
1–5 days	101	28.3	18.5	
>5 days	71	19.1	13.9	

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

gambled \$1–\$10 and 24.3% gambled \$10–\$100. A total of 51% of respondents never gambled any amount of money.

The bivariate analyses of associations between types of gambling activities and the variables of interest (age, gender, income source and acculturation levels) are presented in Table 3. Gamblers who played scratch and win tickets or the lottery, card games or pool or darts for money, bet on horse races, dog, or cockfights, and bet on sports, bingo, or in a casino, were overwhelmingly male. Scratch and win tickets or lottery players had higher legal incomes and those who bet on sports, bingo, or in a casino had higher levels of linguistic acculturation. Playing dice games for money revealed no associations.

Table 2 Prevalence of types of gambling activities ($N = 431$)

Types of gambling (lifetime)	<i>N</i>	%	How often played in last 6 months					
			Not at all		<Once a week		Once a week or more	
			<i>N</i>	%	<i>N</i>	%	<i>N</i>	%
Scratch n win tickets/lottery								
No	242	56.2						
Yes	189	43.9	37	19.7	80	42.6	71	37.8
Played card games for money								
No	388	90.2						
Yes	42	9.8	13	37.1	21	60.0	1	2.9
Played dice games for money								
No	424	98.8						
Yes	5	1.2	2	40.0	1	20.0	2	40.0
Played pool or darts for money								
No	411	95.6						
Yes	19	4.4	2	11.1	9	50.0	7	38.9
Bet on horse races, dog or cock fights								
No	414	96.1						
Yes	17	4.0	10	62.5	4	25.0	2	12.5
Other betting (sports, bingo, casino)								
No	374	87.4						
Yes	54	12.6	11	20.8	34	64.2	8	15.1
Largest amount gambled in one day								
Have never gambled	205 ^a	50.6						
\$1 or less	29	7.2						
>\$1 up to \$10	80	19.8						
>\$10 up to \$100	63	15.6						
>\$100 up to a \$1,000	25	6.2						
>\$1,000 up to \$10,000	2	0.5						
>\$10,000	1	0.3						

^a In Table 1 the *N* for non-gamblers is 199. In this table 205 participants reported not gambling. This may be due to the sensitive nature of the question regarding money

Findings from the multiple logistic regression analyses indicated that gender, year entered the U.S. to live, sending money to family and friends in the home country, and reporting poor mental health from 1 to 5 days in the past 30 days, were all associated with reports of lifetime gambling (Table 4). Specifically, men were more likely to report gambling than women [2.13, 95% CI = (1.03, 4.38)]. The odds of gambling were higher among those reporting sending money to family and friends in the home country [2.65, 95% CI = 1.10, 6.38] and those who reported 1–5 days as compared to no days of poor mental health in the past 30 days [2.44, 95% CI = 1.22, 4.89)]. Conversely, those who reported entering the U.S. to live after 1996 were less likely to report gambling [0.44, 95% CI = (0.22, 0.89)] when compared to those who entered in 1996 or earlier.

Table 3 Bivariate associations between type of lifetime gambling activities and age, gender, legal income, off the books income, linguistic and social acculturation ($N = 431$)

Variable	Lifetime scratch n win tickets/lottery ($n = 189$)				Lifetime card games for money ($n = 42$)				Lifetime dice games for money ($n = 5$)			
	Total N	Total %	Row %	χ^2 (df)	Total N	Total %	Row %	χ^2 (df)	Total N	Total %	Row %	χ^2 (df)
Age categories				3.79 (3)				2.42 (3)				0.35 ^a
18–24	104	24.2	46.2		104	24.2	13.5		103	24.1	0.0	
25–34	177	41.2	39.0		177	41.3	7.9		177	41.4	1.1	
35–44	112	26.1	46.4		111	25.9	9.0		111	25.9	1.8	
>44	37	8.6	54.1		37	8.6	10.8		37	8.6	2.7	
Gender				3.85* (1)				11.7** (1)				0.33 ^a
Male	299	69.7	47.2		299	69.9	13.0		298	69.8	1.7	
Female	130	30.3	36.9		129	30.1	2.3		129	30.2	0.0	
Legal income				7.99* (2)				4.14 (2)				0.37 ^a
No income	246	67.0	44.3		246	67.0	8.5		246	67.2	1.2	
\$1–10,000	70	19.1	41.4		70	19.1	12.9		70	19.1	2.9	
>10 K	51	13.9	64.7		51	13.9	17.7		50	13.7	0.0	
Off the books				3.05 (2)				6.43* (2)				0.12 ^a
No income	112	33.1	45.5		112	33.1	4.5		112	33.2	0.0	
\$1–10000	135	39.9	45.2		135	39.9	12.6		134	39.8	2.2	
>10 K	91	26.9	56.0		91	26.9	14.3		91	27.0	0.0	
Linguistic acculturation/preference				9.37*** (2)				3.1 (2)				0.46 ^a
Lowest level of acculturation	106	26.8	32.1		106	26.9	6.6		106	27.0	0.0	
Moderate acculturation	160	40.5	43.8		159	40.4	8.8		159	40.5	1.3	
Highest level of acculturation	129	32.7	51.9		129	32.7	13.2		128	32.6	2.3	
Social acculturation/preference				14.0*** (2)				0.35 (2)				0.13 ^a
Lowest level of acculturation	172	43.7	33.1		172	43.8	9.3		171	43.6	1.2	
Moderate acculturation	106	26.9	48.1		106	27.0	9.4		27.04	27.0	0.9	
Highest level of acculturation	116	29.4	54.3		115	29.3	11.3		115	29.3	1.7	

Table 3 continued

Variable	Lifetime pool or darts for money (<i>n</i> = 19)			Lifetime bet on horses, dogfights, cockfights (<i>n</i> = 17)			Lifetime other (betting on sports, bingo, casino) (<i>n</i> = 54)			
	Total <i>N</i>	Total %	Row %	Total <i>N</i>	Total %	Row %	Total <i>N</i>	Total %	Row %	χ^2 (df)
Age categories										
18–24	104	24.2	8.7	104	24.2	5.8	104	24.4	18.3	8.61* (3)
25–34	177	41.3	4.0	177	41.2	4.5	176	41.2	14.2	
35–44	111	25.9	2.7	112	26.1	1.8	111	26.0	8.1	
>44	37	8.6	0.0	37	8.6	2.7	36	8.4	2.8	
Gender										
Male	299	69.9	6.0	299	69.7	5.7	298	70.0	15.8	8.59** (1)
Female	129	30.1	0.8	130	30.3	0.0	128	30.1	5.5	
Legal income										
no income	246	67.0	3.7	246	67.0	4.1	245	67.1	14.3	0.24 (2)
\$1–10,000	70	19.1	5.7	70	19.1	2.9	70	19.2	12.9	
>10 K	51	13.9	5.9	51	13.9	5.9	50	13.7	12.0	
Off the books										
no income	112	33.1	5.4	112	33.1	4.5	111	33.0	9.9	2.54 (2)
\$1–10,000	135	39.9	4.4	135	39.9	4.4	134	39.9	14.2	
>10 K	91	26.9	2.2	91	26.9	3.3	91	27.1	17.6	
Linguistic acculturation/preference										
Lowest level of acculturation	106	26.9	2.8	106	26.8	0.9	105	26.8	6.7	6.65* (2)
Moderate acculturation	159	40.4	3.8	160	40.5	4.4	158	40.3	12.0	
Highest level of acculturation	129	32.7	6.2	129	32.7	5.4	129	32.9	17.8	

Table 3 continued

Variable	Lifetime pool or darts for money (<i>n</i> = 19)		Lifetime bet on horses, dogfights, cockfights (<i>n</i> = 17)		Lifetime other (betting on sports, bingo, casino) (<i>n</i> = 54)				
	Total <i>N</i>	Row %	Total %	Row %	Total <i>N</i>	Row %	Total %	Row %	χ^2 (df)
Social acculturation/preference									2.81 (2)
Lowest level of acculturation	172	43.8	2.3	2.3	172	43.7	2.3	2.3	0.17 ^a
Moderate acculturation	106	27.0	5.7	6.6	106	26.9	6.6	6.6	
Highest level of acculturation	115	29.3	7.0	2.6	115	29.4	2.6	2.6	

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

^a Fisher's exact test *P*-value

Table 4 Multivariable associations between social, economic and cultural variables and lifetime prevalence of any gambling ($N = 232$)

Variable	Adjusted O.R. (95% CI)	Adjusted ^a O.R. (95% CI)
Legal income		
No income	Referent	Referent
\$1–10,000	0.86 (0.36–2.08)	0.82 (0.37–1.83)
>10 K	1.55 (0.54–4.44)	1.45 (0.55–3.84)
Off the books		
No income	Referent	Referent
\$1–10,000	0.84 (0.39–1.84)	0.79 (0.39–1.61)
>10 K	1.04 (0.42–2.58)	1.06 (0.46–2.46)
Age categories		
18–24	Referent	
25–34	0.54 (0.24–1.20)	
35–44	0.39 (0.15–1.06)	
>44	0.75 (0.20–2.91)	
Gender		
Male	1.95 (0.85–4.46)	2.13* (1.03–4.38)
Female	Referent	Referent
Marital status		
Single	Referent	
Married	1.32 (0.65–2.67)	
Divorced	1.18 (0.14–10.0)	
Other	1.16 (0.26–5.18)	
Year entered USA		
1996 or earlier	Referent	Referent
After 1996	0.32** (0.14–0.73)	0.44* (0.22–0.89)
Worked as day laborer (past 6 months)		
Yes	1.00 (0.46–2.15)	
No	Referent	
Social support		
Low	Referent	
Medium	0.84 (0.42–1.68)	
High	0.66 (0.27–1.61)	
Last 6 months, received money from social services		
Yes	0.621 (0.20–1.94)	0.82 (0.28–2.41)
No	Referent	Referent
Send money to family/friends in home country		
No	Referent	Referent
Yes	2.54 (0.95–6.79)	2.65* (1.10–6.38)
Education (highest level completed)		
Less than high school	1.39 (0.50–3.86)	
High school or GED	Referent	
At least some college	1.97 (0.45–8.69)	

Table 4 continued

Variable	Adjusted O.R. (95% CI)	Adjusted O.R. (95% CI) Model with variables <0.2 significance level in bivariate
Linguistic acculturation/preference		
Lowest level of acculturation	Referent	Referent
Moderate acculturation	0.76 (0.34–1.74)	0.89 (0.41–1.91)
Highest level of acculturation	1.52 (0.64–3.61)	1.58 (0.73–3.45)
Social acculturation/preference		
Lowest level of acculturation	Referent	Referent
Moderate acculturation	2.02 (0.92–4.43)	1.97 (0.94–4.13)
Highest level of acculturation	1.89 (0.88–4.03)	1.86 (0.91–3.79)
Overall health		
Excellent	Referent	
Very good	1.08 (0.30–3.90)	
Good	0.68 (0.23–2.02)	
Fair	0.36 (0.07–1.98)	
Poor	0.54 (0.17–1.76)	
Poor mental health		
0 days	Referent	Referent
1–5 days	2.59* (1.22–5.53)	2.44* (1.22–4.89)
>5 days	1.38 (0.58–3.30)	1.34 (0.59–3.03)
Poor physical health		
0 days	Referent	Referent
1–5 days	1.18 (0.53–2.63)	1.12 (0.55–2.29)
>5 days	1.96 (0.75–5.14)	2.01 (0.87–4.63)

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

^a The adjusted analyses include predictor variables that in the bivariate analyses were significantly associated with the dependent variable with $P < 0.2$

Discussion

To the best of our knowledge, this is the first study to examine characteristics of gambling among undocumented Mexican immigrants. This demographic group is rapidly growing in both size and social importance in the U.S. and little detailed information exists. When considering the entire sample, we found that the lifetime prevalence of gambling among immigrants (53.8%) was not too dissimilar from that estimated in general population samples of recreational gamblers (60%) (Gerstein et al. 1999; Potenza et al. 2002; Welte et al. 2004a). However, in our study the percent of men who gamble (78%) is considerably larger than the percent of women who gamble (22%) when compared to the percent of men and women estimated to gamble in the general population (66.% vs. 59.3%, respectively) (Gerstein et al. 1999; Potenza et al. 2006b). It is possible that the gender differences in gambling observed in our study reflect gambling behaviors of Mexicans in Mexico. We are unable to confirm this as data on the extent of gambling in Mexico is non-existent and gambling in Mexico is limited to pari-mutuel or Class II gaming (Gambling in Mexico 2008). However, in a U.S. study of Hispanics (nativities not noted) Cuadrado (1999) reports that differences between Hispanic men and women in regard to calls for help to a

gambling hotline (men call less) and gambling prevalence (men gamble more) may be attributed to cultural norms of *marianismo* and *machismo* that promote or serve to enforce certain behavioral expectations for the men and women. *Marianismo* refers to the enforcement of traditional gender roles among Mexican women including but not limited to their being dependent and subordinate to men and being responsible for domestic chores and the care of children (Arciniega et al. 2004). The concept of *marianismo* is the opposite of the concept of *machismo*. The latter encourages men to also follow stereotypical gender roles whereby men's involvement in risk-taking behaviors, such as gambling, is not only tolerated but encouraged as part of what it means to be a 'man'. In U.S. gambling studies of recreational gamblers (as in the current study) men are more likely to engage in gambling for "excitement" and women for "escape" (Pantalon et al. 2008; Trevorrow and Moore 1998). In U.S. studies of problem and pathological gamblers men gamble about two times more than women (Gerstein et al. 1999; Volberg 2001, 2003). Certainly, more research is needed to understand the cultural aspects of gambling behaviors between men and women in general and among diverse cultural groups such as among undocumented men and women, in particular.

We found that undocumented Mexican immigrants who reported worse mental health (stress, depression, and emotional problems) were more likely to report having ever gambled although those with the worst mental health were less likely to have ever gambled. This is consistent with the findings of Kim et al. (2006) who found that depressive symptoms are common among those who engage in gambling, but not as common among pathological gamblers. However, the causal relationship between gambling and depression remains unknown. The St. Louis Epidemiologic Catchment Area Study found that problems relating to gambling occurred after periods of major depression (Cunningham-Williams et al. 1998). It is possible that people suffering from depression turn to gambling to escape from or alleviate the symptoms of the disorder. Conversely, evidence also suggests that gamblers may experience increased bouts of depressive symptoms as financial losses increase (McCormick et al. 1984; Thorson et al. 1994). Although it is clear that an association between gambling and mental health symptoms exists among Mexican immigrants, additional research is needed to untangle the temporal and causal associations between these variables.

Particular aspects of the immigrant experience were associated with gambling behaviors. Immigrants who reported having gambled in their lifetime also reported higher levels of linguistic and social acculturation. Conversely, those who reported entering the U.S. to live after 1996 (i.e. less time in the country) had reduced odds of having ever gambled. The finding that individuals who have lived in the U.S. for a longer period of time were more likely to have ever gambled is interesting for several reasons. First, greater levels of linguistic and social acculturation reflect a greater integration process into mainstream U.S. culture, a phenomena more likely to occur among individuals who have lived in the U.S. for longer periods of time, as is the case in this study. Second, this finding may be a proxy indicator for increased financial stability among those who gamble. This idea is supported by the finding that gambling was more likely to occur among the undocumented immigrants who reported higher incomes (>\$10,000) and among those who reported sending money home to family and friends, both variables reflecting greater financial well-being. Undocumented immigrants typically send a significant proportion of their earnings back to family or friends in their home country. Annual U.S. to Mexico remittances are estimated to be \$10 billion (Marcelli and Lowell 2005). Hence, financial stability, which may increase with the number of years lived in the U.S., may in turn facilitate gambling behaviors.

Limitations

The study findings should be considered within the following study limitations. First, we only assessed prevalence of gambling, not problem or pathological gambling. Second, the data are cross-sectional and, as such provide no basis for inferences about temporal associations and even less about causality. Third, venue based sampling techniques preclude us from calculating a response rate. However, 85% of the respondents were undocumented immigrants, leading us to believe that we were successful in recruiting the targeted study participants, though without a sampling frame of undocumented Mexican immigrants it is not possible to assess the extent to which the sample in our study is representative of the larger population of undocumented Mexican immigrants. We used data from the 2000 U.S. Census for individuals 18 years and older to compare some of the demographic characteristics of our sample to the population of Mexicans (individuals born in Mexico) living in New York City. Our sample included a larger percent of individuals ages 35 and older (35% vs. 22%); males (70% vs. 61.1%) and individuals who did not complete high school (83% vs. 66.8%). Interestingly, differences according to marital status are negligible. For example, in our study and the Census, the corresponding percents of never married individuals were 41% and 40.4%, respectively, and of married individuals were 51% and 52.3%, respectively. Further research is needed with this population to understand the extent to which the findings are generalizable to the larger population of undocumented Mexican immigrants.

This study provides early data about gambling among undocumented Mexican immigrants in New York City. The purpose of this analysis was to assess prevalence and types of gambling behaviors. A more comprehensive study of the gambling behaviors of these undocumented Mexican immigrants is needed to identify the extent to which they are engaged in recreational, problem, or pathological gambling, including identifying factors associated with pathological gambling and the personal and societal consequences of these behaviors. This information could be utilized to inform prevention and treatment of gambling problems in this very vulnerable population.

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