Current depression among women in California according to residence in the California–Mexico border region

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ABSTRACT

Objective. *To estimate the prevalence of current depression; examine the relationship between current depression and immigration, health status, health care access, and health behaviors; and assess differences by California–Mexico border region (Imperial and San Diego Counties) among women in California.*

Methods. *Using a cross-sectional, representative sample of adult women from the California Women's Health Survey (*n = *13 454), a statewide telephone survey, prevalence of current depression and predictors of depression were examined in California and according to border region residence. Depression was assessed with the eight-item Patient Health Questionnaire.*

Results. *The prevalence of current depression for women in California was 12.0%. It was similar in the border (13.0%) and the nonborder (11.9%) regions. Odds of current depression in women were lower among recent immigrants (< 5 years or 5 to < 10 years in the United States) than in women born in the United States and in immigrants who had been living in the United States for 10 to < 15 years or longer (*P < *0.05). Odds ratios for current depression and health status, health care access, and binge drinking were larger in the border region than outside the border region.*

Conclusions. *Similar prevalences of current depression were observed among those who live in the border region of California and in those who do not, but the relationship between depression and health status, health care access, and binge drinking varied by border region residence. Ideally, future surveillance of depression and its predictors along the Mexico–California border will be conducted binationally to inform interventions and tracking such as the Healthy Border Program's objectives.*

Key words Depression; women's health; health surveillance; women's health services; mental health; California.

Depression is a mental disorder that can greatly impair an individual's ability to take care of his or her responsibilities (1). It is the most common mental disorder, affecting about 121 million people worldwide (1). At worst, it can lead to suicide, with about 850 000 lives lost per year (1). Depression is more common among women than men and affects about 10.2% of women in the United States of America (2). It is the leading cause of disability, as measured by years lost due to disability, and is the fourth leading contributor to the global burden of disease, as measured by disability-adjusted life years lost (1). By 2030, unipolar depressive disorders are predicted to be the leading cause of disease burden in high-income countries, including the United States, and the second leading cause of disease bur-

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den in middle-income countries, such as Mexico (3).

Recent data that describe the prevalence of depression are necessary to quantify the disease burden in California. More than one-quarter of California residents are foreign born, the largest proportion of any state in the United States of America, and this population is projected to continue increasing (4). California also has the most foreign-born Hispanic residents of any state in the United States (5). Eighty-four percent of Hispanics in California have Mexican heritage (5). Depression affects about 5.8% of women in Mexico (6).

The area of California that borders Mexico includes Imperial and San Diego Counties and is considered a border region by the United States–Mexico Border Health Commission. The border region between the United States and Mexico is a dynamic region that is medically underserved and an area where residents experience high rates of poverty (7). An objective of the Healthy Border Program in 2010 was to reduce suicide mortality in the United States–Mexico border region (8). Prior research has shown that adults who live on the U.S. side of the Texas–Mexico border have similar mental health status as do their counterparts in the United States as a whole (9). However, that study included severely disadvantaged adults and was not representative of the Texas population. Generally, immigrants have been found to have better mental health status than their counterparts born in the United States (10), which may be a true difference or may be due to cultural differences in how depression presents (11). This study aims to provide a timely snapshot of the current burden of depression, examine predictors of current depression, and explore possible pathways for interventions to treat depression among both foreign-born and U.S.-born women in California and in the California–Mexico border region. A large, representative sample of California women was used to estimate the prevalence of current depression; examine the relationship between current depression and immigration, health status, health care access, and health behaviors; and assess whether the prevalence of current depression—as well as the relationship between immigration, health status, health care access, and health behaviors with current depression—varied by border region residence.

MATERIALS AND METHODS

Sample

The analytic sample included 13 454 women who participated in the California Women's Health Survey (CWHS) between 2006 and 2008. Methodological details have been published elsewhere (12). Briefly, CWHS is a cross-sectional, ongoing, annual telephone survey conducted in English and Spanish that collects information on a variety of health behaviors and conditions among women in California who are 18 years or older. Data are collected from a random sample of California women living in households with telephones and are weighted in order to represent the California female population according to 2000 California Department of Finance figures (12).

Survey data were combined from 2006, 2007, and 2008 to increase sample size. The prevalence of depression appeared constant across years (11.7%, 11.8%, and 12.4%, respectively). After participants who did not have sufficient data on depression or covariates (n = 1 536) from the analysis were excluded, the analytic sample consisted of 13 454 women. If a participant was missing data on some but not all predictors, she was included in the analysis for the predictors present.

Measures

Current depression was assessed with the eight-item Patient Health Questionnaire (PHQ-8), a useful measure of depression for population-based studies that captures depressive symptoms over the past two weeks (13). The PHQ-8 has been tested and validated for use in large, population-based studies (13). It was derived from the nine-item Patient Health Questionnaire (PHQ-9) (13) and provides reliable estimates of current depressive symptoms among English and Spanish speakers in the United States (14). A cut point of 10 or greater was used to indicate the presence of current depressive symptoms as a proxy for current depression (13).

The following predictors, described in Table 1, were examined: border residence, birthplace and years living in the United States, health status (self-rated health, disability, physical health distress, mental health distress, and poor health), health care access (health insurance and routine medical checkups), and health behaviors (smoking and binge drinking).

Demographic variables included as covariates in adjusted analyses were age in years, marital status (married or unmarried couple versus divorced, widowed, separated, or never married), education as the highest grade or year of school completed (less than high school, grade 12 or GED certificate, postsecondary but less than college graduate, and college graduate or higher), and self-reported race and ethnicity (non-Latina white, non-Latina African American or black, Latina of any race, and non-Latina Asian or other). Those who self-identified as Pacific Islander, Native Hawaiian, American Indian, or Alaska Native were included in the non-Latina other category. Those who self-identified as Latina or Hispanic were considered Latina in this study. If a participant considered herself biracial or multiracial, she could report multiple races or ethnicities and then indicate which group or groups she identified with most closely.

Statistical analyses

Prevalence of current depression was estimated for California, in the border region, and outside the border region for predictors and demographic variables. Chi-square tests of homogeneity were calculated to examine whether significant differences existed between groups. Because prevalence of current depression varied by age, stratified estimates are presented by age in addition to nonstratified estimates. Because of small sample sizes (n < 30), prevalence estimates are not presented for 18- to 24-year-old women in the border region even though this group was included in all analyses.

The relationship between predictors and current depression was examined by calculating odds ratios and 95% confidence intervals using unconditional logistic regression. Results are presented for unadjusted estimates and estimates that are adjusted for age, race and ethnicity, marital status, education, and self-rated health. Adjustments are also made for health insurance when predicting

TABLE 1. Description of concepts used in analyses, California Women's Health Survey, 2006–2008

Concept	Question(s) or instrument used	Interpretation
Current depression	Eight-item Patient Health Questionnaire	No current depressive symptoms, < 10 score Current depressive symptoms, ≥ 10 score
Demographics		
California–Mexico border	What county do you live in?	Imperial and San Diego Counties = border Other California counties = nonborder
Birthplace and years in United States	In what country were you born?	Born in United States Foreign born
	For those who reported being born outside of the United States, asked: In what year did you come to live in the United States?	< 5 years in the United States 5 to < 10 years in the United States 10 to < 15 years in the United States ≥ 15 years in the United States
Health status		
Disability	1. Are you limited in any way in any activities because of a physical, mental, or emotional problem? 2. Do you now have any health problem that requires you to use special equipment such as a cane, a wheelchair, a special bed, or a special telephone?	No to both questions = no Yes to either or both questions = yes
Health insurance	Do you have any kind of health care coverage (including health insurance, prepaid plans such as health maintenance organizations, or government plans such as Medicare or Medi-Cal)?	Yes versus no
Routine checkup	Some people visit a doctor or other health care provider for a routine checkup, even though they are feeling well and have not been sick. About how long has it been since you last visited a doctor for a routine medical checkup?	Within the past 2 years = yes Not within the past 2 years = no
Self-rated health	Would you say that in general your health is excellent, very good, good, fair, or poor?	Excellent, very good, good versus fair or poor
Physical health distress	Now thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?	Not frequent = 0–13 days Frequent = ≥ 14 days
Mental health distress	Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?	Not frequent = 0–13 days Frequent = ≥ 14 days
Poor health	Response of frequent (≥ 14 days) to either of the physical or mental health distress questions above.	Not frequent = 0–13 days Frequent = ≥ 14 days
Health behavior		
Smoking	1. Have you ever smoked 100 cigarettes in your entire life? 2. Do you now smoke cigarettes every day, some days, or not at all?	Never smoked = no to both Former smoker = yes to first, no to second Current smoker = yes to second, no to first or yes to both
Binge drinking[a]	Considering all types of alcoholic beverages, how many times during the past month did you have four or more drinks on an occasion?	Yes ≥ 1 No = 0

[a] Cut points for binge drinking differed in 2006 (≥ 5 drinks) compared with 2007 and 2008 (≥ 4 drinks). To make the variables comparable across years, in 2006 a value of yes was assigned to binge drinking if a participant answered yes to consuming five or more drinks on one occasion or if she reported consuming on average four or more drinks per day on the days she consumed alcohol in the past 30 days.

routine checkups. Because prevalence of current depression was low in the sample, it is likely that odds ratios approximate prevalence ratios (15, 16). In addition, to examine whether predictors for current depression differed among the border region compared with the nonborder region in California, odds ratios were calculated as described above and compared for those living in the border region with those living outside the border region. Because of small sample sizes (n < 30), stratified analyses were not conducted among those living in the border region by years in the United States.

For all analyses, region-specific weights were created so that participants in each region of California (border counties Imperial and San Diego versus all other California counties) represented the race and ethnicity distribution of those regions as in the 2000 California female population. The Committee for the Protection of Human Subjects of the California Health and Human Services Agency approved the CWHS on which this analysis was based. Committee-approved informed consent elements were included in the telephone scripts. All statistical analyses were calculated using SAS version 9.2 survey procedures, which allow incorporation of weights to adjust for survey design (SAS Institute Inc., Cary, North Carolina). P values less than 0.05 were considered statistically significant.

RESULTS

General characteristics

Table 2 provides the population distribution by demographics, health status, health care access, and health behaviors among women in California and by border region residence. Residents of the border region were similar to those living

TABLE 2. Characteristics of women in California by California–Mexico border region residence, California Women's Health Survey, 2006–2008[a]

Characteristic	California (*n* = 13 454)	California–Mexico border region (*n* = 1 215)			Nonborder region (*n* = 12 239)		
	No.	No.	%	95% CI	No.	%	95% CI
Demographics							
Age (years)							
18–24	658	61	13.35	9.74–16.96	597	12.80	11.73–13.88
25–34	2 117	200	20.47	17.63–23.32	1 917	20.07	19.16–20.99
35–44	2 691	247	21.99	19.19–24.79	2 444	21.71	20.85–22.57
45–54	2 824	247	17.88	15.43–20.32	2 577	17.69	16.95–18.43
55–64	2 365	189	9.57	8.02–11.13	2 176	11.21	10.66–11.75
≥ 65	2 799	271	16.68	14.45–18.90	2 528	16.51	15.82–17.19
Race/ethnicity							
Non-Latina white	8 122	747	59.18	55.62–62.73	7 375	53.08	51.96–54.18
Non-Latina African American/black	664	51	5.70	3.89–7.53	613	6.47	5.86–7.08
Latina	3 714	351	24.21	21.43–26.99	3 363	25.78	24.86–26.69
Non-Latina Asian or other	954	66	10.91	8.02–13.80	888	14.68	13.67–15.69
Education							
Less than high school	2 078	170	13.00	10.78–15.23	1 908	15.27	14.52–16.02
Grade 12 or GED certificate	2 938	262	21.54	18.45–24.62	2 676	23.37	22.39–24.34
Postsecondary, less than bachelor's	3 453	323	29.36	25.90–32.81	3 130	25.93	24.95–26.90
Postsecondary, bachelor's or higher	4 985	460	36.10	32.84–39.37	4 525	35.43	34.40–36.46
Birthplace and years in United States							
Born in United States	9 836	879	72.51	69.36–75.65	8 957	70.68	69.67–71.70
Foreign born, ≥ 15 years	2 268	199	15.19	12.81–17.57	2 069	17.04	16.22–17.86
10 to < 15 years	457	40	3.25	1.98–4.53	417	4.03	3.55–4.51
5 to < 10 years	577	67	5.52	4.03–7.01	510	4.87	4.40–5.34
< 5 years	316	30	3.53	1.85–5.21	286	3.37	2.91–3.84
Married or unmarried couple	9 008	826	63.98	60.36–67.60	8 182	62.31	61.19–63.43
Health status							
Disability[b]	3 047	266	20.20	17.43–22.96	2 781	20.09	19.27–20.90
Health insurance	11 555	1 041	84.41	81.66–87.15	10 514	84.32	83.48–85.16
Routine checkup (in past 2 years)	10 487	934	74.51	71.29–77.72	9 553	76.16	75.18–77.13
Fair or poor self-rated health[c]	2 407	191	14.07	11.71–16.44	2 216	17.00	16.22–17.79
Frequent physical health distress (≥ 14 days/month)	1 709	141	10.29	8.40–12.18	1 568	11.57	10.92–12.21
Frequent mental health distress (≥ 14 days/month)	1 614	134	12.75	10.19–15.32	1 480	12.78	12.04–13.53
Frequent poor health (≥ 14 days/month)	1 087	86	6.82	4.94–8.71	1 001	7.62	7.08–8.16
Health behavior							
Smoking status							
Never smoked	8 794	791	67.05	63.80–70.31	8 003	68.09	67.09–69.08
Former smoker	3 238	301	21.82	19.13–24.52	2 937	20.45	19.64–21.27
Current smoker	1 415	122	11.12	8.78–13.46	1 293	11.46	10.74–12.18
Binge drinking (≥ 4 drinks/time in past 30 days)[d]	1 083	103	10.62	8.24–13.00	980	9.49	8.78–10.20

Note: CI: confidence interval.

[a] Data were weighted in order to represent the California female population according to 2000 California Department of Finance figures.

[b] Disability was defined as being limited in any way in any activities because of a physical, mental, or emotional problem or having a health problem that requires use of special equipment, such as a cane, a wheelchair, a special bed, or a special telephone.

[c] $P < 0.05$ for chi-square test of homogeneity (border versus nonborder), otherwise $P \geq 0.05$.

[d] Cut points for binge drinking differed in 2006 (≥ 5 drinks) compared with 2007 and 2008 (≥ 4 drinks). To make the variables comparable across years, in 2006 a value of yes was assigned to binge drinking if a participant answered yes to consuming five or more drinks on one occasion, or if she reported consuming on average four or more drinks per day on the days she consumed alcohol in the past 30 days.

outside the border region according to demographics, health status, health care access, and health behaviors, but they were significantly less likely to report fair or poor self-rated health ($P = 0.003$) than those living outside the border region.

Prevalence of current depression among women in California was 12.0% (Table 3). Prevalence of current depression was similar among women living in the border region (13.0%) and in women living outside the border region (11.9%) but varied by age, race, and ethnicity. In the border region and outside the border region, participants 65 years or older had lower prevalence of current depression than their younger counterparts. Outside the border region, Latina participants had higher prevalence of current depression than their non-Latina white or non-Latina Asian or other counterparts, but prevalence of depression was similar among these groups in the border region.

Predictors of current depression

Odds ratios presented in the text are adjusted for age, race and ethnicity, marital status, education, and self-rated health and are statistically significant ($P < 0.05$) unless noted otherwise. Years in the United States, health care access, and health behaviors were associated with depression (Table 4).

The likelihood of current depression increased as years in the United States increased. Immigrants who had spent < 5 years in the United States were 47% less likely and immigrants who had lived 5 to < 10 years in the United States were 42% less likely to have current depression than their U.S.-born counterparts

TABLE 3. Prevalence of current depression compared by California–Mexico border region residence according to demographics, health status, and health behaviors among women in California, California Women's Health Survey, 2006–2008[a]

Characteristic	California			California–Mexico border region			Non-border region		
	No.	%	95% CI	No.	%	95% CI	No.	%	95% CI
Current depression	1 556	12.04	11.35–12.73	141	13.01	10.49–15.53	1 415	11.92	11.21–12.62
Demographics									
Age (years)									
18–24	91	13.37	10.44–16.30	7	. . .[b]	. . .[b]	84	13.26	10.29–16.24
25–34	265	12.05	10.51–13.60	23	12.24	6.74–17.74	242	12.03	10.44–13.62
35–44	335	13.55	12.05–15.05	36	16.89	11.45–22.33	299	13.11	11.57–14.64
45–54	355	12.77	11.35–14.20	31	12.57	7.84–17.30	324	12.80	11.32–14.29
55–64	313	13.72	12.08–15.35	22	14.65	7.78–21.52	291	13.61	11.97–15.26
≥ 65	197	7.18	6.10–8.25	22	7.55	4.33–10.76	175	7.13	5.99–8.27
Race/ethnicity									
Non-Latina white	848	11.50	10.62–12.38	86	13.44	10.19–16.69	762	11.22	10.33–12.10
Non-Latina African American/black	101	15.19	11.94–18.44	5	. . .[b]	. . .[b]	96	15.90	12.46–19.34
Latina	523	13.99	12.67–15.32	43	12.90	8.54–17.27	480	14.13	12.74–15.51
Non-Latina Asian or other	84	9.25	7.12–11.38	7	. . .[b]	. . .[b]	77	8.87	6.76–10.99
Birthplace and years in United States									
Born in United States	1 103	12.17	11.34–13.00	103	13.79	10.68–16.89	1 000	11.95	11.11–12.79
Foreign born, ≥ 15 years	305	13.04	11.38–14.71	28	15.64	9.12–22.15	277	12.74	11.05–14.44
10 to < 15 years	47	10.33	6.89–13.77	1	. . .[b]	. . .[b]	46	11.24	7.47–15.00
5 to < 10 years	67	10.26	7.66–12.86	7	. . .[b]	. . .[b]	60	10.54	7.73–13.34
< 5 years	34	9.37	5.79–12.95	2	. . .[b]	. . .[b]	32	10.16	6.18–14.13
Marital status									
Divorced, widowed, separated	720	15.88	14.53–17.22	64	18.72	13.39–24.04	656	15.52	14.16–16.88
Married or unmarried couple	836	9.76	9.01–10.51	77	9.81	7.32–12.31	759	9.75	8.97–10.53
Health status									
Disability[c]									
No	719	7.59	6.94–8.24	56	7.30	5.03–9.58	663	7.63	6.96–8.30
Yes	837	29.81	27.77–31.84	85	35.61	28.13–43.10	752	29.04	26.97–31.11
Health insurance									
No	341	19.17	16.90–21.44	30	24.36	15.19–33.52	311	18.50	16.25–20.75
Yes	1 214	10.73	10.03–11.42	111	10.94	8.56–13.31	1 103	10.70	9.98–11.42
Routine checkup (in past 2 years)									
No	443	16.05	14.34–17.75	48	20.12	13.87–26.37	395	15.47	13.75–17.20
Yes	1 109	10.78	10.05–11.51	93	10.59	8.02–13.16	1 016	10.80	10.05–11.55
Self-rated health									
Fair or poor	714	30.33	28.09–32.58	54	33.25	24.13–42.37	660	30.02	27.74–32.30
Excellent, very good, or good	842	8.40	7.74–9.06	87	9.71	7.34–12.07	755	8.22	7.54–8.90
Physical health distress									
Not frequent (< 14 days per month)	931	8.91	8.23–9.58	82	9.58	7.07–12.08	849	8.82	8.13–9.51
Frequent (≥ 14 days per month)	624	36.73	34.05–39.40	59	43.23	33.79–52.68	565	35.97	33.20–38.73
Mental health distress									
Not frequent (< 14 days per month)	709	6.08	5.55–6.60	61	5.43	3.74–7.11	648	6.16	5.61–6.71
Frequent (≥ 14 days per month)	842	52.91	49.88–55.94	76	63.25	52.92–73.58	766	51.56	48.44–54.68
Poor health									
Not frequent (< 14 days per month)	965	8.45	7.83–9.07	82	8.51	6.42–10.59	883	8.44	7.80–9.09
Frequent (≥ 14 days per month)	584	56.57	53.06–60.09	55	72.40	61.79–83.02	529	54.72	51.10–58.34
Health behaviors									
Smoking status									
Never smoked	822	9.30	8.55–10.05	68	9.74	6.86–12.63	754	9.24	8.48–10.00
Former smoker	369	12.47	11.03–13.91	39	13.28	8.61–17.95	330	12.35	10.85–13.86
Current smoker	365	27.79	24.89–30.69	34	32.32	21.87–42.78	331	27.21	24.22–30.20
Binge drinking[d]									
No	1 375	11.43	10.74–12.12	115	11.56	9.02–14.10	1 260	11.42	10.71–12.12
Yes (≥ 4 drinks/time in past 30 days)[c]	166	17.84	14.78–20.89	23	24.75	14.52–34.98	143	16.82	13.66–19.99

Note: CI: confidence interval.

[a] Current depression was defined as a score of 10 or higher on the eight-item Patient Health Questionnaire depression scale. Data were weighted in order to represent the California population according to 2000 California Department of Finance figures.

[b] Included in the analyses but not presented because of unstable estimates due to small sample size.

[c] Disability was defined as being limited in any way in any activities because of a physical, mental, or emotional problem or having a health problem that requires use of special equipment, such as a cane, a wheelchair, a special bed, or a special telephone.

[d] Cut points for binge drinking differed in 2006 (≥ 5 drinks) compared with 2007 and 2008 (≥ 4 drinks). To make the variables comparable across years, in 2006 a value of yes was assigned to binge drinking if a participant answered yes to consuming five or more drinks on one occasion or if she reported consuming on average four or more drinks per day on the days she consumed alcohol in the past 30 days.

($P = 0.01$ and < 0.01). Immigrants who had lived 10 to < 15 years in the United States were 36% less likely and immigrants who had lived 15 years or longer in the United States were 6% less likely than those who had spent < 5 years in the United States to have current depression, respectively, but these differences were not statistically significant ($P = 0.06$ and 0.60). Odds ratios among immigrants who reported < 5 years or 5 to < 10 years in the United States differed significantly from odds

TABLE 4. Adjusted odds ratios of current depression by predictors for California and compared with California–Mexico border region, California Women's Health Survey, 2006–2008[a]

Predictor	California (*n* = 13 454)			California–Mexico border region (*n* = 1 215)			Nonborder region (*n* = 12 239)		
	AOR	95% CI	*P*	AOR	95% CI	*P*	AOR	95% CI	*P*
Demographic									
Birthplace, years in United States									
Born in United States	Ref	NA	NA	Ref	NA	NA	Ref	NA	NA
Foreign born, ≥ 15 years	0.94	0.75–1.19	0.60	0.88	0.40–1.91	0.74	0.94	0.73–1.19	0.59
10 to < 15 years	0.64	0.41–1.01	0.06	. . .[b]	. . .[b]		0.71	0.45–1.14	0.15
5 to < 10 years	0.58	0.40–0.84	0.01	. . .[b]	. . .[b]		0.60	0.41–0.88	0.01
< 5 years	0.53	0.32–0.85	0.01	. . .[b]	. . .[b]		0.58	0.35–0.96	0.03
Health status									
Disability[c,d]									
No	Ref	NA		Ref	NA	NA	Ref	NA	NA
Yes	6.67	5.70–7.79	< 0.01	10.62	6.40–17.64	< 0.01	6.31	5.36–7.42	< 0.01
Health insurance									
Yes	Ref	NA	NA	Ref	NA	NA	Ref	NA	NA
No	1.46	1.19–1.80	< 0.01	2.27	1.15–4.50	0.02	1.38	1.12–1.70	< 0.01
Routine checkup (in past 2 years)[e]									
Yes	Ref	NA	NA	Ref	NA	NA	Ref	NA	NA
No	1.46	1.24–1.71	< 0.01	1.72	1.01–2.91	0.05	1.42	1.20–1.68	< 0.01
Self-rated health[c]									
Excellent, very good, good	Ref	NA	NA	Ref	NA	NA	Ref	NA	NA
Fair or poor	5.21	4.45–6.11	< 0.01	5.05	2.93–8.71	< 0.01	5.28	4.48–6.22	< 0.01
Physical health distress									
Not frequent (< 14 days/month)	Ref	NA	NA	Ref	NA	NA	Ref	NA	NA
Frequent (≥ 14 days/month)	6.43	5.52–7.49	< 0.01	9.68	5.76–16.28	< 0.01	6.22	5.30–7.29	< 0.01
Mental health distress									
Not frequent (< 14 days/month)	Ref	NA	NA	Ref	NA	NA	Ref	NA	NA
Frequent (≥ 14 days/month)	16.01	13.69–18.72	< 0.01	28.93	16.30–51.34	< 0.01	14.95	12.71–17.58	< 0.01
Poor health									
Not frequent (< 14 days/month)	Ref	NA	NA	Ref	NA	NA	Ref	NA	NA
Frequent (≥ 14 days/month)	15.06	12.71–17.85	< 0.01	28.82	16.16–51.42	< 0.01	14.09	11.81–16.81	< 0.01
Health behaviors									
Smoking									
Never smoker	Ref	NA	NA	Ref	NA	NA	Ref	NA	NA
Current smoker	3.02	2.48–3.68	< 0.01	2.80	1.45–5.42	< 0.01	3.09	2.53–3.79	< 0.01
Former smoker	1.55	1.30–1.86	< 0.01	1.55	0.89–2.70	0./12	1.56	1.29–1.89	< 0.01
Binge drinking (≥ 4 drinks/time in past 30 days)[f]									
No	Ref	NA	NA	Ref	NA	NA	Ref	NA	NA
Yes	1.61	1.26–2.04	< 0.01	2.75	1.41–5.34	< 0.01	1.49	1.15–1.92	< 0.01

Note: AOR: adjusted odds ratio, CI: confidence interval, Ref: reference group, NA: not applicable.

[a] Models adjusted for age, race/ethnicity, marital status, education, and self-rated health unless noted otherwise. Current depression defined as score of 10 or above on the eight-item Patient Health Questionnaire depression scale. Data were weighted to represent the California population according to 2000 California Department of Finance figures.

[b] Could not be included because of small sample size.

[c] Model adjusted for age, race/ethnicity, marital status, and education.

[d] Disability was defined as being limited in any way in any activities because of a physical, mental, or emotional problem or having a health problem that requires use of special equipment, such as a cane, a wheelchair, a special bed, or a special telephone.

[e] Model adjusted for age, race/ethnicity, marital status, education, self-rated health, and health insurance.

[f] Cut points for binge drinking differed in 2006 (≥ 5 drinks) compared with 2007 and 2008 (≥ 4 drinks). To make the variables comparable across years, in 2006 a value of yes was assigned to binge drinking if a participant answered yes to consuming five or more drinks on one occasion, or if she reported consuming on average four or more drinks per day on the days she consumed alcohol in the past 30 days.

ratios for immigrants who had lived 15 years or longer in the United States and for those born in the United States.

Health status and health care access were positively associated with current depression. Women who reported fair or poor self-rated health were 5.2 times more likely to report current depression than women who reported good, very good, or excellent health. Women who did not have health insurance were 46% more likely to report current depression. Women who had not received a routine checkup in the past 2 years were 46% more likely to report current depression, even after controlling for health insurance in addition to age, race and ethnicity, marital status, education, and self-rated health.

Health behaviors were positively associated with current depression. Current smokers were 3 times more likely to have current depression than those who had never smoked, and former smokers were 1.6 times more likely to have current depression than those who had never smoked. Women who reported binge drinking were 1.6 times more likely to report experiencing current depression than women who did not report binge drinking.

Comparisons by California–Mexico border region

The odds ratio estimates of relationships between current depression with disability, health care access, physical health distress, mental health distress, poor health, and binge drinking were larger and stronger among those in the border region than in those outside the

border region. Among women living in the border region, those without health insurance were 2.3 times more likely to have current depression than those with insurance, while among women outside the border region, those who did not have health insurance were 1.4 times more likely to have current depression than those with insurance. Additionally, among those living in the border region, women who reported binge drinking were 2.8 times more likely to have current depression than those who did not report binge drinking, while among those outside the border region, women who reported binge drinking were 1.5 times more likely to have current depression than those who did not report binge drinking. The relationships between current depression with self-rated health and smoking were of similar magnitude among those in the border region compared with those outside the border region.

DISCUSSION

This study estimated the prevalence of current depression, examined predictors of current depression among women in California, and assessed differences in the relationship between predictors and current depression among women living in the border region (Imperial and San Diego Counties) compared with women living outside the border region. Twelve percent of women in California reported current depression in the past 2 weeks according to the PHQ-8 standardized questionnaire for screening depression (13). Current depression was associated with years living in the United States, health status, health care access, smoking, and binge drinking, even after controlling for race and ethnicity, age, marital status, education, and self-rated health. Importantly, the observed relationship between immigrant status and current depression fits a dose–response model, so that the odds of current depression among immigrants who had lived longer in the United States approached the odds of their counterparts born in the United States. More recent immigrants were less likely to report current depression than their counterparts born in the United States; as immigrants stayed longer in the United States, the odds of reporting current depression increased. This relationship did not differ among women in the border region compared with those outside the border region.

This study observed that not having access to health insurance or routine medical care, having poor perceived health, and health-related behaviors—specifically, smoking and binge drinking—were associated with an increased likelihood of current depression. Similar associations were observed in previous research examining the relationship between current depression with smoking and binge drinking according to the PHQ-8 among adults in California (17) and Florida (18) as well as in previous research examining the relationship between sad, blue, or depressed days and health-related quality of life (19). Associations between serious psychological distress and diabetes (20) and between current depression and disability status (21) have also been described. This study adds to the literature by examining predictors of current depression related to health status, health care access, and health risk behaviors according to border region residence in California. The relationships observed were stronger between current depression and disability, physical and mental distress, poor health, health care access, and binge drinking among women living in the border region compared with women in California living outside the border region.

Depression is a common mental disorder and 9.1% of adults living in the United States have current depression (2). Prevalence of current depression among women in the United States is higher than among men (10.2% versus 8.0%) (2). In California, 9.2% of adults have current depression (22). This study estimated that 12.0% of women in California have current depression and observed similar prevalence of depression in women who lived in the border region and in those who lived outside the region (13.0% and 11.9%, respectively). An analysis of Mexican American adults living in *colonias* on the Texas–Mexico border found similar mental health status among them compared with the general U.S. population (23).

The relationship between mental health and immigration is complex and not well understood (10, 24). Currently, most foreign-born residents in California were born in Mexico, where the prevalence of depression is lower than in the United States: 5.8% among women in Mexico (6) compared with 10.2% among women in the United States (2). Both genetic and environmental factors affect depression. Since migration may involve many environmental stressors, including traumatic events, discrimination, and documentation requirements, depression could be a plausible consequence of migration. However, immigrants in the United States do not necessarily experience higher rates of depression than the general population (25). Studies conducted in the United States of older Latino adults and college students of Mexican heritage have found that as immigrants become more acculturated to Anglo culture, the odds of depression increase (22, 26). It is possible that recent immigrants to the United States from Latin American countries have lower rates of depression because of selection bias, so that individuals who migrate are more resilient to depression than those who do not (10). Conversely, recent immigrants may have increased anxiety, which is often linked to depression. Previous research has found that those who undergo challenging times in isolation, as may happen to immigrants when they arrive in the United States, have increased anxiety but not increased depression (27), so although depression is lower, other mental health issues may be present.

Among Moroccan immigrants in Spain and among Latino youth of immigrant families in the United States, factors supportive of migration, such as family and social support, are associated with decreased depressive symptoms (28, 29). Lack of social support predicts depressive symptoms among university students in Mexico (30). Extended family networks may provide social support that assists migrants as they transition to life in the host country (10, 28, 29). An additional support among immigrants from Mexico may be the collectivist attitude common in Mexican culture, as contrasted with an individualistic attitude in the United States, which may help immigrants who migrate from Mexico to the United States avoid developing depression after migration (26).

Another possible explanation is that social desirability bias is affecting this study's estimates of current depression. A diagnosis of depression often has stigma, despite efforts to reduce it. Recent immigrants to the United States might be more likely to give socially

desirable responses to the depression screening questions regardless of their true feelings compared with immigrants who have spent more time in the United States. Some research suggests that this may not be a factor (10), but it may be prudent to examine stigma related to depression among immigrants in the United States.

Limitations

This study has limitations. First, the data are cross-sectional, so a temporal relationship cannot be inferred. The intent was to describe the relationship between current depression and immigration, health status, health care access, and health behaviors among women in California and not to determine the etiology of depression. Second, the data are self-reported and use a subjective measure of depression. It is possible that misclassification exists, because women who screened positively for current depression were not evaluated for clinical depression, which could be causing underestimates or overestimates of current depression. Third, bias may exist in this study due to excluded participants and populations. Demographics of included participants were compared with participants who were excluded because of missing depression scale data or covariates. Those who were excluded were disproportionately Latina and foreign-born women who had been in the United States for 15 years or longer. It is expected that these women had higher prevalence of current depression than the average for the sample and, consequently, that estimates from this study are underestimates of the true prevalence of depression. Also, women without landline telephone service, such as cell-phone-only users, were not included in the survey used for this study.

Anxiety was not measured among study participants because the data did not contain any anxiety measures. Depression and anxiety diagnoses are often related. The process of immigration is stressful, and prior studies have observed that recent immigrants have high levels of anxiety but low levels of depression (28). Of special note, recent immigrants in this study appeared to have lower levels of depression than immigrants who have lived longer in the United States, but these lower levels of depression do not mean that mental illness concerns are absent in this population. Last, prevalence ratios were estimated by calculating odds ratios using unconditional logistic regression. Because the underlying prevalence of current depression was low (12.0%) in the sample, the calculated odds ratios should be close estimates of prevalence ratios (15, 16).

Conclusion

In this study, a similar prevalence of current depression was observed among those who live in the border region of California compared with those who do not. In addition, higher odds of current depression were observed among immigrants with longer residence in the United States compared with immigrants with shorter residence, as well as among those with poor health status compared with those who are healthy.

The border between California and Mexico is fluid, and people cross in both directions daily for business, family, and pleasure. This study described the prevalence of current depression on the border and examined possible pathways for intervention by examining the relationship between years in the United States, health care access, health status, smoking, and binge drinking. This study has implications for future research conducted in the United States and Mexico. Ideally, studies will examine depression and its predictors among residents in the border region using a binational approach. Surveillance of depression and its predictors along the Mexico–California border will be important to inform border health interventions and tracking, such as the Healthy Border Program's objectives. Furthermore, qualitative research should be conducted to inform prevalence estimates obtained by surveillance. Such research could improve understanding of why residents on the U.S. side of the border have higher rates of depression than residents on the Mexico side of the border. Future studies should reach all residents of the border region, including cell-phone-only users and those without cell or landline phone service, which this study did not include. A community-based approach may be useful in reaching these residents, specifically by engaging trusted community members in the research process to establish rapport. This study was not able to assess the prevalence of depression among men in California, and future research should examine this issue. To better understand the etiology of depression among immigrants specifically, future research should examine the risk of depression according to years in the United States longitudinally.

Mental health, including depression, and physical health are related, as observed in this and other studies, and interventions should approach health holistically, addressing both mental and physical health conditions (2, 20, 21). Stress may also trigger depression (28, 30, 31) and interventions should aim to teach coping strategies to reduce stress as well as stressors (i.e., lack of health insurance) that could trigger depression.

Although the border is fluid, resources for mental health interventions are often tied to country-specific funding agencies. Mental health resources should focus on addressing current depression among women and specifically among women who are most at risk, such as those with disabilities, poor health status, immigrants who have been in the United States for 15 years or longer, and those who smoke or binge drink. Resources invested may prevent suicide mortality, a main objective of the Healthy Border 2010 Initiative. At the time this manuscript was prepared, the Healthy Border Program's 2020 objectives had not been released (32). It is recommended that preventing suicide mortality be incorporated into the Healthy Border Program's 2020 objectives and that services to prevent depression, a major risk factor for suicide, be included as a program that supports the objectives.

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Depresión actual en las mujeres en California según el lugar de residencia en la región fronteriza entre California y México

RESUMEN

Objetivo. Calcular la prevalencia de la depresión actual; examinar la relación entre la depresión actual y la inmigración, el estado de salud, el acceso a la atención de la salud y las conductas relacionadas con la salud; y evaluar las diferencias en la región fronteriza entre California (condados Imperial y San Diego) y México en las mujeres.
Métodos. Se empleó una muestra transversal y representativa de mujeres adultas de la Encuesta de Salud de la Mujer de California (n = 13 454), una encuesta telefónica estatal, para examinar la prevalencia de depresión actual y los factores predictivos de depresión tanto en California como según el lugar de residencia en la región fronteriza. La depresión se evaluó mediante el Cuestionario de Salud del Paciente-8.
Resultados. La prevalencia de depresión actual en las mujeres en California fue 12,0%, y fue semejante en las regiones fronteriza (13,0%) y no fronteriza (11,9%) del estado. Las probabilidades de presentar depresión actual fueron menores en las mujeres que habían inmigrado recientemente (< 5 años o de 5 a < 10 años en los Estados Unidos) que en aquellas nacidas en los Estados Unidos y en las mujeres inmigrantes que habían vivido en los Estados Unidos de 10 a < 15 años o más (P < 0,05). Las razones de posibilidades para la depresión actual y el estado de salud, el acceso a la atención de la salud y el consumo excesivo de alcohol fueron más elevadas en la región fronteriza que en otras regiones del estado.
Conclusiones. Se observaron prevalencias similares de depresión actual entre las mujeres que viven en la región fronteriza de California y aquellas que viven en otras regiones del estado, pero la relación entre la depresión y el estado de salud, el acceso a la atención de la salud y el consumo excesivo de alcohol varió según el lugar de residencia de la región fronteriza. Idealmente, la vigilancia futura de la depresión y sus factores predictivos a lo largo de la frontera entre México y California será llevada a cabo de manera bilateral entre los dos países a fin de comunicar las intervenciones y el seguimiento dentro de los objetivos del Programa Frontera Saludable.

Palabras clave Depresión; salud de la mujer; vigilancia sanitaria; servicios de salud para mujeres; salud mental; California.