ORIGINAL PAPER

Mental health service utilization for psychiatric disorders among Latinos living in the United States: the role of ethnic subgroup, ethnic identity, and language/social preferences

K. M. Keyes · S. S. Martins · M. L. Hatzenbuehler · C. Blanco · L. M. Bates · Deborah S. Hasin

Abstract

Purpose   To examine aspects of Latino experience in the US as predicting service utilization for mood, anxiety, and substance disorders.

Methods   Latino participants 18 and older in the NESARC ($N = 6,359$), a US national face to face survey. Outcomes were lifetime service utilization for DSM-IV lifetime mood/anxiety or substance disorders, diagnosed via structured interview (AUDADIS-IV). Main predictors were ethnic subgroup, ethnic identity, linguistic/social preferences, nativity/years in the US, and age at immigration.

Results   Higher levels of Latino ethnic identity and Spanish language/Latino social preferences predicted lower service utilization for mood disorders [ethnic identity OR = 0.52, language/social OR = 0.44] and anxiety disorders [ethnic identity OR = 0.67, language/social OR = 0.47], controlling for ethnic subgroup, disorder severity, time spent in the US, and economic and practical barriers Service utilization for alcohol/drug disorders was low across all Latino subgroups, without variation by examined predictors.

Conclusion   Ethnic/cultural factors are strong determinants of service utilization for mood/anxiety, but not substance use disorders among Latinos in the US strategies to increase service utilization among Latinos with psychiatric disorders should be disorder specific, and recognize the role of ethnicity and identity as important components of a help-seeking model.

K. M. Keyes · C. Blanco · D. S. Hasin (✉)
New York State Psychiatric Institute, 1051 Riverside Drive
#123, New York, NY 10032, USA
e-mail: dsh2@columbia.edu

K. M. Keyes · L. M. Bates · D. S. Hasin
Department of Epidemiology, Columbia University,
New York, NY, USA

S. S. Martins
Department of Mental Health, Johns Hopkins Bloomberg,
School of Public Health, Baltimore, MD, USA

M. L. Hatzenbuehler
Department of Psychology, Yale University, New Haven,
CT, USA

C. Blanco · D. S. Hasin
Department of Psychiatry, College of Physicians and Surgeons,
Columbia University, New York, NY, USA

Introduction

Latinos are the fastest growing minority group in the US, and will comprise approximately 20% of the population by 2020 [71, 83]. Disparities in health and health care utilization between Latinos and non-Latino Whites are increasing across a range of medical conditions, including psychiatric disorders [2, 4, 56, 66, 79, 80, 84, 85, 89, 91, 94, 96]. Disparities in care arise partly from structural barriers to access. For example, compared with non-Latino Whites, Latinos have, on an average, more limited health insurance and income, constraining financial resources for mental health services [12, 13, 21, 62]. However, differences in health and health care utilization remain even after controlling for economic barriers to care, suggesting the need to better understand other mechanisms through which

differences may arise across racial/ethnic groups. Broader cultural and social factors may play an important role in treatment-seeking behavior and may in part explain the continued disparities between Latinos and non-Latino Whites.

Examining characteristics of the Latino population with respect to health care utilization may assist in the interpretation of overall treatment disparities by identifying important factors that disproportionately affect this group, relative to non-Latino Whites. For example, Latinos' experiences of immigration and adaptation to living in the US involve multi-dimensional processes of acculturation and/or assimilation, whereby individuals over time adopt cultural elements of the host society and become structurally integrated, into the prevailing social fabric. These processes hypothesized to impact health in a number of domains. Indicators of acculturation and assimilation, often approximated by immigrants' nativity or length of residence, are associated with a number of negative health consequences (for example, higher rates of substance use and abuse [63, 98], higher rates of infant mortality [16], and less nutritious diets [31]) but also health benefits (for example, more positive self-ratings of health [62]). Substantial evidence indicates a positive effect of acculturation/assimilation on medical service use, including preventative care, such as cancer screening [37]. In addition, available evidence also suggests that acculturation/assimilation has a generally positive impact on mental health service use; many epidemiologic studies have shown that more recent immigrants with a psychiatric disorder are less likely to use mental health services as compared to immigrants who have been in the US longer [3, 10, 23, 44, 91]. Foreign-born status or years in the US alone, however, may not adequately capture more specific psychological, cultural, or social processes that impact service utilization.

Ethnic identity, language use, and ethnic homophily (i.e., preferences for co-ethnic social interaction) reflect some of these psychological, linguistic, and social domains of the Latino experience in the US that may be associated with service access and use [12, 13, 18, 19, 34, 69]. Models of health services behavior hypothesize that Latino immigrants adapt to their surroundings and learn about health resources as a result of interactions with those in the host culture; Latinos with little interaction among those not in their ethnic group may not receive information about access to health resources [17, 78, 97]. Further, this theory posits that Latino ethnic homophily may exacerbate the stigma of help seeking for a mental health problem, as available evidence suggests that Latinos view mental health conditions are more stigmatizing than non-Latino peers [20, 70]. Indeed, these constructs have been documented to be associated with a wide range of health behaviors and general well-being

among Latino immigrants, including colorectal cancer screening [1], condom use, pain sensitivity [76], academic achievement [68], self-efficacy and self-esteem [72, 82]. Further, the National Latino and Asian American Study (NLAAS), an important source of information on racial/ethnic patterns in psychiatric outcomes, has shown that individuals who mostly speak Spanish and/or mostly interact with other Latinos are less likely to be diagnosed with a psychiatric disorder [10, 46]. Although ethnic identity and linguistic/social preferences are associated with a wide range of health and well-being outcomes, relatively not much is known about whether these factors also affect receipt of mental health services among those with the disorders. Data from the Epidemiologic Catchment Area Study-Los Angeles (ECA-LA) found that Mexican-Americans with any diagnosis of a DSM-III-R psychiatric disorder scoring low on acculturation scales were less likely to utilize specialty mental health services when compared with more acculturated counterparts [96]. The NLAAS indicates that mental health service use among immigrants with any psychiatric disorder increases with years in the US and younger age of immigration, but only at the sub-clinical end of the psychopathology spectrum rather than among those diagnosed with a psychiatric disorder [3]. There may also be important differences in service utilization patterns and their determinants depending on the specific diagnostic categories. Mood/anxiety and substance disorders differ considerably in their risk factors, symptoms, treatment, and treatment settings. Therefore, determining whether the findings from ECA-LA and NLAAS extend across specific diagnostic domains is warranted. In addition, understanding the social, cultural and linguistic processes associated with service utilization among those with a DSM-IV psychiatric disorder could aid in improving access to services among underserved groups.

An important additional consideration in the assessment of service use among Latinos is ethnic heterogeneity. Many US Latino subgroups have a distinct relationship with US culture and health care. For example, Puerto Ricans are born US citizens and tend to spend more time on the US mainland prior to or in the absence of immigration as compared to other Latino ethnic subgroups. Further, rates of psychiatric disorder [7, 9] and mental health service use [3, 48] among people of Puerto Rican origin are more similar to non-Latino Whites than to other Latino ethnic subgroups. Combining Latinos into a single category can obscure this potentially important variation, although few studies have had large enough sample sizes to adequately disaggregate the pan-ethnic "Latino" designation. Available evidence indicates that there are substantial differences among Latino ethnic subgroups in the likelihood of mental health service utilization [4, 6, 20, 32, 67, 95], with Puerto Ricans mental health service utilization generally

higher than all other Latino subgroups. However, previous studies have not examined domains of the Latino immigrant experience in the US as potential explanatory indicators of subgroup differences.

In summary, previous research has been important in documenting that more recent immigration among Latinos is associated with the lower use of mental health services, but information on ethnic subgroup heterogeneity and on the specific roles of key dimensions of immigrant adaptation—e.g., ethnic identity and homophily, language use—is necessary for the identification of subgroups at high risk of being missed by the mental health service sector, and for more comprehensively understanding the processes influencing immigrant mental health service utilization. Further, understanding these effects by diagnostic categories will provide important information on whether the effects are general, spanning all psychiatric disorders, or/are disorder specific. The large sample size of the present national survey allows for examination of these questions. Therefore, we investigated mental health service use among US Latinos diagnosed with mood, anxiety and substance disorders, examining whether four dimensions of the Latino adaptation in the US explain variation in disorder-specific service utilization: (1) age at immigration, (2) years in the US, (3) language/social preferences, and (4) ethnic identity. We further examine variation across five prevalent self-identified subgroups (Puerto Rican, Mexican, Mexican-American, Cuban, and South American). Importantly, we controlled for economic and practical barriers and disorder severity to better understand the ethnicity factors.

Methods

Sample

Data are drawn from two waves of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), a nationally representative survey of US residents of households and group quarters. Interviews were conducted face to face by extensively trained interviewers of the US Bureau of the Census. In 2001–2002, 43,093 individuals were assessed for a lifetime history of psychiatric disorders as well as other information. In 2004–2005, 34,653 of these individuals were re-interviewed. The cumulative response rate across NESARC waves of data collection was 70.2%. The present study focuses on Latinos who participated in both the 2001–2002 and the 2004–2005 survey ($N = 6{,}359$) as complete measures of ethnic identity and linguistic/social preferences were assessed among this subset. Latinos lost to follow-up between waves were more likely to be male ($p < 0.01$), young ($p < 0.01$), low income

($p < 0.01$), and less educated ($p < 0.01$), but did not differ on lifetime mood, anxiety, and substance disorders. Further information on the study methods are found elsewhere [45].

Among the Latino subsample used for the present study ($N = 6{,}359$), 50.9% were male; 24.9% were 20–29 years; 40.1% were 30–44, 25.4% were 45–64, and 9.6% were 65 and older; 20.4% were married or living with someone as if married, and 84% lived in an urban area. As anticipated, the socioeconomic profile of the Latino sample suggested disadvantage: 34.8% reported less than a high school education, 24.4% reported high education; 51.0% reported below $19,999 past year personal income, whereas 25.7% reported $20–34,9999, 15.6% reported $35–64,999 and 7.8% reported $65,000+; finally, 72.0% reported having some form of current health insurance. When compared with the non-Latino NESARC sample, Latino participants are on an average younger ($\chi^2 = 16.6$, $df = 3$, $p < 0.001$), more likely to be male ($\chi^2 = 8.3$, $df = 1$, $p < 0.001$), less educated ($\chi^2 = 19.7$, $df = 2$, $p < 0.001$), have lower income ($\chi^2 = 11.4$, $df = 3$, $p < 0.001$) and are less likely to be currently insured ($\chi^2 = 49.2$, $df = 1$, $p < 0.001$).

Measures

DSM-IV diagnoses

The NESARC survey used the NIAAA Alcohol Use Disorder and Associated Disabilities Interview Schedule-DSM-IV (AUDADIS-IV) [42] designed for experienced lay interviewers. The AUDADIS-IV includes detailed assessment of DSM-IV [11] abuse and dependence criteria for alcohol and 10 drug classes, as well as three mood disorders (major depressive, dysthymic and manic/hypomanic disorder) and four anxiety disorders (social phobia, specific phobia, generalized anxiety and panic disorder). Substance diagnoses evidenced good to excellent reliability in international, clinical, and US general population samples [22, 24, 41, 42, 51, 77]; test–retest of mood and anxiety diagnoses were fair to good [22, 41, 42]. Test–retest reliability in Latinos was good to excellent for alcohol dependence and depression diagnoses [22]. Validity was also demonstrated in numerous studies [39, 40, 43, 49, 50, 52, 54], including a WHO/NIH study [24, 30, 52, 75, 87, 93].

The present analysis included psychiatric diagnoses made at any point in the respondents' lifetime. We repeated all analyses in the past 12 month time frame to examine the concurrent cross-sectional association between predictor variables and psychiatric outcomes, included as an online supplement to this report.

Service utilization

Thirteen types of intervention are assessed in separate modules for alcohol and drugs. These interventions fall into three main categories: 12-step self-help (e.g., alcoholics anonymous), professional services (e.g., detoxification, inpatient psychiatric, halfway house) and other (e.g., employee assistance program). Any lifetime reported service use was included in the present analysis.

Respondents were also asked specifically about lifetime mental health service utilization for each mood and anxiety disorder, measured in separate modules. These were administered to all respondents passing general screening questions for the relevant disorder. The treatment questions covered outpatient (physician or other professional, therapist, counselor), inpatient (hospitalized overnight or longer), emergency room, and prescribed medication. Any lifetime reported service use was included in the present analysis.

Domains of immigrant adaptation

Linguistic/social preferences

Eleven items were used to measure language/social preferences at Wave 2. Examples include "What languages do you read and speak?," "In what language do you speak with friends?," and "You prefer going to social gatherings and parties in which people are…". Five response options ranged from "Only Spanish" to "Only English" or "Only Latinos" to "Only other ethnic groups" as appropriate. These items, the "Language" and "Media" subscales of the Short Acculturation Scale [64] had excellent internal consistency in this sample (Chronbach's $\alpha = 0.93$). Possible scores on the scale ranged from 8 to 59. Higher scores indicate greater Spanish speaking relative to English speaking, and greater interaction with Latinos relative to non-Latinos in daily life. Owing to non-normal distribution, the total score was categorized by quartile (analyses were also conducted with a continuous scale).

Ethnic identity

Ethnic identity was measured with eight items at Wave 2, an expansion of the 3-item Ethnic Identity Scale (EIS) from the National Comorbidity Survey-Replication and the NLAAS. Internal consistency was excellent in this sample (Chronbach's $\alpha = 0.90$) [46]. Examples of items include "Have a strong sense of yourself as a person of Hispanic/Latino origin" and "Hispanic/Latino heritage is important in your life". Six response options ranged from "Strongly agree" to "Strongly disagree". Possible scores on the scale ranged from 8 to 59. Higher scores indicate stronger identity with Latino heritage, whereas lower scores indicate weaker identity with Latino heritage. Owing to non-normal distribution, the total score was categorized by quartile (analyses were also conducted with a continuous scale).

Years in the US

All respondents were asked whether they were born in the US, and if not, the number of years spent in the US responses were categorized to be consistent with other studies [3]: <1–9 years, 10–19 years, 20 or more years, with US born as the reference group.

Age at immigration

Age at immigration range was 0 (born in the US) to 83. Age at immigration was categorized to be consistent with the previous studies [3]: ≤12, 13–17, 18–34, and ≥35, with US born as the reference group.

All measures of the domains of immigrant adaptation were significantly correlated at the $p < 0.01$ level. The highest correlation was between ethnic identity and linguistic/social preferences (correlation coefficient = 0.69, $p < 0.01$), and the lowest between language/social preference and years in the US (correlation coefficient = −0.23, $p < 0.01$).

Latino subgroup

Latino ethnic subgroup was defined from a list of 58 categories. We examined within-group differences among the five most prevalent Latino categories: Mexicans ($N = 1,899$), Mexican-Americans ($N = 1,385$), Puerto Ricans ($N = 740$), Central Americans ($N = 386$), and Cubans ($N = 331$). Remaining Latinos subgroups were too small to provide precise estimates. For analyses in which the main predictor was Latino subgroup, we excluded rather than combining these 1,618 respondents from over 30 cultures and countries because their heterogeneity could lead to misleading results. In all other analyses, these individuals were included. Sensitivity analyses on whether including the 1,618 individuals as an additional category or excluding them affected the results for the five specific subgroups indicated that the subgroup results were unaffected. The survey allowed choosing between Mexican and Mexican-American, but did not provide that option for other Latino subgroups. Because the sample was sufficiently large, we analyzed Mexican and Mexican-Americans separately to determine if they differed.

Statistical analyses

Prevalence and standard errors were computed among those with specific diagnostic profiles (e.g., anxiety service

use among those with any anxiety disorder). An advantage to assess service utilization differences conditional on diagnosis is that the results are not dependent on known differences in rates of psychiatric diagnoses across Latino subgroups [7, 44]. Odds ratios (ORs) and 95% confidence intervals were derived from logistic regressions. All analyses were conducted using SUDAAN (56) to obtain standard errors adjusted for the complex sample design.

Following our previous research [55, 60], control variables from the Andersen model of health services utilization [12, 13] reflected predisposing factors (sex and age) and enabling factors (income, education, marital status, urbanicity, region, and current insurance status). Although indicators of socio-economic status, such as income and education were significantly correlated, the highest correlation coefficient was 0.29, indicating only a moderate degree of correlation and low risk of inaccurate results due to multi-colinearity. Further, to address need for treatment, each model contained a disorder-specific clinical covariate to control for the severity of the disorder (number of symptoms [mood and anxiety disorders] or frequency of use [substance disorders]). The severity indicators evidence a strong correlation (coefficients = 0.32–0.39) with functional disability (as measured by the Short Form Health Survey SF-12v2 [35]). Owing to concerns about multi-colinearity, we did not test a model with all domains of immigrant adaptation. Rather, our final model included only nativity/time spent in the US and nativity/immigration age to determine the direct effect of ethnic/cultural variables unexplained by nativity and time spent in the US. Although nativity/time spent in the US and nativity/immigration age are significantly correlated with other domains of immigrant adaptation used in these analyses, no correlation was higher than 0.3, indicating a low risk of inaccurate results due to multi-colinearity.

Results

Service utilization: any service use

Among those with any psychiatric or substance disorder, less time in the US was associated with lower odds of service utilization (Table 1). Cubans, Mexicans, and Mexican-Americans were less likely to utilize services than Puerto Ricans, but these subgroup differences were no longer significant after controlling for symptom severity. Individuals reporting strong Latino ethnic identity (OR = 0.62 [95% CI 0.42–0.92]) and mostly or completely Spanish language/Latino social preference (OR = 0.68 [95% CI 0.50–0.94]) were less likely to utilize services after adjustment for disorder severity, time in the US, and age at immigration. When language/social preference

scales were analyzed as continuous variables rather than quartiles, results were similar (not shown).

Service utilization: mood and anxiety disorders

The results for specific mood and anxiety disorders paralleled those for any service utilization. No Latino subgroup differences emerged once severity was included as a control variable, except that Mexican-Americans with anxiety disorders were less likely to utilize services as compared to Puerto Ricans (OR = 0.44, 95% CI 0.26–0.76). Fewer years in the US, stronger ethnic identity and stronger Spanish language/Latino social preference were strongly associated with lower odds of service utilization (Table 2). The results considering ethnic identity and language/social preference as continuous scales rather than quartiles were very similar (results not shown).

Service utilization: drug/alcohol disorders

Service utilization was considerably lower for substance use disorders than for mood or anxiety disorders (Table 3). Age at immigration was associated with drug/alcohol treatment utilization when controlling for barrier and severity factors (OR = 0.15 [95% CI 0.04–0.57]), but this finding was not significant after controlling for time in the US. We also examined service utilization differences for alcohol and drugs separately (not shown). No significant findings emerged.

Online supplement: past 12-month diagnoses

We also analyzed service utilization and psychiatric disorders in the past 12 months only (see online supplement). Although limited power restricted the ability to obtain statistically significant estimates, these odds ratios showed similar direction and magnitude to the lifetime estimates, suggesting not much recall bias or differential misclassification in the lifetime results. There were some minor differences in the two analyses. For example, ethnic subgroup was not a predictor of lifetime service utilization, but was predictive of past 12-month service utilization (Cubans (OR = 0.36 [0.14–0.90], Mexicans (OR = 0.55 [0.33–0.91]), and Mexican-Americans (OR = 0.49 [0.30–0.81]) were less likely to utilize psychiatric disorder services when compared with Puerto Ricans.

Discussion

In a large, nationally representative sample of adult US Latinos, we found strong and significant associations between Latino ethnic identity and language/social

Table 1 Mental health service utilization among Latinos in the US with any lifetime DSM-IV diagnosed psychiatric disorder ($N = 3,392$)

		Service use for any Axis I disorder ($N = 1,315$)			
		% (SE)	OR1 (95% CI)	OR2 (95% CI)	OR3 (95% CI)
Years spent in the US					
Entire life	1,980	39.36 (1.6)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)
20+	187	39.23 (2.3)	0.96 (0.76–1.21)	0.98 (0.74–1.30)	1.42 (0.37–5.44)
10–19	448	22.53 (2.5)	*0.51 (0.36–0.72)*	*0.62 (0.41–0.93)*	*0.61 (0.37–0.99)*
<10	775	16.24 (3.5)	*0.32 (0.18–0.56)*	*0.32 (0.15–0.71)*	*0.35 (0.14–0.84)*
Age at immigration					
Born in the US	2,001	39.37 (1.6)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)
<12	322	33.22 (3.9)	0.83 (0.57–1.20)	0.85 (0.54–1.34)	1.32 (0.31–5.64)
12–17	222	29.22 (4.5)	0.78 (0.49–1.25)	0.92 (0.54–1.55)	1.78 (0.44–7.22)
18–34	671	28.52 (1.8)	*0.59 (0.47–0.75)*	*0.68 (0.51–0.92)*	1.43 (0.38–5.39)
35 or older	175	26.10 (4.1)	*0.43 (0.29–0.65)*	*0.39 (0.22–0.66)*	0.97 (0.25–3.73)
Self-identified Latino subgroup					
Central American	129	38.78 (6.2)	0.66 (0.33–1.33)	0.76 (0.42–1.38)	0.86 (0.48–1.54)
Cuban	183	28.61 (3.9)	*0.57 (0.36–0.90)*	0.65 (0.38–1.11)	0.76 (0.44–1.30)
Mexican	948	28.83 (2.1)	*0.64 (0.47–0.88)*	0.78 (0.56–1.09)	0.84 (0.59–1.20)
Mexican-American	793	33.24 (2.8)	*0.71 (0.51–0.97)*	0.87 (0.61–1.22)	0.85 (0.60–1.20)
Puerto Rican	446	45.87 (2.7)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)
Strength of ethnic identity					
1st quartile (strong ethnic identity)	772	32.60 (2.2)	*0.63 (0.46–0.67)*	*0.60 (0.43–0.83)*	*0.62 (0.42–0.92)*
2nd quartile (middle high)	711	30.51 (1.9)	*0.63 (0.48–0.81)*	*0.66 (0.49–0.88)*	*0.66 (0.49–0.90)*
3rd quartile (middle low)	870	32.45 (2.5)	*0.64 (0.47–0.89)*	*0.66 (0.48–0.90)*	0.78 (0.58–1.04)
4th quartile (weak ethnic identity)	1,039	43.54 (2.4)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)
Language/social preferences					
1st quartile (mostly Spanish language/Latino interaction)	851	28.77 (2.2)	*0.51 (0.36–0.73)*	*0.52 (0.35–0.76)*	*0.68 (0.50–0.94)*
2nd quartile (middle low)	875	29.72 (2.2)	*0.57 (0.44–0.75)*	*0.62 (0.46–0.83)*	*0.72 (0.53–0.97)*
3rd quartile (middle high)	715	37.03 (2.1)	*0.75 (0.57–0.98)*	0.76 (0.57–1.01)	*0.66 (0.47–0.91)*
4th quartile (mostly English language/"other" interaction)	951	42.44 (2.3)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)

All odds ratios in italics are significant at $p < 0.05$

OR1 controlled for sex, age, income, education, marital status, urbanicity, region, and current insurance status, *OR2* controlled for the above, plus disorder-specific severity (need) indicators: mood (number of mood disorder symptoms), anxiety (number of anxiety disorder symptoms), alcohol (number of alcohol disorder symptoms), and drug (number of drug disorder symptoms), *OR3* controlled for the above, plus all models included age at immigration and years spent in the US

preferences on service utilization for mood and anxiety disorders. Respondents reporting stronger ethnic identity and Spanish language/Latino social preferences were less likely to utilize mental health services, even after controlling for numerous factors associated with service utilization, including insurance, income, and symptom severity. Further, these factors exerted a direct effect unexplained by years in the US or immigration age.

Because many economic and practical barriers were controlled, these results suggest that language and cultural factors are important in explaining differences among Latinos service use for mood and anxiety disorders. These findings indicate the need for an increased programmatic

emphasis explicitly recognizing factors that are unique to Latino immigrants to improve care. Programmatically, the shortage of Spanish-speaking mental health clinicians is well documented [57, 86], a factor that clearly impairs diagnosis and treatment of mental health problems among non-English speaking Latinos. Further, even among Latinos in the US who speak English, the need for cultural competency in health care treatment, both broadly and in mental health specifically [14, 19, 61, 62, 90, 92], remains an important public health research and policy area. As has been documented for medical health systems more generally [36, 58], Latinos with fewer English language skills or less connection to non-Spanish social networks may also

Table 2 Mental health service utilization among US Latinos with a lifetime DSM-IV diagnosed mood or anxiety disorder (N = 2,514)

	N	Service use for a mood disorder (N = 917)				Service use for an anxiety disorder (N = 623)			
		% (SE)	OR1 (95% CI)	OR2 (95% CI)	OR3 (95% CI)	% (SE)	OR1 (95% CI)	OR2 (95% CI)	OR3 (95% CI)
Years spent in the US									
Entire life	1,400	54.58 (2.4)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	36.43 (2.2)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)
20+	142	49.87 (2.7)	0.79 (0.60–1.03)	0.83 (0.63–1.1.0)	0.81 (0.19–3.49)	32.56 (3.4)	0.88 (0.62–1.23)	0.87 (0.62–1.24)	1.20 (0.24–5.86)
10–19	340	28.53 (4.6)	0.39 (0.23–0.66)	0.42 (0.24–0.74)	0.49 (0.24–1.01)	19.02 (3.3)	0.46 (0.28–0.76)	0.48 (0.27–0.87)	0.61 (0.29–0.95)
<10	632	22.69 (5.0)	0.25 (0.13–0.48)	0.24 (0.12–0.50)	0.27 (0.12–0.67)	14.80 (3.8)	0.37 (0.17–0.67)	0.25 (0.09–0.70)	0.33 (0.10–0.91)
Age at immigration									
Born in the US	1,418	54.53 (2.3)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	36.48 (2.2)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)
<12	257	39.98 (5.7)	0.64 (0.40–1.00)	0.67 (0.40–1.12)	0.62 (0.13–3.02)	30.03 (4.6)	0.83 (0.53–1.30)	0.86 (0.53–1.39)	1.08 (0.20–5.79)
12–17	164	36.33 (6.5)	0.59 (0.30–1.16)	0.63 (0.29–1.38)	0.79 (0.19–3.23)	26.83 (4.8)	0.75 (0.43–1.31)	0.77 (0.43–1.37)	1.19 (0.24–5.93)
18–34	519	38.58 (3.0)	0.46 (0.33–0.64)	0.48 (0.34–0.69)	0.67 (0.16–2.89)	25.64 (2.7)	0.60 (0.42–0.87)	0.60 (0.40–0.89)	1.01 (0.21–4.94)
35 or older	155	42.22 (6.3)	0.43 (0.25–0.73)	0.41 (0.22–0.76)	0.72 (0.15–3.38)	15.7 (4.0)	0.31 (0.17–0.55)	0.26 (0.11–0.60)	0.53 (0.09–3.13)
Self-identified Latino subgroup									
Central American	116	49.56 (7.2)	0.66 (0.29–1.48)	0.72 (0.35–1.48)	0.88 (0.44–1.76)	34.73 (6.5)	0.66 (0.34–1.27)	0.80 (0.42–1.52)	0.85 (0.42–1.70)
Cuban	148	38.95 (5.5)	0.54 (0.28–1.04)	0.79 (0.40–1.59)	1.05 (0.52–2.12)	29.74 (5.0)	0.50 (0.30–0.85)	0.57 (0.33–1.00)	0.67 (0.38–1.19)
Mexican	673	40.70 (3.1)	0.59 (0.37–0.94)	0.72 (0.44–1.16)	0.80 (0.48–1.31)	19.22 (2.8)	0.34 (0.21–0.55)	0.42 (0.24–0.71)	0.44 (0.26–0.76)
Mexican-American	542	47.04 (4.2)	0.68 (0.42–1.10)	0.86 (0.51–1.44)	0.79 (0.45–1.38)	29.17 (3.5)	0.55 (0.35–0.86)	0.65 (0.40–1.06)	0.58 (0.33–1.01)
Puerto Rican	364	59.13 (3.5)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	46.27 (4.2)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)
Strength of ethnic identity									
1st quartile (Strong ethnic identity)	601	38.58 (2.6)	0.39 (0.26–0.57)	0.36 (0.23–0.56)	0.52 (0.29–0.91)	24.28 (2.5)	0.47 (0.33–0.66)	0.40 (0.27–0.59)	0.67 (0.35–1.26)
2nd quartile (middle high)	535	43.15 (3.0)	0.50 (0.35–0.72)	0.48 (0.31–0.73)	0.60 (0.38–0.95)	26.40 (2.3)	0.56 (0.41–0.76)	0.60 (0.44–0.83)	0.60 (0.37–0.98)
3rd quartile (middle low)	640	45.93 (3.5)	0.54 (0.36–0.81)	0.58 (0.38–0.88)	0.75 (0.48–1.17)	33.85 (3.6)	0.78 (0.50–1.20)	0.77 (0.49–1.22)	0.80 (0.51–1.24)
4th quartile (weak ethnic identity)	738	60.83 (3.6)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	41.53 (2.8)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)
Language/social preferences									
1st quartile (mostly Spanish language/Latino interaction)	663	39.78 (2.4)	0.40 (0.27–0.59)	0.37 (0.23–0.59)	0.44 (0.27–0.71)	23.84 (2.8)	0.47 (0.27–0.84)	0.47 (0.25–0.86)	0.47 (0.31–0.72)
2nd quartile (middle low)	641	40.08 (3.1)	0.50 (0.34–0.74)	0.48 (0.32–0.72)	0.53 (0.33–0.85)	25.45 (2.8)	0.51 (0.33–0.78)	0.52 (0.32–0.83)	0.69 (0.49–0.95)
3rd quartile (middle high)	509	48.97 (3.3)	0.66 (0.44–1.00)	0.69 (0.45–1.07)	0.59 (0.39–0.90)	34.14 (3.1)	0.79 (0.54–1.16)	0.76 (0.51–1.14)	0.78 (0.50–1.23)
4th quartile (mostly English language/"other" interaction)	701	57.29 (3.5)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	40.13 (3.2)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)

All odds ratios in italics are significant at $p < 0.05$

OR1 controlled for sex, age, income, education, marital status, urbanicity, region, and current insurance status, *OR2* controlled for the above, plus disorder-specific severity (need) indicators: mood (number of mood disorder symptoms), anxiety (number of anxiety disorder symptoms), alcohol (number of alcohol disorder symptoms), and drug (number of drug disorder symptoms), *OR3* controlled for the above, plus all models included age at immigration and years spent in the US

Table 3 Service utilization among Latinos living in the US with a lifetime DSM-IV diagnosed alcohol or drug disorder (N = 1,752)

		Service use for an alcohol or drug use disorder (N = 319)			
		% (SE)	OR1 (95% CI)	OR2 (95% CI)	OR3 (95% CI)
Years spent in the US					
Entire life	1,232	19.00 (1.9)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)
20+	60	23.29 (3.3)	0.24 (0.88–1.77)	1.38 (0.93–2.04)	2.35 (0.30–18.52)
10–19	173	13.88 (3.2)	0.55 (0.27–1.11)	0.78 (0.38–1.60)	0.50 (0.24–1.01)
<10	286	8.72 (5.1)	0.30 (0.08–1.12)	0.43 (0.09–1.97)	0.34 (0.07–1.58)
Age at immigration					
Born in the US	1,242	18.93 (1.8)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)
<12	146	18.08 (3.4)	0.87 (0.49–1.57)	0.98 (0.51–1.86)	2.76 (0.33–23.16)
12–17	94	19.88 (5.9)	0.93 (0.46–1.89)	1.21 (0.57–2.59)	4.58 (0.52–39.94)
18–34	233	16.93 (2.4)	0.75 (0.47–1.20)	1.11 (0.68–1.83)	4.12 (0.53–31.84)
35 or older	36	6.45 (4.3)	*0.21 (0.06-0.78)*	*0.15 (0.04–0.57)*	0.70 (0.05–10.71)
Self-identified Latino subgroup					
Central American	44	21.87 (9.4)	0.98 (0.24–3.93)	0.81 (0.34–1.91)	0.84 (0.34–2.08)
Cuban	74	16.14 (4.7)	0.59 (0.28–1.28)	0.46 (0.19–1.12)	0.42 (0.15–1.19)
Mexican	476	18.90 (2.7)	0.76 (0.46–1.28)	0.79 (0.47–1.32)	0.78 (0.44–1.38)
Mexican-American	483	14.51 (2.9)	0.58 (0.31–1.06)	0.55 (0.28–1.06)	0.55 (1.29–1.06)
Puerto Rican	188	24.69 (3.7)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)
Strength of ethnic identity					
1st quartile (strong ethnic identity)	273	26.07 (3.9)	1.43 (0.87–2.38)	1.51 (0.90–2.52)	0.86 (0.48–1.56)
2nd quartile (middle high)	295	16.52 (2.2)	0.81 (0.47–1.38)	0.86 (0.48–1.53)	0.73 (0.41–1.30)
3rd quartile (middle low)	489	14.06 (2.3)	0.73 (0.44–1.22)	0.74 (0.45–1.22)	0.99 (0.60–1.64)
4th quartile (weak ethnic identity)	694	17.79 (2.4)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)
Language/social preferences					
1st quartile (mostly Spanish language/Latino interaction)	337	18.82 (3.0)	0.78 (0.49–1.24)	0.87 (0.52–1.47)	1.63 (0.96–2.76)
2nd quartile (middle low)	427	15.85 (2.7)	0.66 (0.40–1.11)	0.79 (0.46–1.35)	0.85 (0.48–1.53)
3rd quartile (middle high)	393	19.16 (2.6)	0.94 (0.60–1.47)	1.00 (0.61–1.64)	0.72 (0.43–1.20)
4th quartile (mostly English language/"other" interaction)	594	18.87 (2.3)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	1.00 (1.00–1.00)

All odds ratios in italics are significant at $p < 0.05$

OR1 controlled for sex, age, income, education, marital status, urbanicity, region, and current insurance status, *OR2* controlled for the above, plus disorder-specific severity (need) indicators: mood (number of mood disorder symptoms), anxiety (number of anxiety disorder symptoms), alcohol (number of alcohol disorder symptoms), and drug (number of drug disorder symptoms), *OR3* controlled for the above, plus all models included age at immigration and years spent in the US

lack the knowledge regarding the appropriate pathways to obtain care. In addition, Latinos are more likely to distrust the medical community and the health care system due to ineffective and/or discriminatory health care practices received in the past [15, 27, 33]. Programs that address these shortcomings are under continuous development. For example, Markowitz et al. [65] recently developed an innovative interpersonal psychotherapy adaptation for Latinos with depression focusing specifically on conflicts arising due to immigration and other issues pertinent to Latinos? (e.g., the centrality of family). This treatment, as well as the emerging research focus on immigrant Latinos, reinforce calls for public health intervention and prevention

efforts to engage in a broader focus on the community contexts in which diverse Latino subgroups live and work to increase service utilization and quality of care for groups facing language, cultural, and other non-economic barriers [5, 19, 61, 88, 90, 92].

Our results also concur with the previous studies suggesting that ethnic homophily, preference for interaction among individuals of similar racial/ethnic background, is associated with decreased engagement with the medical system [1, 68, 72, 76, 82]. The decreased use of services associated with ethnic homophily may reflect culturally specific stigma and attitudes towards psychiatric disorders and mental health services in general; non-Whites,

including Latinos, endorse more stigmatizing attitudes towards mental illnesses [28, 29], and those embedded in ethnic social enclaves may adhere more to culturally based ideas regarding the causes and consequences of psychiatric disorders and mental health service use [74]. Alternatively, several studies have indicated that Latino individuals often seek help within their ethnic enclave from informal sources, such as family or clergy before or in replace of pursuing treatment within the medical system [20, 70]. Individuals will only engage in formal care if the symptoms of disorder intensify or if the resources embedded in the social network are depleted. Further study of Latino conceptions of mental illness and the impact of these conceptions on processes to care seeking are warranted.

Predictors were, in general, consistent for mood disorder service use and anxiety disorder service use. One difference of note is tat those in the Mexican ethnic subgroup with an anxiety disorder had a particularly low prevalence of anxiety disorder service use relative to other ethnic subgroups, whereas a similar pattern was not found among Mexicans with a mood disorder. Further investigation into specific cultural or contextual reasons for the low anxiety disorder service use among Mexicans in the United States is warranted.

A main strength of this survey is the statistical power to examine a range of Latino ethnic subgroups. Through these analyses, we were able to ascertain whether age at immigration and time in the US, ethnic identity, and/or language/social preference explain differences among Latino ethnic subgroups in predicting mental health service utilization. We found that these Latino experience indicators do not explain Latino ethnic subgroup variation; rather, differences among ethnic subgroups were largely explained by severity of symptoms. This suggests that subgroup variation in service use may be due to differences in disorder severity. When compared with other Latino subgroups, mean symptom levels were higher among Puerto Ricans with mood ($p < 0.01$) or anxiety disorders ($p < 0.01$), consistent with the higher prevalence of overall disorder in Puerto Ricans when compared with other Latino subgroups in these data [44]. Previous studies of Latino subgroup variation in service use did not control for severity [4, 6, 21, 32, 67, 95], which appears to be an important source of variation. While Latino subgroups vary in the prevalence of psychiatric disorders [7–10, 44, 47], surprisingly not much is known about ethnic differences in the disorder severity. Identifying the reasons for Latino subgroup severity differences is an important goal for future research.

No factors emerged as predictors of alcohol/drug service utilization, which was much lower overall than service utilization for mood or anxiety disorders, consistent with other findings [25, 26, 53]. These results are consistent with the previous studies showing not much evidence of racial/ethnic variation in service use for substance problems [55, 60]. The overall low usage of services across racial/ethnic groups [53] signals the need for programs that encourage better treatment utilization for substance use disorders across all racial/ethnic groups.

Our results that years in the US was associated with service use among those with a mood/anxiety diagnosis contrast with NLAAS findings that age at migration and years in the US were associated with service utilization only among those meeting partial, but not full diagnostic criteria for a current psychiatric disorder [3]. Our use of lifetime diagnoses that combined information from two waves of assessment conducted 3 years apart may have allowed us to capture more complete information, leading to findings among those meeting full diagnostic criteria for mood or anxiety disorders. Further, while our power was limited in analyses of past 12-month disorders (online appendix), the direction and magnitude of the odds ratio were generally similar to the lifetime analysis, suggesting the applicability of our findings to individuals meeting full diagnostic criteria for mood or anxiety disorders.

Study limitations are noted. First, ethnic identity and language/social preference scales were included only at Wave 2. Thus, their relationships with incident psychiatric disorders could not be assessed prospectively. Some individuals may have had psychiatric disorders and/or treatment before arriving in the US, indicating that the causal direction of observed associations remains in question (as a history of psychiatric disorders could influence feelings of ethnicity identity and language/social preferences). Third, loss to follow-up for male and low SES respondents may have introduced bias into the results, as low SES is associated with the recent immigration and lower service use. Therefore, our results are a conservative estimate of the effects of time in the US on service use. Fourth, respondents with Mexican origin in the NESARC could self-identify as Mexican or Mexican-American. Given that the present analyses demonstrate that Mexicans generally have lower rates of service utilization as compared to Mexican-Americans, we kept these groups separate for the main analysis. Whether the results might have change if other groups were allowed the same choice as Mexicans is unknown and should be examined in future research. Fifth, while the NESARC survey contains one of the largest samples of Latinos in the US, due to the low prevalence of service utilization overall we did not have statistical power to subset the analyses by ethnic subgroup, or by demographic variables such as gender. Further, while we attempted to include a comprehensive set of control variables, statistical power diminished with each additional control, suggesting that our models should be interpreted with caution. Testing for effect modification by ethnic subgroup and demographic subgroups, such as gender are

important areas for future research when larger samples become available. Further, questions on service use were more comprehensive for substance than for mood/anxiety disorders. More detailed information on mood/anxiety service use would improve future studies. Nevertheless, prevalence of service use for mood/anxiety disorders was substantially higher than for substance disorders, indicating that the diagnostic specificity of ethnic differences is unlikely to be a measurement artifact. In addition, further hypothesis testing should be conducted to confirm the present results in other sources of data given the number of statistical tests conducted as part of our research aims.

Finally, while the AUDADIS-IV is unique among large scale epidemiologic surveys in the coverage of questions regarding the Latino immigrant experience in the US, there are several important aspects of Latino immigration that are not addressed in the survey. For example, bicultural identity has been studied as an important aspect of the Latino experience in the US [17, 38, 73, 81]; adaptation and/or assimilation into US culture is multi-dimensional, and Latino individuals often have multiple identities that develop over time and co-exist. Measures capturing bicultural identity would be beneficial in future psychiatric epidemiologic work in this area.

Despite increasing overall rates of mental health service use in the US (including among Latinos) [59], continued disparities among Latinos with varying degrees of language/social preferences and ethnic identity signal the need for public health initiatives to expand access and culturally competent care for a broad range of psychiatric disorders. The present results, in the context of existing literature, indicate that cultural factors, such as ethnic identity and language/social preferences are potentially important drivers of mental health care among Latinos in the US. Although increasing the financial accessibility of mental health service use is an important priority, programs to improve access to care and management of illness should recognize the important role of language, cultural values and beliefs, and more explicitly address access to care for specific psychiatric disorders across diverse populations.

References

1. Afable-Munsuz A et al (2009) Acculturation and colorectal cancer screening among older Latino adults: differential associations by national origin. J Gen Intern Med 24(8):963–970
2. Agency for Healthcare Research and Quality (2005) 2004 National Healthcare Disparities Report. Rockville, MD: Agency for Healthcare Research and Quality. AHRQ Publication No. 05-0014
3. Alegria M et al (2007) Correlates of past-year mental health service use among Latinos: results from the National Latino and Asian American Study. Am J Public Health 97(1):76–83
4. Alegria M et al (2008) Disparity in depression treatment among racial and ethnic minority populations in the United States. Psychiatr Serv 59(11):1264–1272
5. Alegria M et al (2006) Improving drug treatment services for Hispanics: research gaps and scientific opportunities. Drug Alcohol Depend 84(Suppl 1):S76–S84
6. Alegria M et al (2002) Inequalities in use of specialty mental health services among Latinos, African Americans, and non-Latino whites. Psychiatr Serv 53(12):1547–1555
7. Alegria M et al (2006) Nativity and DSM-IV psychiatric disorders among Puerto Ricans, Cuban Americans, and non-Latino Whites in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions. J Clin Psychiatry 67(1):56–65
8. Alegria M et al (2008) Prevalence of mental illness in immigrant and non-immigrant US Latino groups. Am J Psychiatry 165(3):359–369
9. Alegria M et al (2007) Prevalence of psychiatric disorders across Latino subgroups in the United States. Am J Public Health 97(1):68–75
10. Alegria M et al (2007) Understanding differences in past year psychiatric disorders for Latinos living in the US. Soc Sci Med 65(2):214–230
11. American Psychiatric Association (1994) Diagnostic and statistical manual of mental disorders: DSM-IV, 4th edn. American Psychiatric Association, Washington, DC, xxv, 886 p
12. Andersen RM (1995) Revisiting the behavioral model and access to medical care: does it matter? J Health Soc Behav 36(1):1–10
13. Andersen RM, Davidson PL (1996) Measuring access and trends. In: Andersen RM, Rice TH, Kominski GF (eds) Changing the US Health Care System, San Francisco, Jossey-Bass, Inc
14. Anderson LM et al (2003) Culturally competent healthcare systems: a systematic review. Am J Prev Med 24(3 Suppl):68–79
15. Armstrong K et al (2007) Racial/ethnic differences in physician distrust in the United States. Am J Public Health 97(7):1283–1289
16. Becerra JE et al (1991) Infant mortality among Hispanics. A portrait of heterogeneity. JAMA 265(2):217–221
17. Berry JW (1988) Acculturation and psychological adaptation: a conceptual overview. In: Berry JW, Annis RC (eds) Ethnic psychology: research and practice with immigrants, refugees, native people, ethnic groups, and sojourners. Swets & Zeitlinger, Amsterdam
18. Berr JW, Kim U (1988) Acculturation and mental health. In: Dasen P, Berry JW, Sartorius N (eds) Health and cross-cultural psychology: towards application. Sage, London, pp 207–236
19. Brach C, Fraser I, Paez K (2005) Crossing the language chasm. Health Aff (Millwood) 24(2):424–434
20. Cabassa LJ, Zayas LH (2007) Latino immigrants' intentions to seek depression care. Am J Orthopsychiatry 77(2):231–242
21. Cabassa LJ, Zayas LH, Hansen MC (2006) Latino adults' access to mental health care: a review of epidemiological studies. Admin Policy Ment Health 33(3):316–330

22. Canino G et al (1999) The Spanish Alcohol Use Disorder and Associated Disabilities Interview Schedule (AUDADIS): reliability and concordance with clinical diagnoses in a Hispanic population. J Stud Alcohol 60(6):790–799

23. Caplan S (2007) Latinos, acculturation, and acculturative stress: a dimensional concept analysis. Policy Polit Nurs Pract 8(2):93–106

24. Chatterji S et al (1997) Reliability of the alcohol and drug modules of the Alcohol Use Disorder and Associated Disabilities Interview Schedule–Alcohol/Drug-Revised (AUDADIS-ADR): an international comparison. Drug Alcohol Depend 47(3):171–185

25. Cohen E et al (2007) Alcohol treatment utilization: findings from the National Epidemiologic Survey on Alcohol and Related Conditions. Drug Alcohol Depend 86(2–3):214–221

26. Compton WM et al (2007) Prevalence, correlates, disability, and comorbidity of DSM-IV drug abuse and dependence in the United States: results from the national epidemiologic survey on alcohol and related conditions. Arch Gen Psychiatry 64(5):566–576

27. Corbie-Smith G, Thomas SB, St George DM et al (2002) Distrust, race, and research. Arch Intern Med 162(21):2458–2463

28. Corrigan PW, Kuwabara SA, O'Shaughnessy J (2009) The public stigma of mental illness and drug addiction: findings from a stratified random sample. J Social Work 9(2):139–147

29. Corrigan PW, Watson AC (2007) The stigma of psychiatric disorders and the gender ethnicity, and education of the perceiver. Commun Ment Health J 43(5):439–458

30. Cottler LB et al (1997) Concordance of DSM-IV alcohol and drug use disorder criteria and diagnoses as measured by AUDADIS-ADR, CIDI and SCAN. Drug Alcohol Depend 47(3):195–205

31. Dixon LB, Sundquist J, Winkleby M (2000) Differences in energy, nutrient, and food intakes in a US sample of Mexican-American women and men: findings from the Third National Health and Nutrition Examination Survey, 1988–1994. Am J Epidemiol 152(6):548–557

32. Escobedo LG, Kirch DG, Anda RF (1996) Depression and smoking initiation among US Latinos. Addiction 91(1):113–119

33. Finch BK, Kolody B, Vega WA (2000) Perceived discrimination and depression among Mexican-origin adults in California. J Health Soc Behav 41(3):295–313

34. Flaskerud JH, Hu LT (1992) Racial/ethnic identity and amount and type of psychiatric treatment. Am J Psychiatry 149(3):379–384

35. Gandek B et al (1998) Tests of data quality, scaling assumptions, and reliability of the SF-36 in eleven countries: results from the IQOLA Project. International Quality of Life Assessment. J Clin Epidemiol 51:1149–1158

36. Garces IC, Scarinci IC, Harrison L (2006) An examination of sociocultural factors associated with health and health care seeking among Latina immigrants. J Immigr Minor Health 8(4):377–385

37. Goel MS et al (2003) Racial and ethnic disparities in cancer screening: the importance of foreign birth as a barrier to care. J Gen Intern Med 18(12):1028–1035

38. Gonzales NA et al (2000) Acculturation and the mental health of Latino youths: an integration and critique of the literature. In: Contreras JM, Kerns KA, Neal-Barnett AM (eds) Latino children and families in the United States: current research and future directions. Praeger Publishers

39. Grant BF (1996) DSM-IV, DSM-III-R, and ICD-10 alcohol and drug abuse/harmful use and dependence, United States, 1992: a nosological comparison. Alcohol Clin Exp Res 20(8):1481–1488

40. Grant BF, Harford TC (1988) The relationship between ethanol intake and DSM-III alcohol use disorders: a cross-perspective analysis. J Subst Abuse 1(2):231–252

41. Grant BF et al (1995) The Alcohol Use Disorder and Associated Disabilities Interview Schedule (AUDADIS): reliability of alcohol and drug modules in a general population sample. Drug Alcohol Depend 39(1):37–44

42. Grant BF et al (2003) The Alcohol Use Disorder and Associated Disabilities Interview Schedule-IV (AUDADIS-IV): reliability of alcohol consumption, tobacco use, family history of depression and psychiatric diagnostic modules in a general population sample. Drug Alcohol Depend 71(1):7–16

43. Grant BF et al (1992) DSM-III-R and the proposed DSM-IV alcohol use disorders, United States 1988: a nosological comparison. Alcohol Clin Exp Res 16(2):215–221

44. Grant BF et al (2004) Immigration and lifetime prevalence of DSM-IV psychiatric disorders among Mexican Americans and non-Hispanic whites in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions. Arch Gen Psychiatry 61(12):1226–1233

45. Grant BF et al (2008) Sociodemographic and psychopathologic predictors of first incidence of DSM-IV substance use, mood and anxiety disorders: results from the Wave 2 National Epidemiologic Survey on Alcohol and Related Conditions. Mol Psychiatry

46. Guarnaccia P et al (2007) Assessing diversity among Latinos: results from the NLAAS. Hisp J Behav Sci 29(4):510–534

47. Gutmann MC (1999) Ethnicity, alcohol, and acculturation. Soc Sci Med 48(2):173–184

48. Harris KM, Edlund MJ, Larson S (2005) Racial and ethnic differences in the mental health problems and use of mental health care. Med Care 43(8):775–784

49. Hasin DS, Grant B (1994) Nosological comparisons of DSM-III-R and DSM-IV alcohol abuse and dependence in a clinical facility: comparison with the 1988 National Health Interview Survey results. Alcohol Clin Exp Res 18(2):272–279

50. Hasin D et al (1997) Alcohol dependence and abuse diagnoses: validity in community sample heavy drinkers. Alcohol Clin Exp Res 21(2):213–219

51. Hasin D et al (1997) The alcohol use disorder and associated disabilities interview schedule (AUDADIS): reliability of alcohol and drug modules in a clinical sample. Drug Alcohol Depend 44(2–3):133–141

52. Hasin D et al (1997) Nosological comparisons of alcohol and drug diagnoses: a multisite, multi-instrument international study. Drug Alcohol Depend 47(3):217–226

53. Hasin DS et al (2007) Prevalence, correlates, disability, and comorbidity of DSM-IV alcohol abuse and dependence in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions. Arch Gen Psychiatry 64(7):830–842

54. Hasin DS et al (1994) Validity of the bi-axial dependence concept: a test in the US general population. Addiction 89(5):573–579

55. Hatzenbuehler ML et al (2008) Racial/ethnic disparities in service utilization for individuals with co-occurring mental health and substance use disorders in the general population: results from the national epidemiologic survey on alcohol and related conditions. J Clin Psychiatry 69(7):1112–1121

56. Hough RL et al (1987) Utilization of health and mental health services by Los Angeles Mexican Americans and non-Hispanic whites. Arch Gen Psychiatry 44(8):702–709

57. Institute of Medicine (2004) In the National compelling interest: ensuring diversity in health care workforce. National Academy Press, Washington DC

58. Johnson CE et al (2008) Cervical cancer screening among immigrants and ethnic minorities: a systematic review using the Health Belief Model. J Low Genit Tract Dis 12(3):232–241

59. Kessler RC et al (2005) Prevalence and treatment of mental disorders, 1990–2003. N Engl J Med 352(24):2515–2523

60. Keyes KM et al (2008) Service utilization differences for Axis I psychiatric and substance use disorders between white and black adults. Psychiatr Serv 59(8):893–901

61. Kirmayer LJ et al (2003) Cultural consultation: a model of mental health service for multicultural societies. Can J Psychiatry 48(3):145–153

62. Lara M et al (2005) Acculturation and Latino health in the United States: a review of the literature and its sociopolitical context. Annu Rev Public Health 26:367–397

63. Marin G, Posner SF (1995) The role of gender and acculturation on determining the consumption of alcoholic beverages among Mexican-Americans and Central Americans in the United States. Int J Addict 30(7):779–794

64. Marin G et al (1987) Development of a short acculturation scale for Hispanics. Hisp J Behav Sci 9:183–205

65. Markowitz JC et al (2009) Toward an adaptation of interpersonal psychotherapy for Hispanic patients with DSM-IV major depressive disorder. J Clin Psychiatry 70(2):214–222

66. Moy E et al (2005) Preparing the national healthcare disparities report: gaps in data for assessing racial, ethnic, and socioeconomic disparities in health care. Med Care 43(3 Suppl):I9–I16

67. Narrow WE et al (1990) Depression among Cuban Americans. The Hispanic Health and Nutrition Examination Survey. Soc Psychiatry Psychiatr Epidemiol 25(5):260–268

68. Ong AD, Phinney JS, Dennis J (2006) Competence under challenge: exploring the protective influence of parental support and ethnic identity in Latino college students. J Adolesc 29(6):961–979

69. Padgett DK et al (1994) Ethnicity and the use of outpatient mental health services in a national insured population. Am J Public Health 84(2):222–226

70. Pescosolido BA et al (1998) Social networks and patterns of use among the poor with mental health problems in Puerto Rico. Med Care 36(7):1057–1072

71. Pew Hispanic Center (2006) From 200 million to 300 million: the numbers behind population growth. 2006 [cited 12 May 2009], Available from http://pewhispanic.org/files/factsheets/25.pdf

72. Phinney JS, Cantu CL, Kurtz DA (1997) Ethnic and American identity as predictors of self-esteem among African American, Latino, and White adolescents. J Youth Adolesc 26:165–185

73. Portes A, Rumbaut R (2001) Legacies: the story of the immigrant second generation. Russell Sage Foundation, Berkley

74. Publications and Reports of the Surgeon General (2001) Mental health care for Hispanic Americans. Mental health: culture, race, and ethnicity. Available at: http://www.ncbi.nlm.nih.gov/bookshelf/br.fcgi?book=hssurggen&part=A2062

75. Pull CB et al (1997) Concordance between ICD-10 alcohol and drug use disorder criteria and diagnoses as measured by the AUDADIS-ADR, CIDI and SCAN: results of a cross-national study. Drug Alcohol Depend 47(3):207–216

76. Rahim-Williams FB et al (2007) Ethnic identity predicts experimental pain sensitivity in African Americans and Hispanics. Pain 129(1–2):177–184

77. Ruan WJ et al (2008) The alcohol use disorder and associated disabilities interview schedule-IV (AUDADIS-IV): reliability of new psychiatric diagnostic modules and risk factors in a general population sample. Drug Alcohol Depend 92(1–3):27–36

78. Schwartz SJ, Zamboanga BL (2008) Testing Berry's model of acculturation: a confirmatory latent class approach. Cultur Divers Ethnic Minor Psychol 14(4):275–285

79. Simpson SM et al (2007) Racial disparities in diagnosis and treatment of depression: a literature review. Psychiatr Q 78(1):3–14

80. Stockdale SE et al (2008) Racial and ethnic disparities in detection and treatment of depression and anxiety among psychiatric and primary health care visits, 1995–2005. Med Care 46(7):668–677

81. Suarez-Orozco C, Suarez-Orozco MM (2004) Children of immigration. Harvard University Press, Harvard

82. Umana-Taylor AJ, Updegraff KA (2007) Latino adolescents' mental health: exploring the interrelations among discrimination ethnic identity, cultural orientation, self-esteem, and depressive symptoms. J Adolesc 30(4):549–567

83. US Census Bureau (2006) Hispanic Population of the United States. [cited 12 May 2009] http://www.census.gov/population/www/socdemo/hispanic/hispanic.html

84. US Department of Health and Human Services (2007) 2007 National Health Care Disparities Report [cited 19 March 2009] http://www.ahrq.gov/qual/nhdr07/nhdr07.pdf

85. US Department of Health and Human Services (2000) Healthy people 2010: understanding and improving health. US Government Printing Office, Washington, DC

86. US Department of Health and Human Service Substance Abuse and Mental Health Services Administration (2001) Mental health: culture, race, and ethnicity—a supplement to mental health: a report of the surgeon general. Center for Mental Health Services, Maryland

87. Ustun B et al (1997) WHO study on the reliability and validity of the alcohol and drug use disorder instruments: overview of methods and results. Drug Alcohol Depend 47(3):161–169

88. Vega WA, Amaro H (1994) Latino outlook: good health, uncertain prognosis. Annu Rev Public Health 15:39–67

89. Vega WA, Kolody B, Aguilar-Gaxiola S (2001) Help seeking for mental health problems among Mexican Americans. J Immigr Health 3(3):133–140

90. Vega WA, Lopez SR (2001) Priority issues in Latino mental health services research. Ment Health Serv Res 3(4):189–200

91. Vega WA et al (1999) Gaps in service utilization by Mexican Americans with mental health problems. Am J Psychiatry 156(6):928–934

92. Vega WA et al (2007) Research issues for improving treatment of US Hispanics with persistent mental disorders. Psychiatr Serv 58(3):385–394

93. Vrasti R et al (1998) Reliability of the Romanian version of the alcohol module of the WHO Alcohol Use Disorder and Associated Disabilities: Interview Schedule–Alcohol/Drug-Revised. Eur Addict Res 4(4):144–149

94. Wang PS et al (2005) Twelve-month use of mental health services in the United States: results from the National Comorbidity Survey Replication. Arch Gen Psychiatry 62(6):629–640

95. Wells K et al (2001) Ethnic disparities in unmet need for alcoholism, drug abuse, and mental health care. Am J Psychiatry 158(12):2027–2032

96. Wells KB et al (1987) Which Mexican-Americans underutilize health services? Am J Psychiatry 144(7):918–922

97. Williams CL, Berry JW (1991) Primary prevention of acculturative stress among refugees: application of psychological theory and practice. Am Psychol 46(6):632–641

98. Zamboanga BL, Raffaelli M, Horton NJ (2006) Acculturation status and heavy alcohol use among Mexican American college students: investigating the moderating role of gender. Addict Behav 31(12):2188–2198