Journal of Health Disparities Research and Practice
Volume 9, Issue 3 Fall 2016, pp. 45-66

School of Community Health Sciences
University of Nevada, Las Vegas

Depression Symptoms, Acculturation, Needing Care, and Receiving Care: A Study of Adolescents Living in California

Shahrzad Bazargan-Hejazi, PhD, Charles Drew University of Medicine and Science & David Geffen School of Medicine, University of California, Los Angeles
Mohsen Bazargan, PhD, Charles Drew University of Medicine and Science & David Geffen School of Medicine, University of California, Los Angeles
Magda Shaheen, PhD, MPH, MS, Charles Drew University of Medicine and Science & David Geffen School of Medicine, University of California, Los Angeles
Senait Teklehaimanot, MS, Charles Drew University of Medicine and Science
Alireza Ahmadi, MD, PhD, FCPM, Kermanshah University of Medical Sciences, Kermanshah, Iran
Joan Smith Cooper, PhD, Charles Drew University of Medicine and Science
Stacey Teruya, EdD, Charles Drew University of Medicine and Science & David Geffen School of Medicine, University of California, Los Angeles

ABSTRACT

Background**:** The objectives of this study are 1) to depict the prevalence of moderate depressive symptoms (MDS) in adolescents living in California, 2) to examine the role of acculturation in reported MDS, and 3) to identify any relationship between acculturation, "needing emotional help," and "receiving psychological or emotional counseling," as reported by adolescents with MDS.

Methods**:** We analyzed data from a cross-sectional population-based telephone survey for adolescents who completed the California Health Interview Survey (CHIS) in 2007, 2009, and 2011-2012. The primary predictor variable was level of acculturation. Outcome variables were 1) the presence of MDS, 2) whether participants needed help with emotional problems, and 3) whether they had received psychological or emotional counseling.

Results: Of the sample (n = 9816), 6.0% had MDS; 50% of these reported needing help for emotional problems, and 30% reported receiving psychological/emotional counseling. Multivariate analysis that included the interaction effects of race/ethnicity and acculturation showed that the latter was not associated with any of the outcome variables. However, Latino adolescent with MDS and moderate acculturation were less likely to report needing help for psychological/emotional problems, compared to their White counterparts with higher acculturation.

Conclusion: Our findings suggest disparities in reporting depression symptoms and receiving psychological/emotional help are not driven by adolescents' acculturation levels. However, more

studies are needed to clarify what cultural factors facilitate or inhibit moderately acculturated Latino adolescents from reporting needing help for psychological/emotional problems.

Keywords: Adolescents, depression symptoms, acculturation, psychological counseling, emotional help.

INTRODUCTION

An estimated 5 - 9% of American adolescents suffer from major depression. Approximately 20% of all youth in the U. S. will experience at least one episode of major depression before 18 (Lynch FL & Clarke GN, 2006), with peak age of onset between 13 – 15 years of age (Rudolph KD., 2009). An even higher percentage (20 - 50%) are affected by depression symptoms (Ronald C. Kessler et al., 2001). Besides its obvious adverse effects, uncontrolled depression has been associated with many physical and mental health conditions that include suicide ideation, self-harm, and suicide (Burns & Birrell, 2014), as well as high health care costs (Bazargan-Hejazi S, Alvarez G, Teklehaimanot S, Nikakhtar N, & Bazargan, 2010; Katon WJ, 2003; Mather, Cox, Enns, & Sareen, 2009). However, only 30% of adolescents with MDS will receive any intervention or treatment (Son & Kirchner, 2000), which has been shown to be effective in both children and adolescents (March et al., 2007). This failure in identifying depression and providing early intervention constitutes a health disparity, which is significant and requires attention (D. Kessler, Sharp, & Lewis, 2005).

The diathesis-stress model (Monroe SM & Simons AD, 1991) may explain why certain individuals may be more susceptible and resistant to depression than others (Rudolph KD, 2009). It is also relevant in identifying antecedents and the precedence of depression. Adolescents who experience stress as substantial amounts of adversity in their environment, for example, are more likely to develop depression (Rudolph KD, 2009). Besides chronic stressful situations and daily hassles, experiences that arise from disadvantaged socioeconomic status, as well as conflict and loss in relationships, can trigger depression and depression symptoms. In the diathesis-stress model, biological, physiological, cognitive and socio-behavioral deficits or surplus are seen to influence each individual's reaction to such situations, as well as to environmental, contextual, and interpersonal-generated stresses (Hankin BL, Mermelstein R, & Roesch L., 2007; Krackow E & Rudolph KD., 2008).

The acculturation process and related risk factors are also seen to trigger stress, as well as to make immigrant adolescents vulnerable to depression (Garcia C & Lindgren S, 2009). As a whole, racial/ethnic minority youth living in the United States suffer higher rates of depression and anxiety than Whites, with gender differences consistent across race/ethnicities (C. Anderson & Logan, 2010; S. E. Anderson et al., 2011; Murray et al., 2012). Bhugra (Bhugra D, 2005) argues that a disconnect from protective cultural values and resources, as well as a constellation of risk factors associated with immigrant status, can contribute to depression in the immigrant population. The lack of supportive community and success in adjusting to and reconciling familial, cultural and social differences and challenges appears to affect all immigrant groups (Caplan, 2007; Turner, Lloyd, & Taylor, 2006), resulting in depression and substance abuse (Bhattacharya, 2008). These stressors are seen to arise from cultural expectations and norms associated with hopelessness and frustration about future work prospects.

"Acculturation" remains complex and multidimensional (Beck CT, Froman RD, & Bernal H, 2005; Bhugra D, 2005). Despite much research, its association with depression is not yet fully understood (Berry JW, 2002). This may be due, at least in part, to the lack of universal consensus on its definition and measurement. Language (Marin & Marin, 1990), country of birth, nationality of both parents, number of years in the U. S. (Mikolajczyk RT, Bredehorst M, Khelaifat N, Maier C, & Maxwell AE, 2007), and psychosocial adjustment (Kang, Domanski, & Moon, 2009) are posited criteria and predictors. Moreover, "acculturative stress," "acculturation," and "acculturation-related stress" (Buchanan & Smokowski, 2009) are imprecise, sometimes overlap, or are even used interchangeably in the literature. These considerations led us to the following study objectives: 1) to depict the prevalence of MDS in adolescents living in California between 2007 and 2012, 2) to examine the role of acculturation in reported MDS, and 3) to identify any relationship between acculturation, "needing emotional help," and "receiving psychological counseling," as reported among adolescents with MDS.

In positing a mental health stressor which transforms acculturation-related stress into a risk factor for depression (Bhugra, 2004; Garber et al., 2009), we expect that adolescents with a lower level of acculturation will be more likely to report MDS, compared to their more acculturated counterparts. In addition, among those with such symptoms, we expect that a lower level of acculturation will predict the "need for emotional help" and "not receiving emotional or psychological counseling."

METHODS

Study Design, Instrument and Sampling

This was an analyses of a cross-sectional, population-based study using combined data from the adolescent version of the California Health Interview Survey (CHIS) 2007, 2009, and 2011-2012. Prior to 2011, CHIS was conducted every other year. Modeled after the National Health Interview Survey, CHIS provides population-based estimates for civilian, non-institutionalized Californians (*http://www.chis.ucla.edu*). Using a multi-stage sampling design, the CHIS telephone survey is one of the largest state-level health surveys ever conducted in the United States. Random digit dialing (RDD) was used to select one adult age 18 or over per household for interview. In addition, one adolescent was randomly selected for interview in households with children between the ages of 12 and 17.

To obtain consent from potential participants, a screening script was first read to explain the major points of the study and the survey. It included statements about general aims, sponsoring institutions, the confidential and voluntary nature of the interview, and the respondent's right to withdraw from the study, or skip any questions at any time during the interview. Potential respondents were then asked if they were willing to participate in the survey. Those who chose to continue thereby implied consent. Response rate for the CHIS survey was reported at 33.5%.

The survey was conducted in five different languages, and data was collected from more than 40,000 households. These included male and female respondents, representative of races and ethnicities commonly encountered in California. The interview covered topics such as health status, health behaviors, risk prevention behaviors, access to, and utilization of, health care services, and health insurance coverage. Approval for the CHIS study was obtained from the UCLA Research Ethics Committee. For this study, we considered a total of 9816 males and females of all race/ethnicities, between the ages of 12 and 17.

Outcome (Dependent) Variables

Three outcome variables were used for this study: 1) the presence of MDS, 2) whether participants needed help with emotional problems, and 3) whether they had received psychological or emotional counseling. MDS were measured using the *Kessler Psychological Distress Scale* (K6), which ask respondents how frequently they experienced the following six symptoms in the past 30 days: 1) depressed, 2) restless, 3) nervous, 4) hopeless, 5) that everything was an effort, and 6) feeling worthless. The response options were "never" = 0, "a little of the time" = 1, "some of the time" = 2, "most of the time" = 3, and "all of the time" = 4 (R. C. Kessler et al., 2003). The sum of the scores range between 0 and 24. Previous research has shown that dichotomous scoring of responses in the range 13+ versus 0–12 distinguishes between respondents with and without severe mental illness with high accuracy (Furukawa, Kessler, Slade, & Andrews, 2003; R. C. Kessler et al., 2003).

Needing help for emotional problems was measured using a "yes" (= 1) or "no"(= 0) response to the following question: "In the past 12 months, did you think you needed help for emotional or mental health problems, such as feeling sad, anxious, or nervous?" Similarly, *having received psychological or emotional counseling* was assessed using "yes" or "no" responses to: "In the past 12 months, have you received any psychological or emotional counseling?"

Primary Independent Variable

Acculturation level was the primary independent variable for this study, and was measured using seven items from a previous CHIS study (Mikolajczyk, Bredehorst, Khelaifat, Maier, & Maxwell, 2007) (Table 1):

1. Adolescent's place of birth (born in U. S. or not born in U. S.).
2. Language spoken at home (English, English and non-English, non-English).
3. Language spoken during the data gathering/interview process (English, non-English).
4. Years teen lived in USA (<=1 year, 2-4 years, 5-9 years, 10-14 years).
5. Citizenship of father (U.S. born, naturalized, non-U.S. citizen).
6. Citizenship of mother (U.S. born, naturalized, non-U.S. citizen).
7. Teen's citizenship (U.S. born, naturalized, non-U.S. citizen).

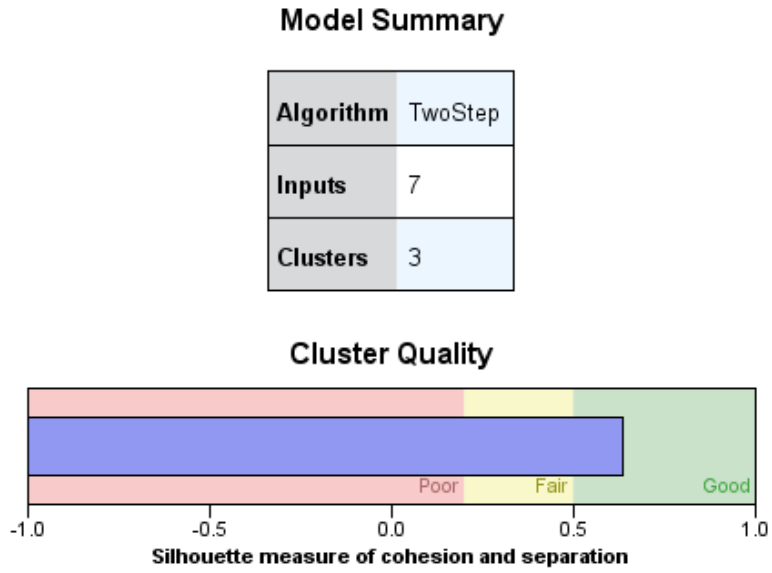
Table 1: Items used to derive the acculturation variable.

Items used to develop the acculturation variable	ACCULTURATION		
	Low	**Moderate**	**High**
Language of interview			
English	731(8.0)	3618(39.8)	4740(52.2)
Not English	386(53.1)	341(46.9)	0(0.0)
Language spoken at home			
English	118(2.1)	883(15.4)	4740(82.6)
English/Other language	368(23.0)	1229(77.0)	0(0.0)
Non English language	631(25.5)	1847(74.5)	0(0.0)
County of birth			
US born	0(0.0)	3959(45.5)	4740(54.5)
Foreign born	1117(100.0)	0(0.0)	0(0.0)
Years Adolescent lived in US			
Born in US	0(0.0)	3959(45.5)	4740(54.5)
<5 years	73(100.0)	0(0.00)	0(0.0)
5-4 years	184(100.0)	0(0.0)	0(0.0)
5-9 years	365(100.0)	0(0.0)	0(0.0)
10 -14 years	426(100.0)	0(0.0)	0(0.0)
15 or more years	69(100.0)	0(0.0)	0(0.0)
Citizenship & immigration status of father			
Native	110(1.9)	1063(18.0)	4740(80,2)
Naturalized	226(12.4)	1595(87.6)	0(0.0)
Non-Citizen	781(37.5)	1301(62.5)	0(0.0)
Citizenship & immigration status of mother			
Native	84(1.4)	1166(19.5)	4740(79.1)
Naturalized	184(11.2)	1458(88.8)	0(0.0)
Non-Citizen	849(38-9)	1335(61.1)	0(0.0)
Citizenship			
Native	0(0.0)	3959(45.5)	4740(54.5)
Naturalized	346(100.0)	0(0.0)	0(0.0)
Non-Citizen	771(100.0)	0(0.0)	0(0.0)

We used a two-step cluster analysis procedure, a scalable cluster analysis algorithm designed to handle very large datasets. This procedure reveals natural groupings or clusters within a dataset. We derived the acculturation variable using data from the aforementioned seven CHIS variables. The algorithm can handle categorical and continuous variables. By comparing the values of a model-choice criterion across different clustering solutions, we were able to determine and test the optimal number of clusters. Through clustering, we grouped the data so that records within a group are similar. This procedure used the model-based distance measure for both categorical and continuous data. We defined the distance between two clusters as the corresponding decrease in log-likelihood by combining them into one cluster. Bayesian information criterion (BIC) was used as the criterion statistic.

To determine the optimal number of clusters, we used the hierarchical clustering method, wherein we first calculate BIC for each number of clusters within a specified range, and use it to find the initial estimate for the number of clusters. We then refine the initial estimate by finding the greatest change in distance between the two closest clusters in each hierarchical clustering stage. Cluster quality was measured by Silhouette measure of cohesion and separation, where a value > 0.5 indicates good quality (Figure 1). Three clusters were found to satisfy our statistical criterion, and they have been coded as 1) low acculturation, 2) moderate acculturation, and 3) high acculturation.

Figure 1. Model summary and silhouette measure of cohesion and separation for the acculturation variable



Other Independent Variables

Potential confounding variables in this study include 1) gender (male vs. female), 2) age (12-14 vs. 15-17), 3) race/ethnicity (White/non-Latino, Latino [from 9 national origins], African American, Asian, and Other, including American Indian/Alaskan Native), (UCLA Center for Health Policy Research) 4) parents' marital status (single or married), 5) parents' education (high school or less vs. college and above), 6) poverty level, as defined by Federal Poverty Level (FPL) (< 200 % FPL vs. ≥ 200 % FPL) and computed using the respondent's number of household members, and total annual household income before taxes, 7) having a usual source of care (yes or no), 8) having health insurance (yes or no), 9) perceived health (excellent, very good, good, fair, poor), and 9) delayed/did not get medical care (yes or no).

Data Analysis

All analyses were conducted using STATA 14.0. To produce accurate standard errors, replication weights were used to control for the complex CHIS sample design. These allow researchers to generate accurate standard errors, confidence intervals, and test of significance for

population estimates. Additional information on how replication weights were applied to CHIS data is available at *www.chis.ucla.edu/pdf/weighting_var_chis_02282007.pdf*.

Descriptive statistics were used to report 1) socio-demographic characteristics of the sample, 2) prevalence of MDS, and 3) the need and the use of psychological or emotional counseling. Bivariate analyses using the chi-squared test of independence were used to identify variables other than the primary independent variable (acculturation), associated with the outcomes. Multivariate logistical regression models were used to adjust for the effects of the confounding variables, and to determine the independent association, if any, between acculturation and 1) MDS, 2) needing help with emotional problems, and 3) receiving psychological or emotional counseling.

To test for factors that could modify the relationship between acculturation and the outcomes variables (i. e. effect modifier), we included the interaction terms in the multivariate logistic regression model. We considered the interaction of race, gender, age, and "had usual source of care" with the acculturation variable. Data were presented as an odds ratio and 95% confidence interval (CI). Statistical significance was defined as having a p-value < 0.05.

RESULTS

Descriptive Analysis: Characteristics of Sample Population

The prevalence of MDS in our overall sample (n = 9816) was 6.0% (Table 2). The mean age of the sample was 14.5 years (SD = 1.68). Whites comprised 37% of the sample, followed by Latinos (30%). The majority of parents were married (71.0%). Ninety percent of adolescents perceived their health as "very good" and "good," while 7% reported their health as fair or poor. More than 80% of the sample reported having a usual source of care, and 94% reported being currently insured. About 13% were classified in the "low acculturation" group, whereas 43.5% and 44.0% were classified as moderately and highly acculturated, respectively (Table 2).

2: Selected characteristics of the study sample (n = 9816).

Patient characteristics	Number	Percent
Gender		
Male	4959	51.0
Female	4857	49.0
Race/Ethnicity		
White	4782	37.8
African American	374	6.4
Latino	2408	30.0
Asian	926	10.4
Other	1326	15.4
Age		
12-14	4856	48.8
15-17	4960	51.2
Parents' Marital Status		
Single	2058	29.0
Married	7758	71.0
Parental Education		
<HS/HS	3425	39.0
College	6287	61.0
Poverty Level		
<200% FPL	3489	41,2
>=200% FPL	6327	58.8
Currently Insured		
Yes	9236	94.0
No	579	6.0
Perceived Health Status		
Excellent / Very Good / Good	8978	90.4
Fair / Poor	838	9.6
Have Usual Source of Care		
Yes	8231	82.5
No	1585	17.5
Depression Symptoms		
Yes	566	6.0
No	9250	94.0
Needed help for emotional problems		
Yes	1421	15.0
No	8395	85.0
Received psychological counseling		
Yes	979	10.0
No	8837	90.0
Delayed medical care		
Yes	503	5.2
No	9313	94.8
Acculturation		
Low	1117	12.5
Moderate	3959	43.5
High	4740	44.0

Bivariate and Multivariate Analyses for MDS

Table 3 showed that MDS did not vary significantly by acculturation ($p>0.05$). Three variables were found to be significantly associated ($p<0.05$) with MDS: 1) gender; 2) self-perceived health status; and 3) delayed medical care. Female had higher percentage of MDS than male (female=8.5% versus 4% in male). Participants who perceived their health status as fair/poor had higher percentage of MDS compared to the excellent/very good/good group (fair/poor=12% versus 5.5% in excellent/very good/good). Those who reported having delayed medical care had higher prevalence of MDS relative to those who did not report delayed medical care (had delayed medical care=18% versus 5.5% in those who did not have delay in medical care) (Table 3, Column 1).

The independent predictors of MDS among the sample (n = 9712) are reported in Table 4. The three significant predictors include being female (OR = 2.8, CI = 1.2.0 -4.1, $p < 0.001$), reporting fair or poor health (OR = 2.3, CI = 1.7-3.2, $p < 0.001$), and experiencing "delayed medical care" (OR = 3.6, CI = 2.6-4.5, $p < 0.001$).

Table 4. Odds ratio and 95% confidence interval for the association between acculturation and MDS, needed help for emotional problem, and received psychological counseling or emotional counseling using multiple logistic regression.

Outcome = MDS (N=9,712)	**Odds Ratio (95%CI)**	**P-Value**
Acculturation		
High (referent)		
Moderate	1.71(0.93, 1.67)	0.153
Low	1.26 (0.41, 3.89)	0.685
Gender*		
Male (referent)		
Female	2.84 (1.96, 4.13)	<0.001
Perceived Health*		
Excellent/very good/good (referent)		
Fair/poor	2.34 (1.71, 3.22)	<0.001
Delayed Medical Care*		
No (referent)		
Yes	3.54 (2.52, 4.97)	<0.001
Race/ Ethnicity		
White (referent)		
African American	1.03 (0.55, 1.94)	0.910
Latino	0.94 (0.53, 1.69)	0.843
Asian and Others	0.87 (0.54, 1.40)	0.571
Race/Ethnicity X Acculturation		
High White (referent)		
African American Moderate	0.93 (0.28, 3.12)	0.912
African American Low	1.56 (0.05, 49.55)	0.800
Latino Moderate*	0.80 (0.35, 1.82)	0.594
Latino Low	0.63 (0.19, 2.14)	0.462
Asian and other Moderate*	1.20 (0.57, 2.53)	0.635
Asian and other Low*	1.05 (0.28, 3.96)	0.946
Outcome = Needed Help for Emotional Problem among the MDS sample (N=556)	**Odds Ratio (95%CI)**	**P-Value**
Acculturation		
High (referent)		
Moderate	3.55 (0.79, 15.88)	0.097
Low	0.72 (0.03, 19.75)	0.847
Race/ Ethnicity		
White (referent)		
African American	2.51 (0.74, 8.48)	0.139
Latino*	4.82 (0.97, 24.04)	0.055
Asian and Other	0.73 (0.29, 1.87)	0.514
Gender		
Male (referent)		
Female*	3.72 (1.62, 8.55)	0.002

Race/Ethnicity X Acculturation High White (referent) African American Moderate African American Low Latino Moderate* Latino Low Asian and other Moderate* Asian and other Low*	 0.28 (0.03, 2.55) 4.67 (0.41, 53.93) 0.09 (0.01, 0.60) 0.66 (0.04, 11.42) 0.38 (0.09, 1.62) 4.28 (0.13, 144.00	 0.256 0.215 0.013 0.774 0.190 0.417
Outcome = Received Psychological Counseling or Emotional Counseling among the sample with MDS (N=550)	**Odds Ratio (95%CI)**	**P-Value**
Acculturation High (referent) Moderate Low	 0.47 (0.07, 3.38) 0.85 (0.51, 14.27)	 0.453 0.912
Race/ Ethnicity White (referent) African American Latino Asian and Other	 0.82 (0.24, 2.86) 0.46 (0.096, 2.23) 0.79 (0.25, 2.56)	 0.759 0.335 0.696
Race/Ethnicity X Acculturation High White (referent) African American Moderate African American Low Latino Moderate* Latino Low Asian and other Moderate* Asian and other Low*	 Empty [not calculated] 0.28 (0.03, 3.09) 1.93 (0.32, 11.64) 1.34 (0.11, 16.35) 0.54 (0.097, 3.01) 4.51 (0.24, 83.72)	 0.299 0.470 0.817 0.481 0.311

***Statistically Significant**
All models were adjusted for: age group, sex, race/ethnicity, marital status, parent's education, poverty level, insurance status, had usual source of health care, self-perceived health status, delay in receiving the medication, and the interaction of acculturation variable with race/ethnicity, sex, age, and had usual source of health care.

Female adolescents had 2.8 times greater odds of reporting MDS than males. Similarly, adolescents who perceived their health status as fair or poor were twice as likely to report MDS than those who perceived their health as excellent, very good and good. In addition, adolescents who reported "delayed medical care" had 3.6 times higher odds of experiencing MDS than those who reported "no delayed medical care" in the past 12 months. There was no significant relationship between MDS and acculturation ($p > 0.05$).

Bivariate and Multivariate Analyses for "Needing Help for Emotional Problems"

Table 3 (Column 2) reveals that among those with MDS (n = 556), 55% reported needing help for emotional problems. At the bivariate level, needing help for emotional problems was significantly associated ($p < 0.05$) with gender. Table 4 reveals that among those with depressive symptoms, females had higher odds of needing emotional help (OR = 3.7, CI = 1.6-8.6, $p = 0.002$), compared to males. Although African American, Latinos, and other racial/ethnic groups had higher odds for needing help for emotional problems compared to White, the relationships were not statistically significant ($p > 0.05$).

While there was no significant relationship between needing emotional help and acculturation ($p > 0.05$), the interaction term between acculturation levels and race/ethnicity was statistically significant for Latinos with moderate acculturation levels relative to Whites with high acculturation ($p = 0.013$). Latinos with moderate acculturation levels had lower odds of needing help for emotional problems, compared to Whites with high acculturation level (OR = 0.09, CI = 0.01 – 0.60, $p = 0.013$).

Bivariate and Multivariate Analyses for Receiving Psychological or Emotional Counseling

Table 3, column 3 reports that, of those identified with MDS (n = 556), 30% received emotional or psychological counseling. At the bivariate level, receiving such counseling was significantly associated ($p < 0.05$) with gender, parental education, poverty level, delay in receiving care, and acculturation level. Table 4 indicates that there was no significant relationship between receiving psychological or emotional counseling, and acculturation levels, after controlling for the confounding variables in the model ($p > 0.05$).

We repeated the multivariate logistic model for receiving psychological or emotional counseling among moderately depressed adolescents, and included the variable "needed help for emotional problems" as an additional predictor. The results showed that this was the only significant predictor for receiving psychological or emotional counseling (OR = 3.13, 95% CI = 1.79 – 5.51). The interference about size, direction, and magnitude of main effects without interaction is reported in Appendix 1.

Table 3. Correlates of moderate depression symptoms (MDS), needing emotional help, and receiving psychological or emotional counseling.

	Adolescents with (K6 > 10) or without (K6 ≤ 10) MDS (N=9816)		**Adolescents with K6> 10 who answered question about needing help with emotional problems (N=566)**		**Adolescents with K6> 10 who answered questions about receiving psychological or emotional counseling (N=566)**	
	K6 ≤10 9250 (93.8%)	**K6 >10 566(6.2%)**	**Yes 332(55.0%)**	**No 234(45.0%)**	**Yes 181(30.0%)**	**No 385(70.0%)**
Gender						
Male	4762(96.0)	197 (4.0)	87(38.8)	110(61.2)	51(21.6)	146(78.4)
Female	4448(91.5)	369 (8.5)	245(62.6)	124(37.4)	130(34.3)	239(65.7)
P-value	**0.001***		**0.001***		**0.039***	
Age						
12-14	4626(94.4)	230 (5.6)	118(49.6)	112(50.4)	65(28.7)	165(71.3)
15-17	4624(93.3)	336 (6.7)	214(59.0)	122(41.0)	116(31.4)	220(68.6)
P-value	0.174		0.148		0.670	
Race/Ethnicity						
White	4526(94.0)	256(6.0)	164(62.4)	92(37.6)	103(40.0)	153(60.0)
African American	347 (93.3)	27(6.7)	18(69.0)	9(31.0)	6(19.0)	21(81.0)
Latino	2267(94.0)	141(6.0)	76(52.3)	65(47.7)	31(21.8)	110(78.2)
Asian	879 (95.0)	47(5.0)	19(39.0)	28(61.0)	8(29.0)	39(71.0)
PI/Other	1231(93.0)	95(7.0)	55(45.3)	40(54.7)	33(28.7)	62(71.3)
P-value	0.705		0.075		0.083	
Parents Marital status						
Married	7342(94.2)	416(5.8)	239(52.0)	177(48.0)	127(29.6)	289(70.4)
Not married	1908(93.0)	150(7.0)	93(61.0)	57(39.0)	54(31.3)	96(68.7)
P-value	0.163		0.117		0.776	

Parental education						
<=High school	3194(93.3)	231(6.7)	124(48.8)	107(51.2)	57(21.7)	174(78.3)
College/ more	5962(94.0)	325(6.0)	205(60.8)	120(39.2)	121(37.0)	204(63.0)
P-value	0.195		0.057		**0.002***	
Poverty level						
<200 FPL	3257(93.3)	232(6.7)	120(49.5)	112(50.5)	51(20.5)	181(79.5)
>=200 FPL	5993(94.2)	334(5.8)	212(59.2)	122(40.8)	130(38.0)	204(62.0)
P-value	0.229		0.117		**0.001***	
Usual source of care						
Yes	7768(93.8)	463(6.2)	276(54.2)	187(45.8)	155(31.0)	308(69.0)
No	1482(94.0)	103(6.0)	56(58.0)	47(42.0)	26(26.8)	77(73.2)
P-value	0.810		0.579		0.559	
Health insurance						
Yes	8705(94.0)	532(6.0)	313(55.3)	219(44.7)	174(31.4)	358(68.6)
No	545(93.3)	34(6.7)	19(49.0)	15(51.0)	7(13.4)	27(86.6)
P-value	0.672		0.659		0.088	
Perceived health						
Excellent/vg/good	8529(94.5)	449(5.5)	262(53.0)	187(47.0)	137(28.0)	312(72.0)
Fair/poor	21(88.0)	117(12.0)	70(62.0)	47(38.0)	44(39.0)	73(61.0)
P-value	**0.001***		0.188		0.081	
Delayed/did not get medical care						
Yes	411(82.0)	92(18.0)	69(68.4)	23(31.6)	37(42.6)	55(57.4)
No	8839(94.5)	474(5.5)	263(52.5)	211(47.5)	144(28.0)	330(72.0)
P-value	**0.001***		0.065		**0.045***	
Acculturation						
Low	1062(95.0)	55(5.0)	27(47.2)	28(52.8)	18(41.6)	37(58.4)
Moderate	3704(93.0)	255(7.0)	146(49.5)	109(50.5)	69(23.4)	186(76.6)
High	4484(94.0)	256(6.0)	159(62.8))	97(37.2)	94(35.0)	162(65.0)
P-value	0.104		0.094		**0.045***	

***Statistically Significant**

DISCUSSION

The prevalence of MDS in our sample (6.0%) is generally consistent with that of the overall U. S. adolescent population (5 - 8%) (Garber et al., 2009). However, only half of adolescents with such symptoms indicated that they needed help with emotional problems, and only one-third received counseling. This may be cause for concern, given the reported association between symptoms of untreated depression, and impairment in relationships and role functioning (Petersen, Andreotti, Chelminski, Young, & Zimmerman, 2009), as well as with the onset of behavioral, subclinical and clinical disorders (Mather AA, Cox BJ, Enns MW, & Sareen J, 2009).

It is therefore essential that healthcare providers and school officials conduct early screenings, and perhaps employ more conservative identification thresholds so that teens with relatively minor depression symptoms such as simple sadness (Son & Kirchner, 2000) are diagnosed and treated in the early stages. Among other beneficial outcomes, this may prevent adolescents from later engaging in risky behaviors to self-medicate their depressive symptoms

(Hallfors DD, Waller MW, Bauer D, Ford CA, & Halpern CT, 2005). Our findings also suggest that half of the adolescents who report having MDS do not ask for help. This could mean that adolescents have different knowledge levels, and various understandings of depression and its treatment. This may, as a result, delay effective treatment. Understanding factors that are related to help-seeking behaviors in adolescents with MDS can inform mental health education for this group, and overcome barriers to providing timely and effective care.

The second aim of this study was to determine any association between acculturation and self-reported MDS. Our findings reveal no difference between highly acculturated and low-acculturated adolescents. We also found that the interaction of race/ethnicity and acculturations, and MDS, was not significant. This may be explained by the direct relationship of stress and the acculturation process in the diathesis-stress model. In this paradigm, reaction to severe, negative stress in the acculturation process may result in depression symptoms (Krackow E & Rudolph KD., 2008); conversely, the lack of such stress would not produce mental distress or depression.

If an adolescent does not experience discrimination or familial disconnect, or the loss of traditional support networks, for example, they may not process the acculturation process as stressful. The relative ease through which they become acculturated will thus facilitate the adaptation process, contribute to mental resilience, and result in little mental distress. However, the limited amount of available data in this study prevented further exploration and testing of this construct.

The third aim of the study was to determine whether acculturation was associated with reporting the "need for emotional help," and "receiving psychological counseling" among adolescents with depression symptoms. We found that adolescents' level of acculturation did not impact their level of need for emotional help. However, the interaction between race/ethnicity and acculturation produced a statistically significant difference for Latinos with moderate acculturation levels. This group, in comparison to Whites with higher acculturation levels, was less likely to report needing help for emotional problems. The finding that moderately acculturated Latinos with MDS were less likely to express the need for care highlights variations in help-seeking behaviors of this group. The role of Latino culture in fostering greater reliance on an indigenous support system is identified in other research (Kaniasty & Norris; Nguyen & Anderson, 2005), and may explain this finding.

The main and interaction effects of acculturation and race/ethnicity on receiving psychological or emotional counseling were not significant. However, the variable "needed help for emotional problem" was a significant predictor in receiving psychological or emotional counseling. That acculturation, and race/ethnic variations did not predict receiving care suggests the importance of further research into the help-seeking behaviors of adolescents, and into identifying circumstances under which adolescents are more willing to utilize mental health services. It has been suggested that stigmatization and negative beliefs about taking antidepressants continues to server as a barrier in seeking timely help for mental care (Horgan & Sweeney, 2010). Our data, however, is limited in analyzing the predictive role of suggested variables.

It is interesting to note, however, that based on our findings, adolescents who expressed needing help received it, independent of other sociodemographic factors. This indicates that those who felt comfortable asking for help somehow overcame barriers in seeking and receiving psychological or emotional care. These findings suggest the need for further studies that examine whether improving mental health literacy in adolescents will motivate them to better voice their

need for help. Promoting help-seeking behavior is seen as critical in mobilizing helping resources (Kaniasty & Norris).

Our findings reveal that females were nearly three times more likely than males to report MDS, and nearly four times more likely than males to report the need for emotional help. That females are more likely to report MDS in general is supported by national and international data (Rola, 2005; Tedstone Doherty & Kartalova-O'Doherty, 2010). The diathesis stress model may explain these gender differences through the interactive contribution of biological, psychological, and contextual changes that occur during the transition into adolescence (Wright et al., 2009). Our findings are consistent with other studies which report that females are also more willing to find pathways to, and utilize, mental health services (Nam et al., 2010). This indicates that gender differences must be considered when developing future mental health initiatives.

We also found that adolescents who perceived their health as fair or poor had higher odds of reporting MDS, compared to adolescents with good or very good health. This is consistent with previous studies that found associations between perceived health and actual depressive symptoms (Breidablik, Meland, & Lydersen, 2009). In the context of the diathesis stress model, illness may in itself be a stressor that precipitates depression (Monroe SM & Simons AD, 1991). Conversely, personal characteristics and coping strategies can affect how adolescents respond to illness, which may result in depression (Rudolph KD, 2009). The negative cognition of a stressful situation such as an illness, for example, can increase stress levels and may possibly predict depression. In this study, participants who perceived their health as anything less than good had higher odds of reporting MDS.

We also found that adolescents who reported "delayed medical care" were over three times more likely to report MDS than those who did not report such delays. Although personal and systemic barriers associated with delayed medical care are well represented in the literature (Driscoll & Bernstein, 2012; Thompson, Hunt, & Issakidis, 2004), few studies have considered any association between moderate depressive symptoms and delayed medical care. Clearly, more investigation is needed to determine not only how we may facilitate earlier identification of depression in adolescents, but also on how to mitigate barriers in obtaining timely medical care.

Study Limitations

Our study has several limitations. One involves the nature of cross-sectional data, whereby only association can be detected, and not causation. Also, CHIS relies on self-reported data that subject our analyses to both recall and social desirability bias. In addition, our sample has a selection bias toward more acculturated participants, because only those who lived in households with telephones had a chance to participate in the study (Johnson-Kozlow, 2010). Furthermore, we used proxy measures of acculturation (the only measures available in CHIS), and our approach toward acculturation was unidirectional, while many researchers advocate for a bi-dimensional model of acculturation (Lara, Gamboa, Kahramanian, Morales, & Bautista, 2005; Van Wieren, Roberts, Arellano, Feller, & Diaz, 2011). Lastly, the size of the sample did not allow us to conduct more precise analyses across countries of ethnicity/country of origin. Longitudinal studies with larger samples of different race/ethnic groups, using bi-directional measures of acculturation are needed to address the aforementioned limitations.

CONCLUSIONS

We found a prevalence of depression symptoms among adolescents in California similar to that among adolescents in the entire U.S. We also found that, of the depressed sample, nearly

half reported needing help for emotional problems, and nearly one third received psychological or emotional counseling. The variable "needed help for emotional problem" was the only significant predictor for receiving psychological or emotional counseling. Risk factors for depression symptoms include female gender, perceiving one's health as fair or poor, and experiencing "delayed medical care." Among adolescents with MDS, moderately acculturated Latino adolescents were more likely to report needing help for emotional problems, compared to highly acculturated Whites. Acculturation level and race/ethnicity did not play a significant role in predicting depression symptoms, and in receiving psychological or emotional counseling.

Findings from this study suggest that a large segment of California adolescents with depression symptoms go undetected and untreated, despite the availability of screening tools to identify such individuals (Winters, Myers, & Proud, 2002; Young, Miller, & Khan, 2010). Health professional with adequate knowledge of these tools can detect at-risk adolescents and determine appropriate care options (Young et al., 2010). Our findings also indicate the need to facilitate help seeking behavior, and advocate for psychological counseling services for adolescents in California. Besides obvious clinical benefits, interventions and programs may improve teen functioning with their peers, families, and at school (Jaycox et al., 2009). They may also increase adolescents' ability to cope with burden of everyday life, and ultimately mitigate the financial costs of depression to society (Burns & Birrell, 2014; Lynch FL & Clarke GN, 2006). More studies are needed to fully understand how to best engage adolescents to use available professional counseling services.

It is equally important to delineate gender-specific risk or protective attributes associated with depression discrepancy between males and females. Moreover, interventions that focus specifically on improving adolescents' self-appraisal of well-being, and seeking timely care are needed. These are in addition to studies that longitudinally assess their impact on physical and mental functioning. Such interventions should investigate whether minority teens' level of readiness to receive psychological counseling is related to generational dissonance, which would possibly prevent them from revealing their depression symptoms with their parents.

ACKNOWLEDGMENTS

Work on this paper was supported by the following grants:

Title III, Part B "Strengthening Historically Black Graduate Institutions" Grant P031B070062

Accelerated Excellence in Translational Sciences (AXIS), NIH-National Institute of Minority Health and Health Disparities, grant# 2U54MD007598-07

NIH-NIMHD under award numbers 54MD008149

UCLA/DREW Project EXPORT, NIH-NIMHD grant "2P20MD000182."

REFERENCES

Anderson, C., & Logan, D. (2010). Impact of traumatic birth experience on Latina adolescent mothers. *Issues Ment Health Nurs, 31*(11), 700-707. doi: 10.3109/01612840.2010.518784

Anderson, S. E., Murray, D. M., Johnson, C. C., Elder, J. P., Lytle, L. A., Jobe, J. B., . . . Stevens, J. (2011). Obesity and depressed mood associations differ by race/ethnicity in adolescent girls. *Int J Pediatr Obes, 6*(1), 69-78. doi: 10.3109/17477161003728477

Bazargan-Hejazi S, Alvarez G, Teklehaimanot S, Nikakhtar N, & Bazargan, M. (2010). Prevalence of depression symptoms among adolescents aged 12-17 years in California

and the role of overweight as a risk factor. *Ethn Dis., 20(1 Suppl 1)*(1049-510X (Print)), S1-107-115.

Beck CT, Froman RD, & Bernal H. (2005). Acculturation level and postpartum depression in Hispanic mothers. *MCN Am J Matern Child Nurs, 30*(5), 299-304.

Berry JW (Ed.). (2002). *Conceptual Approaches to Acculturation.*. Washington, DC: APA Books.

Bhattacharya, G. (2008). Acculturating Indian immigrant men in New York City: applying the social capital construct to understand their experiences and health. *J Immigr Minor Health, 10*(2), 91-101.

Bhugra D. (2005). Cultural identities and cultural congruency: a new model for evaluating mental distress in immigrants. *Acta Psychiatr Scand, 111*(2), 84-93.

Bhugra, D. (2004). Migration and mental health. *Acta Psychiatrica Scandinavica, 109*(4), 243-258. doi: 246 [pii]

Breidablik, Hans-Johan, Meland, Eivind, & Lydersen, Stian. (2009). Self-rated health during adolescence: stability and predictors of change (Young-HUNT study, Norway). *Eur J Public Health, 19*(1), 73-78. doi: 10.1093/eurpub/ckn111

Buchanan, R. L., & Smokowski, P. R. (2009). Pathways from acculturation stress to substance use among latino adolescents. *Subst Use Misuse, 44*(5), 740-762. doi: 10.1080/10826080802544216

Burns, Jane, & Birrell, Emma. (2014). Enhancing early engagement with mental health services by young people. *Psychol Res Behav Manag, 7*, 303-312. doi: 10.2147/PRBM.S49151

Caplan, S. (2007). Latinos, acculturation, and acculturative stress: a dimensional concept analysis. *Policy Polit Nurs Pract, 8*(2), 93-106. doi: 10.1177/1527154407301751

Driscoll, A. K., & Bernstein, A. B. (2012). Health and access to care among employed and unemployed adults: United States, 2009-2010. *NCHS Data Brief*(83), 1-8.

Furukawa, T. A., Kessler, R. C., Slade, T., & Andrews, G. (2003). The performance of the K6 and K10 screening scales for psychological distress in the Australian National Survey of Mental Health and Well-Being. *Psychol Med, 33*(2), 357-362.

Garber, J., Clarke, G. N., Weersing, V. R., Beardslee, W. R., Brent, D. A., Gladstone, T. R., . . . Iyengar, S. (2009). Prevention of depression in at-risk adolescents: a randomized controlled trial. *JAMA, 301*(21), 2215-2224. doi: 301/21/2215 [pii]
10.1001/jama.2009.788 [doi]

Garcia C, & Lindgren S. (2009). "Life grows between the rocks": Latino adolescents' and parents' perspectives on mental health stressors. *Research in Nursing and Health, 32*(2), 148-162. doi: 10.1002/nur.20317 [doi]

Hallfors DD, Waller MW, Bauer D, Ford CA, & Halpern CT. (2005). Which comes first in adolescence--sex and drugs or depression? *American Journal of Preventive Medicine, 29*(3), 163-170.

Hankin BL, Mermelstein R, & Roesch L. (2007). Sex differences in adolescent depression: stress exposure and reactivity models. *Child Development, 78*(279-95).

Horgan, Á, & Sweeney, J. (2010). Young students' use of the Internet for mental health information and support. *Journal of Psychiatric and Mental Health Nursing, 17*(2), 117-123. doi: 10.1111/j.1365-2850.2009.01497.x

Jaycox, Lisa H, Stein, Bradley D, Paddock, Susan, Miles, Jeremy NV, Chandra, Anita, Meredith, Lisa S, . . . Burnam, M. Audrey. (2009). Impact of Teen Depression on Academic, Social, and Physical Functioning. *Pediatrics, 124*(4), e596-605. doi: 10.1542/peds.2008-3348

Johnson-Kozlow, M. (2010). Colorectal cancer screening of Californian adults of Mexican origin as a function of acculturation. *J Immigr Minor Health, 12*(4), 454-461. doi: 10.1007/s10903-009-9236-9

Kang, S. Y., Domanski, M. D., & Moon, S. S. (2009). Ethnic enclave resources and predictors of depression among Arizona's Korean immigrant elders. *J Gerontol Soc Work, 52*(5), 489-502.

Kaniasty, Krzysztof, & Norris, Fran H. Help-Seeking Comfort and Receiving Social Support: The Role of Ethnicity and Context of Need. *American Journal of Community Psychology, 28*(4), 545-581. doi: 10.1023/a:1005192616058

Katon WJ. (2003). Clinical and health services relationships between major depression, depressive symptoms, and general medical illness. *Biol Psychiatry, 54*(3), 216-226. doi: S0006322303002737 [pii]

Kessler, D., Sharp, D., & Lewis, G. (2005). Screening for depression in primary care. *Br J Gen Pract, 55*(518), 659-660.

Kessler, R. C., Barker, P. R., Colpe, L. J., Epstein, J. F., Gfroerer, J. C., Hiripi, E., . . . Zaslavsky, A. M. (2003). Screening for serious mental illness in the general population. *Arch Gen Psychiatry, 60*(2), 184-189.

Kessler, Ronald C., Soukup, Jane, Davis, Roger B., Foster, David F., Wilkey, Sonja A., Van Rompay, Maria I., & Eisenberg, David M. (2001). The Use of Complementary and Alternative Therapies to Treat Anxiety and Depression in the United States. *American Journal of Psychiatry, 158*(2), 289-294. doi: 10.1176/appi.ajp.158.2.289

Krackow E, & Rudolph KD. (2008). Life stress and the accuracy of cognitive appraisals in depressed youth. *J Clin Child Adolesc Psychol, 37*(2), 376-385.

Lara, M., Gamboa, C., Kahramanian, M. I., Morales, L. S., & Bautista, D. E. (2005). Acculturation and Latino health in the United States: a review of the literature and its sociopolitical context. *Annual Review of Public Health, 26*, 367-397. doi: 10.1146/annurev.publhealth.26.021304.144615

Lynch FL, & Clarke GN. (2006). Estimating the economic burden of depression in children and adolescents. *Am J Prev Med, 31*(6 Suppl 1), S143-151.

March, J. S., Silva, S., Petrycki, S., Curry, J., Wells, K., Fairbank, J., . . . Severe, J. (2007). The Treatment for Adolescents With Depression Study (TADS): long-term effectiveness and safety outcomes. *Arch Gen Psychiatry, 64*(10), 1132-1143. doi: 64/10/1132 [pii]

10.1001/archpsyc.64.10.1132 [doi]

Marin, Barbara.V., & Marin, Gerardo. (1990). Effects of Acculturation on Knowledge of AIDS and HIV among Hispanics. *Hisp J Behav Sci, 12*(2), 110-121.

Mather AA, Cox BJ, Enns MW, & Sareen J. (2009). Associations of obesity with psychiatric disorders and suicidal behaviors in a nationally representative sample. *J Psychosom Res, 66*(4), 277-285. doi: S0022-3999(08)00429-7 [pii]

10.1016/j.jpsychores.2008.09.008 [doi]

Mather, AA, Cox, BJ, Enns, MW, & Sareen, J. (2009). Associations of obesity with psychiatric disorders and suicidal behaviors in a nationally representative sample. *J Psychosom Res, 66*(4), 277-285. doi: S0022-3999(08)00429-7 [pii]

10.1016/j.jpsychores.2008.09.008 [doi]
Mikolajczyk, R. T., Bredehorst, M., Khelaifat, N., Maier, C., & Maxwell, A. E. (2007). Correlates of depressive symptoms among Latino and Non-Latino White adolescents: findings from the 2003 California Health Interview Survey. *BMC Public Health, 7*, 21. doi: 10.1186/1471-2458-7-21
Mikolajczyk RT, Bredehorst M, Khelaifat N, Maier C, & Maxwell AE. (2007). Correlates of depressive symptoms among Latino and Non-Latino White adolescents: findings from the 2003 California Health Interview Survey. *BMC Public Health, 7*, 21.
Monroe SM, & Simons AD. (1991). Diathesis-stress theories in the context of life stress research: implications for the depressive disorders. *Psychol Bull*(110), 406-425.
Murray, C. J., Vos, T., Lozano, R., Naghavi, M., Flaxman, A. D., Michaud, C., . . . Memish, Z. A. (2012). Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990-2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet, 380*(9859), 2197-2223. doi: 10.1016/s0140-6736(12)61689-4
Nam, S. K., Chu, H. J., Lee, M. K., Lee, J. H., Kim, N., & Lee, S. M. (2010). A meta-analysis of gender differences in attitudes toward seeking professional psychological help. *J Am Coll Health, 59*(2), 110-116. doi: 10.1080/07448481.2010.483714
Nguyen, Quang Charles X., & Anderson, Louis P. (2005). Vietnamese Americans' attitudes toward seeking mental health services: Relation to cultural variables. *Journal of Community Psychology, 33*(2), 213-231. doi: 10.1002/jcop.20039
Petersen, T., Andreotti, C. F., Chelminski, I., Young, D., & Zimmerman, M. (2009). Do comorbid anxiety disorders impact treatment planning for outpatients with major depressive disorder? *Psychiatry Res, 169*(1), 7-11. doi: S0165-1781(08)00380-6 [pii]
10.1016/j.psychres.2008.10.036 [doi]
Rola, J. (2005). [Depression in adolescents from different environments: town and village]. [Depresyjnosc mlodziezy ze srodowisk wielkomiejskiego i wiejskiego w okresie nauki w gimnazjum.]. *Psychiatr Pol., 39*(3), 537-547.
Rudolph KD. (2009). Adolescent depression. In Gotlib IH (Ed.), *Handbook of depression* (2nd ed., pp. 440-460). New York: Gilford Press.
Rudolph KD. (2009). Adolescent depression. In Gotlib IH. (Ed.), *Handbook of depression* (2nd ed., pp. 440-460). New York: Gilford Press.
Son, SE., & Kirchner, JT. (2000). Depression in children and adolescents. *Am Fam Physician, 62*(10), 2297-2308, 2311-2292.
Tedstone Doherty, D., & Kartalova-O'Doherty, Y. (2010). Gender and self-reported mental health problems: predictors of help seeking from a general practitioner. *Br J Health Psychol, 15*(Pt 1), 213-228. doi: 10.1348/135910709x457423
Thompson, A., Hunt, C., & Issakidis, C. (2004). Why wait? Reasons for delay and prompts to seek help for mental health problems in an Australian clinical sample. *Soc Psychiatry Psychiatr Epidemiol, 39*(10), 810-817.
Turner, R. J., Lloyd, D. A., & Taylor, J. (2006). Stress burden, drug dependence and the nativity paradox among U.S. Hispanics. *Drug Alcohol Depend, 83*(1), 79-89. doi: 10.1016/j.drugalcdep.2005.11.003
UCLA Center for Health Policy Research.). California Health Interview Survey. from http://healthpolicy.ucla.edu/health-profiles/race_ethnicity/Documents/AllRaceEthnic/AllGroupsInfographic.pdf

Van Wieren, A. J., Roberts, M. B., Arellano, N., Feller, E. R., & Diaz, J. A. (2011). Acculturation and cardiovascular behaviors among Latinos in California by country/region of origin. *J Immigr Minor Health, 13*(6), 975-981. doi: 10.1007/s10903-011-9483-4

Winters, N. C., Myers, K., & Proud, L. (2002). Ten-year review of rating scales. III: scales assessing suicidality, cognitive style, and self-esteem. *J Am Acad Child Adolesc Psychiatry, 41*(10), 1150-1181. doi: 10.1097/00004583-200210000-00006

Wright, SL, Langenecker, SA, Deldin, PJ, Rapport, LJ, Nielson, KA, Kade, AM, . . . Zubieta, JK. (2009). Gender-specific disruptions in emotion processing in younger adults with depression. *Depress Anxiety, 26*(2), 182-189. doi: 10.1002/da.20502 [doi]

Young, J. F., Miller, M. R., & Khan, N. (2010). Screening and managing depression in adolescents. *Adolesc Health Med Ther, 1*, 87-95. doi: 10.2147/ahmt.s7539

.

APPENDIX

Table 4a. Odds ratio and 95% Confidence Interval for the Association between Acculturation and MSD, Needed Help for Emotional Problem, and Received Psychological Counseling or Emotional counseling using Multiple Logistic Regression (no interaction).

Outcome = MSD (N=9,712)					**Outcome = Needed Help for Emotional Problem among the MSD sample (N=556)**				**Outcome = Received Psychological Counseling or Emotional Counseling among the sample with MSD (N=556)**			
Independent Variables	**Odds Ratio**	**[95% Conf. Interval]**		**P-value**	**Odds Ratio**	**[95% Conf. Interval]**		**P-value**	**Odds Ratio**	**[95% Conf. Interval]**		**P-value**
Acculturation												
High	Reference				Reference				Reference			
MODERATE	1.24	0.93	1.66	0.149	0.85	0.47	1.53	0.578	0.78	0.47	1.30	0.341
LOW	0.85	0.52	1.41	0.534	0.69	0.24	1.94	0.475	1.93	0.74	5.05	0.18
Adolescent Age (years)												
<15 Years	Reference				Reference				Reference			
15-17 year	1.15	0.87	1.53	0.326	1.10	0.61	1.96	0.754	0.79	0.42	1.48	0.45
Gender												
Male	Reference				Reference				Reference			
FEMALE	2.27	1.72	2.99	**0.000**	2.50	1.49	4.19	**0.001**	1.68	0.86	3.29	0.13
Race/ethnicity												
White	Reference				Reference				Reference			
Blacks	1.04	0.63	1.71	0.886	1.76	0.73	4.28	0.209	0.49	0.17	1.45	0.20
Hispanic	0.77	0.54	1.10	0.155	1.09	0.55	2.17	0.798	0.78	0.29	2.08	0.62
Asian/Pascific Islander/Other	0.98	0.68	1.42	0.926	0.60	0.30	1.19	0.142	0.78	0.37	1.66	0.52

Parent's marital status												
Married	Reference				Reference				Reference			
Single	1.12	0.84	1.47	0.438	1.55	0.88	2.73	0.130	1.44	0.77	2.69	0.25
Parent's education												
College	Reference				Reference				Reference			
Less than High School	1.20	0.86	1.67	0.275	0.89	0.49	1.59	0.683	0.72	0.38	1.38	0.32
Poverty level												
>= 200 FPL	Reference				Reference				Reference			
<200 FPL	1.04	0.74	1.46	0.830	0.70	0.39	1.27	0.245	0.47	0.24	0.94	**0.03**
Insurance status												
Yes	Reference				Reference				Reference			
NO	0.89	0.50	1.59	0.693	0.88	0.21	3.69	0.857	0.37	0.11	1.29	0.12
Usual Source of Care												
Yes	Reference				Reference				Reference			
No	1.08	0.79	1.47	0.625	1.61	0.88	2.95	0.121	0.98	0.45	2.09	0.95
Self Perceived Health Status												
Excellent/very good/good	Reference				Reference				Reference			
Fair/Poor	2.32	1.69	3.20	**0.000**	1.20	0.69	2.10	0.511	1.63	0.91	2.92	0.10
Delay in medical care												
No	Reference				Reference				Reference			
Yes	3.57	2.55	4.99	**0.000**	1.65	0.79	3.45	0.185	1.66	0.83	3.31	0.15

Bold= Statistically Significant