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Acculturation and Drug Use Disorders among Hispanics in the U.S.

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Abstract

The authors' objective was to examine the relationship between degree of acculturation across five different dimensions of acculturation and risk of drug use disorders (DUD) among US Hispanics.

Data were derived from a large national sample of the US adult population, the National Epidemiological Survey on Alcohol and Related Conditions, collected using face-to-face interviews. The sample included civilian non-institutionalized U.S population aged 18 years and older, with oversampling of Hispanics, Blacks and those aged 18-24 years. Interviews of more than 34,000 adults were conducted during 2004-2005 using the Alcohol Use Disorder and Associated Disabilities Interview Schedule -DSM-IV Version. A total of 6,359 subjects who identified themselves as Hispanics were included in this study. Acculturation measures used in this study assessed: time spent in the U.S., age at immigration, language preference, social network composition, and ethnic identification. Among Hispanics, there was an inverse relationship between five complementary dimensions of acculturation and DUD. Moreover, this relationship showed a significant gradient across all acculturation dimensions and DUD.

The prevalence of DUD increases with acculturation in Hispanics, across several measures of acculturation in a dose-response relationship. Hispanic cultural features and values exert a protective effect on risk of DUD. Preservation and promotion of Hispanic values may be an important component of preventive interventions for Hispanics.

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Declaration of Interest

Contributions: Dr. Blanco designed the study, conducted the literature review and wrote the manuscript. Dr. Morcillo and Miss Dedios contributed with the literature review and drafting the manuscript. Dr. Alegria and Miss Regincos contributed in the design of analytic strategy and quality assurance. Drs. Wang and Fernandez-Navarro conducted the data analyses.

INTRODUCTION

Hispanics are the largest and fastest-growing ethnic minority group in the US (Bureau 2007). Although the prevalence of drug use disorders (DUD) among Hispanics is lower than among non-Hispanic Whites (Huang et al., 2006) the Hispanic population is very heterogeneous and data on overall prevalence may conceal important variations among different Hispanics subgroups. In particular, previous research suggests that the prevalence of psychiatric disorders among Hispanics, especially DUD increases with the degree of acculturation (Alegria et al., 2006; 2007b; Blake et al., 2001; Grant et al., 2004b; Ortega et al., 2000; Turner and Gil, 2002; Vega et al., 1998, 2004). Acculturation refers to the changes that occur as a result of the direct and continuous contact of individuals to a culture different from their own (Redfield et al., 1936). This dynamic process is known to involve individual changes and adaptive outcomes at the psychological and socio-cultural levels (Ward et al., 2001). However, acculturation is a multidimensional construct that has been measured differently across studies (Alegria et al., 2007a; Vega et al., 1998). For example, early studies used language as a measure of acculturation and found it a powerful and reliable predictor of risk of substance and drug use disorders (Ortega et al., 2000; Vega et al., 1998). More recent studies have found that Hispanics who immigrated to the US prior to 6 years of age or have lived in US for 13 years or longer had similar risk of SUD than US-born Hispanics of the same age (Alegria et al., 2007b), suggesting that time spent in the US and assimilation to US society may be more important than nativity per se (Alegria et al., 2007a; Gfroerer and Tan, 2003; Vega et al., 2004). Another set of studies has hypothesized that the protective effect of Hispanic culture against various substances is due to strong social networks and highly cohesive families (Gloria and Peregoy, 1996; Ojeda et al., 2008). Therefore, it is important to investigate which dimensions of acculturation are associated with an increased risk for DUD among Hispanics. Moreover, whether there is a dose-response relationship between degree of acculturation across its different domains and risk for DUD is not known. A greater knowledge on these associations may serve to inform specific preventive interventions that take into account the specific aspects of the acculturation process in the development of psychiatric disorders, like DUD.

We sought to build on prior research by examining the relationship between DUD and acculturation in Hispanics drawing on data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC). Specifically, we sought to investigate: 1) the sociodemographic characteristics associated with DUD among Hispanics in a national sample; 2) the relationship between risk of DUD prevalence and degree of acculturation across different dimensions of acculturation, 3) Whether there is a dose-response relationship between all acculturation domains and risk for DUD

METHODS

Sample

The 2004-2005 Wave 2 NESARC (Grant et al., 2007) is the second wave of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) (Grant et al., 2008; Hasin and Grant, 2004). The target population was the civilian non-institutionalized population 18 years and older residing in households and group quarters (e.g., college quarters, group homes, boarding houses, and non-transient hotels). Blacks, Hispanics and adults ages 18-24 were oversampled, with data adjusted for oversampling, and for household- and person-level non-response. Interviews were conducted by experienced lay interviewers with extensive training and supervision (Hasin and Grant, 2004; Grant et al., 2008). All procedures, including informed consent, received full human subjects review and approval from the U.S. Census Bureau and U.S. Office of Management and Budget. In Wave 1, 43,093 individuals were surveyed. Excluding individuals who were ineligible (e.g.,

deceased), the response rate in wave 2 was 86.7%, (n= 34,653) (Grant et al., 2008). The analyses of this study are based on Wave 2 NESARC respondents who identified themselves as Hispanics, based on self report questionnaire. The total number of subjects was 6,359.

DSM-IV Psychiatric Disorders

The diagnostic interview was the Alcohol Use Disorder and Associated Disabilities Interview Schedule - DSM-IV Version (AUDADIS-IV) (Hasin et al., 2003), Wave 2 version (Grant et al., 2004a). Extensive AUDADIS-IV questions covered DSM-IV criteria for drug-specific abuse and dependence for 10 classes of substances. Consistent with DSM-IV, a 12-month diagnosis of abuse required 1 or more of 4 abuse criteria, whereas a dependence diagnosis required 3 or more of 7 dependence criteria, to be met in the year preceding the Wave 2 interview. Drug-specific abuse and dependence were aggregated to yield diagnoses of drug abuse or drug dependence. In the present analyses, alcohol abuse or dependence were not included. The good to excellent ($\kappa=0.70-0.91$) test-retest reliability of AUDADIS-IV substance use diagnoses is documented in clinical and general population samples (Canino et al., 1999; Chatterji et al., 1997; Grant et al., 2003; Grant et al., 1995; Ruan et al., 2008). Convergent, discriminant and construct validity of AUDADIS-IV substance use disorder criteria and diagnoses were good to excellent (Hasin and Paykin, 1999; Hasin et al., 1990, 1997a, 2003), including in the World Health Organization/National Institutes of Health International Study on Reliability and Validity (Hasin et al., 1997b; Nelson et al., 1999; Pull et al., 1997) where clinical reappraisals documented good validity of DSM-IV alcohol and drug use disorder diagnoses ($\kappa=0.54-0.76$) (Canino et al., 1999; Cottler et al., 1997).

Sociodemographic characteristics

Sociodemographic measures included nativity, country of origin, age, level of education, individual income, employment status, marital status, urbanicity, and region of the country.

Acculturation Measures

To provide a broad view of the relationship between DUD and acculturation (Alegria et al., 2007a; Beauvais 1998; Epstein 2001; Gfroerer and Tan, 2003; Krohn et al., 1996; Ortega et al., 2000), we examined five complementary dimensions of acculturation collected as part of the Wave 2 interview: 1) Time spent in US, categorized as US-born, more than 23 years, between 13 and 22 years, and less than thirteen years; 2) Age at migration to US, using the following categories: US-born, migration before age 17, migration between ages 18 to 23, and migration at age 24 or older; 3) Language orientation, assessed with 7 items from the Language Orientation subscale of Short Acculturation Scale (SAS) (Marin et al., 1987) which had excellent internal consistency in this sample (Cronbach's $\alpha=0.93$). Some examples of these items included "What languages do you read and speak?", "In what language do you speak with friends?". Language orientation was categorized as mostly or completely Spanish; both, but more Spanish; both, but more English; and mostly or completely English; 4) Social network composition, measured the 4-item "Ethnic Social Relations" subscale of the SAS, which yielded a Cronbach's α of 0.78. Those items queried about the ethnicity of the respondent's close friends, persons' the respondents visited or preferences for the ethnicity of the friends of the respondent's children. Social network composition was categorized as mostly all Hispanic; both, but more Hispanic; both, but less Hispanic; mostly or all other ethnic groups; 5) Ethnic orientation, categorized as strong Hispanic identification, middle-high Hispanic identification; middle-low Hispanic identification; and low Hispanic identification. Ethnic orientation was measured with 8 items using an expansion of the 3-item Ethnic Identity Scale (EIS) from the National Comorbidity Survey-Replication and the NLAAS (Guarnaccia et al., 2007). Internal consistency of the subscale was excellent (Cronbach's $\alpha=0.90$). Items conceptualized

race-ethnic identification, race-ethnic pride, importance of race-ethnic heritage, role of race-ethnic background in respondents' interactions with others, and shared race-ethnic values, attitudes, and behaviors. Examples of items include: "Have a strong sense of yourself as a person of Hispanic/Latino heritage is important in your life". The eight-item race-ethnic identification scale was scored on a six-point Likert scale (from 1 = strongly agree to 6 = strongly disagree), with a range of values from 6 to 48. After appropriate items were reverse coded, higher scores indicated higher degrees of race-ethnic identification. Due to the non-normal distribution of these measures, the total scores were categorized by quartiles.

Analytic Strategy

Odds ratios (ORs) of Hispanic respondents with and without DSM-IV DUD were calculated to examine the effect of each sociodemographic correlate and dimension of acculturation on risk of past year DUD. The effect of acculturation on risk of DUD was estimated by deriving adjusted odds ratios from multiple logistic regressions that used acculturation as the predictor variable and presence of drug use disorder as the outcome, and adjusted for sociodemographic characteristics of the sample. U.S-born Hispanic individuals were considered as the reference group. We consider 2 percentages to be different if 95% confidence interval of their OR does not include 1 (Agresti and Min, 2002). Linear chi-square trend tests were used to examine dose-response relationships between level of acculturation and risk of DUD. All standard errors and 95% confidence intervals were estimated using SUDAAN, to adjust for the complex design of the NESARC. .

RESULTS

Sociodemographic characteristics of Hispanics with and without past year DUD (Table 1)

Hispanics with past year DUD were more likely to be US-born, to have Puerto Rican origin and to have never been married. Compared to Hispanics without history of DUD, Hispanics with past year DUD were less likely to be 30-64 years old, and less likely to have an annual income of \$20,000-34,000. There were no other differences between individuals with and without DUD (Table 1).

Acculturation and lifetime history of DUD among Hispanics (Table 2)

Among Hispanics, longer time spent in the US and younger age at immigration increased the risk of past year DUD. Spanish language preference, degree of Hispanic social network and level of Hispanic ethnic identification were all inversely associated with the odds of having past year DUD, in a dose-response relationship, as reflected by the significant values of the linear trend tests across all acculturation dimensions (all $p < .001$).

DISCUSSION

In a large, nationally representative sample of US adults, there was an inverse relationship between five complementary dimensions of acculturation and risk of DUD among Hispanics, even after adjusting for a broad range of sociodemographic characteristics. This dose-response relationship was reflected by a gradient in which greater acculturation across all domains was associated with greater risk for DUD.

Acculturation and DUD among Hispanics in the U.S.

In accord with previous findings among Mexican Americans in California, acculturation led to higher increases in the risk of DUD (Vega et al., 1998). Our results held true across all the acculturation measures, suggesting that this result is robust and encompasses a broad range of acculturation domains. English language preference and longer time spent in the US showed the strongest association with DUD. Preference for Spanish language may represent

a proxy for cohesive family relationships, which may serve as a protective influence for Hispanics against drug use (Alaniz et al., 1999). By contrast, a strong English language orientation is related to a high level of integration and exposure to US society (Noels et al., 1996), probably favored by an early access to American elementary education, and by early socialization with English-speaking peers (Zhou 1997).

Age at immigration, which influences linguistic acculturation, was also inversely associated with risk of DUD. Migration during childhood and early American socialization may lead to a greater internalization of US values and less retention of the Latino traditional ones, which have been shown to protect against DUD, by involving a higher sense of obligation, responsibility to parents, and preservation of extended family bonding (Lac et al., 2002). The early internalization of US values by Hispanics who immigrated at a younger age, may also result in higher family stress secondary to the difference in cultural frameworks, with values and ideas from family differing from those prevailing in school or among peers. This may impose an additional challenge to the individual's normal psychological development, and lead to intrapersonal (Zhou 1997) and intergenerational conflicts (Sam 2006) with negative effects on mental health and increased risk for DUD. Age at immigration may also exert its effect by decreasing exposure to drugs, particularly at early ages, since multiple international studies, including those conducted in Latin America have shown lower national prevalence estimates for 12-month DUD than those reported in the US (Vega et al., 2002; World Health Organization Workgroup, 2004).

There were also aspects of Hispanic culture, including identification with Hispanic values and integration in predominantly Hispanic networks that appeared to be specifically protective against DUD. Thus, promoting Hispanic traditional values, integration into Hispanic social networks and feelings of ethnic identification may constitute relevant targets in DUD prevention programs.

Our study goes beyond prior investigations in demonstrating a dose-response relationship between level of acculturation and risk for DUD, which had been previously hypothesized, but not empirically tested. The relationships among all these acculturation constructs and how they interact with each other to modify the risk for DUD is not well understood. Although the cross-sectional nature of the current data does not allow us to determine sequence, we speculate that age at immigration probably constitutes the first step of the acculturation chain process, having a direct impact on language proficiency and preference. In turn, language, the main tool that enables us to communicate and adapt to the environment, is likely to determine the social networks that subjects choose to be involved in, leading them to be part of a more or less Hispanic-oriented network. Depending on the developmental stage, peer influences will play a relevant role in the process of building one's system of values and identification with one's ethnic group. Nevertheless, these relationships are likely to be complex and often bidirectional. For example, integration into certain social networks often influence the values of individuals belonging to them, while at the same time, the choice of networks is least partially determined by the values and goals of the individual.

Clinical and Methodological Implications

Taken together, our findings are in line with previous studies carried out among Hispanic youth and adult population suggesting that Hispanic culture exerts protective effects against DUD through specific aspects, such as high familism and strong social bonding (Gloria and Peregoy 1996; Marsiglia et al., 2005; Parsai et al., 2009). Other areas in the field of medicine have emphasized how traditional values can protect Hispanic adolescents from HIV or hepatitis, by exerting protective effects on risky sexual behavior (Guilamo-Ramos et al., 2009). Within the ecodevelopmental model, some other interventions have considered

the importance of family, and the incorporation of Hispanic cultural values (Coatsworth et al., 2002), as part of prevention programs against behavioral problems among younger populations.

Adding on to previous research on cultural competent mental health care (Lopez 2002; Vega 2005), our study suggests that cultural specific preventive interventions should focus on targeting language competence, social network preferences and ethnic identity as the main components that will shape the sociocultural construct of individuals. Though our findings are based on adults, for whom language, social networks and ethnic identity are very likely to be already firmly established, future research is needed to examine whether Hispanic youth and recent Hispanic immigrants may be more likely to benefit from preventive interventions that emphasize the importance of ethnic identity and cultural values. This could be coupled with a psychoeducational approach that works on identification of needs and how to access mental health services. Prior research has emphasized how lower acculturation among Hispanics is associated with lower use of health care services when they are needed (Amaro and De la Torre, 2002), with a marked decrease in mental health service utilization and high treatment dropout rates (Alegria et al., 2008). Furthermore, Hispanics tend to receive medical and psychiatric treatment of lower quality than Whites, even after clinical environment and patients' personal characteristics are taken into account (Alegria et al., 2008; Hogan 2003).

A potentially fruitful preventive approach could aim at strengthening these feelings of ethnic identification and promoting assertiveness among Hispanic subjects living in the U.S. This could be done by implementing behavioral activation techniques that took place in social settings, such as community centers, bringing interventions closer to the community and sidestepping the need of patients to access mental health clinics. We would expect that by favoring group cohesiveness, Hispanics living in the U.S. would be more likely to internalize the values of the group, and in turn, identify with their own cultural values (Hogg 2000). Behavioral and cognitive strategies could also be useful in preventing a broader spectrum of disorders rather than focusing on a single one, increase assertiveness and possibly contribute towards improved access to care (rather than interfering with it), while still being culturally consonant.

From the methodological point of view, our study indicates that although language preference and time spent in the US are valuable measures of acculturation, as documented by previous studies, other dimensions such as ethnic identity or ethnic composition of the social network may offer complementary information on the impact of acculturation on DUD. Our findings may contribute to previous knowledge by providing a multidimensional view of the construct of acculturation on the risk of DUD. They also complement prior findings indicating that measures that are easy to assess (e.g., nativity), can provide a useful summary measure of acculturation in cases when a multidimensional assessment may not be feasible or appropriate (Canino et al., 2008).

A second important methodological implication of our results is the need to examine whether these findings extend to other racial and ethnic groups. For example, Asian Americans have lower rates of DUD than non-Hispanic Whites (Xu et al., 2011), a finding that may partially due to the promotion of particular values such as a strong sense of family orientation and the existence of supportive social networks (Kim et al., 2008; Zhang, 2009). It will be important to examine whether there are dose-response relationships between risk of DUD and level of acculturation across a broad range of measures.

Limitations

Our study has the limitations common to most large-scale surveys. First, because the NESARC sample only included civilian households and group quarters populations 18 years and older, information was unavailable on adolescents. The challenges and effect of acculturation among young immigrants and its relation with DUD are likely to be different from those faced by adults. Second, the cross-sectional design prevents any attribution of causality between DUD and acculturation. However, it appears unlikely that DUD would modify the degree of acculturation. Third, information on drug use and drug use disorders was based on self-report and not confirmed by objective measures. Fourth, Hispanic population encompasses a very heterogeneous group and our results may not generalize to all Hispanic sub-groups. Prior research has described that greater acculturation among Mexican-Americans poses a higher risk for substance use disorders when compared to other Hispanic sub-groups. (Alegria et al., 2008b). Likewise, alcohol use disorders have been shown to be more prevalent among highly acculturated Puerto Ricans and Mexican-Americans when compared to the foreign-born counterparts (Caetano R., et al 2009). In this respect, it is also possible that the protective effect of traditional values and ethnic identification against substance use is not the same across all Hispanic sub-groups (Ehlers CL et al., 2009).

Conclusion

In summary, the prevalence of DUD increases with acculturation in Hispanics across several measures of acculturation. Hispanic cultural features and values exert a protective effect on risk of DUD, being these mediated by social network composition, and language preference. Preservation and promotion of Hispanic values may be an important component of preventive interventions for Hispanics living in the U.S.

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Table 1
Sociodemographic characteristics among Hispanic population with past year history of Drug Use Disorder

	DUD (N=119)		Without DUD (N=6240)		OR	95% CI
	%	95% CI	%	95% CI		
Nativity						
US-born(ref)	81.60	71.02	88.92	39.40	48.58	1.00
Foreign-born	18.40	11.08	28.98	51.42	60.60	0.18
Country of origin						
Mexican (ref)	47.78	33.11	62.83	43.38	60.75	1.00
Puerto Rican	20.75	11.38	34.79	6.55	14.97	2.26
Other Hispanic	31.48	21.66	43.28	31.50	44.68	0.91
Age						
18-29 (ref)	52.87	41.05	64.38	24.30	26.09	1.00
30-44	34.56	22.79	48.59	40.26	38.34	0.39
45-64	12.18	6.99	20.38	25.68	27.13	0.22
65+	0.39	0.06	2.44	9.76	11.49	0.02
Education						
< High School	29.80	20.32	41.39	34.85	38.07	0.79
High School	25.91	16.46	38.30	24.39	26.20	0.98
College (ref)	44.29	32.39	56.89	40.75	38.03	1.00
Individual Income						
0-19K (ref)	66.20	54.06	76.52	50.64	53.09	1.00
20-34K	17.34	9.90	28.60	23.95	27.89	0.51
35-69K	16.25	8.83	27.98	18.09	19.76	0.69
>70K	0.21	0.03	1.56	5.40	6.30	0.03
Employment Status						
Employed (ref)	69.99	57.85	79.86	71.10	69.38	1.00
Unemployed	30.01	20.14	42.15	28.90	27.23	1.05
Marital Status						
Married (ref)	34.02	24.23	45.38	65.84	68.41	1.00
Widowed/Divorced	15.29	8.09	27.01	14.38	16.09	2.06

	DUD (N=119)		Without DUD (N=6240)		OR	95% CI	
	%	95% CI	%	95% CI			
Never Married	50.70	39.74	19.78	18.05	4.96	3.06	8.05
Urbanicity (wave1)							
Urban (ref)	91.58	82.89	90.44	86.67	1.00	1.00	1.00
Rural	8.42	3.94	9.56	6.77	0.87	0.43	1.78
Region (wave1)							
Northeast	22.36	10.77	15.57	8.01	1.23	0.66	2.28
Midwest	1.34	0.46	8.91	4.30	0.13	0.04	0.46
South	27.25	16.18	33.63	22.32	0.69	0.39	1.23
West (ref)	49.05	32.93	41.90	28.02	1.00	1.00	1.00
Insurance							
Private (ref)	58.11	47.26	58.71	56.31	1.00	1.00	1.00
Public	11.35	5.38	14.32	12.45	0.80	0.38	1.69
No insurance	30.54	21.39	26.97	24.93	1.14	0.71	1.84

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Table 2
Acculturation among Hispanic population with and without Past Year history of DUD

	Total N	DUD (N=119)		Without DUD (N=6240)		Linear Trend Test					
		%	95%CI	%	95%CI	AOR	95%CI	Chi-square (df)	p-value		
Time spent in the U.S.											
<= 17 years	1324	9.01	4.08	18.73	27.60	30.15	0.14	0.06	0.36	30.94 (1)	<0.0001
18+ years	1902	9.39	4.24	19.51	28.45	31.66	0.26	0.11	0.63		
U.S. Born (ref)	3131	81.60	71.02	88.92	43.95	48.60	1.00	1.00	1.00		
Age at immigration											
Age 20 or older	1817	0.82	0.19	3.45	30.92	34.47	0.02	0.00	0.07	59.44 (1)	<0.0001
Age less than 20	1409	17.58	10.36	28.24	25.13	23.06	0.31	0.17	0.59		
Born in the U.S. (ref)	3131	81.60	71.02	88.92	43.95	48.60	1.00	1.00	1.00		
Language orientation											
1st Quartile (Mostly or completely Spanish) (<1.60)	1333	3.06	0.98	9.19	25.01	21.87	0.04	0.01	0.14	40.08 (1)	<0.0001
2nd Quartile (Both, but more Spanish) (1.60-2.95)	1414	8.06	2.49	23.10	23.78	22.01	0.13	0.04	0.43		
3rd Quartile (Both, but more English) (2.95-4.25)	1790	30.17	20.04	42.69	24.85	22.81	0.49	0.31	0.79		
4th Quartile (Mostly or completely English) (4.25+) (ref)	1808	58.71	47.15	69.38	26.36	22.96	1.00	1.00	1.00		
Social Network preference											
1st Quartile (Mostly or all Hispanic/Latino) (<1.86)	1128	10.85	5.82	19.33	20.53	18.55	0.27	0.12	0.61	18.37 (1)	<0.0001
2nd Quartile (Both, but more Hispanic/Latino) (1.86-2.67)	1792	11.99	5.99	22.56	29.96	27.67	0.20	0.09	0.44		
3rd Quartile (Both, but less Hispanic/Latino) (2.67-3.05)	1649	30.80	21.56	41.90	24.29	22.61	0.65	0.37	1.14		
4th Quartile (Mostly or all other ethnic groups) (3.05+) (ref)	1772	46.35	34.57	58.55	25.23	22.09	1.00	1.00	1.00		
Race-Ethnic orientation											
1st Quartile (Strong Hispanic/Latino identification) (<1.34)	1446	6.44	3.01	13.23	24.80	22.15	0.15	0.07	0.36	14.11 (1)	0.0002
2nd Quartile (Middle-high Hispanic/Latino identification) (1.34-1.90)	1423	28.85	19.19	40.91	23.33	21.70	0.69	0.38	1.26		
3rd Quartile (Middle-low Hispanic/Latino identification) (1.90-2.59)	1709	21.30	13.54	31.89	26.03	24.16	0.46	0.24	0.89		
4th Quartile (Low Hispanic/Latino identification) (2.59+) (ref)	1747	43.40	31.23	56.43	25.84	23.28	1.00	1.00	1.00		

AOR adjusted for age, education, income, employment and marital status