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Childhood trauma and adult risk factors and disease in Hispanics/Latinos in the US: Results from the Hispanic Community Health Study/Study of Latinos (HCHS/SOL) Sociocultural Ancillary Study

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Abstract

Objectives—Adverse childhood experiences (ACEs) are implicated in diseases of adulthood. We report the prevalence of ACEs in Hispanics/Latinos in the US and their association with major risk factors and diseases in adulthood.

Methods—Data from the Sociocultural Ancillary Study of the Hispanic Community Health Study/Study of Latinos (HCHS/SOL) were used. HCHS/SOL is an epidemiological study conducted in four urban communities in the US: Bronx, Chicago, Miami and San Diego. The analytic sample comprised 5117 participants, ages 18 to 74 at baseline. Linear and logistic models, adjusted for sociodemographic factors, were used to examine associations of ACEs and risk factors (depressive symptoms, obesity, smoking, and alcohol use) and chronic disease (coronary heart disease, stroke, diabetes, asthma, COPD, and cancer); the latter also adjusted for risk factors.

Results—Most participants (77.2%) experienced at least one ACE, and 28.7% experienced four or more. ACEs were common among all ancestry groups, with variability among them. Prevalence

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of 4 or more ACEs was higher among women than men (31.2% and 25.8%, respectively). ACEs were associated with depressive symptoms, body mass index, smoking alcohol use, cancer, coronary heart disease, and chronic obstructive pulmonary disease, but not asthma, diabetes, or stroke. Associations were not moderated by social support.

Conclusions—ACEs are prevalent among US Hispanics/Latinos and are involved in disease in adulthood. The apparent higher prevalence of ACEs in US Hispanics/Latinos did not correspond with stronger associations with disease. Further studies are needed to identify factors that may moderate the associations of ACE with adult disease.

Keywords

childhood trauma; ACE; obesity; diabetes; heart disease; Hispanics

Adverse childhood experiences (ACEs) have been shown to affect risk for a variety of medical, psychological, and behavioral conditions in adulthood[1]. ACEs refer to physical, sexual or psychological abuse, neglect, or living in a dysfunctional household before the age of 18. The ACE Study of over 17,000 middle class, mostly white US adults, a collaborative study between the Centers for Disease Control and Prevention (CDC) and Kaiser Permanente in San Diego, has documented the prevalence of ACEs and the extent to which reported ACEs are associated with health conditions, including, but not limited to, obesity [2], smoking [3], alcoholism [4], depression [5], pulmonary disease [6], heart disease [7], diabetes [8] and cancer [1]. The study found a linear relationship between the number of adverse experiences during childhood and multiple risk factors for several of the leading causes of death in US adults[1]. Results of this large-scale two-wave study have been widely disseminated and are available on the website for the Centers for Disease Control and Prevention (CDC; http://www.cdc.gov/violenceprevention/acestudy/outcomes.html).

The generalizability of the early stress association with adult disease is worth examining across populations to determine whether cultural or social factors alter, in some way, the potential effects of early stress. The Hispanics/Latino population represents a reasonable group in which to test the generalizability of the ACE findings. In fact, the term “Hispanic paradox” was coined to describe the notion that, although more disadvantaged than non-Hispanic whites, Hispanics/Latinos in the US do not experience the morbidity and mortality risk associated with their socioeconomic disadvantage[9]. However, published data from the HCHS/SOL has indicated that there is variation in risks and morbidity among the various Hispanic/Latino ancestries assessed in HCHS/SOL[10]. The Sociocultural Ancillary Study (SCAS) [11] to the HCHS/SOL included a measure of ACE as part of the psychosocial test battery, thus providing a unique opportunity to examine ACE samong US Hispanic/Latino adults.

The current study assessed the prevalence of ACEs among Hispanic/Latino adults of varying ancestries and examined whether the association between ACEs and several diseases and risk factors in adulthood reported in the original ACE Study can be replicated in Hispanics/Latinos. This paper further tested whether social support, an interpersonal resource that may buffer the impact of stress[12], moderated associations of ACEs with disease prevalence. It was hypothesized that there would be strong linear associations between ACE and obesity,

smoking, alcohol use, depression, pulmonary disease, coronary heart disease, stroke, diabetes, and cancer in Hispanics/Latinos. Furthermore, given the strong reliance on family support associated with the Hispanic/Latino culture[13], it was further hypothesized that social support would moderate those relationships, such that associations would be weaker for individuals who reported higher levels of social support. To our knowledge, no study to date has examined social support in this context in any population.

Methods

Participants and procedures

The Hispanic Community Health Study/Study of Latinos (HCHS/SOL) is an epidemiologic cohort study of the prevalence and incidence of multiple health conditions and associated risk and protective factors in 16,415 diverse Hispanics/Latinos recruited from 4 US communities: the Bronx, NY; Chicago, IL; Miami, FL; and San Diego, CA. Details regarding the study design, sample, and methods have been previously reported[14, 15]. A two-stage area household probability sampling approach was used to recruit participants aged 18 to 74 years who self-identified as being of Mexican, Puerto Rican, Dominican, Cuban, Central American, South American, or other Hispanic/Latino ancestry. Participants underwent a baseline clinical exam that included anthropometric assessment, fasting blood draw, and self-report measures of sociodemographic characteristics and health conditions and behaviors. Data for all outcomes and covariates analyzed in the current study were obtained during the HCHS/SOL baseline exam, collected between January 2008 and December 2011.

The Sociocultural Ancillary Study (SCAS) to the HCHS/SOL was initiated to assess additional socioeconomic, sociocultural, and psychological factors in a subsample of HCHS/SOL participants. A detailed description of the SCAS methods has been published elsewhere[11]. Participants included those willing to attend an additional visit within 9 months of having completed the HCHS/SOL baseline clinical exam. A total of 5,313 participants were enrolled in the SCAS. The ACE and social support data analyzed in the current study were obtained during the SCAS. The current study excluded participants with missing data on Hispanic/Latino background group affiliation and/or ACEs yielding an analytic sample of 5117 participants. Institutional review board approval for all HCHS/SOL and SCAS protocols was obtained from all study sites, and all participants provided informed consent.

Measures

Adverse childhood experiences—The 10-item Adverse Childhood Experiences (ACE) scale was used to determine the number of adverse events experienced in childhood[1]. This measure was developed as part of a large-scale study led by the Centers for Disease Control and Kaiser Permanente to understand the relationship between multiple categories of childhood trauma and health outcomes measured later in life[1]. This scale ascertains whether individuals have been exposed to any of the following adverse experiences before the age of 18: emotional abuse; physical abuse; sexual abuse; emotional neglect; physical neglect; parental separation or divorce; witnessing female parent being abused; living with a substance abuser; living with a mentally ill person; and imprisonment of a household

member. The total score is obtained by counting the number of events reported, and ranges from 0 to 10. The ACE scale has demonstrated adequate psychometric properties[1]. While the ACE is not required to be internally consistent, most items do tend to cluster and the internal consistency reliability was .74 for our sample. However, two of the items, prison and divorce, did not cluster with the others in our data.

Social support—The 12-item Interpersonal Support Evaluation List (ISEL) was used to measure perceived social support.[16] This measure assesses perceived emotional support, tangible support, and sense of belonging using a Likert-type response format. Total scores range from 0 to 36, with higher scores suggesting greater perceived social support. This scale has demonstrated adequate psychometric properties in the HCHS/SOL SCAS cohort[17].

Health outcomes

Depressed affect: The 10-item Center for Epidemiological Studies Depression Scale (CES-D 10), a subset of the original 20-item CES-D scale, was used to assess depressive symptoms[18]. This Likert-type scale asks respondents to endorse how often they have experienced a series of possible symptoms in the past week, ranging from “none of the time” to “most of the time.” Total scores range from 0 to 30, with higher scores reflecting greater depressive symptomatology. The internal consistency reliability was .82 in the SACS cohort.

Body Mass Index: Height and weight were measured to the nearest 1.0 cm and 0.1 kg, respectively, and body mass index (BMI) was calculated as body weight in kilograms divided by the square of height in meters (kg/m^2).

Diabetes: Fasting blood samples were obtained for each participant. Plasma glucose was assessed using a hexokinase enzymatic method (Roche Diagnostics Corporation, Indianapolis, IN) and glycosylated hemoglobin (A_1C) was measured in EDTA whole blood using a Tosoh G7 automated high-performance liquid chromatography analyzer (Tosoh Bioscience Inc., San Francisco, CA). Participants who had fasting plasma glucose (FPG) < 150 mg/dL and who did not report being previously diagnosed with diabetes also underwent a 2-hour oral glucose tolerance test (OGTT). Use of glucose-lowering medications was assessed via self-report and ascertained via scanning of Universal Product Code bar codes when available or centralized manual coding. Following criteria set by the American Diabetes Association[19], diabetes was defined as either FPG ≥ 126 mg/dL, 2-h OGTT glucose level ≥ 200 mg/dL, A_1C level ≥ 6.5%, scanned or transcribed glucose-lowering medication use, and/or self-report of previous diabetes diagnosis by a doctor.

Coronary heart disease (CHD): Each participant received a digital 12-lead electrocardiogram (ECG). Findings were electronically transmitted to a Central ECG Reading Center (EPICARE, Wake Forest University School of Medicine, Winston-Salem, NC) and ascertained for old myocardial infarction (MI) using the Minnesota Code classification system[20]. Additionally, self-report of previous angina, heart attack, and coronary procedures (angioplasty, stent, or bypass surgery to the arteries of the heart) was obtained via standard questionnaire and interview. Prevalent CHD was defined as either ECG report of old MI and/or self-report of angina, heart attack, or coronary procedure.

Cerebrovascular disease: Cerebrovascular disease was defined as self-report of previous stroke, transient ischemic attack (TIA), or cerebrovascular procedures (balloon angioplasty or surgery to the arteries of the neck) as obtained from participants via standard questionnaire and interview.

Chronic obstructive pulmonary disease (COPD): COPD was assessed via self-report using the prompt, "has a doctor ever told you that you had COPD or emphysema?" Participants were asked to answer "yes" or "no".

Asthma: Asthma was defined as self-report of ever having had asthma, whether diagnosed by a health professional or not.

Cancer: Cancer diagnoses were assessed via self-report using the prompt, "has a doctor ever said that you have cancer or a malignant tumor?" Participants were queried about fourteen types of cancer (i.e., prostate, colon, breast, cervical, brain, etc.) as well as an "other" category, and asked to answer "yes" or "no" to each cancer type. Prior cohort studies have demonstrated a good degree of accuracy for this self-report method[21].

Smoking and Alcohol use: Smoking status and alcohol use were assessed by self-report and coded as "never" or "previous or current".

Covariates

Sociodemographic variables included as covariates were age, sex, Hispanic/Latino background (characterized as Mexican, Puerto Rican, Cuban, Dominican, Central American, South American, or other), field center, education (categorized as no, at most, or greater than a high school diploma/GED), total gross family income (categorized as <$10,000, $10,000 to $15,000, >$15,000 to $20,000, >$20,000 to $25,000, >$25,000 to <$30,000, $30,000 to $40,000, >$40,000 to $50,000, >$50,000 to $75,000, >$75,000 to $100,000, or >$100,000), and number of years living in the US.

Analyses

Prevalence for each type of adverse childhood experience was estimated separately by Hispanic/Latino ancestry, sex, and nativity (whether born in mainland US or outside). Prior to estimation, model assumptions were checked and verified. All models were analyzed in SAS PROC SURVEYREG using the sampling weights, clustering and stratification features of the design. Briefly, a two-stage stratified probability sample of addresses in each of the four field centers was selected. Stratification was based on Hispanic/Latino concentration and proportion of high/low socio-economic status. Census block groups were randomly selected at the first stage and households at the second stage. Both stages oversampled high Hispanic/Latino concentration and high socioeconomic status. Therefore, participants were selected with unequal probabilities of selection, and these probabilities were taken into account in data analysis to appropriately represent the target population. HCHS HCHS/SOL sampling weights are the product of a "base weight" (reciprocal of the probability of selection) and three adjustments: 1) non-response adjustments made relative to the sampling frame, 2) trimming to handle extreme values (to avoid a few weights with extreme values

being overly influential in the analyses), and 3) calibration of weights to the 2010 U.S. Census according to age, sex and Hispanic background. These design features have been described elsewhere[14, 15]. Covariates included age, sex, Hispanic ancestry group, field center, education, years in the US, and income when examining BMI, smoking and alcohol use. When examining disease outcomes, in addition to the demographic covariates specified above, we controlled for the risk factors of BMI, smoking and alcohol use. Linear models were used for the CESD-10 and BMI; for all other outcomes, logistic models were used. A measure of social support and the product of ACE and social support (both centered about the sample mean) were added to the models to test for potential moderation. All confidence intervals are for the 95th percent.

Results

Table 1 presents the weighted sample characteristics for the total sample and stratified by Hispanic/Latino ancestry group. The mean age of the total sample was 42.5; individuals of Mexican ancestry were the youngest (39.5) and those of Cuban ancestry the oldest (48.5). Slightly over half of each group was female and over half reported annual household income less than $30,000. The average number of years living in the US was 20.5 and ranged from 13 for individuals of Cuban ancestry to 35.5 for those of Puerto Rican ancestry. With respect to disease endpoints, the lowest prevalence was for stroke (1.3%) and the highest for asthma (18.3%), followed by diabetes (16.9%), consistent with prevalence reported from the parent study. The average BMI (29.6) was in the overweight category, and this was true across all ancestry groups. Prevalence of smoking was 38.7% for the total sample, but there was great variability across ancestry groups. The large majority of the total sample reported drinking (80%).

Prevalence of ACEs

Table 2 presents the weighted prevalence of ACE and 95% confidence interval for the total sample and stratified by sex, Hispanic/Latino ancestry, and nativity (whether born in or outside the US mainland). As shown, 77.2% of the total sample reported experiencing at least one ACE, and 28.7% reported experiencing four or more ACEs. ACEs were common among all ancestry groups. Prevalence of 4 or more ACEs was significantly greater for women than for men (31.2% and 25.8%, respectively). When stratified by Hispanic/Latino ancestry, the highest prevalence of having 4 or more ACEs was reported by individuals of Puerto Rican ancestry (38.1%) or those who self-identified with more than one or “other” heritage (46.1%), with significant differences observed between Puerto Ricans and all other groups, except Dominicans or “other” heritage. Individuals of Cuban heritage reported the lowest prevalence of four or more ACEs (20.2%), significantly lower than for individuals of Mexican and Puerto Rican descent. ACEs were significantly more common among those born in the US, with 37.6% reporting 4 or more ACEs, versus 26.3% for those born outside of the US mainland.

With respect to the specific ACEs, as shown in Table 3, there was variability in prevalence across items for both sexes. The least prevalent ACEs were sexual abuse (7.0%) among men and physical neglect (10.4%) among women. Parental separation or divorce was the most

prevalent ACE among both men (44.8%) and women (46.0%). Significant sex differences were observed in prevalence of sexual abuse (7.0 vs 20.4% for men and women, respectively), emotional neglect (16.1 vs 27.2% for men and women, respectively), household alcohol/drug abuse (26.6 vs 33.8% for men and women, respectively, and household member in prison (28.3 vs 22.1% for men and women, respectively).

Associations with risk factors and disease

ACE was positively and significantly associated with CESD-10 [b = .53; CI .46-.66] and BMI [b = .16; CI .06-.34]. The unstandardized regression coefficients indicate that, for every additional ACE reported, there was over a half unit increase in CESD-10 and about a fifth of a unit increase in BMI, after controlling for the demographic covariates. ACE was also significantly associated with using alcohol [OR = 1.12 (CI 1.07 – 1.17)] and smoking [OR = 1.16 (CI 1.11 – 1.22)].

After controlling for demographic factors and risk factors, ACE was significantly associated with the odds of having CHD [OR = 1.08 (CI 1.01-1.16)], COPD [OR = 1.07 (CI 1.01-1.14)], and cancer [OR = 1.08 (CI 1.01-1.16). However, ACE was not significantly associated with having asthma [OR = 1.04 (CI .99-1.09)], diabetes [OR =.98 (CI .93- 1.03)] or a history of stroke [OR =1.02 (CI .89- 1.16)]. Social support was not a statistically significant moderator of the association between ACE and any of the outcomes (results not shown).

Discussion

In this epidemiological study of the health of US Hispanics/Latinos, ACEs were common among all ancestry groups, albeit with variation in prevalence across groups. Prevalence was greater in women than men, and in those born in the US than outside the US. ACEs were associated with depressive symptoms, BMI, smoking and use of alcohol, controlling for demographic factors. With respect to disease, ACEs were associated with CHD, COPD, and cancer even after controlling for demographics and risk factors; however, they were not associated with asthma, diabetes or stroke. The associations were not moderated by social support. The common occurrence of ACEs in US Hispanics/Latinos is of public health concern as this is the fastest growing minority population in the US. The associations observed between ACEs and risk factors for chronic diseases such as increased depressive symptoms and adiposity, as well as smoking and use of alcohol indicate that exposure to an abusive and neglectful family environment in childhood places individuals along emotional and behavioral pathways conducive to chronic diseases. We found mixed evidence for links between ACEs and chronic diseases in this sample of US Hispanics/Latinos. Of the six chronic diseases considered here, we were able to detect significant associations with three of those (cancer, CHD, and COPD), but not with the least (stroke) and most prevalent ones (asthma and diabetes).

Prevalence of ACEs

Prevalence of ACE appears higher in Hispanics/Latinos than reported in previous studies that included few Hispanics/Latinos[1]. Whereas in the earlier ACE study of mostly white

participants, the prevalence of four or more ACEs was 9.2% and 15.2% for men and women, respectively, the current study found that25.8% and 31.2%, of Hispanic/Latino men and women respectively, had experienced 4 or more ACEs. In parallel, the prevalence of no ACE was reported to be 38% among men and 34.5% among women in the earlier study versus 23.6% and 22.2%, of men and women respectively, in the current study. The higher rate observed in our sample was evident across all of the items, except for sexual abuse. The most notable difference from the earlier study was observed in the items reflecting psychological abuse, violence toward participants' mother, divorce of parents, and imprisonment of a family member.

There are important differences besides race/ethnicity between our sample and the study population for the earlier report. These include but are not limited to the time of data collection, age of participants, income, education, and access to health insurance. The HCHS/SOL sample was younger, had lower income and education, had less access to health insurance and was assessed more recently than the original ACE study. All of these factors could have played a role in the reporting of ACEs. Increased awareness of the problems associated with ACEs, in part due to publications from the original study, may make it easier for any one individual to recognize and report an adverse experience. Current estimates of the prevalence of ACEs may reveal higher estimates in the general population. Furthermore, the lower sociodemographic status of this sample, with over half of the participants lacking access to healthcare, highlights a discrepancy that goes beyond ethnicity. There is evidence suggesting that adverse experiences are more prevalent in lower socioeconomic status families[22]. Thus, lower socioeconomic status could partly account for these findings.

The reasons behind endorsing specific experiences may also differ between Hispanic/Latino immigrants and US born non-Hispanic/Latino individuals. For example, the political situation in the country of origin and the immigration experience may have led to having a parent go to prison. This item was more prevalent in our sample than in the earlier study. It is also the case that political ideology may have resulted in prison for many immigrants in their country of origin. That is particularly the case for immigrants from Cuba and some Central and South American countries[23]. Separation and divorce were also more common in the current sample than originally reported in the ACE study. While rates of divorce have increased in the US since the original study, our sample also may have experienced separation from parents as a result of immigration.

Associations with risk factors and disease

As expected, ACEs were associated with depressive symptoms, BMI, smoking, alcohol use, CHD, COPD, and cancer, but unexpectedly were not associated with asthma, stroke or diabetes. Even when present, the associations with disease appeared weaker than in the earlier study. This pattern of findings is consistent with the Hispanic Paradox, the notion that the disadvantage experienced by Hispanics/Latinos relative to non-Hispanic whites in the US, does not necessarily lead to increased morbidity and mortality[9].

Might there be cultural moderators for the stress response in Hispanics/Latinos? As previously mentioned, there may be cultural differences in the appraisal of ACEs and these differences may also be responsible for the weaker associations between ACEs and disease.

We are reminded that stress is a process with a stimulus, the appraisal of the stimulus, and the response[24]. Stimuli and responses may be quantified in standard ways across cultures, however, the appraisal aspect is shaped by what a culture perceives as normative[25]. Thus, cultural norms may provide ways for individuals to cope with common stressful experiences. This is an area in need of further study, particularly with better brain imaging tools available for understanding cognitive processing of stressful stimuli.

Another hypothesis presented as a reason for the Hispanic paradox is the idea that the Hispanic/Latino culture is more collectivistic[26] and offers stronger family and community ties that might lessen the effect of a stressor on an individual. We included social support and tested whether it moderated the associations between ACE and adult diseases, but did not detect an effect in our sample. However, we note a major limitation in testing such a hypothesis with these data in that the hypothesis implies comparisons across cultural groups, yet our study was only able to capture variations in social support within Hispanic/Latino groups. Thus this hypothesis remains tenable despite its lack of support from our data. Additionally, social support as measured in our study may not be the critical variable rendering Hispanics/Latinos more resilient.

The younger age of our participants may also be partly responsible for these findings. It may be the case that, among older individuals who have higher prevalence of chronic diseases, the associations are more easily detected. Given that ACEs were related to smoking, alcohol use, depressive symptoms and adiposity, and that these risk factors have been linked to many diseases of adulthood[27,28], a mediational role is testable and could be detected with longitudinal data that are currently being collected. We were not able to detect potential mediation in our cross-sectional sample, as the associations (or lack thereof) reported between ACEs and disease were comparable with or without the inclusion of smoking, alcohol use, depressive symptoms and BMI as covariates.

In addition to the lack of comparative data for other race/ethnic groups, there are other limitations to this study that need consideration. One of those is that fact that the reporting of ACE was retrospective. Retrospective reporting characterizes most of the literature of early childhood experiences, as was the case in the original study. To the extent that retrospective reporting led to underreporting of ACE[29], it would have reduced power to detect associations. However, the high prevalence of reports of ACE in our sample makes it less likely that such underreporting occurred. There may have been other biases of a general nature or culture specific that could have influenced how these early experiences are perceived and/or reported. For instance, the association between ACE and depressive symptoms might be partly driven by the possibility that negative affect can lead to a tendency to remember negative events. While the effect of a single bias might be easy to detect and its direction predicted, multiple biases operating in different directions could result in null effects.

It was also the case that some disease outcomes, such as stroke, had low prevalence in our sample, limiting the power to detect associations in a moderately sized study. Also, while we controlled for sociodemographic variables, such as age, sex, education, and income, as was done in the original study, there may be multiple factors responsible for the associations

detected, including genetic variations and other medical and psychological factors. The cross-sectional design of our data prevented us from testing mediation models. Adding other confounders or mediators in future analyses that capitalize on longitudinal data currently being assessed would increase our understanding of the associations between ACE and adult disease. Also, combining data from other race/ethnic groups would allow the possibility of identifying important moderators that play a role in the manifestation of disease among US Hispanic/Latino adults. Given the growth in the Hispanic/Latino population, these are worthwhile scientific endeavors for public health and clinical practice.

We conclude ACEs are prevalent among US Hispanics/Latinos and may play a role in disease in adulthood. Further studies are needed to identify factors that mitigate the magnitude of the associations of ACE with adult disease.

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Glossary

ACE Adverse childhood experience

Table 1

Descriptive statistics for sample demographic characteristics and outcomes stratified by Hispanic subgroup

	Dominican	Central American	Cuban	Mexican	Puerto Rican	South American	More than one/ Other heritage	Total Sample
Weighted Statistics	**N=585**	**N=379**	**N=1017**	**N=1829**	**N=789**	**N=239**	**N=166**	**N=5006**
	N/% or Mean(SE)	**N/% or Mean(SE)**	**N/% or Mean(SE)**	**N/% or Mean(SE)**	**N/% or Mean(SE)**	**N/% or Mean(SE)**	**N/% or Mean(SE)**	**N/% or Mean(SE)**
Demographic Characteristics								
Age	40.0(1.1)	41.0(0.9)	48.5(0.8)	39.5(0.6)	45.2(0.8)	45.2(1)	33.2(1.6)	42.5(0.4)
Female	363/62.0	212/56.0	501/49.3	1024/56.0	415/52.6	128/53.5	100/60.1	2746/54.9
Household annual income <30K	399/75.7	264/79.6	726/85.1	1048/60.0	528/72.6	162/70.7	73/48.4	3203/70.1
Years in US	17.0(0.8)	15.2(0.7)	13.3(0.9)	20.8(0.5)	35.5(1)	15.3(0.8)	23.5(1.4)	20.5(0.5)
Outcomes								
Asthma	98/17.1	51/13.7	238/23.6	139/7.7	304/39.6	21/9.2	49/30.2	900/18.3
COPD	37/6.5	10/2.7	85/8.5	95/5.2	118/15.4	19/8.1	16/9.8	380/7.7
Stroke	8/1.4	4/1.0	14/1.4	15/0.8	14/1.8	3/1.3	5/2.9	63/1.3
CHD	20/3.5	13/3.4	57/5.6	43/2.4	63/7.9	13/5.4	4/2.6	214/4.3
Diabetes	87/14.8	59/15.5	196/19.3	276/15.1	182/23.1	33/13.8	11/6.3	845/16.9
Cancer	13/2.2	10/2.7	61/6	50/2.7	30/3.9	5/2.1	4/2.2	173/3.5
BMI	29.8(0.6)	29.8(0.3)	29.0(0.3)	29.1(0.2)	31.6(0.4)	29.1(0.4)	30.0(0.9)	29.6(0.2)
Smoking								
Never	436/74.4	262/69.2	536/52.8	1225/67.0	380/48.3	152/63.4	71/42.8	3065/61.3
Smoker	150/25.6	117/30.8	479/47.2	603/33.0	407/51.7	88/36.6	95/57.2	1937/38.7
Alcohol Use								
Non-drinkers	58/9.9	113/29.8	404/39.8	241/13.2	99/12.5	56/23.3	27/16.3	1001/20.0
Drinkers	527/90.1	266/70.2	612/60.2	1587/86.8	690/87.5	184/76.7	139/83.7	4005/80.0
Depression	7.2(0.5)	6.8(0.3)	7.8(0.3)	6.3(0.2)	9.2(0.4)	6.4(0.4)	7.7(0.9)	7.3(0.1)

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Table 2

Prevalence of ACE

	Total ACE Score (95% CI)				
	0	**1**	**2**	**3**	**4+**
Weighted Statistics	**N=1105**	**N=1075**	**N=692**	**N=582**	**N=1392**
	%=22.8(21.1 - 24.5)	**%=22.2(20.6 - 23.8)**	**%=14.3(13.0 - 15.6)**	**%=12.0(10.7 - 13.4)**	**%=28.7(26.6 - 30.8)**
Women	22.2(20.0 - 24.3)	20.9(18.8 – 23.0)	13.9(12.2 - 15.7)	11.8(9.8 - 13.8)	31.2(28.4 - 34.1)
Men	23.6(20.9 - 26.2)	23.7(21.4 - 26.1)	14.7(12.6 - 16.7)	12.2(10.4 - 14.1)	25.8(23.0 - 28.4)
Dominican	21.6(16.8 - 26.3)	25.6(19.7 - 31.6)	14.2(10.0 - 18.5)	11.4(7.5 - 15.3)	27.2(19.4 - 35.0)
Central American	21.7(16.4 - 26.9)	25.5(19.9 - 31.1)	14.0(10.3 - 17.8)	11.9(8.7 - 15.0)	26.9(21.3 - 32.5)
Cuban	26.6(22.5 - 30.7)	28.6(24.3 - 33.0)	13.9(10.9 - 16.9)	10.7(8.5 - 12.8)	20.2(16.5 - 23.9)
Mexican	23.8(20.4 - 27.2)	19.8(17.6 - 22.0)	14.2(12.1 - 16.3)	12.7(10.3 - 15.1)	29.4(25.7 - 33.2)
Puerto Rican	16.1(13.2 - 19.0)	17.5(14.1 - 21.0)	14.4(11.2 - 17.6)	13.8(9.1 - 18.4)	38.1(33.2 - 43.1)
South American	27.0(21.7 - 32.3)	22.6(17.3 - 27.8)	15.2(9.8 - 20.6)	11.3(7.7 - 14.9)	24.0(17.5 - 30.4)
More than one/Other heritage	20.5(9.0 - 32.0)	9.3(4.5 - 14.1)	16.5(8.8 - 24.2)	7.6(2.6 - 12.7)	46.1(31.4 - 60.9)
US Born	14.5(11.3 - 17.6)	20.7(17.5 - 24.0)	13.6(10.6 - 16.5)	13.7(10.5 - 16.8)	37.6(32.4 - 42.8)
Born Outside	25.1(23.1 - 27.1)	22.6(20.7 - 24.5)	14.5(13.1 - 15.9)	11.5(10.0 - 13.1)	26.3(24.2 - 28.3)

Table 3
Prevalence of ACE stratified by type of experience and sex

ACE	Men(%)	Women(%)
Emotional abuse	28.8(25.8 - 31.7)	32.4(29.5 - 35.4)
Physical abuse	29.4(26.7 - 32.0)	30.4(27.6 - 33.2)
Sexual abuse	7.0(5.4 - 8.6)	20.4(18.2 - 22.5)
Emotional neglect	16.1(14.1 - 18.1)	27.2(24.3 - 30.1)
Physical neglect	11.0(9.2 - 12.9)	10.4(8.9 - 12.0)
Bettered mother	18.7(16.2 - 21.2)	21.6(19.1 - 24.1)
Household alcohol/drug abuse	26.6(23.7 - 29.6)	33.8(31.0 - 36.7)
Household mental illness	19.2(16.7 - 21.7)	22.6(20.5 - 24.6)
Parent separation or divorce	44.8(41.5 - 48.0)	46.0(43.3 - 48.8)
Household member in prison	28.3(25.5 - 31.1)	22.1(19.9 - 24.3)