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Psychiatric Comorbidity and Acculturation Stress Among Puerto Rican Substance Abusers

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Abstract

Background—Although acculturation to the United States has been associated with an increase in substance, mood, and anxiety disorders in Latino populations, few studies have examined this concept relative to comorbidity among these syndromes.

Methods—This study: (1) compares the prevalence and patterns of psychiatric comorbidity among Puerto Ricans with substance use disorders living in San Juan (Puerto Rico) to those who have migrated to New Haven (Connecticut); and (2) examines the association between acculturation-related stress and the prevalence and patterns of psychiatric comorbidity among those who have migrated to New Haven.

Results—Lifetime levels of nearly all comorbid psychiatric disorders among respondents with substance use disorders (SUD) was generally similar across sites. However, the risk of any co-occurring psychiatric disorder was higher among SUD cases in New Haven who reported high levels of total acculturation stress and family-specific acculturation stress. These findings were generally accounted for by associations between affective disorders and high scores on these indicators of acculturation stress.

Conclusions—The overall prevalence and patterns of psychiatric comorbidity are remarkably similar among Puerto Rican substance abusers whether they live in San Juan or have migrated to New Haven, thereby demonstrating robustness to differences in geographic location. Nevertheless, the degree of acculturation-related family stress is positively associated with co-occurring substance and psychiatric disorders, particularly affective disorders. Intervention in family strain related to the acculturation process may diminish the development of comorbid mental disorders and assist in implementing successful treatment of substance abuse.

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Introduction

Acculturation is the complex process of adaptation to a new society and culture, and a growing body of evidence has underscored its implications for mental health. By various indicators, acculturation to the United States has been associated with an increase of substance, mood, and anxiety disorders in numerous Latino samples.¹⁻⁷ Several interrelated theoretical frameworks have been proposed to explain this phenomenon,⁸⁻¹² and the concept of migration-related stress in particular has emerged as a common explanatory theme. For example, the acculturative stress theory proposes that migration involves cultural, social, economic, and personal challenges and changes that affect mental health outcomes depending on the level of stress that is experienced. Another common interpretation is that acculturation may reduce the protective effects of traditional Latino culture, such as close personal ties in the extended family, that may directly or indirectly buffer the effects of stress and prevent the development of psychiatric disorders.⁸

Although acculturation has been investigated relative to individual psychiatric conditions, few studies have examined its role in substance use disorder comorbidity. Abundant evidence nonetheless indicates that substance use disorders are strongly associated with diverse forms of psychopathology, particularly affective, anxiety and antisocial personality disorders.¹³⁻¹⁷ In addition, the different forms of substance/psychiatric disorder comorbidity have been shown to be of similar magnitude across cultures, despite wide variation in base levels of the specific disorders involved in these associations.^{18;19} That is, despite dramatic differences in the prevalence of alcohol and drug use and disorders across cultures, the patterns of comorbidity with mental disorders are highly similar across the world. The extent to which substance/psychiatric disorder comorbidity is associated with worsened clinical course and social or occupational impairment has also been extensively documented as well as its impact on service utilization and health care costs.²⁰⁻²⁵ Research concerning the effects of acculturation on substance/psychiatric comorbidity is therefore of considerable public health importance, particularly among Latino populations who represent the largest and most rapidly growing ethnic minority group living in the United States.^{26;27}

The limited existing research on this topic provides mixed evidence concerning the association between acculturation and comorbidity among Latinos. Golding and colleagues²⁸ found that low levels of acculturation were associated with increased risk of secondary depression among Mexican men with alcohol use disorders. On the other hand, Ortega's³ study of Mexican-Americans, Puerto Ricans, and "other" Hispanics from the National Comorbidity Survey (NCS) data found no association between acculturation and the risk of substance use disorder comorbidity with any other psychiatric condition. However, it is important to note that information concerning acculturation collected by the NCS was limited, and the lack of Spanish-language interviews may have excluded less acculturated Latinos. Vega and colleagues²⁹ also reported no differences between the proportion of substance/psychiatric comorbidity among Mexican Americans born in the United States compared to those born in Mexico. Although this study used interviews in Spanish, the association between acculturation and comorbidity was examined only by comparing the immigrant and U.S. born samples and no analyses were conducted to examine whether comorbidity varied by extent of acculturation in either sample. Finally, it is also notable that no previous study has examined the association between acculturation-related stress and psychiatric comorbidity in persons with substance use disorders.

The present study attempts to further examine the association between acculturation and substance/psychiatric comorbidity by studying two samples sharing a common culture of origin (that of Puerto Rico), but who live in distinct geographic locations due to migration by one sample. The specific objectives of this study are: (1) to compare the prevalence and patterns

of psychiatric comorbidity among Puerto Ricans with substance use disorders who live in San Juan, Puerto Rico, to those who have migrated to New Haven, Connecticut, and (2) to examine the association between level of acculturation-related stress on the prevalence and patterns of substance/psychiatric comorbidity among those who have migrated to New Haven. Based on prior literature demonstrating cross-cultural consistency in comorbidity levels, it was anticipated that similar patterns of substance/psychiatric comorbidity would occur across both sites. Among those who migrated to New Haven, the level of acculturation-related stress was anticipated to be positively associated with the likelihood of comorbid psychiatric disorders.

Methods and Measures

Selection of Study Participants

Participants in the current study were enrolled in a larger investigation of Puerto Rican families residing in the Standard Metropolitan area of San Juan (Puerto Rico), or in New Haven (Connecticut) after having been reared on the island for at least 5 years during childhood. In the larger study, probands (i.e., the adult index case) were eligible for participation if they were self-identified as Puerto Rican, had offspring between ages 12-17, and had provided consent to interview themselves, their offspring, spouse/co-parent, and other household members.

Exclusionary criteria include inability to understand the questions and assessments in English or Spanish, or evidence of psychosis or organic brain disorder. Illiterate subjects were excluded from the New Haven sample, but because of the high levels of illiteracy in Puerto Rico, all participants in San Juan were read the questions.

The current study focused on the probands in New Haven (N=109) and San Juan (N=121) with a lifetime history of a substance use disorder as described in detail below. Most of the cases in New Haven (62%) and San Juan (60%) were recruited from public outpatient general mental health or substance abuse specialty clinics via telephone contacts from clinic-provided lists of clients, referrals by clinic caseworkers, and advertisements posted within clinic waiting rooms. For the remainder of the cases, households located within neighborhoods inhabited by the clinic-recruited probands were visited door-to-door by highly trained Puerto Rican recruiters who determined eligibility and interest of potential probands.

After obtaining informed consent from all participants, they were interviewed face-to-face in their home or at the local research center by Puerto Rican lay interviewers, and received \$50 in compensation. Participants were given a choice of being interviewed in English or Spanish; 76% of the adults in New Haven and 100% of the adults in San Juan were interviewed in Spanish.

Measures

The *Demographic Module* assessed sex, age, country of birth, language preference (Spanish or English), educational background (presence or absence of high-school degree), marital status (whether single-headed home), employment status (whether currently employed), and other sociodemographic indicators.

A computerized-version of the *Composite International Diagnostic Interview* (CIDI, Version 2.1)³⁰ was administered in English or Spanish to all participants. The CIDI is a structured diagnostic instrument designed for use by trained interviewers who are not clinicians³¹ to produce psychiatric diagnoses according to criteria defined by DSM-IV³² and ICD-10.³³ The following lifetime CIDI modules were administered at both sites: nicotine dependence, phobic states and other anxiety disorders, depression and dysthymia, mania and bipolar disorder, post-traumatic stress disorder, alcohol abuse/dependence, and drug abuse/dependence. In addition, both sites added the antisocial personality disorder module from the Diagnostic Interview

Schedule (DIS).³⁴ For the current study, participants were classified as cases if they fulfilled lifetime criteria for a substance use disorder (i.e., alcohol and/or drug abuse or dependence).

The CIDI has been documented to have high levels of diagnostic coverage, test-retest and procedural reliability, and validity.^{6;35-41} The first field-testing of the CIDI for cross-cultural use was carried out in 1987 by 17 countries, including Puerto Rico.⁴² The inter-rater reliability of the CIDI and its cross-cultural feasibility showed percentage agreements for all diagnoses above 90% and highly significant kappa values.⁴¹ WHO CIDI field trials have shown adequate reliability and validity of the mood and anxiety as well as the alcohol and drug modules.^{37; 43-45} The reliability and validity of the DIS for use in the Puerto Rican adult population has been previously established.⁴⁶

At the New Haven site only, the *Hispanic Stress Inventory* (HSI) was used to assess stress related to the process of acculturation. This self-report inventory was specifically developed to measure culturally-relevant psychosocial stressors associated with the acculturation process among U.S.-born and immigrant Latino groups.^{47;48} For the current study, 20 items from the 73-item immigrant version of the HSI were selected, and they evaluate three different aspects of acculturation stress: family/culture stress (10 items; e.g., “I have felt that family relations are becoming less important for people that I’m close to;” “There have been cultural conflicts in my family.”), discrimination stress (5 items; e.g., “I have felt unaccepted by others due to my Puerto Rican culture;” “Because I am Puerto Rican I have had difficulty finding the type of work I want.”), and language stress (5 items, e.g. “Because I don’t know enough English, it has been difficult for me to interact with others;” “I have felt pressure to learn English.”). Respondents indicate on a 3-point scale how frequent (i.e., hardly ever or never, sometimes, often) each item applies to them; higher scores indicate greater stress. Scores for each component were operationalized as the sum of the respective items, and a total stress score was calculated based upon the sum of all 20 items. Respondents completed the battery in paper-and-pencil format after successful completion of a literacy test. Reliability estimates for the three factors and the total stress score were excellent, with alpha coefficients ranging from 0.78 to 0.91.

Statistical Analyses

All statistical analyses were performed with SAS (SAS for Windows, Version 9.1, 2002). Data analyses included chi-square tests for *n*-way tables of categorical variables and analyses of variance for continuous data. Logistic regressions were used to examine the associations between the HSI dimensions of acculturation stress and comorbid psychiatric disorders, after controlling for sex and language-of-interview (English or Spanish). In addition, current employment status (yes/no) was included as an additional covariate when examining the association between the discrimination dimension of the HSI and comorbid psychiatric disorders, as this dimension includes job-related items that could vary as a function of current employment status.

Results

Table 1 shows the sociodemographic characteristics of the cases separately by site. In New Haven as well as San Juan, the cases were equally likely to be male. At both sites, they tended similarly to come from single-headed homes, to have family incomes less than \$10,000 per year, to have a high-school education or less, and to be employed. The sociodemographic characteristics of the participants with substance use disorders were therefore highly similar in New Haven and San Juan. On average, the New Haven cases lived in the United States for 16.6 (SD=10.3) years.

Potential differences between sites were examined concerning the prevalence and patterns of comorbid psychiatric conditions among participants with substance use disorders. As shown in Table 2, approximately 7 out of 10 participants at either site had at least one lifetime psychiatric disorder. The levels of specific types of comorbid psychiatric disorders were highly similar in New Haven and San Juan. At both sites, anxiety disorders were the most common comorbid psychiatric condition, representing nearly half of the cases with substance use disorders. Post-traumatic stress disorder was by far the most common anxiety disorder, affecting on average three out of every ten probands. Specific phobia was the second most prevalent anxiety disorder, followed by generalized anxiety disorder, social phobia, panic disorder, and agoraphobia. Approximately four out of ten probands had a lifetime history of an affective disorder, with major depressive disorder being the most common comorbid condition at either site, followed by bipolar disorder, and dysthymia. Table 2 also demonstrates only one marginally significant site difference. The proportion of antisocial personality disorder was less common among the New Haven cases (OR = 0.55, 95% C.I. = 0.31-0.98). Finally, at both sites, comorbidity with multiple psychiatric disorders was more common than comorbidity with only one other disorder.

Regarding the results for the HSI, which was administered only to the New Haven cases, the means (and standard deviations, SD) were 10.01 (SD=7.3) for total stress, 4.7 (SD=3.9) for family stress, 2.8 (SD=2.4) for discrimination stress, and 2.5 (SD=2.6) for language stress. Table 3 presents the results from analyses examining the association between acculturation-related stress, as measured by scores on the HSI, and comorbid lifetime psychiatric disorders. The level of any comorbid lifetime psychiatric disorder was associated with higher scores on total stress, family stress, and discrimination stress. Language stress was unrelated to the likelihood of any comorbid psychiatric disorder. It is quite notable that these positive findings were largely explained by the affective psychopathology spectrum (i.e., any comorbid lifetime affective disorder, major depressive disorder, and dysthymia). Moreover, after adjusting for covariates, only family stress was associated with the affective disorders. By contrast, the anxiety disorders and antisocial personality disorder were unrelated to any measure of acculturation-related stress, as was the number of comorbid psychiatric disorders.

The final set of analyses examined the onset of comorbid psychiatric disorders relative to the timing of migration from San Juan to New Haven. Migration occurred before the onset of substance use disorders in 56% of the cases. The first onset of any affective disorder followed migration for 66% of the cases with substance use disorders. The most recent episode of any affective disorder followed migration in 91% of these cases. The first onset of any anxiety disorder followed migration for 50% of the cases, with the most recent episode following migration in 78% of these cases. Thus, substance use disorders, comorbid affective disorders, and comorbid anxiety disorders generally occurred after migrating to New Haven.

Discussion

The findings of the current study confirm previous observations linking migration and acculturation with mental health outcomes, and advance our understanding concerning several aspects of these associations. The results related to the first study objective demonstrated that the lifetime levels of most psychiatric disorders among respondents with substance use disorders were similar across sites, a finding that is generally consistent with other multi-site studies.^{18;19} The only significant site difference was the finding that antisocial personality disorder was less prevalent among substance abusers who have migrated to New Haven. Puerto Ricans with antisocial personality disorder may be less likely to relocate from Puerto Rico, an interpretation that is consistent with the “healthy migrant effect” which has received mixed support from other studies^{2;5;7;49}. That is, certain characteristics of antisocial personality disorder, such as impulsivity and irresponsibility, seem incompatible with and reduce the

probability of migration due to the long-term planning and commitments required for a major relocation. Despite this sole positive finding, the lack of any other site difference suggests that the patterns of psychiatric comorbidity are remarkably similar among Puerto Rican substance abusers whether they live in San Juan or have migrated to New Haven. Overall, these findings are largely consistent with other studies showing that the prevalence and patterns of psychiatric disorders among individuals with substance use disorders are robust to differences in culture and geographic location.¹⁸

Regarding the second study objective, these results generally support the hypothesis linking acculturation-related stress to comorbid substance/psychiatric disorders. Although multiple studies on diverse Latino samples indicate that acculturation to the United States is associated with an increase of substance, mood, and anxiety disorders, none have examined the association between acculturation-related stress and comorbid substance and psychiatric disorders. The findings from the current study provide new information about this understudied phenomenon by indicating that individuals with substance use disorders are more likely to have any co-occurring psychiatric disorder, and particularly mood disorders, if they report high levels of acculturation-related stress. These findings were generally accounted for by associations between the affective disorders and high scores on the family dimension of acculturation-related stress. Indeed, the largest associations were found between dysthymia and elevated family stress (OR=1.3). It is possible that the migration experience itself increases the likelihood of mood disorders due to a host of stressful changes including isolation from family, friends, and other support networks that exist in Puerto Rico. Other studies have underscored this possibility in reporting that migration among Latinos is associated with affective disorders by virtue of disruption of traditional Latino family and social support mechanisms.⁵⁰ Although New Haven does have a sizeable Puerto Rican community, its social infrastructure is surely less developed than those on the island of Puerto Rico, suggesting that compensating for the isolation from native family members may be difficult nonetheless. Although prior research reported no association between acculturation and substance/psychiatric comorbidity, such studies were characterized by limited information about acculturation³ and analyses were not conducted by extent of acculturation stress.^{3:29} These findings indicate that, despite overall similar prevalence and patterns of comorbidity in the San Juan and New Haven substance abusers, the degree of strain – and especially within the family domain – associated with the acculturation process among those who migrated to New Haven is positively associated with the risk of affective disorders. Consistent with this interpretation, the order-of-onset data indicate that the first and most recent episode of affective disorders followed migration in most comorbid cases.

The findings from the current study should be considered in light of respective strengths and limitations of the methodology. The major strengths include the homogeneity across sites relative to culture-of-origin and demographic characteristics of the samples, as well as parallel sampling, data collection, and assessment procedures. The use of Spanish-language interviews and analyses focusing on the association between the degree of acculturation-related stress and comorbidity may also be considered as advances. Limitations include the preponderance of clinic-recruited cases, cross-sectional design, recruitment only of cases with children aged 12-17, retrospective nature of the order-of-onset data, and small sample size. Although recruitment from clinics typically introduces a bias of including more serious cases, two elements of this study attenuate the problem. First, 40% of the cases with substance use disorders were recruited from sources other than clinics, namely door-to-door visits within neighborhoods matched to clinic cases. Second, many of the clinics that were used for recruitment functioned as general health clinics (not just as mental health clinics) that provide a wide array of services to the community, such that not all clinic-recruited cases were receiving mental health treatment. Thus, the diverse recruitment strategies helped to increase the generalizability of the findings to adult Puerto Rican migrants with substance use disorders at

large. The reliance of retrospective and cross-sectional data, particularly for the order-of-onset information, is certainly less than ideal for understanding timing of disorders, and while informative should be considered preliminary. Also, because the study participants are all Puerto Rican adults with offspring ages 12-17, these results may not generalize beyond Puerto Rican parents with adolescents. Furthermore, the association between acculturation stress and psychopathology may be greater in other Latino groups, particularly because of the increased complexity surrounding immigration from areas outside United States territory (e.g., Cuban migrants are both isolated from family and much less able to back-migrate to visit relatives due to legal barriers). Finally, the limited number of cases underscores the need for replication among larger samples, which could have sufficient power to reveal additional small effects.

Although these limitations suggest that caution be taken when interpreting the results, the strengths permit more precise and novel conclusions relative to the role that acculturation stress may play in psychiatric comorbidity among adult Puerto Rican migrants with substance use disorders. Overall, the findings suggest that the level of stress associated with acculturation plays an important role in co-occurring substance and psychiatric disorders, particularly between family stress and affective disorders, although the direction of influence is unclear. Longitudinal studies that offer more reliable indicators of the timing of events and which point towards the mechanisms underlying these associations deserve further attention, particularly among Latino subgroups in light of their expected growth over the next few decades. Previous research linking acculturation with psychiatric disorders, taken together with the present findings showing increased risk of affective comorbidity with more acculturation-related family stress, suggest that mental health interventions and treatments should be directed toward individuals who experience stress in the acculturation process. Although replication of these findings is certainly needed, it seems reasonable to consider testing interventions that specifically target issues associated with family strain (e.g., breakdown in traditional family values, isolation from extended relatives) as means to diminish the development of comorbid mental disorders and to assist in implementing successful treatment of substance abuse.

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Table 1

Sociodemographic characteristics of Puerto Ricans with lifetime substance use disorder, by site, % unless otherwise noted.

	New Haven, Connecticut <i>n</i> =109	San Juan, Puerto Rico <i>n</i> =121	Site difference <i>p</i> value
Male	67.2	67.8	0.9124
Mean age (years) (SD)	37.0 (6.6)	41.5 (6.9)	0.3216
Single-headed home	51.4	65.3	0.3155
Income <10,000	41.3	54.6	0.1659
High-school education or less	78.9	67.8	0.1967
Employed currently	42.2	43.0	0.2203

Table 2
Comorbid psychiatric disorders of Puerto Ricans with Substance use disorder, by site

	New Haven, Connecticut		San Juan, Puerto Rico		Site difference* Odds ratio (95% CI)
	n	%	n	%	
Any psychiatric disorder	79	72.5	84	69.4	1.2 (0.7-2.1)
Any anxiety disorder	56	51.4	59	48.8	1.1 (0.7-1.9)
Generalized anxiety disorder	13	11.9	16	13.2	0.9 (0.4-1.9)
Panic	10	9.2	12	9.9	0.9 (0.4-2.2)
Agoraphobia	7	6.5	11	9.1	0.7 (0.3-1.9)
Social phobia	11	10.2	14	11.6	0.9 (0.4-2.0)
3+ specific phobias	22	20.4	18	14.9	1.5 (0.7-2.9)
Post-traumatic stress disorder	32	29.4	37	30.6	0.9 (0.5-1.7)
Any affective disorder	48	44.0	49	40.5	1.2 (0.7-2.0)
Major depressive disorder	33	30.3	39	32.2	0.9 (0.5-1.6)
Dysthymia	9	8.3	3	2.5	3.5 (0.9-13.4)
Bipolar I or II	10	9.2	10	8.3	1.1 (0.5-2.8)
Any antisocial personality disorder	25	23.2	43	35.5	0.6 (0.3-1.0)
1 psychiatric disorder	30	27.5	24	19.8	1.5 (0.8-2.8)
2+ psychiatric disorders	49	45.0	60	49.6	0.8 (0.5-1.4)

* Test for site differences in rates of each comorbid psychiatric disorder

Table 3
 Acculturation stress and psychiatric comorbidity among Puerto Ricans with substance use disorders: New Haven migrants

	HSI total stress ^a		HSI ^a family stress		HSI discrimination stress ^a		HSI language stress ^a	
	OR ^b	CI	OR ^b	CI	OR ³	CI	OR ^b	CI
Any psychiatric disorder	1.08	1.01-1.15	1.15	1.01-1.32	1.24	1.00-1.53	1.06	0.87-1.28
Any anxiety disorder	1.02	0.97-1.08	1.02	0.92-1.12	1.04	0.88-1.24	1.09	0.92-1.28
Generalized anxiety disorder	0.99	0.91-1.08	0.94	0.79-1.11	0.98	0.0.76-1.28	1.02	0.80-1.30
Panic	0.95	0.86-1.06	0.87	0.71-1.06	0.94	0.68-1.28	1.00	0.76-1.33
Agoraphobia	1.06	0.96-1.17	1.06	0.88-1.28	1.11	0.79-1.54	1.25	0.93-1.70
Social phobia	0.97	0.88-1.06	0.92	0.77-1.10	0.93	0.70-1.24	0.93	0.71-1.22
3+ specific phobias	0.93	0.87-1.01	0.86	0.75-1.00	0.84	0.67-1.06	0.90	0.73-1.11
Post-traumatic stress disorder	1.02	0.96-1.08	1.02	0.92-1.38	1.09	0.90-1.32	1.02	0.86-1.21
Any affective disorder	1.09	1.03-1.16	1.22	1.08-1.37	1.19	0.98-1.42	1.08	0.91-1.27
Major depressive disorder	1.07	1.01-1.14	1.16	1.04-1.30	1.20	0.98-1.46	1.07	0.90-1.28
Dysthymia	1.13	1.02-1.24	1.25	1.05-1.49	1.37	0.99-1.88	1.21	0.92-1.59
Bipolar I or II	0.99	0.90-1.09	1.05	0.89-1.24	0.90	0.67-1.22	0.90	0.68-1.18
Antisocial personality disorder	0.98	0.91-1.05	0.97	0.85-1.10	0.86	0.69-1.07	0.95	0.77-1.16
1 psychiatric disorder	1.05	0.99-1.12	1.08	0.97-1.21	1.24	1.03-1.51	1.07	0.90-1.27
2+ psychiatric disorders	1.01	0.96-1.06	1.03	0.93-1.14	0.98	0.82-1.16	0.98	0.84-1.15

^aHispanic Stress Inventory.

^bOdds-ratios are adjusted for sex and language of interview.

³Odds-ratios are adjusted for sex, language of interview, and current employment status. Odds-ratios in bold are significantly greater than one.