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Does childhood mental health service use predict subsequent mental health service use as Latino youth transition to young adulthood? Evidence from the Boricua Youth Study

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Abstract

Purpose.—Studies document the substantial underutilization of mental health services by US Latinos in young adulthood. Rates of service use are higher in childhood, raising questions about whether mental health service use during childhood may facilitate access to services later in life. This article examines the extent to which utilization of mental health services in childhood is predictive of utilization in young adulthood among US Latinos.

Methods.—Data come from the Boricua Youth Study, a longitudinal study of Puerto Rican youth at two sites (South Bronx, New York, and the standard metropolitan area of San Juan, Puerto Rico). Data were collected in three waves during childhood (ages 5–13; surveyed 1 year apart), with an approximately 11-year follow-up in young adulthood (ages 16–29). In childhood, parents reported on youth mental health service use (Waves 1–3). In Wave 4, as youth transitioned to young adults (N=2,004), they reported on their past year mental health service use.

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Ethical Standards Statement: This study has been approved by the appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

Results.—Whereas 30.2% of parents reported their child received mental health services, only 3.5% of young adults reported mental health service use in the past year. After controlling for young adult disorders and their severity, childhood disorders were associated with increased likelihood of mental health service use in young adulthood. Childhood mental health service use was also associated with young adult service use, however, this association attenuated when controlling for childhood disorders.

Conclusion.—Findings suggest the importance of specifically considering childhood disorders in understanding mechanisms for improving access to mental health services among Latino young adults.

Keywords

Mental health; service use; BYS; Latino; young adult

Research indicates that Latino children living in the United States have rates of unmet mental health need approximately two times higher than their Non-Latino White peers [1–3] and that these disparities persist into adulthood [4, 5]. Despite interest in identifying mechanisms underlying these disparities [6], little is known about longitudinal patterns in mental health service use among Latinos. Research with non-Latino samples in the US and Australia finds that mental health service utilization declines from childhood to young adulthood [7]. Young adulthood is a particularly critical time for examining mental health service access because emerging adults are at elevated risk for developing psychiatric disorders [8] and many are beginning to make independent decisions about health and mental health services utilization.

One question that has been the focus of study is whether childhood mental health service receipt is predictive of later mental health service access. Some studies have found this to be the case [9, 10], suggesting that early experiences with mental health services may facilitate later access. For example, youth receiving ongoing mental health services might have more severe disorders, but also experience fewer barriers to service access [9], making it more likely that they will both need and receive services later in life. However, other studies have found no association [11]. If among Latinos, who report reduced rates of mental health service use in general, it is the case that childhood service use is predictive of later service utilization, these results could have implications for facilitating improved access to services in young adulthood.

The Boricua Youth Study (BYS) is a longitudinal study of mental health and service use during childhood and young adulthood among an ethnically homogeneous sample of Latino youth living in Puerto Rico and the South Bronx, New York [12, 13]. An earlier study using BYS childhood data to examine service use among youth with attention deficit/hyperactivity disorder found that prior mental health service use was significantly associated with subsequent service use in childhood [14]. The current study extends this research by using the fourth wave of BYS data collected in young adulthood to investigate whether psychiatric disorders and mental health service use among Latino children are associated with service utilization when youth transition to young adulthood. Whereas most prior longitudinal research on mental health service utilization has focused on care within a short period of

time (e.g., within childhood or over one-year), the current study investigates the association of childhood mental health service utilization with mental health services prospectively after an 11-year follow-up in young adulthood. Specifically, we will address: To what extent is childhood mental health service use associated with subsequent service use among Latino young adults?

Method

Participants

Data are from the Boricua Youth Study, a longitudinal study of psychiatric disorders [15], their correlates, and consequences among youth who self-identified as being of Puerto Rican background [12, 13]. The BYS used a multistage probability sample design by which household clusters were randomly selected from Puerto Rico (in the standard metropolitan areas of San Juan and Caguas) and the South Bronx in New York. Participants were parents and their children (ages 5–13 years-old at Wave 1).

Data were collected in three waves during childhood, each approximately one year apart (summer 2000 to fall 2004), and one wave in young adulthood that was collected approximately 11 years after Wave 3 completion. Participants could complete the study interview in English or Spanish. Most parents (75%) and children (97%) in the South Bronx elected to participate in English, whereas all participants in Puerto Rico elected to participate in Spanish. More information on sampling and weighting has been previously reported [12, 13].

For Wave 1 (W1), 1,353 parent/child dyads were interviewed in Puerto Rico (response rate=88.7%) and 1,138 dyads were interviewed in the South Bronx (response rate=85.6%). Sample retention for the second and third waves (W2 and W3) in Puerto Rico was 93.8% and 89.7% respectively, and 89.4% and 85.6% in the South Bronx. For the young adult Wave (W4), retention rates were 82.5% in Puerto Rico and 83.1% in the South Bronx (excluding deceased, long-term incarcerated, or cognitively impaired participants). Extensive efforts were made to re-contact youth for W4 data collection including attempts by mail, phone, and home visits. Those who did not participate in W4 were more often male and from W1 households with income below federal poverty guidelines or participating in welfare; with regards to psychiatric disorders, they were more likely to have an externalizing disorder or antisocial behaviors. The total participation rate in the current study was 82.8% of youth initially enrolled in W1 of the BYS. Youth 18 years of age and older in New York, and 21 years of age and older in Puerto Rico, signed informed consent. Youth younger than these ages signed assent forms and their parents signed informed consent.

Measures

Mental health service use.—Mental health service use during childhood was assessed in Waves 1–3 by asking parents if their child had received mental health services in the following settings: schools (including counseling, therapy, or placement in a special classroom or school because of learning, emotional, behavioral, or substance problems), outpatient (treatment in a mental health center, a clinic, a day program, with a private

therapist or doctor, or in an emergency room), and other (probation/juvenile justice, human services/complementary and alternative medicine, inpatient, prison, other; adapted from [16]). For W1, we used the indicator of lifetime service use to identify whether children had ever received mental health services. For W2 and W3, we used the indicator of 12-month service use to identify whether children had received services since the prior wave of data collection. This allowed us to construct a measure of any childhood service use up to the time of the W3 interview. We constructed a categorical variable indicating whether parents reported childhood service use in multiple waves of data collection, as a measure of continuity of childhood services (no mental health services in childhood, services reported during one wave of data collection, services reported during two or all three waves of data collection). Data collected in young adulthood assessed 12-month outpatient service use per self-report and asked about the same categories of service use as Waves 1–3, except for school services.

Psychiatric diagnoses.—In childhood, psychiatric disorders were assessed using the Diagnostic Interview Schedule for Children-IV (DISC-IV) [17] and its Spanish version [18]. The DISC-IV is a structured diagnostic interview used to assess childhood externalizing (attention deficit disorder, conduct disorder, oppositional defiant disorder, alcohol abuse/dependence, marijuana abuse/dependence, other substance abuse/dependence) and internalizing (generalized anxiety, post-traumatic stress disorder [PTSD], major depression) disorders. We used parent report for attention deficit disorder and oppositional defiant disorder. For depression and anxiety, we used youth report for respondents ages 10 and higher, but parent report for children under the age of 10. A continuous variable reflecting the number of comorbid psychiatric disorders (conduct disorder, attention deficit disorder, oppositional defiant disorder, alcohol abuse/dependence, marijuana abuse/dependence, other substance abuse/dependence, generalized anxiety, PTSD, major depression) reported at Wave 3 data collection was also calculated as an indicator of disorder severity [15].

In young adulthood (Wave 4), the Composite International Diagnostic Interview (CIDI) [19] was administered to young adults to assess psychiatric diagnoses. Diagnoses assessed included mood disorders (major depression, mania, hypomania, dysthymia), generalized anxiety disorder, and substance use disorders (drug dependence/abuse, alcohol dependence/abuse, nicotine dependence). The psychometric properties of the English and Spanish versions of the CIDI have previously been established [19–21]. Disorders were assessed in 12-month and lifetime frameworks. We used the 12-month framework in the current study. In addition, the PTSD Checklist (PCL-5) assessed symptoms of post-traumatic stress in the past 30 days [22]. The PCL-5 has been previously validated in English [22] and Spanish-speaking samples [23]. Consistent with prior research [24], we used a DSM-5 scoring rule to identify respondents who reported (a) one or more Criterion B (re-experiencing) symptoms, (b) one or two Criterion C (avoidance) symptoms, (c) two or more Criterion D (negative alternations in cognition and mood) symptoms, (d) two or more Criterion E (hyperarousal symptoms), and (e) significant symptom-related interference or distress. Respondents who met these criteria were considered to have PTSD. PTSD was combined with generalized anxiety disorder into a category indicating presence of any anxiety disorder, as has been done in prior research [8].

Psychological distress in young adulthood.—In young adulthood, participants completed the K6, a 6-item brief measure of non-specific psychological distress [25]. Items ask about the frequency of experiencing symptoms of major depression and generalized anxiety disorder in the month before the interview. Responses have been used previously to indicate disorder severity and are strongly predictive of serious mental illness [25, 26]. K6 items were used to compute a continuous measure of psychological distress (range=0–24), with higher scores indicating greater distress.

Socio-economic and demographics in young adulthood.—At Wave 4, participants reported their age, gender identity, and whether they were in post-secondary education/job-training, employed in a full-time/part-time job, living in a parent/caretaker's home, living in their own home, living in a homeless shelter, or living in temporary housing. They also reported whether they had health insurance coverage and their perceived socioeconomic status, which we categorized as socioeconomically advantaged (i.e., we live very well, we live comfortably) and socioeconomically disadvantaged (i.e., we live from check to check, almost poor, poor).

Analysis

We first described prevalence of any mental disorder, psychological distress, and service use in young adulthood at both sites. Next, we described mental health service use in childhood at both sites, for the total sample and among those identified with a childhood disorder according to the criteria described above. Chi-Square and Wald tests were used to assess site differences for categorical and continuous variables, respectively.

To account for missing covariates/predictors, we used the method of multiple imputation with chained equations (MICE) and implemented this procedure in Stata 15 [27] using the “mi” package. The MICE procedure imputes missing values for each variable using a chained equations approach whereby multiple complete datasets are created (10 datasets in our analysis), each regression model was estimated for each dataset, and standard rules were used to combine the estimates and adjust the standard errors for uncertainty due to imputation.

We then estimated a series of logistic regression models using the imputed data to examine the association of childhood mental health and mental health service use with whether young adults used past year mental health services in outpatient specialty settings. First, we estimated bivariate models, to determine the association between each childhood variable one-by-one and past year mental health service use in young adulthood. We next constructed a series of multivariate models. In Model 1, we used young adult (Wave 4) data only to estimate the association of socio-economic, demographic, and current need variables (based on 12-month disorders, PCL-5, and K6 scale scores) with young adult outpatient mental health service use. This model allowed us to determine the extent to which current service use was explained by current need for services. In Model 2, we added variables indicating childhood mental health service use in Waves 1–3 (i.e., no service use, service use reported in one wave, service use reported in 2 or 3 waves) with young adult service use, adjusting for socio-demographics and young adult need. This model allowed us to estimate whether

service use in childhood was associated with service use in young adulthood, while adjusting for current need for services. Finally, in Model 3, we added variables indicating childhood mental health need in Waves 1–3 (internalizing disorders, externalizing disorders, number of comorbid disorders). With this model, we were able to determine whether childhood service use remained associated with young adult service use, once we accounted for both childhood and young adult need. Regression coefficients were reported as ORs with 95% confidence intervals (CIs). Statistical significance was evaluated using .05-level two-sided tests based on the design-based Taylor series method implemented in the Stata software [27] to adjust for the weighting and clustering of observations.

Results

Sample Sociodemographic Characteristics

The sample for the current study included 2,004 young adult participants (921 who were in the initial South Bronx group and 1,083 who were in the initial Puerto Rico group). The majority of children who were initially in the Puerto Rico sample still lived in Puerto Rico as young adults (approximately 90%). In contrast, about 68% of those originally in the South Bronx sample lived in the South Bronx as young adults. The weighted sample was 49.2% female with an average age of 22.4 (SD=0.1) years at Wave 4 (no differences in gender or age across sites). Most participants reported that they had health insurance coverage, particularly if they were from Puerto Rico (86.0%) as compared with the South Bronx (77.4%). Most young adults were employed (53.7%) or attending post-secondary education (37.6%). The majority lived with a parent or caregiver (64.5%), with an additional 24.6% living in their own home, 0.7% in a homeless shelter, and 2.4% in temporary housing. The proportion of young adults living in their own home was significantly lower in the South Bronx as compared to Puerto Rico (21.2% vs. 27.4%; $p<0.01$). Most young adults indicated that they “lived well or comfortably” (70.3%); with no significant difference between those living in the South Bronx and those in Puerto Rico.

Young Adult Mental Health and Mental Health Service Use

Approximately one-fifth (21.4%) of young adults participating in the BYS reported a 12-month disorder, with significantly higher rates in the South Bronx (26.0%) than Puerto Rico (17.6%, $p<.001$; Table 1). Participants originally from the South Bronx also reported significantly higher scores on the K6 than those from Puerto Rico ($Mean=3.4$ vs. 2.4 , $p<.001$). Twelve-month outpatient mental health service use was reported by only 3.5% of young adults, independent of diagnoses. There were no significant differences in outpatient service use between young adults originally from the Puerto Rico and the South Bronx sites. However, inpatient service use and prison service use in the past 12 months were significantly higher among young adults in the South Bronx compared to those in Puerto Rico (1.4% vs. 0.2%; $p<.01$ for inpatient service use, and 4.1% vs. 0.7%; $p<.001$ for prison service use).

Childhood Mental Health and Mental Health Service Use

Parent reports in Waves 1–3 indicated that 19.4% of youth experienced an externalizing disorder and 4.3% of youth experienced an internalizing disorder during childhood.

Childhood internalizing disorders were reported more frequently in the South Bronx than Puerto Rico (5.1% vs. 3.2%, $p=.048$), whereas childhood externalizing disorders were reported at similar rates in Puerto Rico than the South Bronx (21.0% vs. 18.0%, $p=.136$).

Parent reports in Waves 1–3 indicated that 30.2% of all youth received services at some point during childhood (Table 2). Children in the South Bronx sample (35.6%) were more likely to receive mental health services during childhood than children in the Puerto Rico sample (25.7%). Among children with a childhood psychiatric disorder, as diagnosed by the DISC-IV, 62.4% reported using mental health services in at least one wave of data collection. Specifically, 23.2% received services at one wave of data collection only, 19.2% received services at two waves, and 20.0% received services at all three waves. Participants with a childhood mental disorder were equally likely to receive services regardless of geographical location.

Schools were the most common setting in which parents reported that their children received services in Waves 1–3, with parents being two times more likely to report that their child received school-based services than outpatient specialty/medical services (25.2% vs. 12.2% among all children, 55.1% vs. 28.5% among children with a disorder). Furthermore, in Wave 1, parents were more than twice as likely to report that their child had received school-based (17.3% among all children, 39.0% among children with a disorder) than outpatient (7.6% among all children, 18.2% among children with a disorder) mental health services in their lifetime. These findings indicate that schools were the most common first and ongoing source of mental health services during childhood. We specifically examined parent report of 12-month specialty outpatient service use in Wave 3 alone, as it provided data from the oldest Wave of childhood service use and was therefore the most comparable to the young adult reports. At this Wave 3 data collection, only 5.6% of parents in the South Bronx and 4.0% of parents in Puerto Rico reported 12-month outpatient mental health services, regardless of childhood disorder (results available on request).

Associations between Child Mental Health Service Receipt and Young Adult Service Receipt

Table 3 provides results for the association between childhood mental health service use and outpatient service receipt in young adulthood. In bivariate models, use of twelve-month outpatient specialty services in young adulthood was significantly associated with being female (OR=2.3, 95% CI=1.4–3.9), having health insurance (OR=2.3, 95% CI=1.0–5.0), having a 12-month disorder (ORs=2.2 to 8.2), having higher scores on the K6 (OR=1.2, 95% CI=1.2–1.3), having a childhood internalizing disorder (OR=2.7, 95% CI=1.2–6.4), and having a greater number of comorbid disorders in childhood (OR=1.7, 95% CI=1.3–2.4). Outpatient mental health service use in young adulthood was not associated with site (South Bronx vs. Puerto Rico), age, household economic status, childhood externalizing disorders. Contrary to expectations, mental health service use in young adulthood was not associated with childhood mental health service use.

In Model 1, where young adult demographic and need factors were entered together to determine their association with young adult service use, only gender, insurance status, having a 12-month mood disorder, and K6 scores remained significant. Model 2 added

childhood mental health service use to the model to test whether young adult service use was associated with continuity of mental health services in childhood, as measured by the number of waves in which childhood service use was received. Results indicated that, when controlling for young adult demographics and need, mental health service receipt in young adulthood was significantly associated with reports of childhood service receipt in 2 or 3 waves (OR=2.2, 95% CI=1.0–4.5), suggesting that greater continuity of childhood mental health service use was associated with greater likelihood of young adult service use.

To determine whether these associations were a function of childhood need for services, we estimated a final model (Model 3) which included indicators of childhood mental health need. Once coefficients were added for any childhood internalizing disorders, externalizing disorders, and number of comorbid disorders, the coefficient for mental health service use in childhood attenuated and became non-significant. However, number of childhood disorders was associated with mental health service use in young adulthood (OR=1.9, 95% CI=1.4–2.7). Results were unchanged when we added an indicator of childhood socioeconomic status (results available on request).

Discussion

Consistent with prior research [1, 28, 29] BYS findings indicate that Latino young adults use mental health services at very low rates. In the current sample, only 3.5% of young adults received any treatment, despite 21.4% meeting criteria for having a mental disorder. This rate of young adult service use was substantially lower than reports of service use in childhood, and is consistent with other research documenting a considerable decline in treatment use during the transition to adulthood [7, 10, 30].

One reason for this decline may be related to the settings in which services are received. BYS results indicate that children were most likely to begin and to continue to receive mental health services in schools. Many prior studies have similarly found schools to be the most common setting in which youth access mental health services [31, 32], and that there are fewer ethnic/racial disparities in access to services in schools than other service settings [3, 33]. Importantly, among those in the BYS who received any childhood mental health services, over half received services during two or all three waves of childhood data collection. This suggests that once children entered services, they were likely to continue using those services. This finding is consistent with studies suggesting that prior service use is a strong predictor of subsequent service use in childhood [9, 10, 14], potentially reflecting ongoing service use among those with the greatest need, or perhaps with the fewest barriers to accessing care.

We next looked at the association of service use in childhood with service use in young adulthood. One challenge to comparing rates of childhood and young adult service use is that the majority of childhood services were received in school settings and, in young adulthood, school settings are no longer a primary service provider. The best direct comparison is therefore between parent reports of outpatient mental health service utilization at Wave 3 (final wave of childhood data collection) and young adult reports of outpatient service utilization. At Wave 3, 5.6% of parents in the South Bronx and 4.0% of parents in

Puerto Rico reported 12-month outpatient service use regardless of need, a slightly higher rate than reports by young adults (4.1% in the South Bronx and 3.0% in Puerto Rico). Still, it is notable that the majority of young adults with a 12-month disorder (90%) received no mental health services. Other studies have similarly documented gaps in mental health care specifically for late adolescents and emerging adults, as well as the unique challenges in accessing this population [34–37].

In testing the association between childhood mental health service use and service use in young adulthood, we initially found that respondents were more likely to receive services in young adulthood if their parents had reported service use during two or more waves in childhood. This suggested that continuity of childhood mental health service use might be related to young adult service use. However, once we accounted for childhood disorders (specifically number of childhood disorders, as an indicator of disorder severity), the association of childhood mental health service use with service use in young adulthood attenuated. Although the association was no longer statistically significant, the fluctuation in odds ratios across our models and the size of the confidence interval in the final model suggest that we cannot rule out the possibility that continuity of service use in childhood is associated with greater likelihood of young adult service use. Previous studies have similarly found that earlier service use is associated with later service entry [9, 10, 14]; however, previous studies examined service use in childhood only and over brief time-intervals (e.g., one year). The current study focused on mental health service use in childhood as compared to service use measured in an 11-year follow-up survey and findings were similar to other longitudinal research documenting declines in mental health service use from adolescence to young adulthood [7]. In particular, prior studies have documented the specific challenges of serving late adolescents/young adults within service systems that are generally designed to serve either children or adults, particularly because young adults are typically physically healthy and may not have a relationship with a general practitioner who would provide a mental health referral [34, 38]. Moreover, many young adults receive services under their parents' health insurance and some may not want parents to know about their service use.

There are several reasons to specifically consider the strength of the association between childhood mental health service use and mental health service use in young adulthood. First, this association can provide insight into youth experiences with the mental health services system. For example, young adults who received mental health services in childhood may have perceived those services to be helpful and therefore sought out similar sources of support later in life. This hypothesis is consistent with research finding that the belief that treatment is helpful is positively associated with treatment usage [39]. In contrast, young adults who received services in childhood but did not receive needed services in young adulthood may have perceived their childhood services to be unsatisfactory or ineffective. There is some evidence that youth perceive childhood mental health service receipt to be undesirable or even coercive [40] and that ethnic/racial minority youth are more likely than their White peers to be referred for compulsory, rather than voluntary, mental health services [41]. Second, the association between childhood and young adult mental health service use can provide information about key barriers to service access. For example, it is possible that children who entered treatment faced fewer barriers than children with unmet need and that the same young adults did not face as many service-related barriers as their peers (e.g.,

recognition of symptoms, provider availability, financial resources, stigma, insurance [42]). However, new barriers emerging in young adulthood may also influence young adult entry into mental health services. Schools, in particular, have been implicated as being less likely to coordinate services across agencies than other community providers [32]. Given that the majority of participants in the current sample received services in schools during childhood, it is possible that, for some youth, school personnel or parents did not facilitate ongoing services for youth as they entered young adulthood, even among college-attending youth [7], and even when such services might have been helpful or necessary. In addition, the affordability of services may prevent young adults from accessing treatment. Studies have documented the importance of insurance coverage for predicting service use and that young adults are more likely to pay out-of-pocket for mental health services than children and adolescents [37, 43]. Other barriers may include difficulty with logistics (transportation, time constraints, childcare) and concerns about confidentiality [44]. Identifying the role of childhood barriers in childhood mental health service use might provide important insight into mechanisms underlying disparities in service use in adulthood.

Results of this study should be interpreted with the following limitations in mind. First, the young adult protocol did not assess all psychiatric disorders assessed in childhood. Therefore, some respondents might have met criteria for a disorder not included in the current data and those disorders might be independently associated with mental health service use. However, this suggests that we likely underestimated unmet need. Second, the service utilization questions were broad and did not provide specific information about factors including the nature of services, their intensity, duration, or modality. Third, there were several differences between the service utilization questionnaire used in childhood and in young adulthood. One difference is that the childhood questionnaire relied on parent report, whereas data in young adulthood relied on youth self-report. Another difference is that the childhood questionnaire asked about specific types of services and the young adult questionnaire asked only about overall categories. Both differences might have led us to underestimate the association between childhood and young adult mental health service use. Fourth, the current study uses data from young adults participating in Wave 4 of the BYS. Although there were extensive efforts to re-contact and interview BYS participants 11 years after the conclusion of the last childhood wave, there was some sample attrition (approximately 17% of the Wave 1 sample); however, this attrition is similar to other longitudinal studies. Further, movement out of the initial site (i.e., the South Bronx and Puerto Rico) was not accounted for in the current study. Finally, the BYS is a study of a specific group of Latinos – those identifying as Puerto Rican who lived in defined areas of Puerto Rico and the South Bronx as children. Prior studies have indicated that Puerto Ricans have better mental health care utilization than other Latino ethnic subgroups [45], suggesting that rates of young adult service use may be even lower for other Latino young adults or Latinos living in different contexts.

Despite these limitations, results document the large gap in unmet need for services across these two contexts and suggest a need for policy and practice interventions. Researchers have identified strategies for increasing access to mental health services for young males of color [46]. For example, motivation enhancement, in which clients engage in exercises designed to address psychological barriers to treatment participation (e.g. cost-benefit

analysis), has been found to reduce stigma related to treatment [46, 47]. Given the gender differences identified here, programs that are designed specifically for young Latino males may be particularly important for treatment engagement [48]. Further, clinicians should ensure all aspects of service provision are linguistically and culturally appropriate, including considering the use of bilingual materials, interpreters, and/or cultural brokers. As one example, the National Council of La Raza [49] recommends clinicians recognize experiences that may be unique to young Latinos, such as discrimination, acculturation, and trauma related to relocation, which can be risk factors for depression and suicide [50, 51].

Given that there is substantial use of school-based services by Latino youth during childhood, it may be particularly helpful for school-based providers to develop transition plans with students. Providing youth with information about how to access services in health or higher education settings, as well as how to navigate healthcare systems, may increase the likelihood that young adults continue treatment or seek help if needed. “Warm hand-offs” from school-based or pediatric clinicians to adult providers may support youth as they transition to adulthood. Policy and legislation that facilitates continuity of care and insurance coverage from childhood into young adulthood can further eliminate barriers to treatment.

In conclusion, study results indicate that Latino young adults were significantly less likely than children and adolescents to report mental health service use. Although childhood service use was associated with service use in young adulthood, this relationship may be explained by the severity of young adult disorders. Research should continue to examine facilitators and barriers to treatment access that have previously been related to mental health service utilization. For example, previous studies found that among Latinos, lower income earnings, recent immigration status, greater self-reliance, and living in a non-English speaking household are associated with reduced likelihood of formal service access [4, 52, 53]. It is possible that these barriers could be the target of interventions to reduce unmet need for mental health services in childhood and ultimately in young adulthood.

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Table 1:

Weighted descriptive characteristics, disorders, and service use in young adulthood

	Total Sample (N=2,004)	Puerto Rico (N=1,083)	South Bronx (N=921)
	Mean (SE)/%	Mean (SE)/%	Mean (SE)/%
Demographic Factors			
Age	22.2 (0.1)	22.3 (0.1)	22.2 (0.1)
Gender (Female)	50.8	49.1	49.3
Insurance Coverage	82.1	86.0	77.4 **
Household Economic Status			
Socioeconomically advantaged	70.3	72.0	68.2
Socioeconomically disadvantaged	29.7	28.0	31.8
Disorders and Psychological Distress			
Any 12-mo Disorder	21.4	17.6	26.0 **
K6 Scale Score	2.9 (0.1)	2.4 (0.1)	3.4 (0.1) **
Service Use			
Any 12-mo Outpatient Service Use	3.5	3.0	4.1
Any 12-mo Probation/Juvenile Service Use	1.2	0.7	1.9
Any 12-mo Inpatient Service Use	0.7	0.2	1.4 *
Any 12-mo Prison Service Use	2.3	0.7	4.1 **

Note: Taylor series linearization is used to estimate standard errors (SE) given the complex survey design. Site differences were tested using Chi-square tests and Wald test for categorical and continuous variables, respectively.

No individuals in Puerto Rico reported living in homeless shelter, therefore the statistical test for difference between the two sites for this variable could not be conducted.

* $p < 0.01$,

** $p < 0.001$

Table 2:

Childhood (Waves 1–3) Mental Health Service Utilization Patterns

	Total Sample			Among those with Childhood Disorder		
	Total Sample (N=2,004)%	Puerto Rico (N=1083)%	South Bronx (N=921)%	Total Sample (N=426)%	Puerto Rico (N=215) %	South Bronx (N=211)%
Any Sector Use (Waves 1–3)						
Educational Sector	25.2	20.0 **	31.4	55.1	46.9	63.8 *
Specialty/Medical Sector	12.2	10.7 *	14.1	28.5	22.9	34.4 *
First Sector Use (Wave 1 only)						
Educational Sector	17.3	13.2 *	22.2	39.0	30.4	48.0 **
Specialty/Medical Sector	7.6	6.9	8.5	18.2	14.7	21.9
Service Use Pattern						
No Service Use	69.8	74.3 **	64.4	37.6	44.8	30.0 *
1 wave only	14.0	12.9	15.3	23.2	24.3	22.0
2 waves	8.9	7.4	10.8	19.2	17.4	21.1
All 3 waves	7.3	5.4	9.5	20.0	13.6	26.8

Note: Estimates of Wave 1 service use are based on lifetime service use. Estimates of Wave 2 and Wave 3 service use are based on 12-month service use to capture service use since the last assessment.

* $p < 0.01$,

** $p < 0.001$

Table 3:

Associations of Demographic Factors and Childhood Service Use with Young Adult Service Use

	Young Adult 12-month MH Outpatient Service Use (N=1986)							
	Bivariate Models		Model 1 W4 Demos & Need		Model 2 W4 Demos & Need W1-3 Services		Model 3 W4 Demos & Need W1-3 Services & Need	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
<u>Demographics</u>								
Bronx (ref=PR)	1.38	0.84, 2.28	1.09	0.65, 1.83	1.04	0.61, 1.75	1.06	0.62, 1.82
Age	1.03	0.94, 1.12	1.02	0.93, 1.11	1.00	0.91, 1.10	0.99	0.91, 1.09
Gender (ref=male)	2.30**	1.36, 3.90	2.01*	1.11, 3.65	2.20*	1.20, 4.01	2.18*	1.19, 4.00
Insurance	2.26*	1.01, 5.04	2.62*	1.20, 5.72	2.78*	1.25, 6.22	3.29**	1.42, 7.65
Low SES	1.09	0.66, 1.81	0.79	0.43, 1.45	0.78	0.42, 1.43	0.78	0.42, 1.46
<u>Young Adult Need</u>								
12-month Disorders ^I								
Mood	8.15***	5.14, 12.90	3.91***	1.93, 7.92	4.11***	2.06, 8.19	4.15***	2.03, 8.52
Anxiety	7.27***	4.17, 12.66	1.69	0.72, 3.97	1.61	0.69, 3.77	1.64	0.69, 3.91
Substance Use	2.21*	1.16, 4.22	1.14	0.49, 2.67	1.2	0.52, 2.77	1.25	0.55, 2.83
K6 Scale	1.20***	1.16, 1.25	1.11***	1.05, 1.17	1.10***	1.04, 1.17	1.10**	1.04, 1.17
<u>Childhood Service Use</u>								
Waves Service Use (ref=None):								
1 wave only	1.65	0.82, 3.32			1.27	0.55, 2.95	1.31	0.56, 3.06
2 or 3 waves	1.86	0.98, 3.53			2.16*	1.04, 4.50	2.04	0.96, 4.30
<u>Childhood Need</u>								
Any internalizing	2.70*	1.15, 6.35					1.58	0.64, 3.91
Any externalizing	1.49	0.81, 2.76					0.62	0.28, 1.35
Number comorbid dx	1.74***	1.27, 2.38					1.91***	1.37, 2.67

Note: Odds Ratios and 95% confidence intervals are reported for each model. Missing values were imputed using the method of multiple imputation.

^I Reference group is no mood, no anxiety, no substance use disorder, respectively

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$