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## Clinical Diversity in a Randomized Trial that Explicitly Sought Racial/Ethnic Diversity in its Sample: Baseline Comparisons in a Treatment of Youth Substance Use and Posttraumatic Stress

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### Abstract

**Objective:** For more than two decades, federal agencies have sought to address a persistent lack of inclusion of Black, Latinx, Asian, and indigenous peoples in randomized controlled trials (RCTs), often with an underlying hypothesis that such efforts will increase diversity across clinically-relevant dimensions (M. S. Chen et al., 2014). We examined racial/ethnic and clinical diversity, including racial/ethnic differences in prior service access and symptom dimensions, in an RCT focusing on trauma-related mental health and substance use among adolescents.

**Method:** Participants were 140 adolescents in an RCT of Reducing Risk through Family Therapy. Recruitment followed several recommendations for enhancing diversity (Bonevski et al., 2014). Structured interviews examined trauma exposure, posttraumatic stress disorder and depression symptoms, substance use, service utilization and demographics.

**Results:** Non-Latinx (NL) Black youth were more likely receive mental health services for the first time and have greater trauma exposure, but less likely to report symptoms of depression ( $p < .05$ ) relative to NL White youth. Relevant caregiver differences included that NL Black caregivers were more likely to be unemployed and looking for work ( $p < .05$ ) despite having similar levels of education relative to NL White caregivers ( $p > .05$ ).

**Conclusion:** Results suggest that efforts to expand racial/ethnic diversity in an RCT of combined substance use and trauma-focused mental health may also expand other clinical dimensions. Many of these differences reflect multiple dimensions of racism experienced by NL Black families that clinicians must attend to.

### Keywords

diversity in clinical trials; violence victimization; substance use; comorbidity; adolescents

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Black, Latinx, Asian, and indigenous<sup>1</sup> peoples have long been underrepresented in medical and mental health clinical trials (Geller et al., 2011). This limits generalizability, while also hindering uptake and effectiveness of innovations, amplifying disparities (Geller et al., 2011). Multiple federal agencies have issued guidelines and funding initiatives aimed at increasing inclusion in clinical trials, including by congressional mandates (Congress, 1993). The National Institutes of Health (NIH) have implemented specific guidelines for randomized control trials (RCTs) to include sufficient demographic representation. However, many studies still fail to adequately recruit diverse samples and seldom include effects across racial/ethnic minority groups (Polo et al., 2019).

Several proposals have offered suggestions for increasing recruitment among marginalized populations. In a review of proposals for increasing diversity, Hughson and colleagues (Hughson et al., 2016) identified five themes for such strategies: 1) Community Relationship Building and Outreach; 2) Communication (Education); 3) Cultural Sensitivity; 4) Facilitate Access; 5) Awareness Raising among Researchers and Other Stakeholders regarding barriers to participation. They note that engaging community leaders or working with established community agencies who already work with the population of interest are key and frequently recommended for relationship building. In a systematic review of empirical evidence, Bonevski and colleagues identified similar themes (Bonevski et al., 2014), though they also note that the overwhelming majority of empirical literature consists of descriptive studies, qualitative data of participants' or prospective participants' recommendations or responses, and case studies without data. Comparatively less literature directly compared recruitment strategies to test these recommendations. Nevertheless, their review emphasizes the importance of conducting trials with community partners and building relationships.

An underlying hypothesis across the conceptual and empirical literature is that increasing racial/ethnic diversity will increase diversity across multiple other domains, including symptom presentations and other treatment-related variables allowing for greater translation of results even at the earliest stages of RCTs (M. S. Chen et al., 2014). There is, however, a need to examine this directly. The present study examines preliminary data from a randomized clinical trial (RCT) that explicitly sought to expand racial/ethnic diversity in recruitment using strategies outlined in prior recommendations (e.g., partnering with trusted community organizations). The RCT tested Risk Reduction through Family Therapy (RRFT), an outpatient intervention intended to address co-occurring posttraumatic stress disorder (PTSD) symptoms and substance use problems (SUP) in adolescents. RRFT combines elements trauma-focused cognitive-behavioral therapy (TF-CBT) (Mannarino et al., 2014) and principles of multisystemic therapy (MST) (Henggeler et al., 2009). Summaries of RRFT, the treatment rationale and preliminary efficacy data can be found elsewhere (Danielson, 2006; Danielson et al., 2010, 2012, 2020). Distinct from other interventions, RRFT addresses these frequently co-occurring problems in an integrated

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Footnote

We recognize that selecting pan-ethnic/pan-racial terms is fraught with challenges with usages that nearly always in reference to their distinction from Whiteness and flatten the diversity of cultures and peoples. We have elected to use the terms Latinx, non-Latinx Black, and non-Latinx White throughout the manuscript to be as inclusive as possible, though even these usages have limitations. Further, for gender-inclusive reasons, we use Latinx instead of Latina/o, similar to the rationale outlined by the National Latinx Psychological Association and the respective flagship journal when both changed their name (Cardemil et al., 2019).

fashion. The focus of the current study, however, is to examine potential variability in clinical dimensions (e.g., symptomology). Importantly, we interpret racial/ethnic differences as reflective of different recruitment strategies and systemic barriers to care. By extension in this context and based on decades of data (U.S. Department of Health and Human Services, 1999), we view race/ethnicity as a socially-derived construct that serves as a marker for historical and ongoing exclusion from access to mental health services, as well as experiences of racism, including bias in drug policing.

### **Racial/Ethnic Differences in Symptom Presentations Relevant for RRFT**

Ensuring racial/ethnic diversity may be particularly critical for trials that evaluate treatments like RRFT, as racial/ethnic disparities have been demonstrated for nearly every clinical dimension addressed by the treatment. Non-Latinx (NL) Black and Latinx youth experience disparities in a range of traumatic events (Andrews III et al., 2015; López et al., 2017), which may lead to widening disparities in PTSD (Andrews III et al., 2015). Still, disparities are not uniform across event types. NL Black and Latinx youth more frequently report witnessing community violence and experiencing physical assault compared with NL White youth (McLaughlin et al., 2013). On the other hand, NL White youth often report experiencing physical abuse by a parent and witnessing domestic violence at higher rates compared NL Black youth (McLaughlin et al., 2013). Other trauma types, such as sexual victimization, may not differ across the two groups (McLaughlin et al., 2013). Latinx and NL Black youth report experiencing more types of violence, also called polyvictimization, than NL White youth (Andrews III et al., 2015), although some studies have documented lower polyvictimization among Latinx youth compared with NL White youth (Finkelhor et al., 2011). Overall, many violence exposure disparities can be traced to continued segregation and related concentrated poverty (D. R. Williams & Collins, 2016). Further, racial trauma, traumatic events related to race or racism link directly to PTSD among Latinx and NL Black youth (Bernard et al., 2021; Comas-Díaz et al., 2019).

Despite trauma exposure inequalities, national surveys indicate NL Black youth report lower SUP than NL White youth (P. Chen & Jacobson, 2012; López et al., 2017). Further, PTSD symptoms may be more prevalent among NL Black and Latinx youth compared with NL White youth and Asian youth, but these differences are often small (Andrews III et al., 2015; López et al., 2017); however, traditional PTSD measures may not capture discrimination-related traumatic stress that is often more specific to situations involving perpetrators of discrimination (Bernard et al., 2021; M. T. Williams et al., 2018). While processes explaining these differences have not been well examined, at a minimum, these results suggest that the effect of traumatic event exposure on substance use and PTSD symptoms may differ across race/ethnicity for adolescents. In turn, capturing racial/ethnic diversity in RCT evaluations of RRFT and interventions with similar target outcomes may be necessary for adequately capturing clinical processes that may vary across race/ethnicity.

## Racial/Ethnic Differences in Relevant Treatment Process and Socioeconomic Factors

Several other RRFT-relevant variables vary across race/ethnicity. Notably, substantial disparities persist in mental health access (Merikangas et al., 2011). National survey results suggest NL Black and Latinx youth receive services less often than NL Whites for mood and anxiety disorders, although not for externalizing disorders (e.g., substance use or other behavior difficulties) (Merikangas et al., 2011). This may be due, in part, to biases in referrals for mental health services and recognition of symptoms by referral resources, especially given that one of the most common referral sources, schools, more often identifies severe externalizing concerns than internalizing concerns (i.e., the squeaky wheel phenomenon) (Bradshaw et al., 2008). Nevertheless, the differences in treatment history may have implications for treatment presentation and outcomes. As one example, it is likely that some of those who have received treatment before and are referred to the trial did not respond positively to prior treatment efforts. This may be especially true for co-occurring SUP and posttraumatic stress in adolescents, as most providers attempt to treat only one symptom area at a time (Adams et al., 2016).

While racial/ethnic differences in treatment history may be important to examine at the outset of trial, many of the factors associated with treatment access disparities also may inform subsequent treatment processes and generalizability of findings. As one example, household structure also varies by race/ethnicity, as NL White youth more often reside in two-caregiver households, but are more frequently placed with non-family members during foster care placement compared with NL Black youth (Harris & Skyles, 2008). Relevant for extending results of RCTs, youth in single caregiver households discontinue treatment at higher rates compared with youth in two caregiver households (de Haan et al., 2018), likely due factors such as reduced flexibility in scheduling and transportation. Trials of youth mental health treatments should ensure that multiple different family arrangements are represented because caregivers occupy critical functions in virtually all child and adolescent interventions.

### Purpose

As a central facet of calls for expanding RCT enrollment diversity, demographic homogeneity may often lead to homogeneity across treatment-relevant domains, such as service utilization history, symptom severity, and symptom clustering in ways that are often not explicitly specified in inclusion or exclusion criteria. Several recommendations have proliferated for expanding trial diversity, though they often emphasize building trust or creating partnerships with trusted organizations, eliminating socioeconomic and systemic barriers, ensuring accessibility of study materials, and improving communication/education with the broader community. The current study sought to examine multiple facets of baseline sample diversity across demographic and clinically-relevant domains while implementing recruitment recommendations: 1) representativeness of sample demographics relative to the broader community in which the RCT occurred; 2) initial symptom severity and presentation; and 3) racial/ethnic comparisons of SUP, prior service utilization, family

socioeconomic characteristics (relevant for treatment access barriers), PTSD symptoms and diagnosis, depression symptoms and diagnosis, and trauma exposure. We include depression as an outcome of interest because it often co-occurs with PTSD, particularly in adolescent samples (Adams et al., 2015) and TF-CBT has been shown to reduce depression symptoms (Jensen et al., 2017). Within the racial/ethnic comparisons, we tested hypotheses that would be anticipated if efforts to broaden recruitment were successful, meaning that recruitment yielded more than demographic diversity: **Hypothesis 1:** NL Black youth would have less often received prior mental health or substance use treatment; **Hypothesis 2:** NL Black youth would report experiencing more traumatic events than NL White youth; **Hypothesis 3:** Caregivers of NL Black youth would more often report socioeconomic indicators reflecting systemic racism compared with caregivers of NL White youth: lower education and greater unemployment; **Hypothesis 4:** NL Black youth would report less substance use than NL White youth; **Hypothesis 5:** Based on prior national data and because referral sources may not recognize symptoms among NL Black youth until they become more severe, NL Black youth would endorse greater PTSD and depression symptoms compared with NL White youth. These research questions were explored with Latinx youth, but not interpreted due to inadequate power (see Methods below).

## Methods

### Participants

Participants were 140 adolescents aged 13 to 18 primarily recruited through two local child advocacy centers (CACs) presenting for routine treatment for either substance use or trauma-related mental health concerns from 2012 to 2017. In accordance with prior recommendations, these CACs were selected as treatment sites because of their established trust within their respective communities. Once recruited, research staff confirmed inclusion criteria: (1) at least one instance of interpersonal violence (while other traumatic events were included, interpersonal violence was required and initially focused exclusively on sexual violence), (2) used non-tobacco substances (alcohol and/or drugs) at least once in the past 90 days, and (3) endorsed five or more PTSD symptoms. Youth were excluded from the study based on the following criteria: (1) Pervasive Developmental Disability or severe cognitive impairment; (2) actively suicidal or homicidal; or (3) active psychosis. While not a specified inclusion or exclusion criterion and despite having multiple bilingual investigators, all participants and caregivers spoke English as a primary language, which may have been a function of limited bilingual providers at the partner sites.

### Procedure

A multi-pronged approach was used to recruit participants and was constructed to fit recommendations for increasing clinical trial diversity (Hughson et al., 2016). First, we partnered with local Child Advocacy Centers (CACs) as treatment locations and recruited clinicians from these centers to be treatment clinicians. Partnership with the CACs were explicitly sought because of their history of providing services for highly diverse populations of youth who have experienced physical or sexual abuse. By partnering with the CAC, we engaged a trusted community resource where community members already received treatment, which fits central recommendations for increasing trial diversity

(Bonevski et al., 2014; Hughson et al., 2016; Yancey et al., 2006). The study was advertised to clients of the CACs. In addition, a senior member of the research team (the fifth author) had already developed an extensive network of community contacts consisting of schools and social service agencies through clinical services he had developed (for a description of this model of trauma-focused treatment see De Arellano et al., 2005). He is also Cuban American and fully bilingual (Spanish/English). He advertised the study with each of these agencies through in-depth community liaising, particularly in areas with large Black and Latinx populations. The first author (also Spanish/English bilingual) helped administer a school-based clinic in a school with predominantly Black and Latinx youth and also assisted in recruitment. Together, the network of referral sources and community engagement for recruitment was substantial and predated the RCT. This also fulfills recommendations for diversifying trial samples through building community trust (Bonevski et al., 2014; Hughson et al., 2016). While not directly related to recruitment, the CACs have standard procedures of providing several resources that address many of the recommendations for reducing socioeconomic barriers to care including flexible scheduling, low-cost or no-cost services, available childcare for siblings or other children, and case management to assist with material and similar needs. Because of the partnership with the CACs, all of these services were available to study participants and thus fulfilled multiple recommendations for reducing socioeconomic barriers to RCT inclusion. Potential participants were able to access these services regardless of their inclusion in the trial.

Once potential participants were identified, trained research staff contacted caregivers to determine interest and schedule intake interviews. Interviews included the youth report of the Child Depression Inventory (CDI) (Helsel & Matson, 1984), parent and youth report of the UCLA Posttraumatic Stress Disorder Reaction Index for DSM-IV (UCLA) (Pynoos et al., 1998; Steinberg et al., 2004, 2013), and youth-reported timeline follow back (TLFB) (Donohue et al., 2004) for each substance endorsed by the youth. Youth who met inclusion criteria and their caregivers were then asked to provide written consent/assent and complete a pre-treatment assessment, including a demographics form, clinical interview, and a urine drug screening. Participants who had reached 18-years-of-age were able to provide consent for themselves, though their caregivers were still completed treatment and assessment components. In total, 394 potential participants were screened. Of those excluded from the study, most did not meet inclusion criteria (n=232), with the majority not meeting substance abuse history criteria (n=213). An additional 8 participants or their caregivers declined to participate.

Participants were then randomized to treatment condition, which included either treatment-as-usual for the CAC (control) or RRFT (treatment). Regardless of condition, participants began treatment during the following session with a licensed clinician at the partnering CAC. All procedures and methods were approved by the Institutional Review Board at the Medical University of South Carolina prior to beginning the study.

## Measures

**Posttraumatic stress disorder (PTSD).**—PTSD symptom severity was assessed with the UCLA-PTSD-RI for DSM-IV (Pynoos et al., 1998). The UCLA has both parent and

child-report versions, which have both demonstrated good internal consistency. The current analysis utilized the child report. The UCLA child report demonstrated good internal reliability in the current sample ( $\alpha = .90$ ). Further, a cutoff total score of 38 was used to determine likely PTSD diagnosis, as this score has previously demonstrated good sensitivity and specificity (Steinberg et al., 2004).

**Substance use problems (SUP).**—SUP were determined using two methods. During initial interviews with participants, youth completed the TLFB procedure. TLFB procedures were completed for each substance a youth reported having used in the previous 30 days. This procedure uses a calendar format to review each day a youth reports having used a given substance and the quantity of the substance. TLFB procedures substantially outperform other self-report measures and evidence significant validity compared with objective analyses, such as hair and urinalysis (Donohue et al., 2004; Hjorthøj et al., 2012; Levy et al., 2004; Lewis-Esquerre et al., 2005). Substance use was also examined with a urine drug screen at time of enrollment. While this measure is limited in the range of prior use days covered (i.e., many of the substances are metabolized within less than a week), it provided an alternate measure for recent substance use.

**Depression symptom severity and diagnosis.**—Depression symptom severity was assessed with the CDI. The CDI is a 27-item self-report measure with overall scores range from 0 to 54 and individual item responses ranging from 0 to 2, with higher scores indicating greater symptom severity for the overall and individual item scores. It has been used with children ranging from seven to 17. The CDI has good internal consistency, concurrent validity, and test-retest reliability (Helsel & Matson, 1984; Smucker et al., 1986). In the current study, the CDI demonstrated good internal reliability ( $\alpha = .90$ ).

**Demographics.**—Participants completed a demographic questionnaire regarding caregivers' and youth's age, race/ethnicity, and gender. They also completed items related to household composition (e.g., number of caregivers), caregiver education, and caregiver employment.

## Analytic Plan

Symptom severity and diagnoses were first examined to explore sample heterogeneity across these dimensions. Prevalence of service utilization history was also examined, in addition to bivariate correlations with symptom severity and diagnoses to determine if any clinical presentations were more likely to have received services previously.

Following this, multiple racial/ethnic, gender, and socioeconomic variables were compared using a series of general linear models using maximum likelihood estimation. Because of the small samples, NL Biracial ( $n = 7$ ) and Latinx ( $n = 8$ ) youth were included in these analyses, but the comparisons were not interpreted. First, socioeconomic indicators were examined as outcome variables with race/ethnicity, age, and gender as predictors. Second, the following were examined as outcome variables: depression and PTSD diagnostic status; depression and PTSD symptom severity per the CDI and UCLA scores; polyvictimization scores; recent SUP per the TLFB; and prior service utilization as outcomes. Diagnostic status

and service utilization outcome variables were examined as dichotomous outcomes with logit models, while polyvictimization and SUP variables were examined using a negative binomial distribution. UCLA and CDI scores were examined as continuous outcomes. Race/ethnicity, age, gender, secondary caregiver status, and primary caregiver education were examined as predictors for each model. Marijuana and alcohol use days from the TLFB, polyvictimization, and UCLA and PTSD symptom severity were examined as predictors of prior service utilization. Analytic assumptions were met, including normality and heteroscedasticity for linear outcomes, multicollinearity for all outcomes, and linearity of IV's relations with logits for binary outcomes (i.e., logistic regressions). No variable contained more than 5% missing data. Missing data were estimated using FIML (Enders & Bandalos, 2001). All analyses were conducted using Mplus version 8.1. Supplementary Table 1 contains a correlation matrix of all study variables.

## Results

### Sample Demographic Description

A majority of participants identified as NL White ( $n = 84$ , 60.0%) and a substantial minority identified as NL Black ( $n = 43$ , 30.7%). An additional eight participants identified as Hispanic/Latina/o/x (5.7%) and seven others identified as biracial (5.0%). This largely mirrors the racial/ethnic composition of the primary county in which recruitment took place (65.2% NL White, 26.3% NL Black, 5.3% Latinx, 1.7% multiracial, and all other racial/ethnic categories comprising less than 2%) (U.S. Census Bureau, 2022). Age ranged from 13 to 18 years-of-age with a mean of 15.35. The majority of participants were cis-gender girls ( $n = 122$ , 87.1%).

### Initial Symptom Severity, Likely Diagnoses, SUP, and Service Utilization

The average UCLA PTSD symptom score was 40.99 ( $SD = 16.28$ ) and the majority of participants also endorsed scores higher than the clinical cut-off (38) for likely diagnosis based on the overall score ( $n = 80$ , 57.1%). The average CDI score was 18.29 ( $SD = 9.79$ ) and a substantial minority of participants also scored at or above the cutoff (20;  $n = 58$ , 42.3%).

Of the 139 youth who completed the TLFB, all self-reported having used alcohol or another substance in the previous three months and reported using a substance an average of 13.10 days ( $SD = 16.62$ ). Most participants endorsed using alcohol ( $n = 103$ , 74.1%) and a majority also reported having used marijuana ( $n = 93$ , 66.9%). No other substance was frequently endorsed (i.e., no more than 10%). Similarly, only marijuana was frequently flagged as positive by urinalysis ( $n = 43$ ). Additional descriptive detail is presented in Table 1.

### Racial/Ethnic, Gender, and Socioeconomic Comparisons

**Caregiver characteristics.**—Primary caregivers were approximately equally likely to be employed across NL Black (63.2%), NL White (67.9%), NL Biracial (71.4%), and Latino youth (75.0%;  $p$ -values > .10); however, primary caregivers of NL Black youth were more likely to be unemployed and looking for work compared with caregivers of NL White youth

(23.7% and 4.9%, respectively,  $p = .009$ ). No caregivers of NL Biracial youth reported being unemployed and looking for work, whereas one caregiver of a Latinx youth reported being unemployed and looking for work (12.5%). Caregiver education, however, did not appear to differ significantly between the two groups, as caregivers of NL Black and caregivers of NL White youth reported similar rates of having attained a high school diploma equivalent or more (83.7% and 85.3%, respectively;  $aOR = .63$ , 95% CI = 0.19 – 2.12,  $p = .454$ ) and having earned a college degree or more (32.4% and 38.6%, respectively;  $aOR = 1.00$ , 95% CI = .41 – 2.41,  $p = .991$ ). Caregivers of NL Black youth were less likely to report a secondary caregiver living at home (41.5%) compared with NL White youth (61.7%;  $aOR = .36$ , 95% CI = 0.16 – 0.80,  $p = .013$ ). A minority of caregivers of NL Biracial (28.6%) and Latino (25.0%) youth reported a secondary caregiver living at home.

**Trauma exposure history.**—NL Black youth experienced significantly more types of traumatic events compared with NL White youth ( $b = 0.27$ ,  $SE = .10$ ,  $p = .005$ ). NL Black youth reported an average of 4.16 different types of victimization ( $SD = 2.09$ ), whereas NL White youth reported approximately one fewer ( $M = 3.17$ ,  $SD = 1.84$ ). No other variable significantly predicted polyvictimization ( $p$ -values  $> .05$ ). NL Biracial youth reported 3.14 types of traumatic events ( $SD = 1.86$ ) and Latinx youth reported 4.63 types (2.67). Sexual assault was the most common traumatic event reported for both NL Black (65.1%), NL White (70.7%), NL Biracial (71.4%), and Latino youth (75.0%). This difference was not significant ( $p > .05$ ). Witnessing community violence was reported by a majority of NL Black youth ( $n = 26$ , 60.5%) and a substantial minority of NL White youth ( $n = 25$ , 30.5%) and the difference between the two groups was significant ( $aOR = 4.10$ , CI = 1.80 – 9.37,  $p = .001$ ). Half of Latinx youth (50.0%) also reported witnessing community violence while a minority of NL Biracial youth (28.6%) reported the same. Significantly more NL Black youth also reported experiencing a serious accident (23.3%;  $aOR = 4.30$ , CI = 1.45 – 12.74,  $p = .009$ ) compared with NL White youth (8.5%). A significant minority of NL Biracial (28.6%) and Latino (25.0%) youth also reported have experienced a serious accident. Having a secondary caregiver at home was negatively associated with witnessing domestic violence ( $aOR = 0.31$ , CI = 0.14 – 0.67,  $p = .001$ ). No other variable significantly predicted individual trauma types ( $p$ -values  $> .05$ ).

**Prior service utilization.**—NL Black youth (35.1%) were less likely to have ever received outpatient mental healthcare previously compared with NL White youth (61.5%;  $aOR = 0.29$ ,  $p = .008$ ). A majority of NL Biracial youth (71.4%) and 37.5% of Latinx youth had also received mental healthcare previously. No other predictor was significantly related to prior mental health service utilization ( $p$ -values  $> .05$ ). NL Black and NL White youth did not significantly differ across outpatient substance use history ( $aOR = 0.54$ ,  $p = .688$ ). Polyvictimization ( $aOR = 1.37$ ,  $p = .007$ ) and PTSD symptoms ( $aOR = 0.90$ ,  $p = .004$ ) positively predicted prior substance use outpatient treatment history, such that those with greater polyvictimization and those with lower PTSD scores were more likely to have received substance use treatment. Table 1 contains additional descriptive information on service utilization and Table 2 contains additional information regarding logistic regression results.

**Current SUP, symptoms, and diagnoses.**—NL Black and NL White youth did not significantly differ in the number of marijuana use days over the prior three months ( $b = .15$ ,  $SE = .33$ ,  $p = .624$ ), but NL Black youth ( $M = 1.65$ ,  $SD = 3.54$ ) reported significantly less alcohol use days than did NL White youth ( $M = 4.14$ ,  $SD = 7.74$ ;  $b = -.76$ ,  $SE = .39$ ,  $p = .036$ ). NL Biracial youth reported 2.29 alcohol use days ( $SD = 3.90$ ) and Latinx youth reported 5.00 use days ( $SD = 11.35$ ). Additionally, NL White youth reported significantly higher depression symptoms ( $M = 20.51$ ,  $SD = 9.77$ ) on the CDI compared with NL Black youth ( $M = 13.79$ ,  $SD = 8.79$ ;  $p = .001$ ), but PTSD symptoms on the UCLA did not differ ( $p = .781$ ). The mean CDI score for NL Black youth was 18.86 ( $SD = 8.03$ ) and was 17.25 ( $SD = 8.24$ ) for Latinx youth. NL Black youth were also less likely to exceed cutoff criteria for likely depression on the CDI relative to NL White youth ( $aOR = 0.29$ ;  $p = .005$ ), but the two groups did not significantly differ across likely PTSD diagnosis on the UCLA ( $aOR = 0.87$ ,  $p = .756$ ). Table 3 contains more information regarding predictors of SUP, PTSD, and depression outcomes.

## Discussion

The current study utilized multiple strategies for recruiting a more diverse sample and the resulting sample appeared to reflect the demographics of the larger community. Clinical variables differed across a number of sociodemographic factors that were specifically targeted for greater recruitment, most notably race/ethnicity. NL Black youth were less likely than NL White youth to have previously received mental health services (Hypothesis 1) and endorsed greater traumatic event exposure (Hypothesis 2). Supporting hypothesis 3, many differences appeared to reflect historical and ongoing racism. Specifically, compared to caregivers of NL White youth, those of NL Black youth were more likely to be unemployed and looking for work, even though education did not differ. These inequalities likely reflect the realities of racism in employment for NL Black caregivers (J. Williams & Wilson, 2019). Similarly, segregation in its many historical and ongoing forms has led to dense concentrations of poverty in neighborhoods with primarily Black residents, which yields interpersonal violence disparities like those observed in this study (D. R. Williams & Collins, 2016). Thus, our data may reflect how systems of exclusion and disadvantage likely affected symptoms and presentations relevant to RRFT.

### Diversity in Clinical Trials

The racial/ethnic differences observed here point to how diversifying clinical trial samples may lead to greater understanding of treatment efficacy for a range of youth. While PTSD symptom severity and substance use days appeared similar across groups, multiple notable differences emerged across other outcomes. Specifically, NL White youth reported more alcohol use days than NL Black youth. NL Biracial youth also appeared to more similar to NL Black youth with regard to alcohol use days (2.29 vs 1.65 days, respectively), while Latinx youth appeared more similar to NL White youth (5.00 vs 4.14 days). This provides partial support for Hypothesis 4 that NL Black youth would endorse less substance use. NL White youth also reported significantly higher depressive symptoms compared to NL Black youth with symptom severity for NL Biracial and Latinx youth falling between the other two groups. Results with both PTSD and depression failed to support Hypothesis 5.

As one explanation, depression symptom differences could reflect community differences in symptomology, but they may also reflect differences in the symptoms that referral resources identified within each group.

### **Clinical Considerations with Enhanced Diversity**

Results from the current analyses demonstrate important clinical considerations when providing services for diverse populations. As one example, this RCT was significantly more likely to be the first treatment episode for NL Black youth compared with NL White youth. In practice, clinicians may need to be prepared to provide greater orientation to the therapy process for those without prior utilization. Additionally, the often-found lower prevalence of alcohol and substance use among NL Black youth may result in findings similar to those found here when services are delivered equitably with lower severity of alcohol use among NL Black adolescents. Providers should also consider if referral resources may be less likely to refer NL Black youth with internalizing symptoms and more likely to refer them at lower thresholds of alcohol use. They should also be aware of how such differences in clinical presentations may result from experiences with racism (e.g., biases in expectations of substance use, surveillance of NL Black youth, and policing of substance use among NL Black youth; (Gelman et al., 2007)). Finally, with NL Black families reporting significantly lower service utilization, treatment outcome data should be consistently analyzed to determine effects of prior service utilization.

### **Strengths and Limitations**

The current analysis examined potential differences in participants' clinical presentation at pre-treatment for an NIH-funded RCT testing a novel intervention for co-occurring PTSD symptoms and SUP among adolescents. The trial from which data were drawn involved explicit, focused efforts expanding diversity and inclusion for families in need of trauma treatment. Specifically, recruitment strategies were based on recommendations for improving clinical trial diversity and outreach to populations underrepresented in RCTs with a particular emphasis on strategies to improve trust while reducing socioeconomic barriers (Hughson et al., 2016). We were able to recruit a sample that appeared largely representative of the area's racial/ethnic composition and multiple clinically-relevant variables differed across race/ethnicity. While this sample may be representative of area demographics, it may not be fully representative of area youth with clinical needs similar to those in this study's findings. For example, while Latinx youth were included in the study at rates comparable to the community population (5.7% vs 5.3% respectively), only English-proficient participants completed the study. Therefore, it is unclear as to whether certain clinical groups are over or underrepresented. While significant clinical differences were found in NL White and NL Black youth, sample sizes were too small for other racial/ethnic groups to make statistical comparisons. Likely owing to the RCT's initial focus on sexual assault/abuse, this study also failed to recruit a representative sample of adolescent males, limiting our ability to adequately test gender differences. Analyses only include data collected at baseline and are therefore cross-sectional, limiting capacity to determine how these findings may change over time or affect treatment process/outcomes. Potential biases may have existed in referral thresholds across race/ethnicity. Relatedly, the study does not capture youth's experiences with discrimination, including potentially traumatic experiences, or

the specific trauma-related symptoms that may arise from frequent or severe exposure to discrimination (Bernard et al., 2021; M. T. Williams et al., 2018). As demonstrated by our data, seeking greater demographic diversity may—and we argue *should*—yield diversity of client experiences as diversity efforts should not be tokenized quotas. Additional studies are needed to directly demonstrate the effect of following these recruitment guidelines. The lack of a control condition or comparison group here is a limitation. Still, assessment of such differences, including discrimination-related experiences, should become routine in RCTs of trauma-related difficulties and/or substance use, as well as many others. Standard trauma assessments, including those like ACEs that are pervasively used in RCTs are insufficient to capture these effects (Bernard et al., 2021; M. T. Williams et al., 2018). Lastly, it is unclear how differences in clinical findings impact the treatment process, which future studies should further examine.

## Conclusion

This study recruited a sample of youth that largely appeared to reflect the racial/ethnic composition of the community. Results indicate disparities among NL Black youth and NL White youth in a variety of baseline presentations relevant for trauma-related mental health and substance use treatment. Findings advance trauma treatment and health disparities literature in several ways. Specifically, clinicians may need to attend more to the possibility of youth having witnessed domestic violence for those with a single caregiver. It may also be beneficial for clinicians to continually monitor youth's SUP given the significant racial/ethnic differences in alcohol use. Given disparities in service access, our data further indicate the need for screening for prior service utilization. Most notably, this study points to the strong importance of recruiting a diverse and representative sample. Replication of this study is crucial to influence equity in future treatment and intervention efforts for families seeking trauma treatment.

## Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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**Clinical impact statement:**

Improving racial/ethnic diversity in mental health treatment trials through community-based efforts may lead to diversity in other ways, including clinical factors.

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Table 1.

Sample Characteristics

	NL White n=82 n (%) or M (SD)	NL Black n=43 n (%) or M (SD)	NL Biracial n=7 n (%) or M (SD)	Latinx n=8 n (%) or M (SD)	Total n=140 n (%) or M (SD)
Adolescent age	15.51 (1.40)	15.12 (1.35)	14.71 (1.50)	15.50 (0.93)	15.35 (1.28)
Adolescent gender (male) *	6 (7.3%)	10 (23.3%)	2 (28.6%)	0 (0.0%)	18 (12.6%)
Secondary caregiver present *	50 (61.7%)	17 (41.5%)	2 (28.6%)	2 (25.0%)	72 (52.2%)
Caregiver education					
Some high school or less	11 (14.7%)	6 (16.2%)	1 (14.3%)	3 (37.5%)	21 (16.4%)
High school graduate/GED	8 (10.7%)	7 (18.9%)	2 (28.6%)	0 (0.0%)	17 (13.3%)
Some college	27 (36.0%)	12 (32.4%)	0 (0.0%)	3 (37.5%)	43 (34.8%)
College graduate or higher	29 (38.6%)	12 (32.4%)	4 (57.2%)	2 (25.0%)	47 (36.6%)
Caregiver employed					
Yes *	55 (67.9%)	24 (63.2%)	5 (71.4%)	6 (75.0%)	92 (67.6%)
No, but not seeking employment	22 (28.2%)	9 (23.7%)	2 (28.6%)	1 (12.5%)	20 (14.7%)
No, but seeking employment *	4 (4.9%)	9 (23.7%)	0 (0.0%)	1 (12.5%)	14 (10.3%)
UCLA total score	42.04 (14.76)	40.33 (17.82)	42.14 (13.37)	32.75 (24.21)	40.99 (16.28)
Likely PTSD diagnosis (UCLA 38)	52 (63.4%)	22 (51.2%)	3 (42.9%)	3 (37.5%)	80 (57.1%)
CDI total score	20.73 (9.78)	13.79 (8.96)	18.86 (8.03)	17.25 (8.24)	18.29 (9.79)
Likely depression diagnosis (CDI 20) **	41 (50.0%)	9 (23.1%)	4 (57.1%)	4 (50.0%)	58 (42.3%)
Polyvictimization total	3.17 (1.84)	4.16 (2.09)	3.14 (1.86)	4.63 (2.67)	3.56 (2.02)
Sexual assault/abuse victimization	58 (70.7%)	28 (65.1%)	5 (71.4%)	6 (75.0%)	67 (67.8%)
Prior substance use days					
Any	15.06 (17.78)	11.00 (14.84)	11.71 (16.91)	5.75 (11.50)	13.10 (16.62)
Alcohol *	4.14 (7.74)	1.65 (3.54)	2.29 (3.90)	5.00 (11.35)	3.32 (6.87)
Marijuana	11.37 (19.29)	9.42 (15.01)	4.86 (9.87)	5.00 (11.75)	10.07 (17.30)
Prior mental health service use **	48 (61.5%)	13 (35.1%)	5 (71.4%)	3 (37.5%)	70 (52.2%)
Prior substance use service use	6 (7.7%)	2 (5.0%)	1 (14.3%)	2 (25.0%)	12 (9.0%)

\* Note:  $p < .05$

\*\*  $p < .01$ : Participant numbers for each variable may vary due to missing data.

**Table 2.**

Binary Logistic Regression Predicting Service Utilization

	Any Mental Health Serv. Util		Any Substance Use Serv. Util.	
	aOR	95% CI	aOR	95% CI
NL Black (NL White as referent)	0.29**	0.12–0.72	0.54	0.04–8.37
NL Biracial (NL White as referent)	1.44	0.23–9.02	NA	NA
Latinx (NL White as referent)	0.39	0.07–2.20	1.69	0.23–12.57
Boys (girls as referent)	1.10	0.36–3.33	0.83	0.13–5.35
Age	0.90	0.65–1.23	2.17	0.90–5.23
Polyvictimization	1.01	0.82–1.25	1.36	0.91–2.02
CDI score (depression symptoms)	1.00	0.95–1.05	1.06	0.89–1.27
UCLA total score (PTSD symptoms)	1.00	0.97–1.03	0.90**	0.84–0.97
Days used marijuana	1.02	1.00–1.04	1.03	0.98–1.07
Days used alcohol	1.03	0.97–1.09	1.03	0.89–1.19
Secondary caregiver reported at home	0.71	0.33–1.50	0.17*	0.04–0.67
Caregiver education	1.29	0.97–1.72	1.32	0.84–2.08

\* *Note:*  $p < .05$

\*\*  $p < .01$ ; CDI-Child Depression Inventory; UCLA – UCLA PTSD Index for DSM-IV; NL – non-Latinx;

**Table 3.** Generalized Linear Models Predicting PTSD Scores from the UCLA and Depression Scores from the CDI

	Alcohol Use Days	Marijuana Use Days	CDI Total	Likely Depression	UCLA Total	Likely PTSD		
	<i>b</i> (SE)	<i>b</i> (SE)	$\beta$	aOR	95% CI	$\beta$	aOR	95% CI
NL Black (NL White as referent)	-.76 (.39) *	.15 (.33)	-.27 **	0.29 *	0.12-0.70	.05	0.87	0.36-2.08
NL Biracial (NL White as referent)	N/A	N/A	-.02	1.46	0.26-8.23	.06	0.69	0.13-3.63
Latinx (NL White as referent)	.30 (.86)	N/A	-.06	1.01	0.24-4.36	-.14	0.29	0.06-1.37
Boys (girls as referent)	.07 (.54)	-.79 (.38) *	-.21 ***	0.43	0.14-1.39	-.32 ***	0.07	0.01-0.35
Age	.54 (.16) ***	.13 (.10)	.02	0.92	0.69-1.23	.13	1.15	0.86-1.52
Caregiver education	-.08 (.11)	-.17 (.12)	.012	1.12	0.80-1.56	.05	1.07	0.84-1.36
Secondary caregiver present	.21 (.39)	.77 (.30) *	.05	1.15	0.54-2.43	.03	0.89	0.42-1.88

\* *Note:*  $p < .05$

\*\*  $p < .01$

\*\*\*  $p < .001$

UCLA – UCLA PTSD Index for DSM-IV; NL – non-Latinx; Biracial participants were removed from analyses of alcohol use and marijuana use days because their inclusion resulted in non-positive definite solutions, likely due to small sample sizes within the group. Latinx participants were removed from analyses of marijuana use days for the same reason.