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Brief Report: Initial Evidence of Depressive Symptom Disparities among Black and White Transition Age Autistic Youth

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Abstract

The lived experience of being autistic and being Black in America both put youth at higher risk for developing depressive symptoms. However, there is a dearth of research examining potential disparities in autistic youth with depression. The current study examined disparities in depressive symptoms among a sample of Black and White autistic youth between the ages of 16 and 26 years old. Using analysis of covariance this study found that the Black autistic youth had significantly higher depressive symptoms than White autistic youth (m = 7.3, sd = 4.4 vs. m = 3.8, sd = 3.6; t = 2.6, p = 0.013). This study presents initial evidence of a significant racial disparity between Black and White autistic youth depressive symptoms.

Keywords

Autism; Depression; Disparity; Race; Youth

Introduction

The lived experience of being autistic and the lived experience of being Black in the United States both put youth at higher risk for developing depressive symptoms. Current research suggests the rate of depression for autistic youth overall is between two and four times

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Conflict of Interest Statement

The University of Michigan will receive royalties from SIMmersion LLC on the sales of the virtual interview training tool that was the focus of the parent randomized controlled trial. These royalties will be shared with Dr. Matthew Smith and the University Of Michigan School Of Social Work. Dr. Smith adhered to the University of Michigan's Conflict Management Plan that was reviewed and approved by a University of Michigan Conflict of Interest Committee. No other authors have a conflict of interest.

that of non-autistic youth (Pezzimenti et al., 2019). A recent study examining 1,272 autistic youth found that over 20% of the sample between ages 13 and 17 years old reported co-occurring depression (Greenlee et al., 2016). This rate is more than double the typical rate (8.4%) of depression among non-autistic youth in the same age range (Center for Behavioral Health Statistics and Quality, 2018; Pezzimenti et al., 2019). Identifying depression among autistic youth is important given its association with increased isolation, long-term substance abuse, self-harm, bullying, and suicide, all of which are already disproportionately higher for autistic youth compared to non-autistic youth (Chen et al., 2017). Although autistic transition-age youth have disproportionately higher rates of depression compared to their non-autistic peers, we were unable to identify published research that examined the presence of racial disparities in clinical depression or depressive symptoms in this group.

The paucity of such research is notable given that Black autistic youth have elevated risk factors for depression compared to White autistic youth. For example, Black autistic youth are less likely to have access to adequate mental health resources and ongoing mental health support than their White autistic peers (Shattuck et. al., 2018; Yingling & Bell, 2019). They also have poorer social communication skills compared to their White autistic peers (Oswald & Hamworth, 2016). These greater challenges in mental health service access and social communication skills exacerbate the risk for experiencing depressive symptoms (DeFilippis, 2018; Greenlee et al., 2016; Nevison & Zahorodny, 2019; Thapar et al., 2012). Beyond the risk factors experienced by Black autistic youth, Black youth, in general, are at heightened risk of experiencing depressive symptoms (Adkins et al., 2009; Cokley et al., 2014). These experiences are also associated with the increased risk of stressful life circumstances such as higher rates of poverty, experiences of racism/discrimination, police brutality, greater rates of community violence, community isolation, exposure to trauma, and inadequate access to mental health services (Bell et al., 2015; Caldwell et al., 2016; Nguyen et al., 2007). Additionally, studies have found that behavior such as code-switching (i.e., Black youth changing their behavior and vernacular in spaces in which they are racial minorities) is associated with increased risk of depressive symptoms (Durkee et al., 2019; Walton et al., 2015). Furthermore, studies suggest that autistic youth take part in similar behavior referred to as masking or social camouflaging in which they attempt to blend into the non-autistic population by adapting their behaviors. Studies report that both masking and code-switching are associated with an increased risk of depressive symptoms (Hull et al., 2017; Mandy, 2019; Pearson & Rose, 2021).

Thus, as described there are several reasons why there is a critical need to examine potential racial differences in depression and depressive symptoms among autistic youth. To advance our knowledge in this area, we aimed to take the first step in understanding racial disparities in depression in autistic people by examining racial differences in depression and depressive symptoms among autistic transition-age youth using baseline data collected as part of a multi-site randomized controlled trial. We hypothesized that Black autistic youth would have elevated clinical depression and depressive symptoms beyond what is experienced by their White autistic peers. Co-occurring disabilities, poorer cognitive ability, and greater behavior challenges are known to exacerbate depression among autistic individuals and will be modeled as covariates (Ghaziuddin et al., 2002; Sterling et al., 2008; Wallace et al., 2016).

Methods

Participants

The present study is a secondary analysis of data collected during a pre-test visit from autistic transition-age youth who participated in a randomized controlled trial (RCT). The RCT evaluated whether a virtual interview training tool improved interview skills and access to employment. Participants were enrolled in pre-employment transition services at five secondary special education programs located in urban, suburban, and rural communities (Smith et al., 2021). Recruitment strategies for the parent RCT can be found here (Smith et al., 2021).

This study analyzed data from all RCT participants who identified as Black (N=13) or White (N=26) and had an autism spectrum disorder diagnosis based on educational record or with a mild-to-moderate severity identified by a score between 60T and 75T on the Social Responsiveness Scale (SRS-2nd Edition; Constantino & Gruber, 2012). Parents or teachers completed the SRS-2 (α = .94). Participants were 16 to 26 years old and 82.1% male.

Additional inclusion criteria from the RCT included having: (1) at least a 3rd grade reading level; and (2) a willingness to be video recorded. Exclusion criteria were having: (1) uncorrected hearing or visual limitation or (2) a documented medical illness that compromised cognition (e.g., traumatic brain injury) that prevented them from using a computer. Notably, the term Black is used in lieu of African American to be inclusive of participants that may identify as Black but not necessarily as African American. The University of Michigan's Institutional Review Board approved the study protocol.

Study Measures

Background Characteristics—Study participants completed a demographic survey (e.g., age [computed from birth date], sex assigned at birth [male or female]). Meanwhile, teachers and administrators were asked to identify whether the participants had any potential co-occurring disabilities as part of their active individualized educational program (1 = "Yes" or 0 = "No"). The disabilities were chosen based on the 2004 Individuals with Disabilities Education Act (i.e., specific learning disability, emotional disturbance, intellectual disability, other health impairment. For the purposes of our analysis, the presence of any of the aforementioned co-occurring disabilities with autism was coded as 0 = "no co-occurring disability" and 1 = "at least 1 co-occurring disability."

Cognitive Ability—We assessed cognition using a full corrected *t* score reflecting total cognition as an indication of both fluid and crystallized cognition (i.e., ability to think logically, problem solve, and an accumulation of knowledge and skills) from the National Institutes of Health Toolbox Cognition Battery (NIH-TCB) (Akshoomoff et al., 2013). The use of fully-corrected scores have demonstrated racial equivalence (Casaletto et al., 2015) and NIH-TCB feasibility with autistic youth has been demonstrated (Jones, et al., 2021). The internal consistency for the current study was acceptable (α = .70). Data were missing for n=1 Black and n=3 White participants.

Behavioral Challenges—We used the Achenbach System of Empirically Based Assessment (ASEBA) to evaluate behavioral challenges (via parent or teacher report). Participants 18 years and older were assessed using the adult behavior checklist (ABCL, n = 30), while 16 and 17-year-old participants were assessed using the child behavior checklist (CBCL, n = 8) (Achenbach, 1997; Achenbach & Rescorla, 2001). The ASEBA has been validated for use among autistic youth (Deckers, Muris, & Roelofs, 2019) as well as racial minority groups (Assari, et al., 2020). Items were rated on a three-point scale, 0 = "not true"; 1 = "somewhat true"; and 2 = "very true." The standardized Total Problems *T*-scores score reflected internalizing and externalizing problems, along with the thought, attention, and other problems. Data (CBCL) were missing for n=2 White participants. The ABCL and CBCL had acceptable internal consistencies (α = .78 and α = .75, respectively).

Depressive Symptoms—Participants completed a self-report of their state-level depressive symptoms using the brief version of the Mood and Feelings Questionnaire (b-MFQ; [Angold et al., 1995]). The b-MFQ was recently validated among autistic youth (Rai et al., 2018) and includes 13 items evaluating one's mood over the past two weeks. Items are scaled at 0 = "not true"; 1 = "somewhat true"; and 2 = "true"; and had strong internal consistency (α = .81). A score of 12 or higher suggests clinical depression for which we coded a dichotomous variable (0 = "no clinical depression" and 1 = "clinical depression."). The b-MFQ has also been assessed for measurement equivalence across racial groups (Bahn et al., 2012). One participant in the current study did not complete this measure at baseline, therefore we used their b-MFQ post-test data from the RCT as the virtual interview intervention ameliorated interview skills, not depressive symptoms.

Data Analysis

We used *t*-tests and chi-square analyses (or Fisher's Exact Test if chi-square assumptions were not met) to compare the groups with respect to the study variables (i.e., age, sex assigned at birth, co-occurring disabilities, cognitive ability, and behavioral challenges) and primary outcomes (i.e., clinical depression and depressive symptoms). Notably, all Levene's Tests were non-significant (all $p>0.10$). Subsequently, we conducted an analysis of covariance (ANCOVA) with baseline depressive symptoms as the dependent variable. All assumptions for an ANCOVA were met. We included the presence of any co-occurring disability as a fixed effect covariate, and cognitive ability and behavior challenges as covariates given their known associations with depression (Ghaziuddin et al., 2002; Sterling et al., 2008; Wallace et al., 2016). In order to optimize the statistical power of this small sample, we imputed values for the missing cognitive and behavioral data using the expectation-maximization algorithm, which results in less biased parameter estimates than mean or regression imputation (Dempster et al., 1977).

Results

Demographic, Cognitive, and Behavioral Characteristics

Table 1 displays the sample characteristics. The Black participants were significantly older than the White participants ($p = .049$), while the groups did not differ with respect to sex assigned at birth ($p = .238$) or the presence of any co-occurring disability ($p = .365$).

More specifically, groups did not differ with respect to the presence of a specific learning disability (p = 1.00), emotional disturbance (p = .310), intellectual disability (p = 1.00), or other health impairment (p = .689). The groups did not differ with respect to cognitive ability (p = .925), behavioral challenges (p = .564), and their SRS-2 T score (p = .507).

Primary Outcomes

As reported in Table 1, Black participants had significantly higher unadjusted depressive symptoms than White participants (p = .013); however, the groups did not differ with respect to clinical levels of depression (p = .253). Given the group differences in age, we also added age as a covariate to the ANCOVA. The ANCOVA results in Table 1 revealed that Black participants had significantly higher depressive symptoms than White participants ($F_{1,32}$=9.3, p = .005) after adjusting for covariates known to be associated with depression. The ANCOVA also revealed that participants with a co-occurring disability had lower depressive symptoms than participants with no co-occurring disability ($F_{1,32}$=5.9, p = .021). Behavior challenges ($F_{1,32}$=4.1, p = 0.049) was a significant covariate in the ANCOVA, while cognitive ability ($F_{1,32}$=2.1, p = .152), age ($F_{1,32}$=0.3, p = .611), and a race-by-co-occurring disability interaction were non-significant covariates ($F_{1,32}$=0.6, p = .455). Notably, we did not model clinical depression with covariates given the non-significant chi-square results for this variable and we wanted to be cautious about potential spurious associations given the small sample size.

Discussion

This study examined racial differences in depressive symptoms among autistic transition-age youth using baseline data collected as part of a multi-site randomized controlled trial. This study is important given the dearth of studies on racial disparities in autism and depression research. A thorough search of scholarly literature on autism and depression found no current literature that specifically examines potential racial differences in autistic youth experiencing depression or depressive symptoms, making this study among the first. Beyond age, the Black and White participants in this sample did not differ with respect to remaining demographic, cognitive, and behavioral characteristics. Of note, this data was collected between Fall 2018 and Fall 2019 prior to the rise in the political climate that took place beginning in 2020 in the United States. Our primary finding from this preliminary study suggests that Black autistic participants had significantly higher depressive symptoms than White autistic participants, which presents initial evidence of a Black/White racial disparity among autistic youth experiencing depressive symptoms. Notably, the rate of clinical depression was approximately 12% higher among Black autistic youth than their White autistic peers; however, this difference did not obtain significance.

Existing literature on Black youth and depression suggests that Black youth in general are more likely to experience depressive symptoms compared to their White peers (Adkins et al., 2009; Cokley et al., 2014). Many of the factors associated with the increased prevalence of depressive symptoms among Black youth could be exacerbated for Black autistic youth due to behaviors such as code-switching (Durkee et al., 2019; Walton et al., 2015) and masking (Hull et al., 2017; Mandy, 2019; Pearson & Rose, 2021). Both masking and code-

switching are associated with high levels of stress, feelings of loneliness, mental distress, and suicidality (Cage & Troxell-Whitman, 2019; Cassidy et al., 2020). These behaviors potentially contribute to a unique experience for Black autistic youth in which their potential engagement in masking and code-switching could be facilitating increased levels of mental distress and resulting depressive symptoms.

Social injustices such as systemic racism uniquely affect Black youth, leading them to experience greater depressive symptoms than their White peers. Black autistic youth navigate these same social circumstances while also navigating the many social inequities that are associated with autistic youths increased risk of depressive symptoms. Oswald and Hamworth (2016) reported that Black autistic youth navigate a unique form of stigma and bias related to their race and autistic identities. This is apparent in the reported delays in autism diagnosis of Black youth as well as in the reported disparities in quality of care and the many unmet mental health needs of Black autistic youth. The 2018 National Autism Indicators Report found that Black autistic youth were more likely to have significant deficits in communication skills, to live in a household that is at or near the poverty line, to rely on public insurance, and to report experiencing racism (Shattuck et al., 2018). This matrix of multiple, intersecting oppressions experienced by Black autistic youth may also explain their greater depressive symptoms found in this study.

In addition, our results suggest that independent of race, the presence of a co-occurring disability was associated with fewer depressive symptoms. One potential explanation for this finding could be that masking, code-switching, and other mechanisms of autistic burnout (Raymaker et al., 2020) could be affecting autistic transition age youth with a co-occurring disability to a lesser extent given they may be receiving more support and may be less aware of their struggles than autistic transition age youth without a co-occurring disability. However, future research is needed to intentionally evaluate these hypothesized associations.

Limitations and Future Directions

Though the findings from this preliminary study initiate an understudied area of autism research, our findings must be considered in light of several limitations. First, our sample and was not powered to detect small or medium effects. Thus, future studies need to explore this disparity in larger nationally representative data to validate these findings. Although non-significant, the 12% difference in clinical depression between groups could inform power analyses for future studies. Second, future studies should explore key demographic and social indicators (e.g., income, racism, school and community attachments, and age of autism diagnosis) as potential mechanisms of depressive symptoms. Third, the study was cross-sectional and cannot assess causal associations between race and depressive symptoms. Future longitudinal studies have the potential to explain causal mechanisms underlying racial disparities in depressive symptoms among autistic transition age youth. Fourth, findings from this study are limited to mildly to moderately autistic youth and therefore cannot be generalized to severely autistic transition age youth. Fifth, no studies could be identified that validated the Mood and Feelings questionnaire (MFQ) for transition age youth beyond the age of 18. Finally, we did not collect data on a control group of non-autistic youth and were thus unable to determine whether the elevated depressive

symptoms we identified in Black autistic youth were elevated to a greater degree than Black, non-autistic youth.

In conclusion, these preliminary findings speak to an important need to further examine racial disparities in depressive symptoms and clinical depression among autistic youth using larger and more representative samples. Future research could also include control groups in order to test whether depressive symptoms and depression are elevated in Black autistic youth compared to Black youth in the general population. Furthermore, it calls for greater attention to be given to the unique intersecting identities that emerge from historically underserved groups.

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Table 1

Study Sample Characteristics and ANCOVA Results

Sample Characteristics	Black (n=13)	White (n=26)	Test Statistic (*t* or X^2)	*p*
Age (M, SD)	21.4 (2.7)	19.5 (2.7)	2.0	.049
Biological sex (% Male)[a]	92.3%	76.9%		.388
Comorbid disability (% yes)	61.5%	46.2%	0.8	.365
Specific learning disability[a]	7.7%	11.5%		1.00
Emotional disturbance[a]	23.1%	7.7%		.310
Intellectual disability[a]	19.2%	23.1%		1.00
Other health impairment[a]	26.9%	15.4%		.689
Cognitive ability (M, SD)	31.1 (10.6)	30.8 (9.5)	0.1	.925
Social Responsiveness (M, SD)	60.5 (9.3)	62.5 (8.6)	0.7	.507
Behavioral challenges (M, SD)	53.0 (11.2)	55.2 (10.9)	-0.6	.564
Depressive symptoms (unadjusted M, SD)	7.3 (4.4)	3.8 (3.6)	2.6	.013
Clinical depression (based on b-MFQ cutoff)[a]	15.4%	3.8%		.253
ANCOVA Results	**Black (n=13)**	**White (n=26)**	**Test Statistic (F)**	***p***
Depressive symptoms (adjusted M, [SE])	8.0 (1.1)	3.7 (0.7)	9.3	.005
	No co-occurring disability (n=20)	**Co-occurring disability (n=19)**	**Test Statistic (F)**	***p***
Co-occurring disability (adjusted M, [SE])	8.0 (1.2)	3.7 (1.0)	5.9	.021

[a]A Fisher's Exact Test was conducted as this variable did not have a minimum of n=5 cases per cell. This test reports a *p*-value but not a test statistic.