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51 Cognitive Functioning in Neurofibromatosis Type 1: The Role of Community Socioeconomic Status

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Objective: Neurofibromatosis type 1 (NF1) is a neurogenetic disorder associated with increased risk of neuropsychological challenges. While research has evidenced associations between environmental factors and neurocognitive development, few studies have examined the role that socioeconomic status (SES) plays on neuropsychological development in NF1. The aim of this study is to examine the relationship between community SES and cognitive/psychosocial outcomes in a neuropsychology clinic sample of pediatric NF1 patients.

Participants and Methods: The sample consisted of 47 youth with NF1 (M age=11.91, SD=3.69). The sample was 51.1% female, 72.3% White, 19.1% Black/African American, and 4.3% Hispanic. All participants had completed neuropsychological assessments for clinical purposes at an outpatient clinic in an urban, midwestern medical center. Data from neuropsychological measures and demographic information were pulled from records and entered into a de-identified dataset. The Wechsler Intelligence Scales, California Verbal Learning Test (CVLT), Woodcock Johnson Test of Achievement, and parent- and teacher-report versions of the Behavior Assessment System for Children (BASC) and the Behavior Rating Inventory of Executive Function (BRIEF) were used to examine broad neuropsychological functioning. The Area Deprivation Index (ADI) measures SES at the community level, as opposed to the individual level. It is composed of 17 factors related to education, poverty, employment, and housing. This information is used to assign index scores by zip code, with scores on a scale of 1-10 and 10 indicating the highest level of

socioeconomic disadvantage. Mean ADI for this sample was 4.02 (SD=1.93).

Results: Mean neurocognitive scores were consistently in the low average to average range. Parent and teacher scores on the BASC were in the average range. Mean scores on the BRIEF indicated Global Executive Composite scores in the mildly and moderately elevated range for parents and teachers, respectively. Correlational analyses revealed significant associations between ADI scores and immediate recall performance on the CVLT (Trials 1-5; $r=.37$; $p=.03$) and the BRIEF Planning and Organization subscale ($r=.35$; $p=.02$). Both remained significant after controlling for FSIQ (CVLT: $rFSIQ=.49$, $p=.003$; BRIEF: $rFSIQ=.38$; $p=.02$).

Conclusions: Mean cognitive scores for the sample are consistent with existing literature demonstrating that individuals with NF1 are at risk of reduced functioning in several domains. Sample mean ADI of 4 indicates a relatively low level of disadvantage in this sample., ADI was significantly associated with two variables, and greater deprivation was associated with better list learning performance. This suggests that the role of community SES is likely nuanced in how it impacts neurocognitive development. Results provide mild evidence of an association between ADI and learning and planning/organization. However, limitations to the current study, including a small sample size, and the retrospective nature, likely limits a more detailed understanding of the true relationship between community resources and cognitive and psychosocial outcomes among children with NF1. Future research comparing larger low and high ADI samples is necessary to fully examine the relationship between these factors. With better understanding of how community SES may limit or support neurocognitive and psychological growth in this population, more effective interventions can be designed for this group whose members are at notable risk for cognitive and psychological challenges.

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