**Title**: Co-Occurring Attention-Deficit/Hyperactivity Disorder and Anxiety Disorder Diagnoses in the Context of Autism Diagnostic Evaluation

**Authors**: Evangeline Kurtz-Nelson1, Cristina James 1, & Debra Reisinger2

**Introduction**: Approximately 28% of autistic people have a co-occurring diagnosis of attention-deficit/hyperactivity disorder (ADHD), while approximately 20% have a co-occurring diagnosis of an anxiety disorder (Lai et al., 2019). Despite high co-occurrence of ADHD and anxiety disorder in autism, these diagnoses may be missed in clinical settings due to diagnostic overshadowing and overlap with features of autism (Rosen et al., 2018).Co-occurring mental health diagnoses may be particularly difficult to identify among autistic people with intellectual disability due to measurement challenges and variable presentation of symptoms (Clark & Bélanger, 2018; Totsika et al., 2022). Autism diagnostic evaluations may present an opportunity for screening and identification of co-occurring psychiatric diagnoses, facilitating early intervention and appropriate treatment referrals. As such, the purpose of this study was to identify rates and predictors of co-occurring ADHD and anxiety diagnoses provided in the context of a clinical autism evaluation.

**Method**: Participants were 248 individuals ages 6-17 years (mean age = 8 years, 26% female) who presented for an autism evaluation at an academic medical center and were diagnosed with autism spectrum disorder. All patients completed an in-person evaluation with a psychologist, which included administration of the Autism Diagnostic Observation Schedule-2 (ADOS-2; Lord, et al., 2012). Additional assessments typically included caregiver reported measures of adaptive skills (Vineland-3; Sparrow, Cicchetti, & Saulnier, 2016) and emotional/behavioral problems (Behavior Assessment System for Children-3; Reynolds & Kamphaus, 2015) as well as an appropriate cognitive measure. DSM-5 diagnoses were provided by the psychologist based on the results of the evaluation.

Logistic regression was used to predict co-occurring diagnostic status. In both logistic regressions, age and sex were entered in the first step, while cognitive and adaptive skills were entered in the second step. BASC-3 Hyperactivity and Attention Problems T-scores as well as elevation on the ADOS-2 E1 code (Overactivity) were entered in the third step of the equation predicting ADHD diagnosis, while BASC-3 Anxiety T-scores and ADOS-2 E3 code elevation (Anxiety) were entered in the third step of the equation predicting anxiety disorder diagnosis.

**Results**: 21% of participants received a co-occurring diagnosis of ADHD, while 9% received a co-occurring diagnosis of anxiety disorder. After controlling for age and sex, higher cognitive (β = 0.04, *p* < .05) and lower adaptive skills (β = -0.07, *p* < .05) significantly predicted ADHD diagnosis. Caregiver rated attention problems (β = 0.13, *p* < .05) and observed overactivity (β = 2.70, *p* < .001) during the ADOS-2 significantly predicted ADHD diagnosis after controlling for age, sex, IQ, and adaptive skills, while caregiver-rated anxiety problems (β = 0.08, *p* < .05) predicted anxiety disorder diagnosis. Both final models had strong specificity (94% ADHD; 99% anxiety disorder) but poor sensitivity (65% ADHD; 44% anxiety disorder).

**Discussion:** While caregiver screening and observed behavior during autism diagnostic evaluation inform the provision of co-occurring ADHD and anxiety disorder diagnoses, these measures may not have adequate sensitivity to consistently identify appropriate diagnoses. This may be particularly likely for anxiety disorder, given very poor overall sensitivity and low rate of co-occurring diagnosis as compared to previously published estimates. Future efforts should examine the feasibility and value of integrating enhanced assessment of co-occurring diagnoses into autism evaluations, such as adding disorder-specific rating scales, using structured clinical interviews, or incorporating measures with increased validity in intellectual disability and autism.

**References:**

Clark, B., & Bélanger, S. A. (2018). ADHD in children and youth: part 3—assessment and treatment with comorbid ASD, ID, or prematurity. *Paediatrics & Child Health*, *23*(7), 485.

Lai, M. C., Kassee, C., Besney, R., Bonato, S., Hull, L., Mandy, W., Szatmari, P., & Ameis, S. H. (2019). Prevalence of co-occurring mental health diagnoses in the autism population: a systematic review and meta-analysis. *The Lancet Psychiatry*, *6*(10), 819-829.

Rosen, T. E., Mazefsky, C. A., Vasa, R. A., & Lerner, M. D. (2018). Co-occurring psychiatric conditions in autism spectrum disorder. *International Review of Psychiatry*, *30*(1), 40-61.

Totsika, V., Liew, A., Absoud, M., Adnams, C., & Emerson, E. (2022). Mental health problems in children with intellectual disability. *The Lancet Child & Adolescent Health*, *6*(6), 432-444.

Indiana University

2 Cincinnati Children’s Hospital Medical Center