

# Relationship Between Sleep Difficulties and ADHD and Anxiety Symptoms in Autistic and Non-Autistic Youth

Reilly, S. T., Wolf, J. M., Naples, A., Cukar-Capizzi, C. C., Momsen, J. P., Carrow, C., Eberle, S., Rodden, I., and McPartland, J.

## Background

- Sleep difficulties in both autistic (ASD) and non-autistic (non-ASD) youth often co-occur with symptoms of ADHD and anxiety (Waddington et al., 2020).
- Recent studies have compared sleep characteristics across diagnostic groups; however, the extent to which sleep difficulties are differentially linked to ADHD and anxiety symptoms in ASD and non-ASD youth remains unclear (Hatch et al., 2021).

## Objectives

- This study aimed to examine correlations between parent-reported sleep domains, ADHD symptoms, and anxiety symptoms in ASD and non-ASD youth.

## Methods

- Participants included 62 children and adolescents (ASD: n=39; non-ASD: n=23) who completed the Yale Developmental Sleep Questionnaire (YDSQ) and the Child and Adolescent Symptom Inventory-5 (CASI-5).
- We focused on YDSQ items (rated 1–10, with lower values reflecting greater sleep challenges) assessing bedtime adherence, sleep onset latency, maintenance of sleep, return to sleep after waking, morning waking, and overall sleep quality.
- Symptom measures included CASI-5 ADHD Combined T-scores, Generalized Anxiety Disorder (GAD) T-scores, and Social Anxiety T-scores.
- Correlational analyses (Pearson) were conducted in the full sample and stratified by diagnostic group (ASD; non-ASD).
- Fisher's Z score comparisons were used to examine diagnostic differences in the strength of sleep-symptom associations.

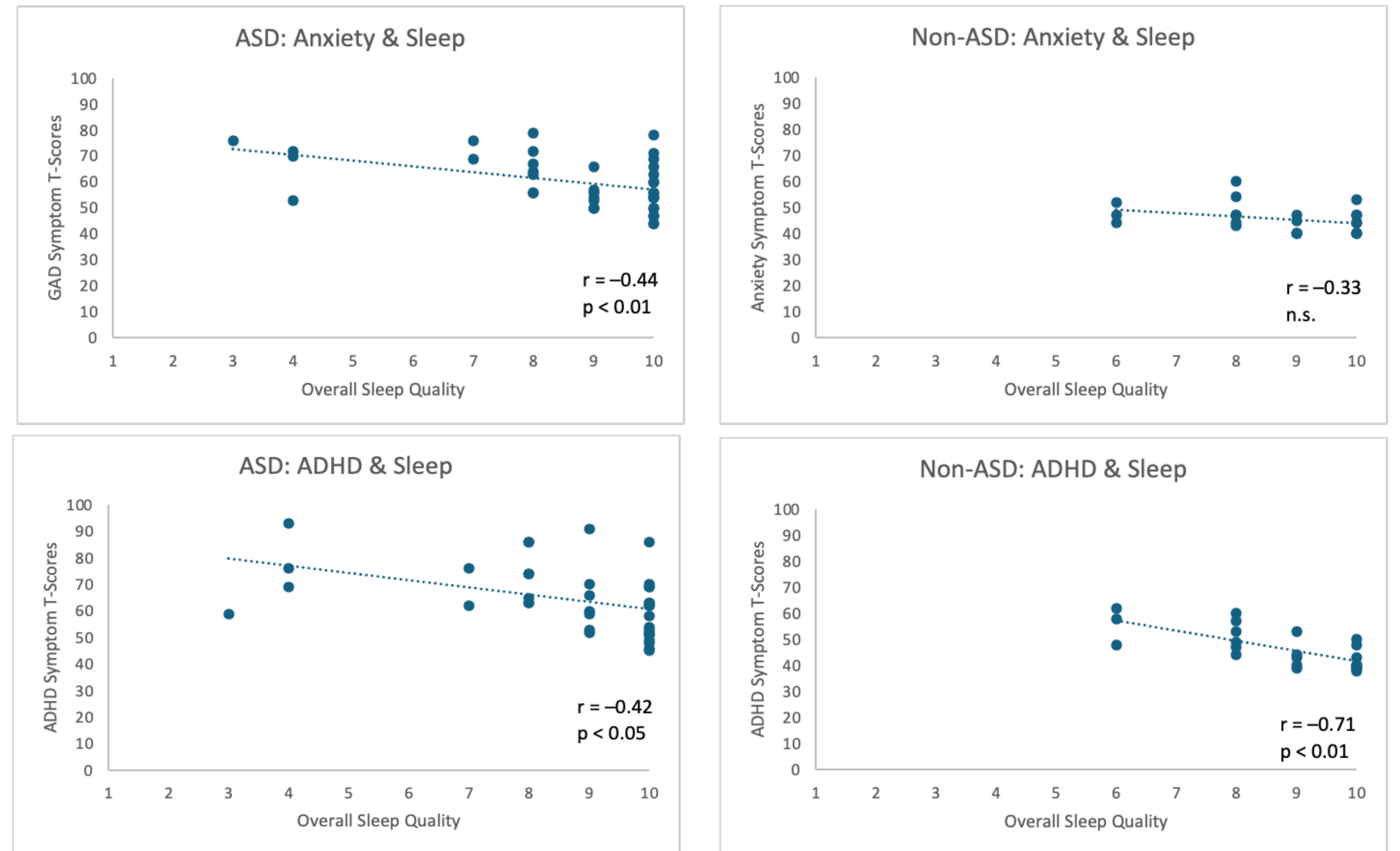
## Results

	N	Mean (SD) [Range]						
		Age (years)	Sex (male:female)	IQ (WASI-II FSIQ & DAS-II GCA Standard Score)	CASI-5 ADHD	CASI-5 GAD	CASI-5 Social Anxiety	YDSQ Self-Report Ratings 1-10
ASD	39	11.25 (46.09) [5.5-17.75]	34:5	103.05 (21.78) [57-146]	64.42 (12.64)	60.05 (9.87)	51.05 (11.5)	8.62 (1.91)
Non-ASD	23	11.35 (41.91) [6.5-17.42]	18:5	117.91 (10.51) [99-138]	46.7 (7.44)	45.61 (5.19)	46.93 (6.5)	8.74 (1.36)
Between-group comparison		t(59) = -0.10		t(59) = -0.10	***t(59) = 6.11	***t(59) = 6.48	*t(59) = 3.26	t(60) = -0.27
All Participants	62	11.29 (44.28) [5.5-17.75]	52:10	108.41 (19.76) [57-146]	57.74 (13.92)	54.61 (10.94)	49.44 (9.94)	8.66 (1.72)

\*p < 0.05  
\*\*p < 0.01  
\*\*\*p < 0.001

**Table 1:** All participants were stratified into two groups according to their diagnosis (ASD and non-ASD). Significant differences were found between the ASD and non-ASD groups in their mean ADHD, GAD, and Social Anxiety T-Scores, with the ASD group having significantly higher symptoms across all three domains.

## Results



**Figure 1:** Associations between symptom domains and overall sleep quality by diagnostic group. In ASD youth, anxiety symptoms ( $r = -0.44$ ,  $p < 0.01$ ) and ADHD symptoms ( $r = -0.42$ ,  $p < 0.05$ ) were significantly associated with poorer overall sleep. In non-ASD youth, ADHD symptoms were strongly associated with poorer sleep ( $r = -0.71$ ,  $p < 0.01$ ), whereas the relationship between anxiety symptoms and sleep was not statistically significant ( $r = -0.33$ , n.s.).

	ASD Group						Non-ASD Group					
	Yale Developmental Sleep Questionnaire (YDSQ) Self-Report Ratings 1-10						Yale Developmental Sleep Questionnaire (YDSQ) Self-Report Ratings 1-10					
	Bedtime adherence	Sleep onset latency	Maintenance of sleep	Return to sleep after waking	Morning wake	Overall sleep quality	Bedtime adherence	Sleep onset latency	Maintenance of sleep	Return to sleep after waking	Morning wake	Overall sleep quality
CASI-5 ADHD	-0.58**	-0.47**	-0.16	-0.14	-0.26	-0.42*	-0.42*	-0.48*	-0.10	-0.09	-0.53**	-0.71**
CASI-5 GAD	-0.62**	-0.59**	-0.37*	-0.35*	-0.44**	-0.44**	-0.06	-0.27	-0.52*	-0.58**	-0.28	-0.33
CASI-5 Social Anxiety	-0.21	0.01	-0.29	-0.43*	0.21	-0.22	-0.21	-0.22	-0.04	-0.21	0.08	-0.50

\*p < 0.05  
\*\*p < 0.01

	Fisher's Z Score Comparisons Between ASD & Non-ASD					
	Bedtime adherence	Sleep onset latency	Maintenance of sleep	Return to sleep after waking	Morning wake	Overall sleep quality
CASI-5 ADHD	-0.77	0.05	-0.22	-0.18	1.16	1.58
CASI-5 GAD	-2.38**	-1.44	0.67	1.07	-0.66	-0.46
CASI-5 Social Anxiety	-0.01	0.85	-0.93	-0.88	0.48	1.17

**Table 2:** Pearson correlations between sleep domains and symptom measures differed by diagnostic group. In ASD youth, GAD showed consistent moderate-to-strong associations with poorer sleep across domains ( $r = -0.35$  to  $-0.62$ ,  $p < .05$ ), while social anxiety was less consistent and ADHD showed moderate associations with select domains ( $r = -0.42$  to  $-0.58$ ,  $p < .05$ ). In non-ASD youth, ADHD symptoms demonstrated stronger and more consistent associations with sleep difficulties ( $r = -0.42$  to  $-0.71$ ,  $p < .05$ ), whereas GAD showed more limited associations ( $r = -0.52$  to  $-0.58$ ,  $p < .05$ ) and social anxiety was not significantly related to sleep. Fisher's Z comparisons indicated that most sleep-symptom associations did not significantly differ between ASD and non-ASD groups; however, a significant group difference emerged for GAD and bedtime adherence ( $z = -2.38$ ,  $p < .01$ ), with stronger associations observed in the ASD group.

## Conclusions

- These findings suggest that sleep difficulties are strongly associated with ADHD and anxiety symptoms in autistic and non-autistic youth, but the strength and patterns of these associations differ by diagnostic group.
- In ASD youth, sleep disturbances are associated with both ADHD and anxiety symptoms, whereas in non-ASD youth, they are more tightly linked to ADHD symptoms.
- These results suggest that tailoring sleep interventions to diagnosis could differentially influence symptom outcomes.

## References

- Hatch, B., Nordahl, C. W., Schwichtenberg, A. J., Ozonoff, S., & Miller, M. (2021). Factor Structure of the Children's Sleep Habits Questionnaire in Young Children with and without Autism. *Journal of Autism and Developmental Disorders*, 51(9), 3126–3137.
- Jackson, A., Mulraney, M., Melvin, A. G., Evans, S., Efron, D., & Sciberras, E. (2024). "Stuck in a Loop": A Qualitative Examination of Challenges for Children and Adolescents with Attention-Deficit/Hyperactivity Disorder and Anxiety. *Journal of Emotional and Behavioral Disorders*, 32(3), 169–182.
- Waddington, H., McLay, L., Woods, L., & Whitehouse, A. J. O. (2020). Child and Family Characteristics Associated with Sleep Disturbance in Children with Autism Spectrum Disorder. *Journal of Autism and Developmental Disorders*, 50(11), 4121–4132.

## Funding Sources

Alan B. Slifka Foundation (McPartland); DOD W81XWH2110479 (McPartland)

McPartland Lab  
mcp-lab.org  
mcp.lab@yale.edu  
mcpartland.lab on Instagram

