

# Sleep Health and Attention Dysregulation in a National Study of Infants and Preschool Aged Children with Atopic Dermatitis

## Background & Methods

### Background:

- Most children with atopic dermatitis (AD) are diagnosed by 5 years old (y.o.)<sup>1</sup>
- Many suffer from sleep disturbance and poor attention regulation<sup>2,3</sup>
- Long-term consequences for development and academic performance<sup>4</sup>

### Objective:

- Determine the impact of AD severity on these symptoms in young children with AD and characterize sleep health and attention regulation behaviors

### Methods:

- National survey distributed via panel company OP4G and National Eczema Association
- Stratified by AD severity (Patient Oriented Eczema Measure, POEM)
- Parents of children 1-5 y.o. with AD
- Questionnaires:
  - Sleep Disturbance (Patient-Reported Outcomes Measurement Information System-Sleep Disturbance measure (PROMIS) Sleep Health)
  - Itch Severity
  - Attention Dysregulation (Multidimensional Assessment Profile of Attention Regulation, MAPS-AR)
- Linear regression modeled predictors of sleep disturbance and attention dysregulation

TABLE II. Outcome Measures Stratified by Disease Severity

Variable	Disease Severity by Patient Oriented Eczema Measure (POEM)				P-value
	Total (n=60)	Mild AD (n=10)	Moderate AD (n=25)	Severe AD (n=25)	
<b>Sleep Disturbance (Nights of Disturbed Sleep)</b>					<b>&lt; 0.01</b>
1-2 Days, n (%)	16 (27)	6 (60)	8 (32)	2 (8)	
3-4 Days, n (%)	14 (23)	0	11 (44)	3 (12)	
5-6 Days, n (%)	13 (22)	0	6 (24)	7 (28)	
Every Day, n (%)	12 (20)	0	0	12 (48)	
No Days, n (%)	5 (8)	4 (40)	0	1 (4)	
<b>POEM (SD)</b>	15.25 (6.30)	5.60 (1.65)	13.00 (2.22)	21.36 (2.96)	<b>&lt;0.01</b>
<b>PROMIS Early Childhood Sleep Health T-score (SD)</b>	65.16 (8.87)	53.60 (8.03)	64.83 (5.99)	70.11 (7.22)	<b>&lt;0.01</b>
<b>Itch Severity NRS (SD)</b>	5.93 (2.04)	3.60 (1.78)	5.40 (1.47)	7.40 (0.44)	<b>&lt;0.01</b>
<b>MAPS-AR Composite Score (SD)</b>	45.55 (12.50)	34.20 (8.40)	43.52 (12.03)	52.12 (10.47)	<b>&lt;0.01</b>

FIGURE I. Proposed Model of AD Severity and Attention Dysregulation

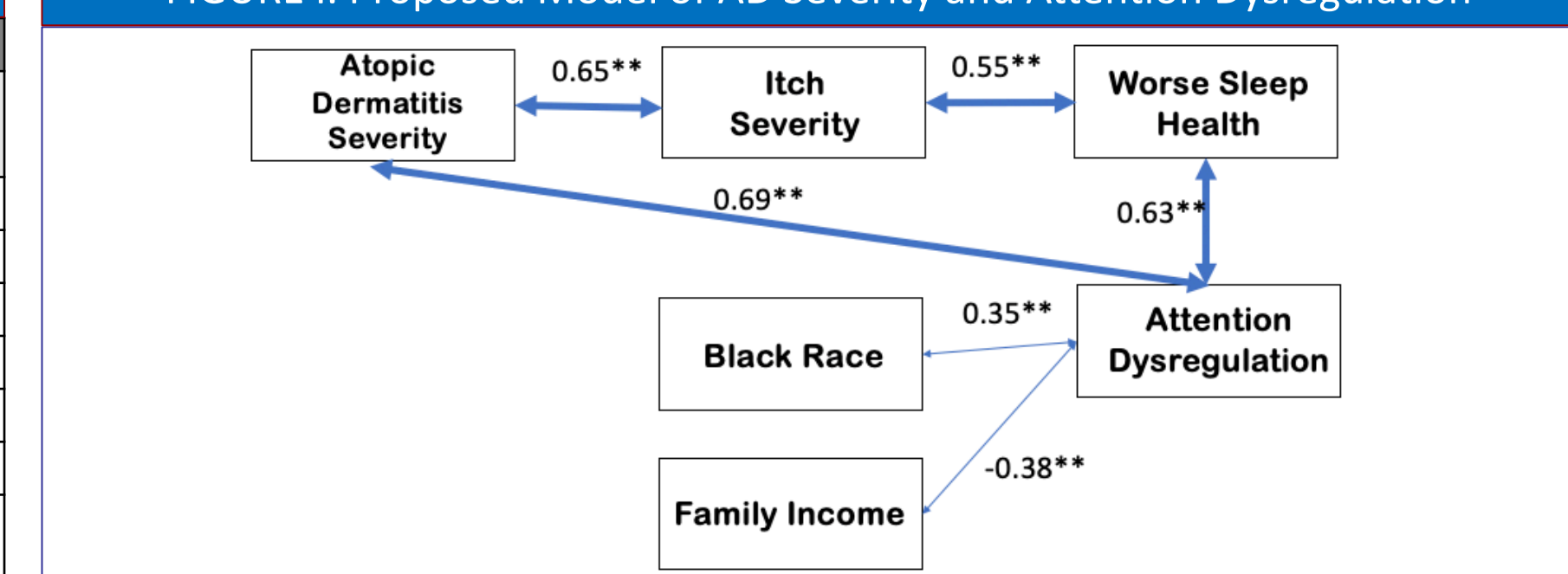


TABLE I. Demographic Characteristics Stratified by Disease Severity

Variable	Disease Severity by Patient Oriented Eczema Measure (POEM)				P-value
	Total (n=60)	Mild AD (n=10)	Moderate AD (n=25)	Severe AD (n=25)	
<b>Age, mean (SD)</b>	2.78 (0.98)	2.21 (0.99)	3.00 (0.93)	2.80 (0.97)	0.10
<b>Male, n (%)</b>	33 (55)	7 (70)	16 (64)	10 (40)	0.14
<b>Race/Ethnicity</b>					0.92
Caucasian, n (%)	21 (35)	3 (30)	9 (36)	9 (36)	
Black, n (%)	19 (32)	3 (30)	8 (36)	8 (32)	
Other, n (%)	20 (33)	4 (30)	8 (28)	8 (32)	
<b>Household Income in Past 12 mo</b>					<b>&lt;0.01</b>
<\$30,000 (%)	6 (10)	0	2 (8)	4 (16)	
\$30,000-\$74,999 (%)	32 (53)	3 (30)	9 (36)	20 (80)	
>\$75,000 (%)	19 (32)	7 (70)	11 (44)	1 (4)	
Omitted (%)	1 (4)	0	1 (4)	0	

TABLE III. Linear Regression of PROMIS Sleep Health and MAPS-AR

PROMIS Sleep Health			MAPS-AR		
Variable	Unstandardized β value (95% CI)	P-value	Variable	Unstandardized β value (95% CI)	P-value
<b>Model 1</b>			<b>Model 1</b>		
POEM w/o itch/sleep	1.22 [0.88-1.56]	<b>&lt;0.01</b>	POEM w/o itch/sleep	1.72 [1.24-2.203]	<b>&lt;0.01</b>
<b>Model 2</b>			<b>Model 2</b>		
POEM w/o itch/sleep	1.01 [0.56-1.45]	<b>&lt;0.01</b>	POEM w/o itch/sleep	1.21 [0.57-1.85]	<b>&lt;0.01</b>
Itch Severity	0.80 [-0.29-1.88]	0.15	PROMIS Sleep Health	0.42 [-0.06-0.78]	<b>0.02</b>
<b>Model 3</b>			<b>Model 3</b>		
POEM w/o itch/sleep	0.79 [0.31-1.28]	<b>&lt;0.01</b>	POEM w/o itch/sleep	1.04 [0.33-1.75]	<b>&lt;0.01</b>
Itch Severity	0.85 [-0.19-1.88]	0.31	PROMIS Sleep Health	0.38 [0.20-0.75]	<b>0.04</b>
<b>Black race</b>	3.89 [0.49-7.28]	<b>0.03</b>	Itch Severity	0.80 [-0.71-2.31]	0.29
Parental Income	-1.05 [-2.20-0.10]	0.07	<b>Model 4</b>		
			POEM w/o itch/sleep	1.22 [0.51-1.93]	<b>&lt;0.01</b>
			Itch Severity	0.86 [-0.56-2.29]	0.23
			PROMIS Sleep Health	0.15 [-0.22-0.52]	0.41
			<b>Black race</b>	7.79 [3.01-12.58]	<b>&lt;0.01</b>
			Parental Income	-0.30 [-1.89-1.30]	0.71

## Results

- 67% of parents of children with severe AD reported sleep disturbance on at least 5 nights/week compared to moderate (24%) and mild (0%) AD.
- 72% of parents of children with severe AD reported trouble paying attention, “no matter what was going on” at least 3 times/week compared to moderate (20%) and mild (0%) AD.
- AD severity ( $B=0.79, p<0.01$ ) and being Black ( $B=3.89, p=0.03$ ) were significant predictors of sleep disturbance.
- AD severity ( $B=1.22, p<0.01$ ) and being Black ( $B=7.79, p<0.01$ ) also predicted more attention regulation problems.

## Discussion & Conclusion

- Parents of children with worse AD severity reported significantly worse sleep health and attention dysregulation.
- Future studies with larger samples sizes should be performed in order to establish causality and directional effects between AD severity, itch, sleep, race, and attention.

## References

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