



# Effects of Parent-Participatory Exercise and Psychoeducation on Children with ADHD

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## Objective

- To examine the effects of a parent-participatory physical activity (PA) and psychoeducation (PE) program on anxiety, depression, and social skills in children with attention-deficit/hyperactivity disorder (ADHD).

**Figure 1.** Parent-participatory physical activity



## Methods

- Thirty-six children aged 7–12 years diagnosed with ADHD were allocated into three groups: PA combined with PE (PA+PE, n=12), PA only (n=11), and a control group (n=13).
- The 8-week intervention included twice-weekly PA sessions (90 min) of moderate-to-vigorous intensity and weekly PE sessions (60 min) incorporating psychological skills training components.
- Both children and their mothers participated in all sessions.
- Outcomes were assessed using the Revised Children's Manifest Anxiety Scale (RCMAS), Children's Depression Inventory (CDI), and Korean Social Skills Rating System–Parent Form (K-SSRS-P) at baseline, post-intervention, and 6-month follow-up.

**Table 1.** Baseline characteristics of study participants

Characteristics		PA+PE (n=12)	PA only (n=11)	Control (n=13)
Sex, No. (%)	Boy	10 (83.3)	9 (81.8)	9 (69.2)
	Girl	2 (16.7)	2 (18.2)	4 (30.8)
Age, mean (SD), y		8.6 (1.4)	8.6 (1.0)	9.2 (1.4)

PA, Physical activity; PE, psychoeducation

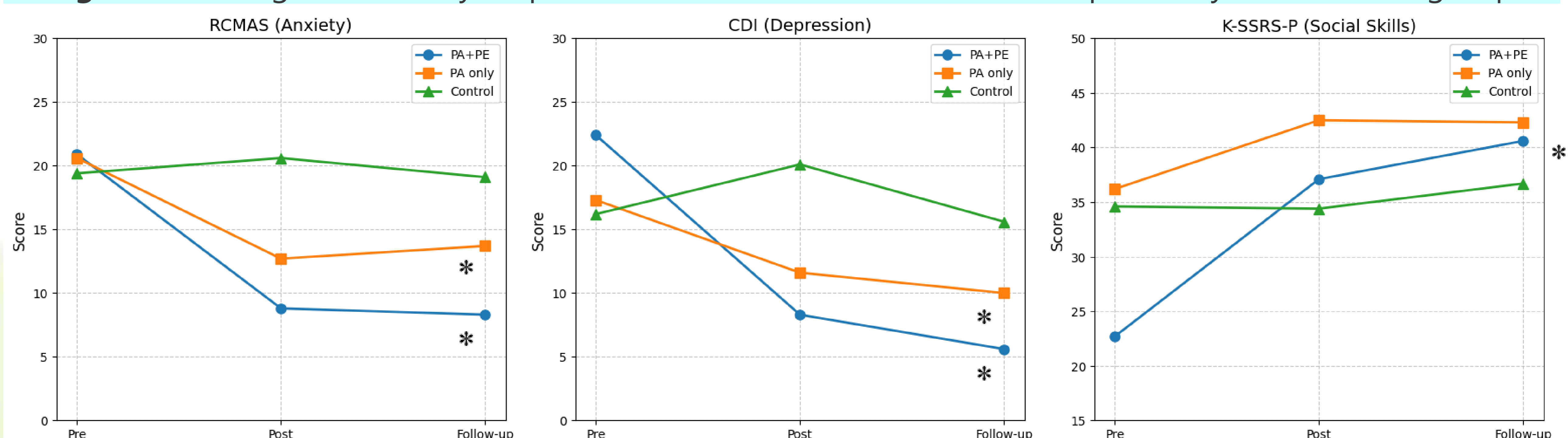
## Results

- Anxiety scores significantly decreased over time ( $p < .001$ ), with significant group ( $p = .014$ ) and interaction effects ( $p < .001$ ). The PA+PE group showed the greatest reduction.
- Depression scores also significantly decreased over time ( $p < .001$ ) with a significant interaction effect ( $p < .001$ ).
- Social skills improved significantly over time ( $p < .001$ ), with a significant interaction effect ( $p = .045$ ).
- The PA+PE group demonstrated superior improvements across all outcomes compared to PA only and control groups.

**Table 2.** Outcome measures across time points

Outcome	Group	Pre	Post	Follow-up	$\Delta$	T	G	T×G
RCMAS (Anxiety)	PA+PE	20.9 (6.1)	8.8 (5.4)	8.3 (7.5)	<b>-12.1 (6.7)</b>			
	PA only	20.6 (5.9)	12.7 (6.2)	13.7 (6.9)	<b>-7.9 (6.9)</b>	<b>&lt;.001</b>	<b>.014</b>	<b>&lt;.001</b>
	Control	19.4 (6.7)	20.6 (6.4)	19.1 (6.9)	1.2 (4.7)			
CDI (Depression)	PA+PE	22.4 (5.6)	8.3 (4.2)	5.6 (5.4)	<b>-14.0 (3.7)</b>			
	PA only	17.3 (9.2)	11.6 (8.3)	10.0 (5.8)	<b>-5.8 (7.2)</b>	<b>&lt;.001</b>	.107	<b>&lt;.001</b>
	Control	16.2 (5.6)	20.1 (5.9)	15.6 (6.3)	3.9 (4.4)			
K-SSRS-P (Social Skills)	PA+PE	22.7 (5.9)	37.1 (14)	40.6 (14)	<b>14.4 (15)</b>			
	PA only	36.2 (7.6)	42.5 (14)	42.3 (11)	6.3 (13)	<b>&lt;.001</b>	.187	<b>.045</b>
	Control	34.6 (9.1)	34.4 (8.3)	36.7 (7.2)	-0.2 (7.3)			

**Figure 2.** Changes in anxiety, depression, and social skills across time points by intervention group



## Conclusion

- A parent-participatory PA and PE program incorporating psychological skills training may effectively reduce anxiety and depression while improving social skills in children with ADHD.
- These findings support integrated, family-centered intervention strategies for ADHD management.