

# Assessing the Impact of Playful Visual Feedback Coaching on Mechanical In-Exsufflation Learning in Children: A Randomized Trial

Audag N.<sup>1,2,3,4</sup>, Chartier PA.<sup>4</sup>, Le Bret M.<sup>5,6</sup>, Toussaint M.<sup>7</sup>, Rey chler G.<sup>1,2,3,4</sup>

1. Institut de Recherche Expérimentale et Clinique (IREC), Pôle de Pneumologie, ORL (airways) & Dermatologie (skin), Groupe Recherche en Kinésithérapie Respiratoire, Université Catholique de Louvain, Brussels, Belgium. 2. Service de kinésithérapie et ergothérapie, Cliniques universitaires Saint-Luc, Brussels, Belgium. 3. Service de Pneumologie, Cliniques universitaires Saint-Luc, Brussels, Belgium. 4. Haute École Léonard de Vinci, PARNASSE-ISEI, Brussels, Belgium. 5. VentLab, Medical ICU, Angers University Hospital, Angers, France 6. Med2Lab, Air Liquide Medical Systems, Antony, France 7. Centre de Référence Neuromusculaire, Department of Neurology, ULB Hôpital Universitaire de Bruxelles, CUB Hôpital Erasme, Brussels, Belgium. nicolas.audag@saintluc.uclouvain.be.

## INTRODUCTION

- Mechanical insufflation-exsufflation (MI-E) is an effective and safe technique for proximal airway clearance.
- In children, the perception of MI-E as “boring” during the initial learning and fear related to the device’s appearance can be significant reasons for non-adherence. Solutions to make the device more engaging and motivating for children are needed.

→ The EOVE-70 (EOVE, Pau, France), introduced a "coaching" module that includes a visual animation, designed to simplify education and increase motivation.

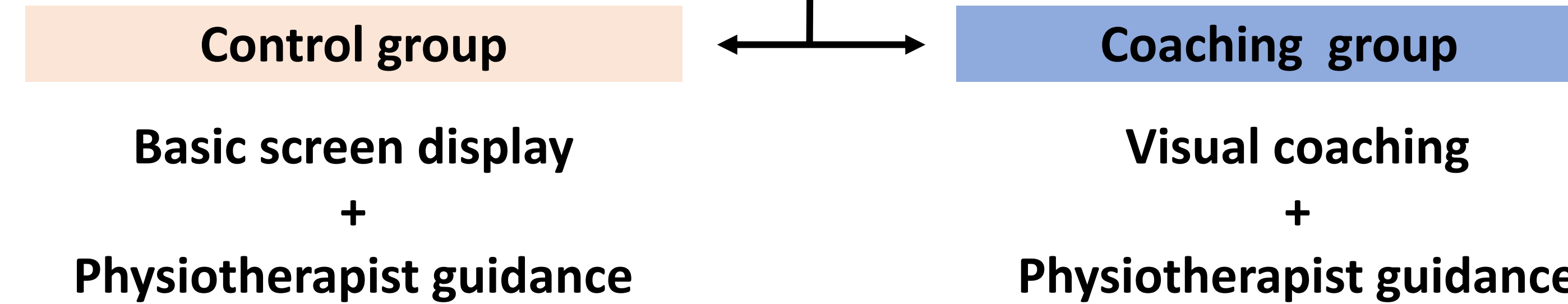
→ No study has yet explored the benefit of this functionality.

**Aim of this study:** Investigate whether adding the coaching module to the guidance by a physiotherapist improves the learning of the techniques.



## METHODS

Healthy subjects  
6-10 years old  
Naive to MI-E  
No sign of obstruction



**Each group performed MI-E training during two sessions**  
Teaching effect was assessed during Session 1 and learning effect in Session 2, conducted 24 hours apart in identical conditions.

<b>Session 1</b>	Training	+	Measurement
<b>Session 2</b>	Measurement		

**Training** = Familiarization with MI-E, adjusting parameters, and interface.  
**Measurement** = Performing a set of five cough cycles, evaluated on a 0-10 Likert scale. Unsuccessful sets were repeated until successful score within a 10-minute limit. Children also assessed the learning experience for its ease of learning (VAS-e) and playfulness (VAS-p) using a Visual Analogue Scale.

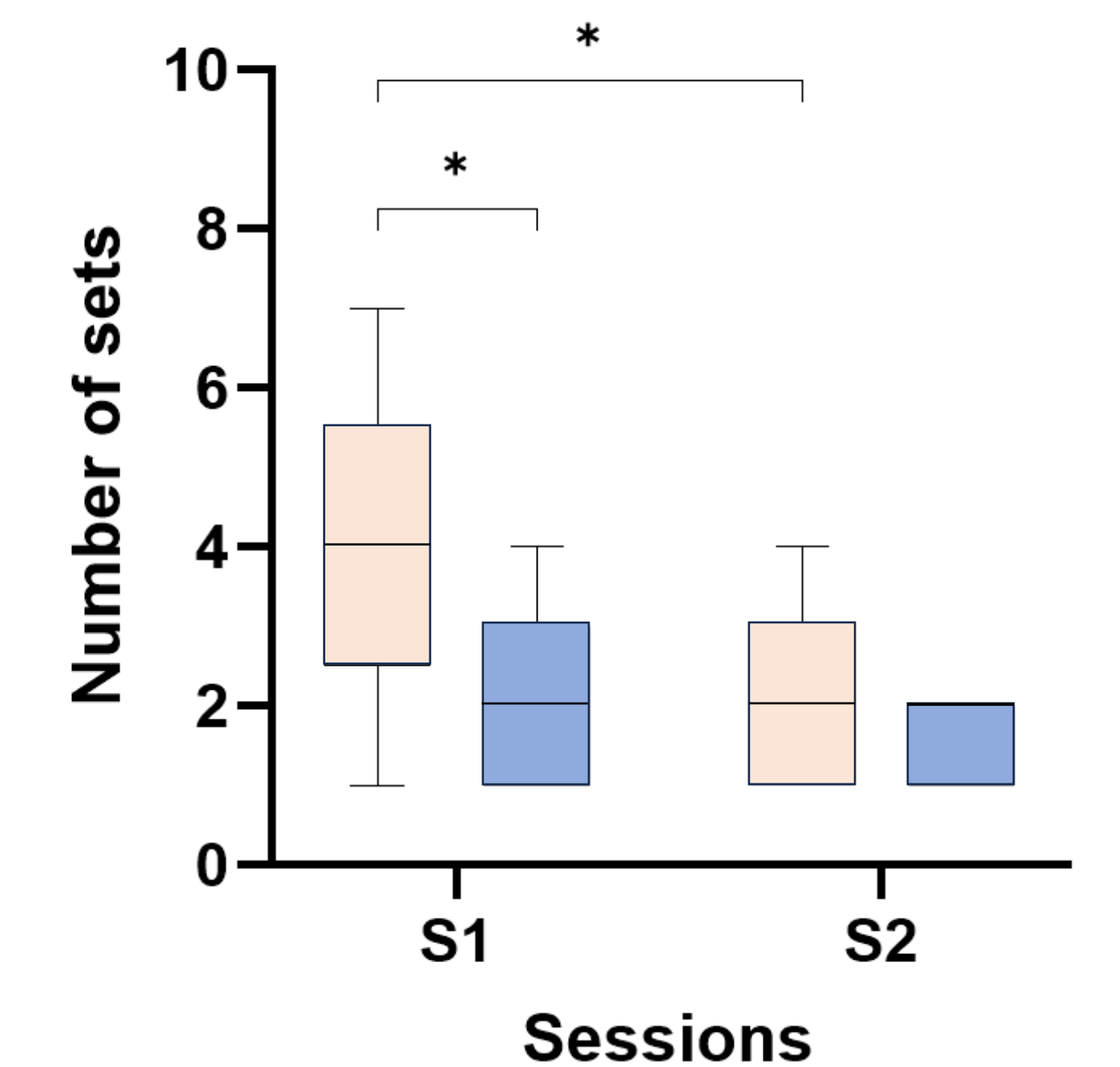
**Primary outcomes**  
Number of sets needed to achieve a successful score of 10 in Session 1 (teaching effect).

**Secondary outcomes**  
Sets needed in Session 2 to achieve a successful score (learning effect), VAS scores, and final MI-E parameters.

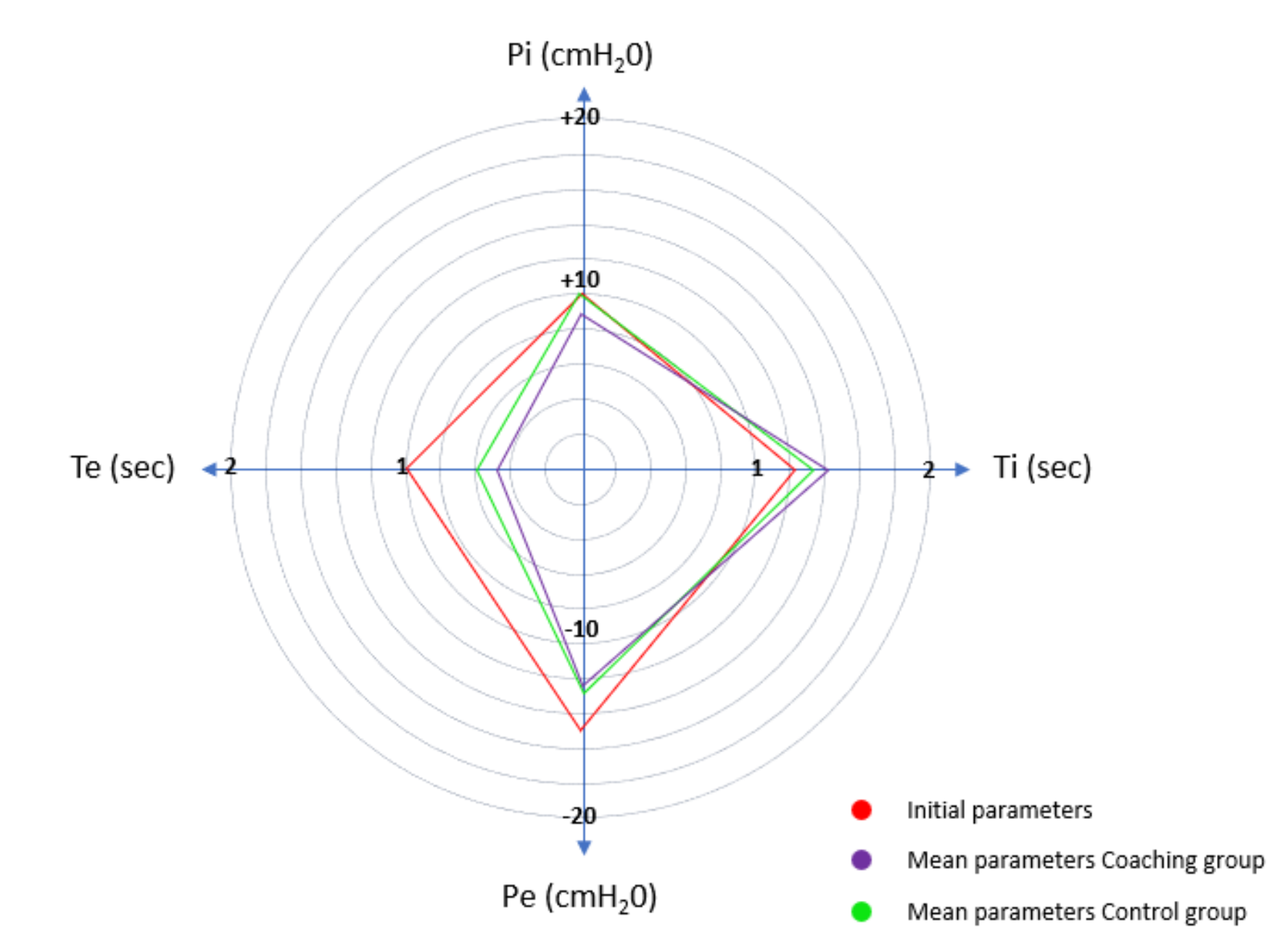
## RESULTS

**20 children**  
9 girls and 11 boys, aged 9.0 ± 1.3 years

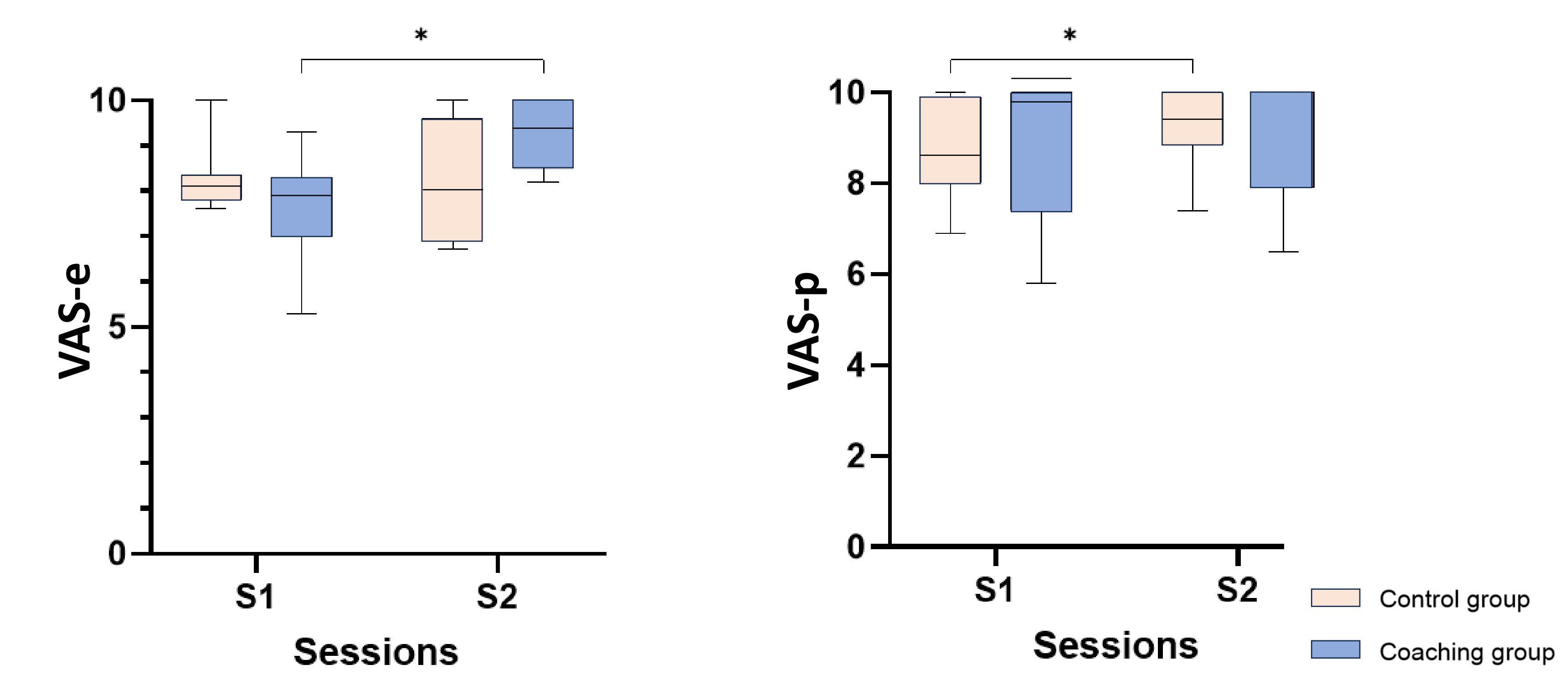
Number of sets for sessions 1 and 2



Final mean MI-E parameters



Scores for perceived ease of learning (VAS-e) and playfulness of training (VAS-p)



## MAIN FINDINGS

Adding the coaching module appears to be a promising approach to accelerate MI-E learning in the initial sessions. This research with healthy children lays the groundwork for further studies, especially among those with neuromuscular disorders or neurodisabilities, to evaluate long-term and home use.

