

Introduction

- Differences in phonological working memory (PWM) and several aspects of attention (sustained, selective, divided, and attentional switching) have been reported in people with ADHD (PWADHD).
- ADHD is also associated with differences in behavioural regulation and oculomotor control.
- Traditional laboratory tasks may have limited ecological validity and may not fully capture attentional performance in everyday settings.
- Increasingly, ADHD is considered heterogeneous in nature, raising the possibility that multimodal approaches may better characterise this neurodevelopmental profile.

Aim

The study examined attentional and oculomotor differences between PWADHD and neurotypical participants in ecologically valid virtual reality (VR) tasks and tested whether combining behavioural and oculomotor measures improved group classification.

Methods

Neurotypical participants (N = 30) and people with ADHD (PWADHD; N = 34) were assessed in:

(1) Adult ADHD Self-Report Scale (ASRS) for measuring ADHD traits; (2) Stuttering Severity Instrument-3 (SSI-3) for measuring fluency; and (3) Universal Non-Word Repetition Test (UNWR) for measuring PWM.

Participants completed ten VR tasks assessing sustained, selective, divided, and attentional switching.

Conclusions

Behavioural Data

- PWADHD showed lower attention, fluency and PWM as assessed by ASRS, SSI-3 and UNWR.
- Compared to neurotypical participants, PWADHD exhibited lower performance in the sustained attention domain.
- PWADHD showed lower accuracy, increased omission errors in the traditionally formatted task (TFT).

Oculomotor Data

- Oculomotor differences varied by task. The clearest difference was observed in the TFT with PWADHD exhibiting higher saccade peak velocity (SPV).

Multimodal Approach

- Combining behavioural and oculomotor data from the TFT, improved classification performance.

Implications

- Behavioural and eye movements appear to capture different aspects of attention.
- All participants reported high levels of task realism and presence on the VR questionnaires.
- VR paradigms can provide ecologically valid tools for detecting domain-specific attentional differences associated with ADHD.

