

POSTER: FIDGET SPINNERS AFFECT NEURAL INVOLVEMENT AND EFFICIENCY DIFFERENTLY IN INDIVIDUALS WITH AND WITHOUT ADHD

*Elham Bakhshipour 1 , Austin Schimmel 1 , Reza Koiler 1 , Nancy Getchell 1

1 University of Delaware, Biomechanics and Movement Sciences, Newark, DE, USA
{elhambak, aschim, radis, getchell }@udel.edu

Objective: Fidget spinners have been marketed as repetitive motion devices that improve attention and motor performance, and as such, they have become quite appealing to the ADHD population. To date, no studies have explored changes in brain activity that may occur due to fidgeting. Our aim was to use functional Near-Infrared Spectroscopy (fNIRS) to examine the prefrontal cortex (PFC) during performance of a standardized fine motor skills test after participants used a fidget spinner. **Method:** 8 right-handed adults with ADHD and 8 age and gender matched TD adults (4F/4M, 4 control/4 fidget) performed the Purdue Pegboard Test (PPT) while their PFC oxygenation was monitored using fNIRS. The first 4 subtasks (right unilateral, left unilateral, bimanual, and rest, 30 sec each) were pseudorandomized for each participant with an additional assembly subtask always last(1 min). **Result:** There were significant differences between the Relative Neural Efficiency (RNE) of ADHD-Control(RNE=- 0.80) and those of the ADHD-Fidget (RNE=0.18; pp=0.02), Typical-Control (RNE=0.28; pp=0.01), and Typical-Fidget (RNE=0.34; pp=0.01) during the simpler, non-assembly tasks but not the more cognitively demanding assembly task. In terms of Neural Involvement (NI), there was a significant difference between ADHD-Control(NI=-0.47) and ADHD-Fidget(NI=0.39) in the non-assembly tasks (pp=0.05). In the assembly task, a significant interaction was found ($F(1, 15)=7.41$, $p<0.02$). There were no significant differences within the ADHD group while Typical-Fidget(NI=-1.12) was significantly different from Typical-Control(NI=0.68; pp= 0.05). **Implication:** During simpler, non-assembly motor tasks it appears the fidget spinner may help to improve RNE of those with ADHD while not affecting TD participants. Fidget spinners appear to improve NI (a measure of task motivation) for those with ADHD. In contrast, it appears the fidget spinner may distract those without ADHD, leading to lower neural involvement. Further research is needed to evaluate the extent to which these results may benefit those with ADHD.