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Investigating the relationship between mild traumatic brain injury and memory performance in a multilingual paediatric cohort

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Abstract

The long-term sequalae of paediatric mild traumatic brain injuries (mTBI) is abound with controversy and deficient research. A history of outdated frameworks, arbitrary definitions, and varying methodologies have largely resulted in depicting mTBI in children as benign and inconsequential, culminating in negligible treatments or follow-up visits. However, recent strives in research have demonstrated a small but substantial percentage of children adversely affected by mTBI, particularly as it applies to typical cognitive development. That being said, investigations on these findings are still scarce and widely dispersed, especially within the diverse South African context. The present study aimed to examine cognitive impairments – memory and learning specifically – within a multilingual mTBI-cohort. Archival data on a battery of neuropsychological tests (i.e. NEPSY-II and WISC-IV) administered to a sample of 50 children (ages 6-12) were used to compare neurotypical- and mTBI-groups. Children's overall performance on various memory (verbal, visual, and associative) and auditory-attention (maintenance, shifting, inhibitory) tests were compared to establish whether any statistically significant group differences were present. Inferential statistics found an overall statistical nonsignificance between the two groups, despite a clear advantage in the neurotypical group on tests with a timed-component, in contrast to a numerically better performance by the mTBI group on untimed-tests. These findings suggest an underlying mechanism related to working memory (i.e. speed of processing) may be adversely affected in the clinical group, but not the neurotypical group. Further, multiple regression analyses of the clinical group found sex-differences, mainly negative associations between test performance and number of languages/ age at assessment, as well as a hypothesised negative association between test performance and time elapsed since injury. However, multiple inconsistencies, as well as design and sample limitations warrant further investigation into this matter.

Keywords: mild traumatic brain injury, paediatric, multilingual, memory performance, assessment, South Africa,