

neurocognitive/psychological risk for survivors. The identification of these specific and potentially modifiable risk factors is crucial to inform individual-level problem-prevention following oncological treatment, as well as community-level policy and advocacy efforts.

Categories: Cancer

Keyword 1: brain tumor

Keyword 2: pediatric neuropsychology

Keyword 3: neuro-oncology

Correspondence: Johanna Nielsen, Children's National, jnielsen@childrensnational.org

12 Differential Processing Efficiency Skills in Survivors of Pediatric Primary CNS Cancer and Cancers of non-CNS Origin

Julie A Trapani, Victoria C Seghatol-Eslami, Tiffany D Tucker, Amanda M Cook, Sarah-Ann McGilvray, Shreya Grandhi, Donna L Murdaugh
University of Alabama at Birmingham, Birmingham, AL, USA

Objective: Pediatric cancer and cancer-related treatments may disrupt brain development and place survivors at risk for long term problems with cognitive functions. Processing efficiency has been operationalized as a nuanced cognitive skill that reflects both processing speed (PS) and working memory (WM) abilities and is sensitive to neurobiological disruption. Pediatric cancer survivors are at risk for processing efficiency deficits; however, a thorough characterization of processing efficiency skills across pediatric primary central nervous system (CNS) tumor and non-CNS cancer survivors has not yet been reported.

Participants and Methods: Participants were selected from a mixed retrospective clinical database of pediatric cancer survivors (Total $n=160$; primary CNS tumor $n=33$; Non-CNS $n=127$). Univariate analyses were conducted to examine differences in processing efficiency mean scores (t-tests) and percent impairment (scores >1 SD below mean; chi-squared tests) between the total sample and normative sample, and across groups (CNS vs. Non-CNS). Multiple linear regressions were utilized to evaluate the relationships between additional risk factors, including biological sex, age at diagnosis, time

since treatment, and socioeconomic status, and processing efficiency outcomes.

Results: The total sample obtained lower scores on WM ($M=90.83$, $SD=13.35$) and PS ($M=88.86$, $SD=14.38$) measures than normative samples ($M=100$, $SD=15$), $p < 0.001$. Greater percentage of pediatric cancer survivors demonstrated impairment across all processing efficiency measures (24.8-38.1%) than normative samples (15.9%), $p < 0.001$. Regarding group differences, the CNS group obtained lower mean WM ($M=84.85$, $SD=11.77$) and PS ($M=80$, $SD=14.18$) scores than the Non-CNS group (WM $M=92.39$, $SD=13.32$; PS $M=91.16$, $SD=13.56$), $p < 0.001$. Rates of impairment between groups only differed for PS scores, with 63.6% of the CNS group and 31.5% of the non-CNS group demonstrating impairment, $p < 0.001$. Primary CNS tumor cancer type and male biological sex emerged as the only significant risk factors that predicted processing efficiency skills, with male sex predicting lower scores on PS ($B=8.91$, $p<.001$) and semantic fluency ($B=7.59$, $p=.007$).

Conclusions: These findings indicate that both pediatric primary CNS tumor and non-CNS cancer survivors exhibit substantial weaknesses in processing efficiency skills after treatment. While both groups demonstrated deficits compared to normative samples, the CNS group was more susceptible to PS impairments than non-CNS group. A basic initial study of the relationships between risk factors and processing efficiency skills revealed that primary CNS cancer was a predictor of lower performance on working memory and processing speed measures, while male biological sex was a significant risk factor for worse performance on processing speed and semantic fluency measures. Continued focus on the construct of processing efficiency in pediatric cancer survivors is warranted. Applying a standardized approach to assessing and communicating this nuanced cognitive skill could contribute to advancing both clinical practice and outcomes research of pediatric cancer survivors.

Categories: Cancer

Keyword 1: cancer

Keyword 2: pediatric neuropsychology

Keyword 3: executive functions

Correspondence: Julie A. Trapani, University of Alabama at Birmingham, jtrapani@uab.edu