


# Chapter 15

## Neuropsychological Functioning of Childhood Cancer: The Interplay Between Executive Functions and Emotionality

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### **ABSTRACT**

*The study examines the neuropsychology of childhood cancer, with neuropsychological development and executive functions being the main areas of interest. It first analyses the effects of cancer and treatments on memory, attention and self-regulation. Treatment methods are based mainly on chemotherapy and radiotherapy. In addition, the developmental effects at different stages of childhood are analysed to correlate with the prevention of deficits and to develop individualised treatment strategies. Psychosocial effects, occur in children who have had childhood cancer. These emotional difficulties contribute to social isolation, reduced self-esteem and deterioration in quality of life. Certain psychosocial interventions are necessary for the enhancement of psychological resilience and well-being. In this chapter, emphasis is placed on the importance of designing individualised teaching plans, so that they can be tailored and respond precisely to the needs of the individual child.*

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## INTRODUCTION

The neuropsychology of cancer in children is a complex field of research, related to theories in neuroscience, oncology, and psychology, as it focuses on how cancer and treatments affect the psychological development and brain function of the child. Childhood cancer is undoubtedly a burning issue that tends to concern more and more infants and children (American Cancer Society, 2024). The type of cancer, the stage of detection, and the selected forms of treatment followed on a case-by-case basis contribute to the developmental and neurocognitive course of children (Marusak et al., 2017). Also, it is necessary to highlight the association and the impact of childhood cancer on the neuropsychological development of the child by also accounting for the relevance of late effects.

Cancer found in children, primarily results from DNA alterations and modifications and is associated with either hereditary or genetic causes (Trask & Peterson, 2016). The most common form of childhood cancer detected is leukemia, accounting for almost 1 out of 3 cancers (American Cancer Society, 2024). Brain and spinal cord tumors are the second most common cancers in children and they account for about 1 out of 4 childhood cancers (American Cancer Society, 2024). Following neuroblastoma, Wilms Tumor and lymphomas. The international literature reports approximately 400,000 new diagnoses worldwide in children, making it a burning issue for its effects on a variety of areas of daily life (Brinkman et al., 2018; Thompson et al., 2015). Childhood cancer is a rare phenomenon, however, along with its occurrence comes a variety of effects on the psychology, social interaction and overall development of a child (Dijkstra-de Neijs et al., 2020). In this respect, there is a significant literature gap, which is sought to be covered in this chapter. Also, seeks to emphasize the neuropsychological implications of childhood cancer, focusing on cognitive development and the role of executive functions.

The purpose of this chapter is to highlight the impact of childhood cancer and treatments on neurocognitive development, particularly on children's executive functions (Siegel & Gust, 2024). In addition, the effect of cancer on children's emotional state can be seen as an impact of treatments (Mulhern & Butler, 2004). In particular, the work presented seeks to analyze the neurocognitive deficits, developmental challenges and psychological difficulties that arise as a consequence of childhood cancer treatments. Since childhood is the most important part of a person's development, it is extremely important that great emphasis is placed on the therapeutic approach so that the consequences can be tackled.

More specifically, it is important to shed light on the effect of childhood cancer on executive functions such as memory, effort, problem-solving ability and other cognitive aspects. Furthermore, it is indispensable to present and analyze intervention strategies to enhance executive functions in children who have survived cancer. Finally, the work will summarize evidence on the contribution of the enhancement of survivor's emotional resilience through respective individualized intervention programs on any post-traumatic disturbance they experience afterwards of the treatment process.

Overall, this chapter could be a cornerstone for future research on the neurocognitive investigation of childhood cancer, in conjunction with the investigation of the emotional resilience of survivors. It is important to note that there is a significant gap in the literature regarding the investigation of neurocognitive exploration and emotional development in childhood cancer survivors. Therefore, this chapter seeks to cover and bring to light the aspects covering the highly important topic of childhood cancer from the perspective of neuropsychology and emotional development.

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