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ORIGINAL ARTICLE

Cognitive profiles of Post-traumatic Stress Disorder and depression in children and adolescents

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KEYWORDS

PTSD;
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Descriptive study.

Abstract *Background/Objective:* Several diagnostic criteria of Post-traumatic Stress Disorder (PTSD) are remarkably similar to symptoms reported by individuals with depression, particularly as they manifest as cognitive processing deficits in children. Because of this overlap in profile and the high rate of comorbidity of PTSD and depression (48% to 69%), pinpointing similarities/differences in cognitive processes related to each of these disorders is essential to accurate diagnosis. This study aims to examine cognitive performance profiles of 23 children who have been victims of PTSD and to compare their results with 23 children with depression and 24 controls. *Method:* Empirical study, observational and descriptive methodologies were performed using several neuropsychological tests to assess IQ, attention, memory and executive function. Statistical comparisons between groups were made using the non-parametric Kruskal-Wallis test and post-hoc analyses were conducted using a Mann Whitney *U* test, as well as Quade's co-variance analysis. *Results:* Data show different profiles of cognitive performance in those with PTSD compared to those with depression and controls. *Conclusions:* The findings suggests that PTSD and depressed children differ somewhat in their cognitive profiles, and the differences in IQ found between those with PTSD and those without are not necessarily a confounding variable, but may rather be a consequence of their traumatic experience. © 2017 Asociación Española de Psicología Conductual. Published by Elsevier España, S.L.U. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

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PALABRAS CLAVE

Trastorno de estrés
postraumático;
depresión;
neuropsicología;
estudio descriptivo
observacional

Perfiles cognitivos en el trastorno del trastorno de estrés postraumático y la depresión en niños y adolescentes

Resumen *Antecedentes/Objetivo:* Varios criterios diagnósticos del trastorno de estrés post-traumático (PTSD, por sus siglas en inglés) son similares a los síntomas de la depresión, particularmente relacionados con aspectos cognitivos de niños afectados por estas condiciones. Debido a esta superposición del perfil cognitivo y dada la alta comorbilidad entre PTSD y depresión (48% y 69%), identificar las características en los perfiles cognitivos de cada trastorno pudiera ser útil para hacer diagnósticos más precisos. El objetivo fue examinar el rendimiento cognitivo en 23 niños con PTSD y comparar sus resultados con 23 niños con depresión y 24 controles. *Método:* Estudio empírico, observacional y descriptivo mediante aplicación de una batería neuropsicológica que evaluó inteligencia, atención, memoria y función ejecutiva. Las comparaciones estadísticas se realizaron mediante la prueba no paramétrica Kruskal-Wallis. Los análisis post-hoc se realizaron utilizando *U* de Mann Whitney y el análisis de covarianza de Quade. *Resultados:* Los datos muestran diferentes perfiles cognitivos del grupo con PTSD en comparación con los grupos de depresión y controles. *Conclusiones:* Los hallazgos sugieren que el grupo de PTSD y el grupo de depresión difieren en sus perfiles cognitivos y que las diferencias en el nivel intelectual encontradas en los niños con PTSD pudieran no ser una variable de confusión sino una consecuencia de la experiencia traumática.

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The latest version of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013) includes a new type of trauma and stress related disorder, namely Post Traumatic Stress Disorder (PTSD). The latter is a specific classification derived from traumatic experiences in which four distinct factors converge: 1) re-experiencing of the trauma, 2) effortful avoidance of trauma reminders, 3) negative alteration in mood and cognition and 4) alterations in arousal and reactivity (Danzi & La-Greca, 2016; Van Dusen, Tiamiyu, Kashdan, & Elhai, 2015). While PTSD is a common diagnosis associated with trauma, in the clinical context, some similar symptoms typically associated with depression are increasingly being reported following traumatic experiences, particularly in children and adolescents (Calderón-Delgado & Barrera-Valencia, 2013; Itzhaky, Levin, Fingerhut, & Solomon, 2014; Thabet, Thabet, & Vostanis, 2016). In fact, PTSD and depression are frequently comorbid with 48%-69% of individuals diagnosed with PTSD also showing clinical evidence of depression (Elhai, Grubaugh, Kashdan, & Frueh, 2008).

The rates of early traumatic experiences related to maltreatment, abuse and neglect against children and adolescents are increasing worldwide. For example, in the United States during 2014 about 6.6 million children were reported to have experienced some form of maltreatment with 1,580 of them dying from abuse and neglect (U.S. Department of Health & Human Services, Administration for Children and Families, Administration on Children, Youth and Families, & Children's Bureau, 2016). In Colombia, during the same year 10,402 children and adolescents were victims of intra-familial violence along with 15,807 reported cases of rape and sexual abuse. Tragically 1,064 individuals died from these situations of violence and abuse. Perhaps more alarmingly 2,931 children and adolescents have

simply disappeared as a result of armed conflicts in Colombia (Instituto Nacional de Medicina Legal y Ciencias Forenses, 2015). These large numbers highlight the importance of gaining a deeper understanding of the consequences of early traumatic experiences on several aspects of brain development and potential changes in cognitive functioning.

Child maltreatment is known to have a significant negative impact on the developing nervous system, which in turn interferes with the achievement of numerous developmental/cognitive milestones (Davis, Moss, & Nogin, 2015) as well as increasing the incidence of some somatic diseases related to PTSD (Britvić et al., 2015). Some of the cognitive deficits are related to under-development of the prefrontal cortex (and thus executive functions) which does not fully reach maturity until early adulthood, and is particularly sensitive to maltreatment and abuse during the early years (Holmes, Kim-Spoon, & Deater-Deckard, 2016). In light of this fact, a better understanding of the association between early traumatic experiences and cognition would contribute greatly to the accurate diagnosis of PTSD and depression.

One major complication to the process of diagnosing these conditions is the fact that children with depression often exhibit a similar alteration of their cognitive performance profiles as those with PTSD. For example, previous studies have suggested that children with PTSD have lower intelligence quotient (IQ) scores, deficits in verbal memory, attention, and learning, as well as impairments in a variety of higher-order executive functions, for example difficulties in pre-planning purposeful action and lower inhibitory control (De Bellis, Hooper, & Spratt, 2009; Fry, Langley, & Shelton, 2016). Similarly, children diagnosed with major depression also show alterations/deficits

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