Resilience affects whether childhood trauma results in harmful gene response

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A small child in Mumbai, with a shaved head, eating bread with her hand. Credit: Wen-Yan King/Wikipedia

In a first-ever study to identify how trauma affects gene expression among child soldiers, a Duke researcher and colleagues found resilience to be a key factor in determining individual response at the molecular level.

Previous research has shown that chronic exposure to trauma is associated with an increase in pro-inflammatory gene expression and a decrease in antibodies and antiviral responses in immune cells. Those molecular responses have been linked to cardiovascular and neurodegenerative diseases, cancer, infections and mental illnesses such as anxiety and depression.

Brandon Kohrt, M.D., Ph.D., professor of psychiatry and global health at Duke, and colleagues conducted a five-year longitudinal study of former child soldiers exposed to the trauma of a decade-long civil war in Nepal. The findings were published during the week of July 11 in the *Proceedings of the National Academy of Sciences*.

"This study has important implications for responding to young people exposed to war, terrorism and natural disasters," Kohrt said.

The researchers focused on 154 former child soldiers and 136 youths who experienced the war as civilians. They were evaluated using the Child PTSD (post-traumatic stress disorder) Symptom Scale and a Resilience Scale, both of which were adapted for use in Nepal. Blood samples were also taken to examine a molecular defense program called the corresponding transcriptional response to adversity (CTRA), which is activated by the body's fight-or-flight stress system.

Researchers found that child soldiers with PTSD who demonstrated high resilience scores appeared to be protected from the elevated CTRA gene expression compared to those with average or low resilience. In fact, PTSD-affected child soldiers with high levels of resilience had comparable gene expression to the civilian youth who had no signs of PTSD. The finding suggests that PTSD did not impact CTRA gene expression among highly resilient children.

"We now have clues to how the body and mind can be protected against the effects of PTSD," said Kohrt. "Interventions to promote resilience can be delivered more easily than specialized PTSD treatments in post-conflict and post-disaster

settings, and our study raises the hope that resilience-focused interventions could change the genetic response to childhood trauma."

Kohrt and colleagues are currently applying these new insights in their interventions for young people affected by last year's earthquake in Nepal.

More information: Psychological resilience and the gene regulatory impact of posttraumatic stress in Nepali child soldiers, *Proceedings of the National Academy of Sciences*, www.pnas.org/cgi/doi/10.1073/pnas.1601301113

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