

Study finds childhood trauma and genetics linked to increased obesity risk

March 9 2022



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New research from the Healthy Nevada Project has found associations between genetics, obesity, and childhood trauma, linking social health determinants, genetics, and disease. The study, which was published this

week in *Frontiers in Genetics*, found that participants with specific genetic traits and who experience childhood traumas are more likely to suffer from adult obesity.

In 2016, Desert Research Institute (DRI) and Renown Health launched the Healthy Nevada Project, the nation's first community-based, population health study, which now has more than 60,000 participants. The project is a collaboration with personal genomics company, Helix, and combines genetic, environmental, social, and clinical data to address individual and community health needs with the goal of improving health across the state and the nation.

The new study focuses on Adverse Childhood Experiences (ACEs), which are traumatic and unsafe events that children endure by the age of 18. Over 16,000 participants in the Healthy Nevada Project answered a mental health survey, and more than 65 percent of these individuals self-reported at least one ACE occurrence. These 16,000 participants were cross-referenced with their genetic makeup, and clinical Body Mass Index (BMI) measures.

According to the research team's findings, study participants who had experienced one or more types of ACE were 1.5 times more likely to become obese adults. Participants who experienced four or more ACEs were more than twice as likely to become severely obese.

"Understanding that Adverse Childhood Experiences, like abuse, poverty, food insecurity, and poor relationships with primary caregivers increase a person's risk for obesity but also interact with your genetics are key to understanding how we might provide earlier interventions, help reduce health disparities, and create a Healthier Nevada for all," said Tony Slonim, MD, DrPH, President & CEO of Renown Health. Slonim, CEO of Reno, NV-based Renown Health, is the first quadruple-board-certified doctor in the United States with certifications in adult

critical care, internal medicine, pediatric critical care, and pediatrics and holds a Doctorate in Public Health.

"Our analysis showed a steady increase in BMI for each ACE a person experienced, which indicates a very strong and significant association between the number of [adverse childhood experiences](#) and adult [obesity](#)," said lead author Karen Schlauch, Ph.D., of DRI. "More importantly, participants' BMI reacted even more strongly to the occurrence of ACEs when paired with certain mutations in several genes, one of which is strongly associated with schizophrenia."

"We know that genetics affect disease in [the Healthy Nevada Project](#), and now we are recognizing that ACEs also affect disease," said principal investigator Joseph Grzymiski, Ph.D., of DRI and Renown Health. "Our new study shows that the combination of genes and environmental factors like ACEs, as well as many social determinants of health, can lead to more serious health outcomes than either variable alone. More broadly, this new work emphasizes how important it is for population [genetic](#) studies to consider the impact of social determinants on health outcomes."

The study team believes that it is important for clinical caregivers to understand the strong impact that negative childhood experiences such as ACEs can have on both child and adult health. The researchers hope the information from this study will encourage doctors and nurses to conduct simple screenings for ACEs and consider a patient's social environment and history in combination with genetics when developing treatment plans for better patient health.

According to the 2019 Youth Behavior Risk Survey (YRBS), 25.6 percent of Washoe County teenagers are overweight or obese. Obesity is a serious health concern for children and adolescents. According to the Centers for Disease Control and Prevention, obese children and

adolescents are more likely to become obese as adults.

"Obese and overweight children and adolescents are at risk for multiple health problems during their youth, which are likely to be more severe as adults," said Max J. Coppes, MD, Ph.D., MBA, FAAP, Nell J Redfield Chair of Pediatrics at the University of Nevada Reno School of Medicine, Physician in Chief of Renown Children's Hospital. "Obese and overweight youth are more likely to have risk factors associated with cardiovascular diseases, such as high blood pressure, high cholesterol, and type 2 diabetes. Losing weight, in addition to a healthy diet, helps to prevent and control multiple chronic diseases and improves quality of life for a lifetime."

"We'd like to thank all of the Healthy Nevada Project participants who provided information to make our work possible," said Robert Read, M.S., of DRI. "Our research illustrates that it's not just genetics that cause disease, but that our environment and life experiences interact with our genes to impact our health in ways that we are only beginning to understand."

More information: Karen A. Schlauch et al, The Impact of ACEs on BMI: An Investigation of the Genotype-Environment Effects of BMI, *Frontiers in Genetics* (2022). [DOI: 10.3389/fgene.2022.816660](https://doi.org/10.3389/fgene.2022.816660)

Provided by Desert Research Institute

Citation: Study finds childhood trauma and genetics linked to increased obesity risk (2022, March 9) retrieved 2 April 2023 from <https://medicalxpress.com/news/2022-03-childhood-trauma-genetics-linked-obesity.html>

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