

Kids with high body mass index are at greater risk of pedestrian injury

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Child development experts already know obese children are at greater risk than their peers for developing high blood pressure, high cholesterol levels, diabetes, and joint problems.

Now, researchers at the University of Iowa have added another concern to the list: pedestrian injury.

It's not because overweight and obese kids can't cross the street fast enough. Rather, in a study involving traffic simulations, researchers found that [children](#) with higher body mass indices were more impatient and impulsive than their peers; they waited less before crossing, allowed for a smaller buffer of time and distance between themselves and oncoming traffic, and were involved more collisions in the experimental settings.

Elizabeth O'Neal, lead author of the study and a graduate student in the Department of Psychological and Brain Sciences at the UI, says that extra weight influences how obese children choose to cross the street. "Being overweight is putting increased stress on their joints, which is a little uncomfortable," she says. "So, they are compromising their safety in order to expedite the crossing."

In addition, obesity in children is associated with deficits in executive functioning, which involves any task that requires planning, organization, memory, time management, or flexible thinking. Researchers say this deficit could explain why participants with higher BMIs were more

impulsive and uninhibited during the road crossings.

O'Neal says examining the risk of pedestrian injury represents a new avenue in childhood obesity research.

"As an area of study, it is not very well developed," she says. "This is sort of the beginning. We think there is a lot to be done both epidemiologically and behaviorally to see what is going on."

The study, "The Role of Body Mass Index in Child Pedestrian Injury Risk," was published online in February in the journal *Accident Analysis & Prevention*.

According to the National Center for Injury Prevention and Control (NCIPC), in 2013, pedestrian injury was the ninth-leading cause of death and the 14th-leading cause of disability among children ages 6 to 11.

Previous work by the NCIPC shows a number of factors that increase the risk of childhood pedestrian injuries. One risk is age, with kids between 6 and 8 experiencing 1.5 times more motor vehicle crash-related deaths than those ages 9 to 11.

Gender is also a factor: Boys experience almost twice as many pedestrian injuries as girls. Location is also important: Mid-block crossings have the highest incidence of pedestrian injury in children ages 5 to 9.

UI researchers think obesity could be another potential risk for child pedestrian injuries. Rates of childhood obesity have doubled over the past 30 years.

The study involved 206 children between the ages of 7 and 8 from Birmingham, Ala. The children crossed a road in a virtual environment

that simulated a crosswalk near a school in the local area. Outfitted with head-tracking gear, participants stood on a wooden curb and watched traffic displayed on three side-by-side 24-inch monitors.

When they felt it was safe to cross, the children stepped down onto a trigger plate that launched an avatar that crossed the simulated roadway. The avatar was programmed to move at each child's typical walking speed, based on multiple trials taken before the experiment.

The children completed 30 road crossings that were randomly presented at three levels of difficulty: 25 mph and light volume, 30 mph and medium volume, and 35 mph and high volume.

Next, the children were assessed on their ability to select the safest pedestrian route. Four written prompts asked the children to make road-crossing choices based on a goal, such as catching a dog that escaped the house or making it home for dinner on time. They also used a tabletop model that represented two road scenarios: the intersection of a four-lane road and two-way road in an urban setting and a T-shaped intersection between a major and minor street in a residential setting.

In addition to their findings about overweight and [obese children](#), the researchers found that girls were more cautious than boys when crossing the virtual roadway. And when it came to determining what type of route the children would select when crossing a roadway, race emerged as the strongest predictor, with African American children selecting riskier routes for crossing.

Researchers speculated that because most of the African American children in the study lived in urban neighborhoods where they generally had more exposure to traffic, they may have had more experience crossing streets.

O'Neal said more research is needed on obesity as a risk factor for childhood [pedestrian injury](#).

"We tend to think of obesity as being detrimental to health, but we don't necessarily think of it affecting our health in the way we behave," she says.

More information: Elizabeth E. O'Neal et al, The role of Body Mass Index in child pedestrian injury risk, *Accident Analysis & Prevention* (2016). [DOI: 10.1016/j.aap.2016.02.001](https://doi.org/10.1016/j.aap.2016.02.001)

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