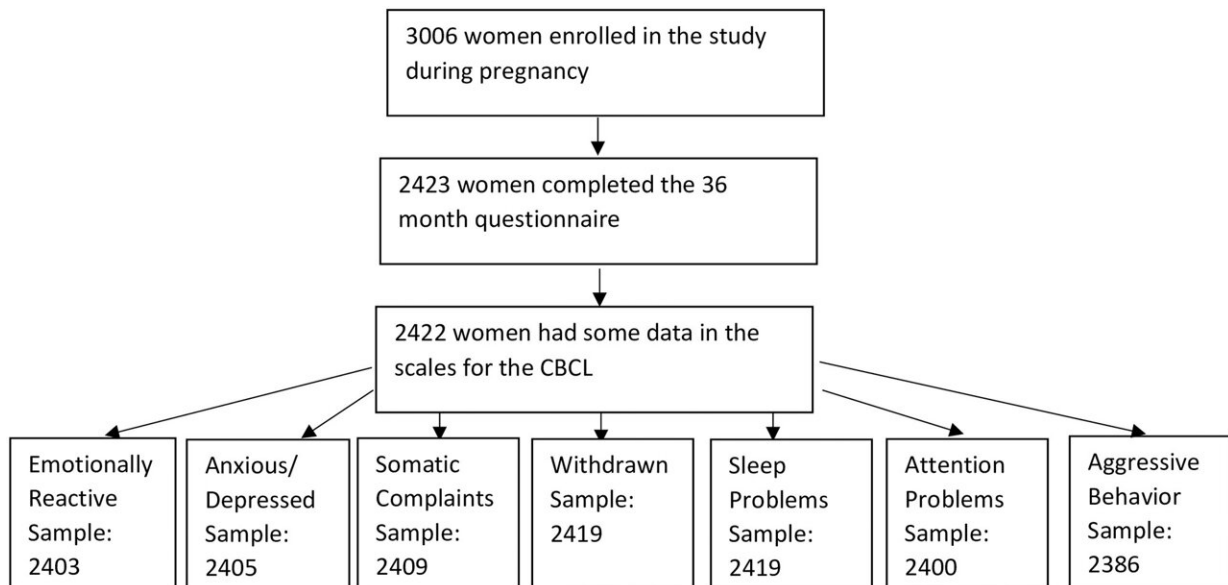


Prenatal acetaminophen use linked to sleep, attention problems in preschoolers

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Study population. Credit: *PLOS ONE* (2022). DOI: [10.1371/journal.pone.0272593](https://doi.org/10.1371/journal.pone.0272593)

Acetaminophen use during pregnancy is associated with sleep and behavior problems consistent with attention deficit hyperactivity disorder (ADHD), according to a study by Penn State College of Medicine researchers.

Acetaminophen is a common drug used to treat a variety of issues, including fever, infection, muscle pain, headache, migraine, colds and

allergies. Traditionally, the medication has been considered by medical professionals to be safe for use during [pregnancy](#). However, according to Kristin Sznajder, assistant professor of public health sciences and lead author, emerging studies support the idea that this drug may affect [child development](#) and may be associated with [attention problems](#).

Sznajder said their new study confirms these trends and was also the first to observe an association between [acetaminophen](#) use during pregnancy and child sleep challenges.

"Pregnant people experience pain, fever and other ailments that could be alleviated through the use of acetaminophen," said Sznajder, a Huck Institutes of the Life Sciences researcher. "While the medication may provide relief in the moment, research increasingly indicates there may be downstream effects that could be detrimental to child development. More research is needed so appropriate recommendations can be made to pregnant people."

The researchers used data from a study of more than 2,400 women who had never given birth before and followed them and their children from the third trimester of pregnancy to 3 years postpartum. Women were surveyed once during their pregnancies about their medication use and frequency and stress levels. Of these, 41.7% of women reported using acetaminophen during pregnancy.

The participants were then interviewed at 1, 6, 12, 18, 24, 30 and 36 months after their child was born. At the 36-month interview, participants were asked to rate their child using a three-point scale to describe how often they exhibit a wide variety of neurodevelopmental and behavioral outcomes (very often true, somewhat or sometimes true, and not true) like "can't sit still or restless," "avoids looking others in the eyes" and "doesn't want to sleep alone." Scores for each behavior were then compiled to determine whether children scored highly in the

domains of emotionally reactive, anxious or depressed, withdrawn, sleep problems and [aggressive behavior](#).

Using responses from the 99-item Child Behavior Checklist, the researchers then evaluated whether children of mothers who used acetaminophen during pregnancy were more likely to have attention, sleep or other neurobehavioral issues. Because women who used acetaminophen during pregnancy were more likely to have been diagnosed with anxiety or depression before becoming pregnant and to report high levels of stress during pregnancy, the research team controlled for stress, depression during pregnancy, and previous diagnoses of depression or anxiety in their statistical analyses.

After adjusting for confounding variables, children of women who used acetaminophen were significantly more likely to have sleep problems and attention problems compared with children of those who did not use acetaminophen during pregnancy.

The results confirm the findings of previous studies that suggest that prenatal acetaminophen use could lead to attention issues, while also showing that sleep may also be affected. Among women who used acetaminophen during pregnancy, 22.7% described their child as having sleep problems and 32.9% described their children as having attention problems. Of the participants who did not report using acetaminophen while pregnant, 18.9% reported their child had sleep problems while 28.0% reported their child had attention problems. The results were published in *PLOS One* on Sept. 28.

According to the study team, more research is needed to understand these relationships. Survey responses lacked data on the trimester of use, frequency of use and dosage amount. According to Sznajder, these are factors that could have an impact on the outcome. She noted a study is underway that will attempt to dive deeper into the trimester, frequency

and dosage and how that affects outcomes. She also said using a child development expert to assess children's behaviors might help ensure more accurate results.

According to the researchers, it is not clear what processes in prenatal development may be disrupted by prenatal acetaminophen use. But they said some possibilities include acetaminophen damaging the placenta and thereby disrupting fetal development, or acetaminophen damaging liver cells in the fetus, in turn disrupting gut health and impacting neurodevelopment.

"We should interpret these results with some degree of caution," Sznajder said. "Although acetaminophen is generally considered safe for use during pregnancy, data from multiple studies suggest that there could be effects on childhood development by its use. It's important we learn as much as we can about this subject so we can give expecting mothers data-driven recommendations to care for their children and themselves."

More information: Kristin K. Sznajder et al, Maternal use of acetaminophen during pregnancy and neurobehavioral problems in offspring at 3 years: A prospective cohort study, *PLOS ONE* (2022). [DOI: 10.1371/journal.pone.0272593](https://doi.org/10.1371/journal.pone.0272593)

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