

# Maternal Smoking and Attention-Deficit/Hyperactivity Disorder in Offspring: A Meta-analysis

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Pediatrics. January 2018, VOLUME 141 / ISSUE 1

## Abstract

### CONTEXT:

Attention-deficit/hyperactivity disorder (ADHD) is a common neurodevelopmental disorder in childhood. Exploring the risk factors for ADHD is helpful in preventing ADHD.

### OBJECTIVE:

To explore the association between maternal smoking during pregnancy and the occurrence of ADHD in offspring.

### DATA SOURCES:

PubMed, Embase, and Cochrane Library were searched from inception to May 2017 for studies.

### STUDY SELECTION:

Cohort or case-control studies in which the association between maternal smoking and ADHD in offspring were investigated were eligible if they included odds ratios (ORs), hazard ratios, or risk ratios and 95% confidence intervals (CIs).

### DATA EXTRACTION:

Two investigators independently extracted data on definition of exposure and outcome, number of cases and total sample population, and potential confounders adjusted. Any dose-relationship data for smoking and ADHD risk were also extracted.

### RESULTS:

Fifteen cohort studies and 5 case-control studies with 50 044 cases and 2 998 059 participants were included. Smoking during pregnancy increased the risk of offspring ADHD (OR: 1.60; 95% CI: 1.45–1.76). The risk of ADHD was greater for children whose mothers were heavy smokers (OR: 1.75; 95% CI: 1.51–2.02) than for those mothers were light smokers (OR: 1.54; 95% CI: 1.40–1.70).

### LIMITATIONS:

The limitations of our study included different assessment tools of ADHD and a lack of objective biological measures for maternal smoking.

### CONCLUSIONS:

With our meta-analysis, we provide evidence for an association between maternal smoking and offspring ADHD but do not solve the causality issues concerning potential confounding by other risk factors. More high-quality studies are needed to establish whether the association with smoking is causal.