

# Impact of maternal obesity on the cognitive function and mental health of the offspring: a systematic review

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Globally, more than 20% of women of reproductive age are currently estimated to be obese<sup>(1)</sup>. Increasing clinical and experimental evidence suggests that maternal obesity also affects the health and function of the offspring brain across the lifespan<sup>(2)</sup>. This a systematic review summarises human studies that explore the impact of maternal obesity on aspects of attention-deficit hyperactivity disorder, autism spectrum disorders, and neurodegeneration in the offspring.

We used the methods recommended by the Centre for Reviews and Dissemination, University of York<sup>(3)</sup> and followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement<sup>(4)</sup>. Several databases were used for searching (PubMed, Science Direct, Web of Science, and Google Scholar). Studies were eligible if they compared the mental health of offspring born to females that were obese before and during pregnancy to offspring born to females that had a normal weight before and during pregnancy. We excluded studies for the following reasons: disease factor such as severe diabetes, lack of a control group with a normal weight, editorials, conference abstracts and interviews. Exposures considered were maternal BMI, height and weight. The outcome was any measure of cognitive function and mental health of the offspring. Quality assessment and risk of bias was assessed using a standardized form consisting of 22 criteria, including information about study setting, population and design, sample selection, baseline characteristics, reliability of exposure and outcome measurements, the appropriateness of data analyses, confounding factors adjusted for and the study results. We included observational and longitudinal studies which conducted between January 2010 and January 2021. The initial search yielded 250 articles and only 19 articles met the criteria to be included in this review.

Results showed that 4 studies largely support a negative correlation between pre-pregnancy maternal obesity and child Cognitive Function and Intelligence Quotient. Five studies revealed that elevated maternal BMI has also been positively associated with difficulties with emotional regulation and high inattention scores while 3 studies showed no association between maternal BMI and the risk

Attention-Deficit Hyperactivity Disorder in the offspring. Mixed findings have also been reported for the association between maternal weight and risk of autism spectrum disorders. Two studies have found that children born to obese mothers were more likely to be diagnosed with autism. Other two studies showed that this risk is further exacerbated in offspring of obese women who gain excess weight during pregnancy. However, 3 studies did not report a significant association between maternal obesity and offspring risk of autism.

In conclusion, analyses of longitudinal and observational studies support an association between maternal BMI and poorer cognitive performance. The relationship between maternal obesity and offspring risk of developing attention-deficit hyperactivity disorder and autism spectrum disorder is currently less clear.

## References

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