

Infant sleep duration associated with mother's level of education, prenatal depression and method of delivery

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Analyzing data from Canadian parents, a new study has found that babies sleep less at three months of age if their mothers do not have a university degree, experienced depression during pregnancy or had an emergency cesarean-section delivery.

The study, which examined associations between a mother's level of education, prenatal depression, method of delivery and her infant's sleep duration, was published this month in [Sleep Medicine](#). It found that infants born to mothers without a university degree slept an average of 13.94 hours per day—23 minutes less than infants born to mothers with a university degree, and just short of the National Sleep Foundation guidelines of an average of 14-17 hours of sleep per day at three months of age.

The researchers analyzed data from 619 infants and their mothers participating in AllerGen's CHILD Cohort Study—a national birth cohort study collecting a wide range of health, lifestyle, genetic and environmental exposure information from nearly 3,500 children and their families from pregnancy to adolescence.

"Sleep affects a baby's growth, learning and emotional development, and is one of the most common concerns of new parents," said Dr. Piush Mandhane, associate professor of pediatrics in the University of Alberta's Faculty of Medicine & Dentistry, and one of the study's lead authors.

"While earlier research has linked a mother's socioeconomic status, including level of education, to shorter infant sleep duration, we have not really understood the factors at play. Our study revealed that 30% of the effect of maternal education on infant sleep duration is actually mediated by a mother's prenatal depression, as well as the type of delivery."

Specifically, the researchers found mothers without a university degree to be at significantly higher risk of having symptoms of depression during both the prenatal and postnatal periods, or the prenatal period alone, compared to women with a university degree.

There are several possible explanations for the association between maternal depression and infant sleep, according to co-lead author Dr. Anita Kozyrskyj, also a professor of pediatrics at the University of Alberta. "Mothers in distress tend to have sleep problems during pregnancy, which can be 'transmitted' to the fetus *via* the mother's circadian clock and melatonin levels," she said. "Maternal depression and emergency cesarean section also both lead to elevated free cortisol levels, which, in turn, may cause an exaggerated stress response in infants that negatively impacts their sleep."

Further, the researchers found that the method of delivery independently predicted infant sleep duration, with infants delivered by emergency cesarean section sleeping approximately one hour less per day than infants born by vaginal delivery.

“This was an interesting finding, as we did not observe an association between shorter infant sleep and scheduled cesarean sections or vaginal deliveries,” commented first author Brittany Matenchuk, an AllerGen trainee and a Master’s student at the University of Alberta.

“While we are still at an early stage of unravelling the underlying biologic mechanisms, our study suggests that prenatal depression and birth mode are potential targets for healthcare professionals and policy makers to improve infant sleep duration. Mothers who experience prenatal depression or an emergency cesarean delivery may benefit from support so that infant sleep problems do not persist into childhood.”

About the CHILD Cohort Study and AllerGen NCE

Launched in 2008 by CIHR and AllerGen NCE, the [CHILD Cohort Study](#) is tracking nearly 3,500 Canadian infants and their families through adolescence to help determine the root causes of chronic diseases such as asthma, allergies and obesity. The CHILD Cohort Study spans four provinces, involving over 140 multidisciplinary researchers, students and research staff. Watch the CHILD Cohort Study videos.

[AllerGen NCE Inc.](#) is a national research network dedicated to improving the quality of life of people suffering from allergic and related immune diseases. Funded by Innovation, Science and Economic Development Canada through the federal Networks of Centres of Excellence (NCE) Program, the Network is hosted at McMaster University in Hamilton, ON.

About the U of A Faculty of Medicine & Dentistry

The [Faculty of Medicine & Dentistry](#) at the University of Alberta is a leader in educating and training exceptional practitioners and researchers of the highest international standards. The faculty’s mission is to advance health through excellence in teaching, research and patient care. It is home to one of the top 100 ranked medical schools in the world.

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