

## PRESS RELEASE

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### **Feelings Upon Learning of Pregnancy, Child Developmental Delays, and the Role of Social Support**

*Nationwide birth cohort study finds that negative feelings about pregnancy are associated with child developmental delays, while highlighting a potential role of social support*

**In a recent study, researchers from Japan analyzed data from over 73,000 mother–child pairs and found that a mother’s negative or indifferent feelings upon learning they are pregnant were associated with a higher likelihood of developmental delays at age three. The study also revealed social support substantially reduced this risk, highlighting the need for timely interventions.**

Pregnancy is often one of the biggest emotional and physical transitions in a woman’s life. Alongside the well-known physical changes, many women also experience shifts in mood and mental health during pregnancy and after giving birth, with anxiety and depression being quite common. Research over the past few decades has consistently shown that a mother’s emotional well-being does not just affect her own health but may also delay the child’s development. Because of this, healthcare systems are placing greater emphasis on providing timely support to mothers throughout pregnancy and early parenthood.

However, women respond in various ways upon learning that they are pregnant. While some feel immediate joy, others may feel confused, worried, or even emotionally neutral. It has remained unclear whether these early emotional reactions are linked to a higher risk of developmental delays, or whether social support could reduce those risks.

To answer these questions, a research team led by Dr. Mitsue Nagamine, a Collaborative Researcher from the Department of Public Health, Faculty of Medicine, University of Toyama, Japan, and Professor at the Institute for Liberal Arts, Institute of Science Tokyo, Japan, analyzed data from one of Japan’s largest birth cohort studies. The study was co-authored by Professor Kenta Matsumura, Collaborative Researcher, Department of Public Health, Faculty of Medicine, University of Toyama, and Professor at Aomori University of Health and Welfare, Japan; along with Assistant Professor Akiko Tsuchida, Department of Public Health, Faculty of Medicine, University of Toyama; and Professor Emeritus Hidekuni Inadera, Department of Public Health, Faculty of Medicine, University of Toyama. Their paper, published online in the [\*Journal of Health Psychology\*](#) on June 28, 2026, examined how mothers’ feelings upon learning they were pregnant related to their children’s development at age three, and whether social support extended to mothers during the postpartum period could mitigate associated developmental delay risks.

The team analyzed data from 73,518 mother–child pairs enrolled in the Japan Environment and Children's Study, a nationwide birth cohort study following families across Japan. The women completed a questionnaire in their first trimester to report how they felt when they learned of their pregnancy, choosing from options ranging from “very happy” to “unexpected and confused,” “upset,” “no specific feelings,” or “other feelings.” The researchers then examined the children’s development at age three through a developmental screening questionnaire completed by the parents, namely the Ages and Stages Questionnaire, Third Edition. This questionnaire evaluated developmental skills such as communication, motor skills, problem-solving, and social development. They also measured the impact of social support received by the mothers when their children were two and a half years old.

Compared with mothers who reported being “very happy,” every other emotional response was associated with a higher likelihood of developmental delays at 3 years of age. Surprisingly, the strongest association was found among mothers who reported having “no specific feelings” when they learned they were pregnant. Mothers reporting anything other than being very happy also tended to have experienced lower levels of social support. Usually, unintended pregnancies affect a mother’s mental health and behavior, often distancing them from regular prenatal check-ups, thereby not receiving support or help.

Social support itself appeared to make a significant difference, as mothers with stronger support networks were less likely to have children with developmental delays. This protective effect was strongest among mothers who described their reaction at intimation of pregnancy as “other feelings.” *“Our work shows women’s feelings at the time they find out they are pregnant can serve as an early indicator for identifying those who may need support,”* says Prof. Nagamine. *“Building on this, it may be possible to connect them to continuous and multifaceted social support through prenatal check-ups and regular postnatal health examinations.”*

The findings also suggest a simple and low-cost opportunity. Since healthcare providers in Japan already ask women about their feelings when a pregnancy is confirmed, this question may help identify women who could benefit from additional or tailored support well before they face health concerns. The researchers stress that this support should not stop at birth and instead continue through early childhood years.

Overall, the team hopes future research will explore exactly how social support translates into better health outcomes for children. *“Since feelings at the time of pregnancy confirmation are associated with the risk of child developmental delays, encouraging attendance at prenatal check-ups is crucial, and these opportunities should be used to build a system of continuous support that extends throughout the postpartum period and early childhood,”* concludes Prof. Nagamine.

## Reference

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#### About University of Toyama

The University of Toyama located in Toyama Prefecture, Japan is comprised of 3 former national universities; Toyama University (founded in 1949), Toyama Medical and Pharmaceutical University (founded in 1975) and Takaoka National College (founded in 1983), which were integrated in October 2005. This integrated university houses 9 schools, 8 graduate schools, the University Laboratory, Hospital, and Library, among others like the Organization for International Education and Exchange. There are approximately 9,300 students (including 300 international students) studying at the university.

Website: <https://www.u-toyama.ac.jp/en/>

#### About Professor Mitsue Nagamine from University of Toyama

Dr. Mitsue Nagamine serves as a Collaborative Researcher at the Department of Public Health, Faculty of Medicine at University of Toyama, and a Professor at the Institute for Liberal Arts, Institute of Science Tokyo. Her research focuses on experimental psychology and psychoneuroendocrinology. She is also an editorial board member and councilor of The Japanese Association of Stress Science. She has been honored with the Seiichi Tejima Book Awards, Introduction to Stress Psychology, Institute of Science Tokyo, in March 2025.

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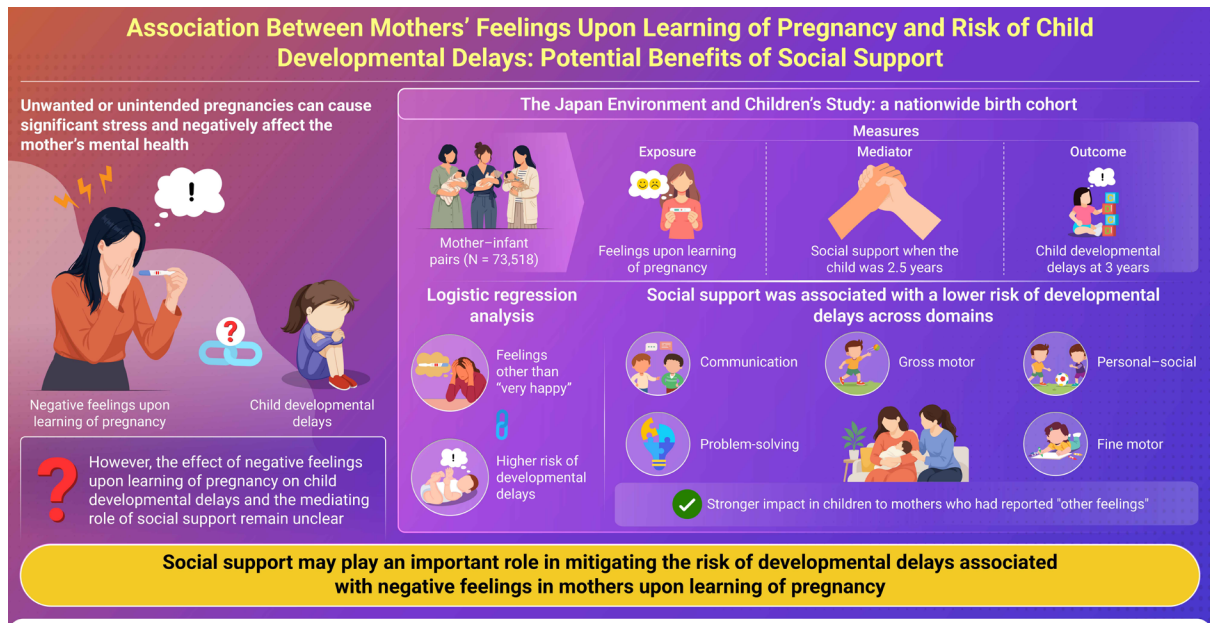
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#### Image



The mediating effect of social support on the relationship between negative feelings about pregnancy and child developmental delays: A nationwide birth cohort – the Japan Environment and Children's Study  
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**Title:** Feelings upon learning of pregnancy and postpartum social support are associated with developmental delay at 3 years

**Caption:** A large-scale study of more than 73,000 mother–child pairs in Japan reveals the developmental risks associated with negative or indifferent feelings upon learning of pregnancy, as well as the mediating role of postpartum social support.

**Credit:** Professor Mitsue Nagamine, Institute of Science Tokyo, Japan; Collaborative Researcher, University of Toyama, Japan

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