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News Release

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The paper, “Maternal multiple micronutrient supplementation and other biomedical and socioenvironmental influences on children’s cognition at age 9-12 years in Indonesia: follow-up of the SUMMIT randomised trial” is available at <http://www.thelancet.com/journals/langlo/latestcontent>

Prenatal Vitamins, Nurturing Environment Boost Child Development

Maternal micronutrient supplements during pregnancy and a strong nurturing environment result in measurably greater child development and cognitive ability at age 9-12

Mataram, Indonesia: Mothers who take multi-micronutrient supplements during pregnancy can add the equivalent of up to one full year of schooling to a child’s cognitive abilities at age 9-12, says a new study conducted in Lombok, which was published January 16th in the prestigious journal, *Lancet Global Health*.

Other essential ingredients in the recipe for smarter kids include early life nurturing, happy moms, and educated parents, according to the research led by the Summit Institute of Development.

As well, the study finds that a child’s nurturing environment is more strongly correlated than biological factors to brain development and general intellectual ability, declarative memory, procedural memory, executive function, academic achievement, fine motor dexterity, and socio-emotional health.

“The long-term effects of maternal micronutrient supplementation on child cognition are important for our national and global policy formulation.” Dr. Anung Sugihantono, MD, MPH, Director General for Public Health, Ministry of Health of the Republic of Indonesia.

“The study provides insights into the specific effects and magnitude of early life determinants on child cognition, and highlights the need for interventions at the household level to better enable parents to improve child development.” Dr Rina Agustina, MD, PhD, Director of the Nutrition Cluster, Faculty of Medicine, University of Indonesia

Between 2012 and 2014, the researchers tested extensively almost 3,000 Indonesian school children, then 9 to 12 years old, whose mothers had participated in an earlier study into the effects of consuming either multiple micronutrient (MMN) supplements or standard iron-folic acid (IFA) supplements during pregnancy.

In the earlier “Supplementation with Multiple Micronutrients Intervention Trial” (SUMMIT), conducted between 2001 and 2004, half of the 31,290 participating Indonesian mothers consumed MMN supplements; the other half received IFA supplements. The IFA supplements were similar to what is typically distributed by midwives in Indonesia as a part



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of routine ante-natal care, while the MMN supplements provided iron and folic acid, plus additional vitamins and minerals.

The latest follow-up study revealed impressive long-term benefits to children whose mothers took MMN supplements, including better “procedural memory” equivalent to the increase in score typical after an additional half-year of schooling.

The procedural memory is tied to the learning of new skills and the processing of established perceptual, motor, and cognitive skills. Procedural memory is important for a child’s academic performance and daily life, and is tied to activities such as driving, typing, reading, arithmetic, reading, speaking and understanding language, and learning sequences, rules, and categories.

Children of mothers who were anemic during pregnancy and received MMN scored substantially higher in general intellectual ability than IFA, a difference comparable to the increase associated with an additional full year of schooling.

What further impressed and surprised the researchers: The strength of the relationship between cognitive abilities and early life social and environmental conditions.

Biological factors such as maternal nutritional status during pregnancy, low infant birth weight, premature birth, poor infant physical growth and nutritional status at follow-up were not as strongly linked to cognitive ability as the socio-environmental factors assessed during the study: parental education, socio-economic status, home environment and maternal depression.

“No one on the team had anticipated the extent to which social and environmental factors would exceed biological factors as the determinants of cognitive function — 2- to 3-fold by some measurements. This work has global implications as countries are currently planning how to achieve the global Sustainable Development Goals with targets for improved childhood development.”

Dr. HusniMuadz, University of Mataram, co-Principal Investigator

This suggests that current public health programs focused only on biological factors may not sufficiently enhance child cognition, and that programs addressing socio-environmental factors are essential to achieve thriving populations, according to the study.

“These data show the global importance of integrated programs for child health and development. We must innovate and respond with new approaches.” Dr. Endang Achadi, MD, Dr PH, Professor, Faculty of Public Health, University of Indonesia

In Indonesia's West Nusa Tenggara Province, where the study was carried out, officials are already taking action in light of the research results.

Says Provincial Secretary General Dr. Rosiady Sayuti: “The findings led us to create, with the Summit Institute of Development and colleagues, the inter-sectoral Golden Generation Program to enhance social interventions to foster early childhood development.”

Adds Dr. Nurhandini Eka Dewi, Head of the Provincial Health Office of West Nusa Tenggara: “We are procuring multiple micronutrients and scaling-up the Golden Generation Program for family nurturing. These will inform efforts to scale the work nationally.”



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And Mandri Apriatni, CEO of Summit Institute of Development, says: “This unprecedented work indicates how local community-driven research approaches exemplified by SUMMIT and the Summit Institute of Development provide high value for local and global health and development. We have now created a real-time information platform with the government that coordinates multiple front line workers to enhance early childhood development, this enables rapid scaling in Indonesia and beyond.”

Funded by the Government of Canada through Grand Challenges Canada’s Saving Brains program, Dr. Peter A. Singer, CEO of Grand Challenges Canada, stated *“This study shows that maternal micronutrients and a nurturing environment in early life save brains and help children thrive and succeed. A more prosperous and peaceful world starts with our children’s early brain development.”*

The research was conducted by an international group of researchers, led by the Summit Institute of Development in Indonesia. Other collaborators were the Center for Research on Language and Culture at the University of Mataram in Indonesia, Harvard University’s T.H. Chan School of Public Health, University of California Davis, and Georgetown University in the USA; the University of Lancaster in England; and Deakin University in Australia.

FOR MEDIA ENQUIRIES

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