

**EFFECTS OF EARLY CHILDHOOD STUNTING ON BEHAVIOUR,
SCHOOL ACHIEVEMENT AND FINE MOTOR ABILITIES AT
AGE 11-12 YEARS**

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ABSTRACT

Stunting in early childhood is common in developing countries and is associated with poor development in later childhood. In 1986, a major intervention study of supplementation and stimulation on the development of stunted children aged 9-24 months was carried out in Kingston, Jamaica. One hundred and twenty-nine stunted children were recruited from a house to house survey in poor neighbourhoods in Kingston. They were randomly assigned to 1 of 4 groups – control, supplement only, stimulation only, both treatments or control.

The supplement consisted of 1 kg milk-based formula for the child and additional food for the family and was distributed weekly. The stimulation comprised weekly play sessions conducted at the child's home between the child, mother and a trained health worker. A group of 32 non-stunted children matched for gender, age and neighbourhood were also recruited. All children received free medical care. At the end of the 2 year study, the developmental quotient (DQ) of the stunted children receiving both treatments improved the most followed by the stimulated group.

This study is a follow-up of the cohort eight years after the intervention ended. At ages 11-12 years, the children's anthropometry, behaviours at home and school, academic achievement and fine motor abilities were assessed. No long term effects of either the supplementation or stimulation were found on any of the measures. The results showed the previously stunted children were smaller in size and living under poorer circumstances than the non-stunted children. They

also had more conduct problems and were performing at a lower academic level than the non-stunted children regardless of social background. The fine motor abilities of the stunted group were significantly poorer than the non-stunted group. These motor differences are suggestive of subtle neurological deficits among the stunted children. Within the stunted group, smaller head circumference in early childhood predicted greater motor deficits. Conduct problems significantly predicted poorer reading and spelling abilities regardless of IQ and poorer motor abilities were associated with increased conduct problems. The results extend the domain in which stunted children have been shown to have problems and emphasize the need for strategies to prevent early childhood stunting and access to interventions for this at risk group.

Keywords: Susan Chang-Lopez, stunting, intervention, supplementation, stimulation, development, developmental quotient (DQ), behaviours, Rutter scales, conduct problems, school achievement, Wide Range Achievement Test (WRAT), intelligence quotient (IQ), Wechsler Intelligence Scales for Children-Revised (WISC-R), fine motor abilities, head circumference (HC), soft neurological signs (SNS)