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# High prevalence of malnutrition and vitamin A deficiency among schoolchildren of rural areas in Malaysia using a multi-school assessment approach

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## Abstract

Childhood malnutrition is known as a public health concern globally. The present study aims to assess the anthropometry and blood biochemical status of rural primary schoolchildren in Malaysia. A total of 776 children (7–11 years old) from ten rural primary schools from five states were included in this study. Nutritional outcomes were assessed based on sex, age group and school categories among the children (median age: 9 years (P25:8, P75:10)). The overall prevalence of malnutrition was 53.4%. Vitamin A deficiency (VAD) was recorded at 20.6 and 39.8% based on retinol and retinol-binding protein (RBP) levels, respectively. Anaemia, iron deficiency (ID), iron-deficiency anaemia (IDA) and elevated inflammation were found at 14.9, 17.9, 9.1 and 11.5%, respectively. Malnutrition, VAD, anaemia, ID, IDA and elevated inflammation were more prevalent among Orang Asli (OA) schoolchildren compared with Non-Orang Asli schoolchildren. Higher occurrences of VAD and anaemia were also found among children aged <10 years. Retinol, RBP,  $\alpha$ -carotene, ferritin and haemoglobin levels were lower among undernourished children. Besides, overweight/obese children exhibited a higher level of high-sensitivity C-reactive protein. Multivariate analysis demonstrated that OA school children (adjusted OR (AOR): 6.1; 95% CI 4.1, 9.0) and IDA (AOR: 3.6; 95% CI 1.9, 6.6) were associated with stunting among this population. The present study revealed that malnutrition, micronutrient deficiencies and anaemia are prevalent among rural primary schoolchildren in Malaysia, especially those from OA schools and younger age children (<10 years). Hence, more appropriate and targeted measures are needed to improve the nutritional status of these children.

## Keywords

Malnutrition

Vitamin A deficiency

Anaemia

Iron Deficiency

Inflammation