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RESEARCH PAPER

# Under-five Nutritional Status and its Relationship with Household Dietary Diversity and Food Security Among the Dayak Communities in Sarawak, Malaysia

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## Abstract

***Background:*** Malnutrition among under-five children is one of the paramount public health concerns in the country.

***Objectives:*** This study aimed to determine the relationship between under-five nutritional status and household dietary diversity (HDD) and household food security (HFS).

***Methods:*** In this cross-sectional study analysed 808 under-five children's data from 50 villages in five divisions of Sarawak using a multistage cluster sampling technique. Data were collected by face-to-face interview using interviewer-administered questionnaires. WHO Anthro version 3.2.2 was used for anthropometric, and IBM SPSS version 22.0 was used for multivariate data analysis.

***Results:*** Multivariate analysis showed that children with low HDD were 1.68 times more likely to be stunted than those with high HDD. Children from households with food insecurity but without hunger were 3.86 times and with hunger were 4.02 times likely to be wasted in the last three months and were almost six times more likely to stunted at the same time. The likelihood of being underweight was 2.86 times more likely to occur in households with food insecurity without hunger and 4.89 times in food insecurity with hunger households. In the past 12 months, children from households with food insecurity with hunger were 8.56 times and four times more likely to be stunted with food insecurity without hunger. Underweight children had twice the odds of occurring in households with food insecurity without hunger compared with food secured households. HFS in the last three months had a significant association with wasting, stunting and underweight of the children, while HFS in the last 12 months was associated with stunting and underweight children.

***Conclusion:*** Low HDD had resulted in stunting, and food insecurity had resulted in wasting, stunting and underweight in under-five Dayak children in rural areas of Sarawak. A food-based intervention programme should be undertaken for malnourished children.

**Keywords:** Stunting, Dietary diversity, Food security, Sarawak

## Introduction

Malnutrition technically means imbalanced nutrition, either under or overnutrition. As a developing country, Malaysia is concerned about undernutrition. On the other hand, changes in eating behaviours in industrialised countries lead to increased overnutrition. The prevalence of malnutrition in Malaysia is still significantly high, although the rates gradually decrease over the past decades. The National Health and Morbidity Survey (NHMS) 2016 reported that the prevalence of stunting, underweight, and wasting among Malaysians under five years children were 20.7%, 13.7%, and 11.2%, respectively.[1]

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Dietary diversity has been a popular method to assess food variation and nutritional adequacy of an individual or household levels. A high level of dietary diversity is considered to indicate an adequate intake of essential nutrients, promote good health and better nutritional status.[2,3] Household Dietary Diversity (HDD) consists of 12 groups of foods measured at household level.[4,5] The measurement scores of HDD would categorize households as low HDDs of ≤3; medium HDDs of 4-6; and high HDDs of 7–12. Scoring of HDDs ≤3 is considered low dietary diversity while consuming four food groups over 24 hours is considered good dietary diversity.[6] Multiple studies revealed that HDD is strongly associated with childhood growth indicators.[7–11]

Household food security is another important indicator to measure well-being by identifying the food-insecure, assessing the severity of food inadequacy and