

## ORIGINAL RESEARCH

# A structural equation model of the determinants of malnutrition among children in rural Kelantan, Malaysia

WL Cheah, WAM Wan Muda, Z-H Zamh

*Universiti Malaysia Sarawak, Sarawak, Malaysia*

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Cheah WL, Wan Muda WAM, Zamh Z-H

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## ABSTRACT

**Introduction:** Many studies had shown that poor growth in children is associated with malnutrition. The underlying factors are diverse, multisectoral and interrelated, ranging from biological to social, cultural and economically related. Because the highest levels of under-nutrition worldwide are found in South Asia, it is essential that policy-makers in the region understand the underlying determinants, in order to design effective public health intervention programs. This is especially so if public resources are limited, as in rural areas. The purpose of this cross-sectional study was to examine causal relationships among the biological, behavioural and environmental factors related to malnutrition in children aged 5 years and under.

**Method:** The instrument used in this study was based on a previously described conceptual framework for malnutrition in children, and tested for its psychometric components, using both qualitative and quantitative methods. As well as the use of a questionnaire, anthropometric and dietary data were collected from 295 children aged 5 years and below, randomly selected from clinics in Tumpat, Kelantan. The proposed model was tested and modified using structural equation modelling (AMOS software: ADC, Chicago, IL, USA).

**Results:** The modified model fitted the data adequately. The results demonstrated that an environmental construct (with factors that included total household income  $\beta = 0.68, p < 0.01$ ; total expenditure  $\beta = 0.67, p < 0.01$ ; number of rooms in the house  $\beta = 0.46, p < 0.01$ ; and socioeconomic status  $\beta = 0.71, p < 0.01$ ) had a significant effect on malnutrition. Neither the biological nor behavioural constructs had significant effects.

**Conclusion:** These findings provide useful insights into the importance of environmental factors when designing intervention programs for malnutrition. This information will be useful for the prioritization of preventive programs when resources are