

FOOD SECURITY STATUS AND NUTRITIONAL STATUS AMONG UNDERNOURISHED CHILDREN AGED 24 TO 48 MONTHS OLD IN TASKA SEREMBAN, NEGERI SEMBILAN

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INTRODUCTION

- Food insecurity has a negative impact on children's optimal health, academic performance, and social development (Soliman et al., 2018).
- Optimal nutrition allows children to survive, grow, develop, learn, play, participate and contribute while malnutrition affects children of their futures and leaves young lives hanging in the balance (UNICEF, WHO & The World Bank, 2020).
- Not to forget poor cognition and academic performance, and reduced economic productivity and earnings, under-nutrition increases the future risk for overweight and subsequently non-communicable diseases such as hypertension and cardiovascular disease (Norris et al., 2012).
- Studies suggested that there is association between food security status, nutritional status and dietary quality in low-income children (Jun et al., 2019; Landry et al., 2019).
- This study aimed to determine the association between food security status and nutritional status among undernourished children (underweight, stunting or wasting) aged 24 to 48 months old from B40 households in Taska Seremban.

METHODOLOGY

- **Study Design:** Cross-sectional study
- **Study Location:** Taska KEMAS in Seremban
- **Study Population:** Undernourished children (aged 24 to 48 months old) (n = 85) (male = 38, female = 47) based on WHO (2006)
- **Sampling Design:** Cluster sampling method
- **Ethical Clearance:** Obtained from Ethics Committee for Research Involving Human Subjects Universiti Putra Malaysia (JKEUPM) and Jabatan Kemajuan Masyarakat (KEMAS)
- **Study Instruments:**



TANITA Model HD662



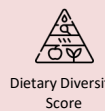
SECA Model 213



US Household Food Security Survey Module (6-item)

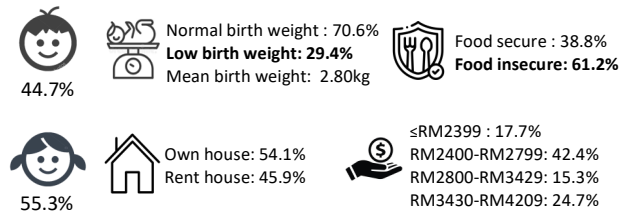


3-Day 24-Hour Dietary Recall



Dietary Diversity Score

RESULTS & DISCUSSION



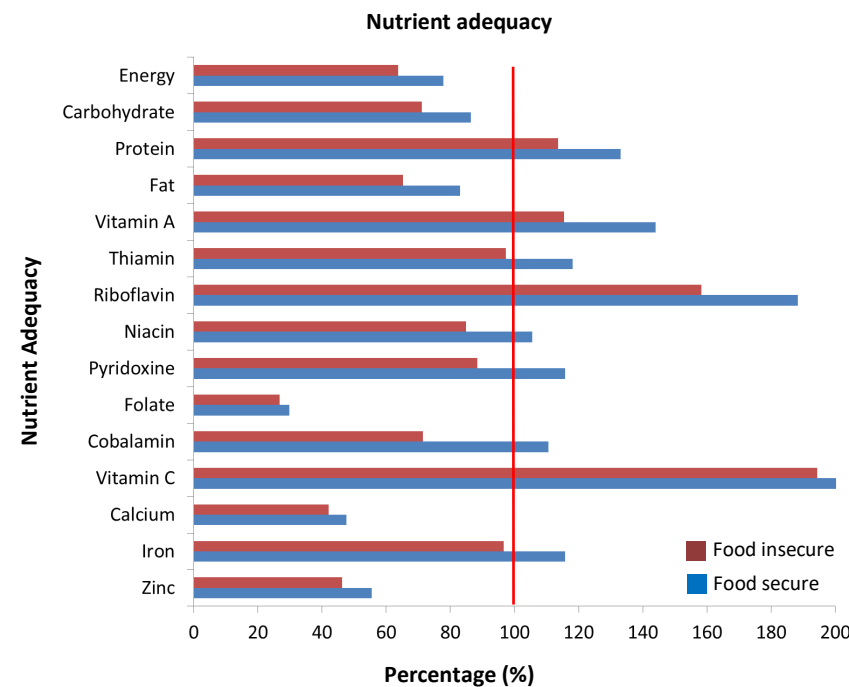
Anthropometric measurements by sex								
	Age		Weight		Height		BMI	
	months	kg	z-score	cm	z-score	kg/m ²	z-score	
Male	40.16 ± 6.28	12.45 ± 1.82	-1.61 ± 0.47	92.94 ± 4.76	-1.53 ± 0.77	14.43 ± 1.26	-0.95 ± 1.11	
	Female	39.66 ± 4.53	11.97 ± 1.01	-1.59 ± 0.41	91.85 ± 4.52	-1.50 ± 1.01	14.23 ± 1.27	-0.96 ± 1.05
Total		39.88 ± 5.36	12.19 ± 1.11	-1.60 ± 0.43	92.34 ± 4.63	-1.52 ± 0.76	14.32 ± 1.26	-0.96 ± 1.07
	p-value	0.672	0.048*	0.810	0.284	0.849	0.477	0.971

*Independent t-test is significant at p<0.05.

Anthropometric measurements by food security status			
	Underweight n (%)	Stunting n (%)	Wasting n (%)
Food Secure	10 (35.7%)	19 (43.2%)	5 (21.7%)
Food Insecure	18 (64.3%)	25 (56.8%)	18 (78.3%)
p-value	0.680	0.393	0.049*

*Chi-square test is significant at p<0.05.

- Previous study showed that undernutrition was more prevalence in food-insecure households. Of the households containing wasted, underweight and stunted children, majority (85.3%, 88.3% and 91%) were classified as being food insecure compared to only 14.7%, 11.7% and 9.0% of households which were food secure, respectively (Lwanga et al., 2015).



Comparison in dietary diversity score between food-secure and food-insecure children				
	Day 1 (Weekday)	Day 2 (Weekday)	Day 3 (Weekend)	Total
Food Secure	6.58 ± 0.87	6.36 ± 0.78	5.85 ± 0.94	6.26 ± 0.56
Food Insecure	6.67 ± 0.73	6.40 ± 0.91	5.87 ± 0.82	6.31 ± 0.47
Total	6.64 ± 0.78	6.39 ± 0.86	5.86 ± 0.86	6.29 ± 0.50
p-value	0.580	0.835	0.930	0.644

- Out of 14 nutrients of interest, only 9 nutrients (protein, vitamin A, thiamin, riboflavin, niacin, pyridoxine, cobalamin, vitamin C, and iron) can be achieved by the children from food-secure households based on the requirements suggested by the Recommended Nutrient Intakes 2017 (National Coordinating Committee on Food and Nutrition., 2017).
- There is no significant difference in dietary diversity score between food-secure and food-insecure children in the current study.

Comparison in dietary intake between food-secure and food-insecure children

	Food Secure	Food Insecure	Total	p-value
Energy (kcal/day)	701 ± 94	573 ± 177	623 ± 162	<0.001**
Carbohydrate (g/day)	98 ± 12	80 ± 24	87 ± 22	<0.001**
Protein (g/day)	31 ± 5	26 ± 9	28 ± 8	0.010*
Fat (g/day)	21 ± 5	16 ± 6	18 ± 6	0.001*
Vitamin A (µg/day)	576 ± 134	462 ± 178	506 ± 171	0.002*
Thiamin (mg/day)	0.6 ± 0.1	0.5 ± 0.1	0.5 ± 0.2	0.001*
Riboflavin (mg/day)	0.9 ± 0.2	0.8 ± 0.3	0.9 ± 0.2	0.004*
Niacin (mg/day)	6 ± 1	5 ± 2	6 ± 2	<0.001**
Folate (µg/day)	48 ± 12	43 ± 15	45 ± 14	0.113
Vitamin C (mg/day)	63 ± 17	58 ± 23	60 ± 21	0.288
Calcium (mg/day)	334 ± 78	294 ± 105	309 ± 97	0.065
Iron (mg/day)	7 ± 1	6 ± 2	6 ± 2	0.005*
Zinc (mg/day)	2.2 ± 0.6	1.9 ± 0.8	2.0 ± 0.7	0.025*

*Independent t-test is significant at p<0.05. **Independent t-test is significant at p<0.001.

- Findings of this study showed that children from food-secure households were able to achieve higher nutrient adequacy when compared to the children from food-insecure households.
- Consistent with the findings of Hutchinson and Tarasuk (2022), dietary intakes were generally lower among children in food-insecure households.
- The results of the current study is in line with the results from previous study which reported that micronutrient adequacy, but not dietary quality, significantly differed by food-security status (Jun et al., 2019).
- However, association was found from other study showing that a strong and consistent relationship of food insecurity with lower vegetable intake compared with food security was determined among children aged 1 to 5 years (Eicher-Miller & Zhao, 2018).
- Also, significant differences in dietary intakes were observed between food-secure and food-insecure children. Food-insecure children had lower overall diet quality and had lower scores for greens and beans, seafood and plant proteins, and added sugar (Landry et al., 2019).

CONCLUSION & RECOMMENDATIONS

- This study found that food insecurity had a great impact on the nutritional status of undernourished pre-schoolers.
- Future intervention programs should improve dietary intakes especially among food-insecure children.

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