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Factors Affecting Nutritional Status of Children below 24 Months in Pekan District, Pahang, Malaysia

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ABSTRACT

Introduction: This study aimed to assess the nutritional status of children below 24 months in the district of Pekan, Pahang, and identify the contributing factors. **Methods**: Using a cross-sectional methodology, a total of 910 children was selected by random sampling from four public health clinics. Anthropometric measurements were taken and weight-for-age, height-for-age, and weight-for-height were calculated in Z scores. Immediate caregivers of children were interviewed by using a pretested validated questionnaire to assess their socio-economic, demographic, educational and occupational status. **Results:** Of the 910 children who participated in the study, the majority were Malay (70.1%), while the remaining comprised indigenous or *Orang-Asli* (OA) children. Prevalence of wasting, stunting and underweight were 28.7 %, 15.6 % and 19.0% respectively. There were more underweight males than females. Wasting was most common among children aged below 6 months. Stunting was more prevalent in children between 12 to 24 months. Obesity was seen in 7.3% of the sample. Maternal education, employment and socio-economic status had a significant influence on wasting and underweight. Children were vulnerable to stunting as age advanced, whereas prevalence of wasting tended to decrease. **Conclusion**: Malnutrition exists in significant proportions among children below 24 months in the Pekan district. This study identified low birth weight along with age, race, gender, large family size and socio-economic status as important risk factors of malnutrition.

Key words: Anthropometry, childhood malnutrition, maternal education, social status

INTRODUCTION

Early childhood is a critical period of growth and development requiring greater protein and energy inputs. Among the environmental factors, nutrition has a major impact on early child growth. Further, many underlying factors also have an important influence and these include household

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variables, child care practices, economic conditions and sanitation (WHO, 2013). Positive determinants of a child's nutritional status include maternal education and employment. Children from poor socio-economic conditions, less educated families and exposed to poor care practices are three times more likely to be stunted (Ruel, Armar-Klemasu & Arimond, 2002).

Malnutrition significantly contributes to mortality and is often not stated as a cause of death, but is a hidden cause of death and acts synergistically with infection to increase the mortality rates. Risk of death is eight times higher in severely malnourished children, five times higher in moderate malnutrition, and twice higher in mild cases. In epidemiological studies by WHO, it is shown that risk of death exceeds ninefold in children with weight for height < -3 SD, when compared to children with weight for height above -1 SD (Allen *et al.,* 2008).

Assessment of nutritional status and its contributory factors is the first step towards a healthy nation. In children, three indices are commonly used to assess growth status: weight-for-age (underweight), height-for-age (stunting), and weight-for-height (wasting). Stunting and wasting are the preferred measures of childhood nutritional status as these measures can distinguish between long standing and short-term malnutrition.

The aim of this study is to explore nutritional status of young infants in the district of Pekan. The study also aims to identify the social, economic and maternal factors that affect the current growth patterns in the community. Part 1 of this study which discusses the effect of socio-demographic and maternal factors like education and employment on malnutrition is contained in this paper. Part II which will further discuss the infant feeding practices will be contained in another paper.

METHODS

A cross-sectional descriptive and analytical study was conducted from January 2012 to July 2012 in the district of Pekan. Four clinics, two in the central and two in the peripheral areas ,were selected purposely for data collection. The sample size was computed using the formula for a single proportion with an expected prevalence of 20% with the precision of 3% at 95% confidence interval. A total of 682 children were required. This gave us approximately 850 children as the sample, anticipating a 20% non-response rate. A total of 910 children aged below 24 months and their mothers or caregivers participated in the study. The distribution of children by clinic is shown in Table 1.

Children less than 24 months old were included in the study while children with chronic disease and secondary malnutrition were excluded.

Questionnaire design

An original English version of a modified questionnaire was developed from the study done by Food and Drug Administration in collaboration with Centres of Disease Control and Prevention on infant and child feeding practices study (WHO, 2007). It was translated into Bahasa Malaysia by bi-language subject expertise. Backward translation was done for validation of the translated questionnaires.

The questionnaire was structured into three modules: household roster and socio-demographic module; breast feeding module; infant and young child feeding module that included 24-hour dietary recall.

The questionnaire was pretested on 10 subjects and feedback from the pretest were incorporated in the study. Data collection was structured into two parts. A face-to-face interview using the questionnaire was followed by anthropometric measurements. Interview of the immediate caregiver (mothers) was conducted by qualified trained nurses, fluent in the local language, and who had received prior training especially on 24-hour dietary recall modules. Informed consent was also obtained in

Table 1. Socio-demographic data of the children from the four clinics in Pekan

Variables	*Ibn dan Anak n=166 (%)*	*Peramu Jaya n=258 (%)*	*Chini n=251(%)*	*Nenaci n=235 (%)*	*Total n=910(%)*
Age					
1 to 5.9 months	79 (47.6)	191(74.0)	163 (64.9)	172(73.2)	605 (66.5)
6 to 12 months	37 (22.3)	36 (14.0)	56 (22.3)	27 (11.5)	156 (17.1)
>12 months	50 (30.1)	31 (12.0)	32 (12.7)	36 (15.3)	149 (16.4)
Gender					
Male	75(45.2)	95 (36.8)	125 (49.8)	131(55.7)	425 (46.8)
Female	91(54.8)	163(63.2)	126 (50.2)	104(44.3)	484 (53.2)
Race					
Malays	133(80.1)	237(91.9)	193(76.9)	121 (51.5)	684 (75.16)
Orang Asli	33 (19.9)	21 (8.1)	58 (23.1)	114 (48.5)	226 (24.83)
Income per capita					
< RM300	85 (17.63)	82 (17.01)	149(30.9)	166(34.43)	482 (53.)
RM300—RM500	33 (15.2)	81 (37.32)	68 (31.3)2	35(16.12)	217 (23.8)
RM500—RM1000	34 (22.2)	71 (46.4)	24 (15.68)	24(15.68)	153 (16.8)
>RM1000	14 (24.13)	24 (41.37)	24 (41.37)	10(17.24)	58 (6.37)
Mothers' Employment					
Unemployed	114(69.51)	170 (65.9)	220(87.6)	203(86.4)	707(77.7)
Self-employed	15 (9.0)	15 (5.8)	9 (3.6)	11 (4.7)	50 (5.5)
Govt Employee	25 (15.1)	45 (7.4)	13 (5.2)	15 (6.4)	98 (10.8)
Private employee	12 (7.2)	26 (10.1)	8 (3.2)	6 (2.6)	52 (5.7)
Mother's education					
Illiterate	4 (2.4)	9 (3.5)	42 (16.7)	34 (14.5)	89 (9.8)
Primary school	28(16.9)	21(8.1)	52 (20.7)	70 (29.8)	171 (18.9)
Secondary school	97(58.4)	139(53.9)	114 (45.4)	106 (45.1)	456 (50.3)
Higher education	37(22.28)	87(33.72)	42 (16.73)	25 (10.63)	191 (21.1)
Nutritional status					
Weight-for-height (wasting)	14(8.6)	62(26.06)	83(37)	84(37.1)	243(28.7)
Weight-for-age Height-for-age	30(18.2)	41(16.0)	42(16.9)	59(25.2)	172(19.0)
(Stunting)	29(18.5)	46(18.3)	33(13.4)	30(12.9)	1138(5.6)

writing before the interview. The exact date of birth and birth weight of the child was recorded from the immunisation book carried by the mother.

Anthropometric measurements

The recumbent length was measured for children unable to stand by using a portable infant meter, and a stadio-meter for standing height. Measurements were recorded to the nearest 0.1 cm. Body weight was measured in light clothing after removing pampers by portable calibrated (SECA) scale to the nearest 0.1kg. Instruments were calibrated regularly.

To assess growth status, standard deviation of Z-scores was calculated for weight-for-age (WAZ), height-for-age (HAZ) and weight-for-height (WHZ) in order to identify prevalence of underweight, stunting and wasting respectively. For the purpose of this study, the following definitions were adopted from WHO Global database on Child Growth and Nutrition (1997).

(1) *Normal nutritional status* - defined as weight-for-age between -1 to + 1 SD.

(2) *Mild Stunting/Wasting and Underweight* - defined as HAZ score /WHZ score/ WAZ Score < -1 to – 2 SD from the median of WHO growth standard 2006 (WHO, 2006).
(3) *Significant Stunting/Wasting and Underweight* - defined as HAZ score/ WHZ score and WAZ score < -2 SD from the median of WHO standard 2006 (WHO, 2006).
(4) *Severe Acute Malnutrition* - defined as weight-for-length/ height <-3 SD (WHO, 2009).
(5) *Overweight* - defined as WHZ between +1 to +2 SD.
(6) *Obesity* - defined as WHZ score > +2(WHO, 2006).

Data entry and analysis were conducted using IBM SPSS Statistics Version 20. Frequency distribution and summary descriptive statistics were done for continuous numerical data analysis. A cross-analysis by using chi-square test was done for categorical data to determine the influence of socio-demographics, education and employment of mothers on nutritional status of their children.

Ethic approval was obtained from the ethics committee of International Islamic University of Malaysia, as well as Medical Research and Ethics committee of the Ministry of Health Malaysia.

RESULTS

A total of 910 children participated in the study. The four clinics where the children were drawn from were Ibu dan Anak (n= 166), Peramu Jaya Clinic (n=258), Nenaci Clinic (n=251) and Chini Clinic (n=235).

Socio-demographic characteristics of study population

As shown in Table 1, of the 910 children, 605 were less than 6 months old, 156 between 6 to 12 months, and 149 were above 12 month of age; the mean age was 6.3 months; gender distribution was almost equal in all clinics except at Peramu Jaya where males were nearly half of the female population. In terms of ethnicity, the Malays were the largest ethnic group (74.2%), the Orang Asli (OA) the second largest (24.8%) while the Indian and Chinese constituted very small numbers (0.3 and 0.7%).The highest proportion of OA were from Nenaci and Chini clinics (48.5 % and 23.1).

More than half of (53.0%) of the sample population was from the lower socio-economic group with a per capita income of less than RM300. Mean per capita income was 378.86 RM. Nearly one-tenth (9.8% n=89) of mothers had not been to school at all; 18.8% (n=171) had primary school education; 50.3% (n=456) had a secondary education; higher education was observed in only 21.1 % (n=191) of mothers and all were Malays.

Most of the mothers were unemployed (77.7%, n=705) and did not contribute to the family income; only 22.0% (n=200) worked outside their homes. They were either government employees (10.8%, n=98), self-employed (5.5%, n=50) or privately employed (5.7% n=52).

Nenaci and Chini Clinic had twice as many from the low income group (34.4%, n=166 and 30.9%, n=149) in comparison to Ibu dan Anak and Peramu Jaya (17.6 %, n=85 and 17.1, n=82%). Orang Asli made up 50% of the patients at Nenaci Clinic and 25% at Chini. The rate of illitracy was higher at Nenaci and Chini (16.7 %and 14.5%) with the majority being unemployed (87% to 86%).

The children of Nenaci and Chini had poor nutritional status with significant wasting being highest (37.1 %, n=84 and 37%, n=83) while 13.2 % of children from Nenaci were severely wasted (< -3 SD) (p=0.005).

The nutritional status of the children is shown in Table 2. In all the four clinics of Pekan, normal WAZ (between –1 SD to +1 SD) was found in 41.9% (n=378). Normal length/ height for age (between -1SD and

Table 2. Nutritional status of children in Pekan

Standard deviation of Z score	*% WAZ (n)*	*% WHZ (n)*	*% HAZ (n)*
<- 3 SD	7.1 (64)	15.1 (131)	6.1(54)
< -2 SD	19.1(172)	28.7 (243)	15.6 (138)
-2 to < - 1 SD	24.7 (223)	20.2 (171)	18.4(163)
-1 to +1 SD	8.4(76)	35.1(297)	38.5 (342)
> +1 to +2 SD	41.9(378)	8.7 (74)	12.0(106)
> 2 SD	6.0(54)	7.3(62)	15.5(138)
Total	903	847	887

Severe underweight (WAZ), stunting (HAZ), wasting (WHZ) :< - 3 SD of the median of WHO growth standard.
Significant underweight, stunting or wasting: < - 2SD.
Mild malnutrition: -2 to -1 SD.
Normal: -1 to +1 SD.
Overweight: WHZ score > +1 to +2 SD.
Obesity: WHZ score > +2 SD

+1 SD) was seen in 38.5% (n=342) of children. Prevalence of significant underweight, stunting and wasting ***(< -2*** SD) observed in the four clinics of the study was 19.0% (n=172), 15.6% (n=138), and 28.7% (n=243). The data showed that 7.1% of the children were severely underweight (< -3 SD), 6.1% severely stunted and 15.1% of severely wasted. Mild underweight, stunting and wasting (between -1 SD to -2 SD) was found in one-fifth to one-quarter of children (24.7% n= 223, 18.2% n=163, 20.2% n= 171). Obesity and overweight figures were 8.7% (n=74) and 7.3% respectively..

Association of variables with the three indicators of malnutrition is shown in Table 3. There were 604 children under 6 months, 156 between 6 to 12 months, and 149 between 1 to 2 years. Proportion of underweight and wasting was higher among children under 6 months of age (22.7% and 36.3%); on the other hand stunting was more prevalent after 12 months (10.3% versus 25.5%). Malnutrition was more prevalent in males than in females. Males made up twice the number of underweight (25.1%, n= 106) than females (13.7%, n=66). Likewise, wasting and stunting was more common in males (19.6%, 31.6% versus 12.1%, 26.1%). In terms of malnutrition among the ethnic groups, Table 4, shows a high prevalence of malnutrition among the OA. Proportion of underweight children is twice in OA (31.1% versus 15.3%), whereas 39 % were wasted and 19 % stunted in comparison to the Malays (14.2 % and 25.4%) (P =0.000).

Birth weight is an important risk factor of growth retardation in infancy (p=<0.00). In this study, 115 (13.0%) babies had a birth weight of < 2.5kg (LBW). Of this low birth weight group of children, 25.6 % (n=30) failed to gain their linear growth potential and were short; 49.6 % (n=59) underweight and 45.5% (n=50) were wasted (p=0.000). Also, rates of overweight and obesity among low birth weight children were significant at 9.5% and 3.2 % (p= 0.009).

Association with socio-economic status

Socio-economic status plays a vital role in malnutrition. The sample population was divided into three per capita income groups: RM 300; RM300 to RM500; RM500 to RM1000 and above. Prevalence of underweight, wasting and stunting is much higher in the poorest category of income per capita of <300 RM (68%, 58.4%, 59.4%) (P value =0.002). In comparison, the higher income class with a per capita income of >RM

Table 3. Variables and their association with malnutrition

Variables	*WHZ Score < -2 SD 243(28.7%)*	*WAZ Score < -2 172(19%)*	*HAZ score< -2 SD 138(15.6%)*
Location			
Ibu Dan Anak	14 (5.8)	30 (17.4)	29 (21)
Peramu Jaya	62 (25.5)	41 (23.8)	46 (33.3)
Nenaci	83 (34.2)	54 (34.3)	30 (21.7)
Chini	84 (34.6)	42 (24.4)	33 (23.9)
X^2 & P value	X^2=60.921	X^2= 23.874	X^2=29.280
	P= 0.000	P=0.005	P= 0.001
Age			
< 6 months (604)	207(36.3)	137 (22.7)	49 (10.3)
6 to 12 mn (153)	22 (14.9)	20 (13.1)	41 (27.2)
12 to 24 mn (146)	14 (10.9)	15 (10.3)	36 (25.5)
X^2 & P value	X^2= 99.590	X^2=54.591	X^2=30.124
	P= 0.000	P=0.001	P=0.001
Gender			
Male	125 (31.6)	106 (25.1)	81 (19.6)
Female	118 (26.1)	66 (13.7)	57 (12.0)
X^2 & P value	X^2 =7.140	X^2=24.665	X^2=15.353
	P=0.068	P=0.000	P=0.002
No of household members			
< 4	137(31.6)	89(19.3)	59(12.7)
>5	106(27.46)	83(18.94)	79(18.54)
X^2 & P value	X^2=16.413	X^2=37.43	X^2= 54.33
	P =0.059	P=0.273	p= 0.011
Birth weight (Kg)			
LBW (< 2.49)	50(45.5)	59(49.6)	30(25.6)
NBW(2.5 to 4.0)	193(26.2)	113(14.4)	108(14.0)
X^2 & P value	X^2=27.933	X^2=86.778	X^2=29.159
	P= 0.000	P=0.000	P=0.000
Race			
Malay (638)	160(25.4)	103(15.3)	95 (14.2)
Orang Asli (209)	82 (39.2)	69 (31.1)	43 (19.6)
X^2 & P value	X^2=20.001	X^2=30.124	X^2=10.430
	P=16.687	P=0.000	P=0.015
Income per capita			
Less than RM 300	142(58.4)	117(68)	82 (59.4)
RM 301 – RM 500	53 (21.8)	24 (14)	29 (21)
>500 RM – up to 2000	48 (19.35)	31 (18)	27 (19.5)
X^2 & P value	X^2=16.413	X^2 =56.9523	X^2 = 18.822
	P =0.059	P= 0.000	p=0.027
Mothers' Education			
No Education	29 (34.9)	16 (18.2)	19 (22.1)
Primary school	67 (42.9)	62 (36.7)	27 (16.1)
Secondary school	102(23.6)	63 (13.8)	60 (13.5)
Diploma and Bachelors	45 (26)	30 (15.9)	28 (17.4)
X^2 & P value	X^2=50.333	X^2=86.961	X^2= 16.682
	P=0.000	P= 0.000	P=0.545
Mothers' Employment			
Unemployed (688)	196(29.6)	143(20.37)	107(15.5)
Employed (195)	47 (25.4)	14.07 (28)	31 (15.89)
X^2 & P value	X^2= 27.039	X^2= 37.156	X^2= 10.257
	P= 0.028	P= 0.001	p= 0.803

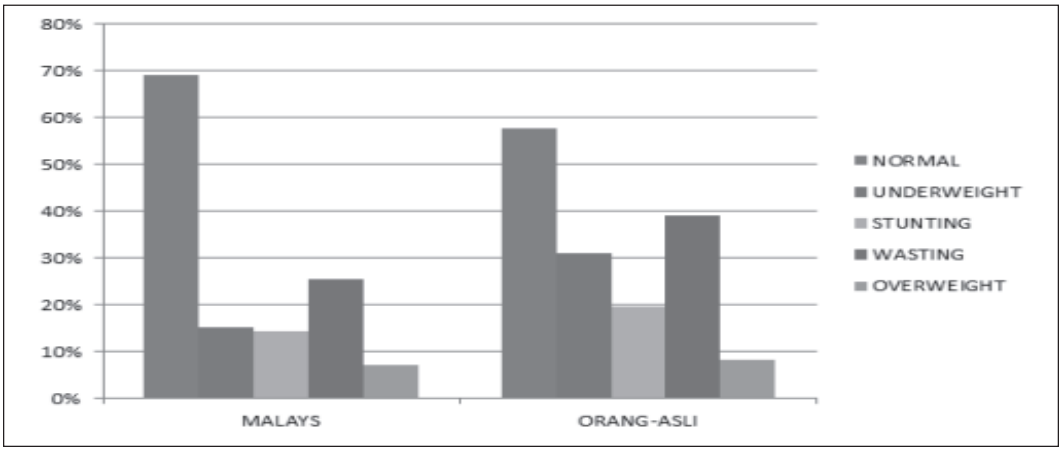

Figure 1. Nutritional status of Malays and Orang Asli

500 had three times less proportion of children with growth failure (18 %;19.35%; 19.35%).

Association with maternal education

Underweight and wasting were common among children of mothers with no education and primary education (18.2%, 34.9% and 36.7%, 42.9%) compared to mothers with secondary education (13.8%, 23.6%) ($P < 0.01$). Although stunting was found to be more common among children whose mothers were illiterate, statistically it was not found to be significant ($P = 0.545$).

Association with maternal employment

Most mothers in this sample were housewives. The proportion of underweight and wasted children among the non-working mothers was higher in comparison to the employed mothers (20.4%, 29.6% versus 14.0% and 25.0%) ($p=0.002$). On the other hand, stunting did not show any significant relationship with maternal employment.

Association with household size

The study found a statistically significant association between household size and stunting. Children of larger families were found to be shorter than those of nuclear families (18.5% versus 12.7%).

DISCUSSION

An assessment of nutritional status and its contributory factors is the first step towards a healthy nation. With economic development in Malaysia, growth status of children has improved. Studies carried out in 1970s and1980s indicated poor growth status especially in rural areas (Chong *et al.*, 1984). A large scale study done in 1990 using a sample of 4779 children (< 18 years) in poor villages of Malaysia reported that 29.8% boys and 25.5% girls were underweight. Similarly stunting was observed in 31.3% boys and 26.9% girls (Khor & Tee, 1997). Wasting was found to be much lower (9.3% in boys and 8.5% in girls).

The Third National Health and Morbidity survey NHMS III (Khor *et al.,*2009) identified that the overall nutritional status of children had improved but that there was no change in the prevalence of stunting over the past decade. Prevalence of underweight, stunting and wasting (< 5 years) was 12.9%, 17.2% and 14.9%. Rural areas have a higher prevalence of underweight and stunting (16.0%,19.4%) in comparison to urban areas (11.4%,13.5%).

Our study revealed that less than half of the children in the district of Pekan had normal nutritional status, in comparison to national figures. There was a higher prevalence of significant stunting and wasting (15.6%, 28.7%) under 24 months. Prevalence of malnutrition in previous studies done in Malaysia reported very low rates of significant stunting and wasting in children under 5 years old (5.8%, 4.4%) (Zalilah & Ang, 2001). Another large scale study on primary school children between 6 to 10 years of the low income group revealed 52 %, 50% & 30% are underweight, stunted and wasted, with the majority of them being mildly malnourished (37.4%,32%,23%). (Zalilah, Taylor & Johnson, 2000). A higher prevalence of malnutrition was also noted among the toddler age group (24-59 months) of the poor in developing countries such as Bangladesh (Quddus & Baurer, 2013).

Findings of our study revealed severe underweight, wasting and stunting to be very high (7.1%, 15.1%, and 6.1%). A rate of >5 % prevalence of wasting is alarming and > 15 % is critical (WHO, 1997). Wasting indicates a recent process of weight loss and is usually the result of inadequate feeding and acute illnesses. Anthropometric measurements of children has shown wasting in nearly half of the children (48.5%, n=414) with more than half being significantly wasted (< -2 SD) (28%, n=243). The figures are twice as high as that reported by NHMS III 2006 (Khor *et al.*, 2009). A substantial proportion of children (15.1%) were severely wasted. It is common in children who are less than 6 months but beyond 12 months their status seems to improve. This is probably because of increasing short stature after the first year.

This study reports a significant association of wasting and underweight with income per capita and birth weight. This is in contrast to a previous study conducted in rural Peninsular Malaysia, which did not report any correlation of paternal education with malnutrition (Hesham *et al.,* 2005). In our study, maternal literacy rate and employment were positively associated with wasting and underweight. A recent study on disadvantaged low income communities of Bangladesh also identified maternal education to have a significant association with all three indicators of malnutrition. (Quddus & Baurer, 2013). Educational attainment plays a vital role in economic development and global health. Educated mothers are more health conscious and are likely to take more preventive efforts towards health issues. Furthermore, there is a strong relationship between education, particularly of mothers and child mortality. In South Asia, economic growth and improvement in maternal education has resulted in a 39.1% reduction in the number of child deaths in the past 40 years (Gakidou *et al.*2010).

Stunting is the commonest form of malnutrition. Worldwide, 170 million children (0 to 5) are stunted and it appears to be a problem of developing countries. The prevalence has decreased worldwide from 39.0% in 1990 to 26.0% in 2010. Over the last two decades, the rates have been static. Though there is a marked reduction in Asian countries from 49 % to less than 28% in 2010 (de Onis *et al.,* 2011), it is highest in African preschool children (around 40%). Stunting starts in infancy and continues until first 3 years of life. On the other hand wasting occurs mostly between 3 to 15 months, and subsequently there is a period of improvement (Shrimpton e*t al.,* 2001). The NHMS III 2006 (Khor *et al.,* 2009) observes that prevalence of stunting over the past decade has not changed much. Although the prevalence of stunting in the present group of children under 24 months of age can be graded as 'Low' (WHO, 1997), prevalence differs in different age groups. It is three times higher in children aged 1 -2 years old than under 6 months (27% versus 10.3%). Proportion of stunting increases with age. Stunting has shown a significant relationship with age, race, sex, large family size

and low birth weight. The majority (60%) of stunted children in the study belonged to the poor income strata (p=0.027). A similar observation was noted by studies among poor communities, where household food security caused by low income,parental education level and large family size were important risk factors (Zaliha & Ang, 2001). A study from Bangladesh has also shown that food insecure children are 39 times more likely to be stunted and 3.5 times wasted. (Quddus & Baurer, 2013). We did not observe any association of stunting with maternal employment and education. A country such as Brazil has shown remarkable reduction in stunting, from 34% in 1986 to 6% in 2006, as a result of improvement in maternal education, increasing purchasing power of communities and provision of health care facilities (Monteiro *et al.*, 2009). Hence it should be considered as the proxy measure of child health deprivation.

Employment although observed in fewer mothers (22 %), was not found to be a constraint to child growth; rather it contributed to family income and improved socio-economic conditions. Similarly prevalence of underweight and wasting was higher among children of housewives than working mothers.

Orang Asli children are the most disadvantaged. Nearly 40% of their mothers were illiterate and less than half had a primary school education. They face poverty because of a higher illiteracy rate and as a consequence, the majority was self-employed. Poor economic conditions in turn have had an influence on their nutritional status. Their children were disproportionately twice as underweight as Malays, and more wasted and stunted (39 %, 19% versus 25.4% and 14.2%). A recent study in remote villages of Pahang reported even poorer rates of stunting (43.6% versus 19.6%) among OA children. Surprisingly on the other hand, wasting was quiet low (5.6% versus 39.2 %) (Hesham *et al.,* 2008).

CONCLUSION AND RECOMMENDATIONS

Malnutrition generally starts in early infancy and continues, especially in the second year of life where linear growth and brain development are maximal. In our study, there is a combination of very high prevalence of wasting and low stunting, indicating predominance of acute over chronic malnutrition. The study concludes that malnutrition is not only a problem of poor-socioeconomic status but a product of multiple factors. Age, ethnicity, birth weight and large family size have important influence on underweight, stunting and wasting. Growth retardation starts in utero; children are vulnerable to stunting with increasing age, especially in the second year of life. It has adverse short term and long term consequences in the form of psychomotor and cognitive skill loss (Chang *et al.,* 2002). Studies have identified LBW to be an important risk factor of malnutrition and a consistent factor in several other studies (Hien, 2009. The best indicator of optimal growth are maternal education and family income (Mohammad *et al.* 2004).

More efforts are needed to meet the targets of the National Plan of Action for Nutrition (NPAN) which aims to reduce underweight to 5 %, and stunting to 10 % by 2015. It is time that we focus on our LBW babies, prenatal care and nutrition of women and adolescent girls to break the cycle of growth retardation and to prevent Intrauterine growth retardation (IUGR). Educational attainment of mothers is one of the important targets as it will play a dual role in economic development and in reducing child mortality (WHO, 2013; Gakidou *et al.,* 2010).

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Conflict of Interest

The authors report no conflict of interest. The authors alone are responsible for the content and writing of the paper.

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