Malaysian Journal of Medicine and Health Sciences Vol. 7 (1) January 2011: 41-49

Nutritional Status of Rohingya Children in Kuala Lumpur

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ABSTRACT

The Rohingya is a group of refugees from Myanmar who have been residing in Malaysia since the 1980s. At present, there is no published information on health and nutritional status of refugee children in Malaysia. This study was conducted to assess nutritional status of the Rohingya children aged 6 months to 12 years old (N=87) and to determine the associations between nutritional status with socio-demographic, dietary diversity and health (birth weight, immunization and childhood illness) variables. Children were measured for weight and height while their guardians were interviewed for socio-demographic, dietary diversity and health information. About 27.5% of the Rohingya children were underweight, 11.5% stunted, 16.1% thin and 12.6% at risk of overweight and overweight. The percentage of children with low birth weight (< 2.5 kg) and no immunization was 17.8% and 11.5%, respectively. Fever (67.8%) and flu (62.1%) were the most common childhood illnesses reported in previous month with 44-75% of the children with these illnesses did not receive any medical treatment. The mean dietary diversity score was 8.9+3.2 out of a possible 14, with a higher score indicating a more diverse diet. There were significant correlations between frequency of immunization received by the children with weight-for-age-z score (r_s=0.27, p<0.05), height-for-age-z score (r_s=0.25, p<0.05) and BMI-for-age-Z score (r_s=0.24, p<0.05). Height-for-age-z score was also positively correlated with childhood illness score (r_p=0.24, p<0.05) and dietary diversity score (r_p=0.23, p<0.05) in that children with less common childhood illnesses and variety of foods in the diets had better linear growth. As refugees have limited access to health care services, they are at greater risk of health and nutritional problems.

Keywords: Nutritional status, refugee, Rohingya, immunization, dietary diversity

INTRODUCTION

A refugee is defined as "a person who owing to a well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality and is unable or, owing to such fear, is unwilling to avail himself of the protection of that country; or who, not having a nationality and being outside the country of his former habitual residence as a result of such events, is unable or, owing to such fear, is unwilling to return to it" [1, 2]. Globally, the total population of refugees is about 9.9 million [3].

In Malaysia, there were 41,400 refugees and asylum seekers registered with United Nations High Commissioner for Refugees in 2008 [4]. The majority of these refugees came from Indonesia and Myanmar with the largest ethnic groups being Acehnese (Indonesia), Chins (Myanmar) and Rohingyas (Myanmar). Since Malaysia has not ratified the 1951 United Nations Convention Relating to the Status of Refugees [5], the Federal Government does not have the obligation to protect or grant any legal status to the refugees. However, the government permits the operation of UNHCR in Malaysia and it is the responsibility of UNHCR to grant the status of refugees in Malaysia as well as to provide protection and financial support to the refugee population.

Compared to the Rohingyas, the Acehnese and Chins have higher chances to return home or be resettled in other countries [6]. The Rohingya is a Muslim minority ethnic group from the Rakhine state of Myanmar. In 1978, the Rohingyas started to flee Myanmar to escape ethnic persecution by the Myanmar government. Since then, the Rohingyas have fled to its neighboring countries, including Bangladesh, Thailand and Malaysia [7]. Subsequently, the Rohingyas have been residing in Malaysia for more than 20 years and the estimated population in mid-year 2007 was 12708, comprising 31.1% children and 68.9% adults.

As the Rohingyas do not have work permits, many are illegal workers surviving on part time jobs with relatively low wages [8]. The children do not have access to formal education but they attend religious or informal schools organized by UNHCR and other non-governmental agencies. Although the identity cards issued by UNHCR allowed the Rohingyas to have access to the government health care services at a discounted rate [3], financial and social

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constraints may prevent them from seeking medical care. Lack of education and employment opportunities as well as access to health care services may place the Rohingyas at risk of poor health and nutritional status.

The general health status of refugees in various countries is reported to be poor with malnutrition being the major health problem due to lack of access to sufficient food and nutrient intakes [9, 10, 11]. Other health problems among refugees include mental illnesses, intestinal parasites, hepatitis B, tuberculosis, sexually transmitted diseases, HIV/AIDS, malaria and anemia [12]. Refugees may have difficulties to access health care services due to reasons such as unaffordable medical costs, language barriers, difficulty to take work leave, lack of transportation and discrimination or rejection by health staff due to absence of legal documentation [13]. Consequently, refugees become hesitant to seek medical care and this may exacerbate their health problems.

At present, there is no published information on health and nutritional status of Rohingya population in Malaysia. This study was conducted to assess nutritional status of Rohingya children and to determine its association with socio-demographic, dietary diversity and health factors.

METHODS

This study was conducted in three Rohingya concentrated areas in Ampang, Cheras and Setapak as recommended by UNHCR (United Nations High Commissioner for Refugees) Malaysia. Rohingya informal schools (madrasah) and community centers in these areas were visited to recruit male and female children in the age group of 6 months – 12 years. A study information sheet and an informed consent form were distributed to all children to be given to their caregivers. Only children who met the study criteria (age 6 months-12 years, no physical deformity and free from health problems such as asthma, diabetes mellitus and congenital diseases) and whose caregivers were willing to be interviewed and allowed their children to be measured were accepted as study subjects. The final sample consisted of 87 children.

The weight and standing height of the children were measured without shoes using TANITA weighing scale (to the nearest 0.1kg) and SECA body meter (to the nearest 0.1cm), respectively. Each weight and height was measured twice and the average value was recorded as the final value for analysis. The z-scores for weight-for-age (WAZ) (aged 0 – 9 years), height-for-age (HAZ) (aged 0 – 12 years) and BMI-for-age (BMI Z) (aged 0 – 12 years) were calculated and compared to WHO growth standard (0-60 months) [14] and WHO growth reference (5-19 years) [15].

Information on household demographic and socio-economic as well as children's health status and dietary diversity were obtained through an interviewer-administered questionnaire with the caregivers. Children's birth weight and immunization information were obtained from either caregiver's recall or official documents such as birth certificate and immunization card. However, as a majority of the caregivers did not have children's immunization cards or birth certificates at the time of the interviews, most of the information was based on recalls. Birth weight was classified as low birth weight (less than 2.5kg) and normal birth weight (equal to or more than 2.5kg) according to WHO definitions (1990). The caregivers were also asked whether their children had never received immunization, received only once or received more than once since birth (excluding the immunization received immediately after birth). These categories were used as it was difficult for the caregivers to recall the types of immunization received as well as the actual number of times they brought the children to the clinics or hospitals for immunization.

The caregivers were also asked on the frequency of children having 6 common childhood illnesses (fever, cough, diarrhea, vomiting, runny nose and asthma) in the previous month. A scoring system was constructed in that 1 point was given to children having the symptoms but were not brought to the doctors, 2 points for children with symptoms and were brought to the doctors and 3 points for children with no symptoms. The higher score indicates better health status of the children.

The dietary diversity questions were adapted from individual dietary diversity questionnaire [16]. The instrument consisted of 16 food groups – cereals (e.g. rice, glutinous rice, bread), vitamin A rich vegetables and tubers (e.g. pumpkin, carrots, sweet potato), white tubers and roots (e.g. potato, cassava, yam), dark green leafy vegetables (e.g. spinach, mustard leaves, swamp cabbage, green shoots), other vegetables (e.g. cucumber, tomato, cabbage, broccoli), vitamin A rich fruits (e.g. mango, papaya), other fruits (e.g. apple, pineapple, banana, orange), organ meats, flesh meat (e.g. beef, mutton, chicken), eggs, fish (e.g. fresh fish, dried fish, seafood), legumes/nuts/seeds, milk and milk products, oils and fats, sweets, coffee and tea. The examples of foods in each food group were modified as to represent foods commonly consumed by Malaysians. The caregivers were asked on the children's consumption frequency of each of the food groups in the past 7 days. One score was given to each food group if it was consumed ≥ 3 times in the past week and 0 for the food group that was consumed less than 3 times in the past week. Dietary diversity score (DDS) was calculated as the sum of 14 food groups, excluding sweets, coffee and tea [17].

Ethical approval for this study was obtained from the Medical Research Ethics Committee, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia. Permission to conduct the study with Rohingya communities was granted by UNCHR Malaysia. Rohingya community leaders were also consulted for assistance to recruit children and caregivers for the study. Anthropometric assessments of children and interview of the caregivers were conducted in the madrasah or community centers. Incentives were given to the children upon completion of all measurements.

The Statistical Package for the Social Sciences (SPSS) version 15 was used for data analysis. Data were presented descriptively and associations between variables were analyzed using Pearson correlation (continuous data) and Point Bi-serial / Spearman Rank correlation (categorical data) tests. Significance level was set at $p<0.05$.

RESULTS

Socio - demographic Characteristics

Table 1 shows the socio-demographic characteristics of the study sample. The mean age of the children was 6.15 ± 2.86 years ranging from 9 months to 11 years 8 months. There were almost equal numbers of male (50.6%) and female (49.4%) children in the study. All of the caregivers were women and mothers to the children. The caregivers' average year of education was 2.54 ± 3.90 years with more than half (63.2%) had no formal schooling. The mean year of residence in Malaysia was 3.88 ± 1.48, with a range of 1 to 10 years. Sixty five (74.7%) of the caregivers were unemployed and only 22 (25.3%) were employed. The mean household size and number of children was 6.16 ± 2.46 and 3.62 ± 1.78, respectively. Out of the 87 children, 9 families (10.3%) had no fixed monthly household income while 66.6% had income between RM 401 – RM 800. Families with no fixed household income depended on aids (monetary, food and non-food items) given by various non-profit organizations. The mean income per capita was RM 113.15 ± 63 with a majority of the families (78.9%) were living below the poverty line income (PLI) of RM 155 per month.

Table 1. Socio-demographic characteristics of children (N =87)

Variable	n (%)	Mean ± SD
Children		
Sex		
Male	44 (50.6)	
Female	43 (49.4)	
Age (years)		6.15 ± 2.86
6 – 12 months		
Male	1 (1.1)	
Female	0 (0)	
1 – 5.99		
Male	19 (21.8)	
Female	18 (20.7)	
6 – 9.99		
Male	20 (23.0)	
Female	21 (24.1)	
10 – 11.99		
Male	4 (4.6)	
Female	4 (4.6)	
Caregivers		
Age		32.09 ± 8.38
Years residing in Malaysia		3.88± 1.48
Education (years)		2.54 ± 3.90
Never attended school	55 (63.2)	
Primary school	14 (16.1)	
Secondary school	15 (17.2)	
Others	3 (3.4)	
Employment status		
Employed	22 (25.3)	
Unemployed	65 (74.7)	
Household size		6.16 ± 2.46
Number of children per household		3.62 ± 1.78
Monthly household income (RM)		618.85 ± 305.96
No income	9 (10.3)	
RM 1 – 600	6 (6.9)	
RM 401 – 600	25 (28.7)	
RM 601 – 800	33 (37.9)	
RM 801 – 1400	14 (16.1)	
Income per capita (RM)		113.15 ± 63.63
< 155[a]	68 (78.2)	
> 155	19 (21.8)	

[a] Poverty line income (9th Malaysian Plan)

Health Status

Birth weight information was only available for 45 children based on recall by the caregivers. For the other children, the information could not be obtained as caregivers could not recall, the information was not available in the birth certificate or several children (n=16) were born at home in Myanmar. The mean birth weight was 2.97 ± 0.69 kg with more male (28.6%) than female (8.3%) children had low birth weight (< 2.5 kg) (Table 2). Although the majority of male (75.0%) and female (76.7%) children were taken more than once to the clinics or hospitals for immunization after birth, about 24% of the children were not brought or brought only once for immunization. Fever (67.8%), runny nose or cold (62.1%) and cough (51.7%) were the most common childhood illnesses among the Rohingya children. The percentages of children with common illnesses and were not brought to the doctors were 44% (fever), 53% (cough), 65% (diarrhea), 62% (vomiting), runny nose (44%) and 75% (asthma). The mean total score for common childhood illnesses was 14.4+3.1 (out of possible 18).

Table 2. Health status of children

Variable	Male n (%)	Female n (%)	Total
Birth weight *(Mean ± SD)* (n=45)	*2.92 ± 0.82*	*3.00 ± 0.56*	*2.97 ± 0.69*
< 2.5 kg	6 (28.6)	2 (8.3)	
> 2.5 kg	15 (71.4)	22 (91.7)	
Immunization			
> Once	33 (75.0)	33 (76.7)	
Once	4 (9.1)	7 (16.3)	
Never	7 (15.9)	3 (7.0)	
Childhood illnessa *(Mean ± SD)*	*14.68± 3.07*	*14.05 ±3.05*	*14.37 ± 3.06*
Fever (n=59)			
Brought to the doctor	16 (57.1)	17 (54.8)	
Did not bring to the doctor	12 (42.9)	14 (45.2)	
Cold (n=54)			
Brought to the doctor	15 (60.0)	15 (51.7)	
Did not bring to the doctor	10 (40.0)	14 (48.3)	
Cough (n=45)			
Brought to the doctor	12 (54.4)	9 (39.1)	
Did not bring to the doctor	10 (45.6)	14 (60.9)	
Vomiting (n=26)			
Brought to the doctor	6 (46.1)	4 (30.8)	
Did not bring to the doctor	7 (53.9)	9 (69.2)	
Diarrhea (n=17)			
Brought to the doctor	3 (37.5)	3 (33.3)	
Did not bring to the doctor	5 (62.5)	6 (66.7)	
Asthma (n=8)			
Brought to the doctor	2 (50.0)	0 (0.0)	
Did not bring to the doctor	2 (50.0)	4 (100.0)	

[a] Only for children with the reported symptoms in the previous month

Dietary diversity score

Table 3 shows the frequency of food groups consumed by the children in the last 7 days. Grain and cereals (94.3%), dark green leafy vegetables (79.3%), other vegetables (81.4%), other fruits (77.0%), eggs (66.7%), fish (71.3%), milk and milk products (67.8%), oils and fats (87.4%) and sweets (80.5%) were consumed > 3 times in the last week by at least two third of the children. Organ meats (92%), legumes/nuts and seeds (60.9%) and coffee/tea (57.5%) were

consumed less frequently (< 3 times last week). The average dietary diversity score for all children was 8.90 ± 3.19 (out of possible 14), with similar mean score for male (8.90 ± 3.30) and female children (8.89 ± 3.11).

Table 3. Dietary diversity of children

Food Group	Eat < 3 times last week n (%)	Eat > 3 times last week n (%)
Grain and cereal	5 (5.7)	82 (94.3)
Vitamin A rich vegetables and tubers	43 (49.4)	44 (50.6)
White tubers and roots	43 (49.4)	44 (50.6)
Dark green leafy vegetables	18 (20.7)	69 (79.3)
Other vegetables	16 (18.6)	70 (81.4)
Vitamin A rich fruits	41 (47.1)	46 (52.7)
Other fruits	20 (23.0)	67 (77.0)
Organ meats	80 (92.0)	7 (8.0)
Flesh meats	35 (40.2)	52 (59.8)
Eggs	29 (33.3)	58 (66.7)
Fish	25 (28.7)	62 (71.3)
Legumes, nuts, seeds	53 (60.9)	34 (39.1)
Milk and dairy products	28 (32.3)	59 (67.8)
Oils and fats	11 (12.6)	76 (87.4)
Sweets	17 (19.5)	70 (80.5)
Coffee and tea	50 (57.5)	37 (42.5)
Dietary Diversity score[a] *(Mean+SD)*	8.90 ± 3.19	
Male	8.90 ± 3.30	
Female	8.89 ± 3.11	

[a] Total possible score =14 (sweets and coffee/tea are not included in the total score)

Nutritional status

About 22.5% of the children were underweight (UW), 11.5% stunted (S) and 16.1% thin (T) with more male (UW=30%; S=13.6%; T=18.2%) than female children (UW=15%; S=9.3%; T=14.0%) were underweight, stunted and thin (Table 4). The percentages of children who were at risk of overweight and overweight were 5.7% and 6.9%, respectively.

Table 4. Nutritional status of the children

Indicators	Male n (%)	Female n (%)
Weight for age (n=80)		
< -2SD *(underweight)*	12 (30.0)	6 (15.0)
-2SD < X < 2SD *(normal)*	28 (70.0)	34 (85.0)
Height for age		
< -2SD *(stunted)*	6 (13.6)	4 (9.3)
-2SD < X < 2SD *(normal)*	38 (86.4)	39 (90.7)
BMI for age		
< -2SD (*thinness)*	8 (18.2)	6 (14.0)
-2SD < X < 1SD *(normal)*	31 (70.5)	30 (69.8)
1 SD < X < 2D *(at-risk of overweight)*	3 (6.8)	2 (4.6)
> 2SD *(overweight)*	2 (4.5)	5 (11.6)

Correlates of nutritional status

There was no significant correlation between growth status with any of the socio-demographic characteristic (Table 5). Table 6 shows that higher frequency of visits for immunization was significantly associated with WAZ (r=0.27, p<0.05), HAZ (r=0.25, p<0.05) and BMI Z (r=0.24, p<0.05) while common childhood illness score (r=0.24, p<0.05) and dietary diversity score (r=0.23, p<0.05) were significantly associated with HAZ.

Table 5. Correlations[a] between socio-demographic factors and nutritional status

Variables	Weight for age (n=80) r	Height for age (n=87) r	BMI for age (n=87) r
Sex of children	0.15	0.10	0.06
Age of children	-0.07	-0.17	-0.19
Age of caregivers	-0.06	-0.14	-0.05
Years of education	-0.13	-0.06	0.03
Occupation	-0.03	-0.09	0.09
Household size	-0.07	-0.17	0.10
Number of children	-0.09	-0.17	-0.04
Monthly household income	0.13	0.20	0.15
Total years residing in Malaysia	0.06	0.04	0.17

[a] Pearson correlation

Table 6. Correlations[a] between birth weight, immunization, common childhood illness, and dietary diversity with nutritional status

Variables	Weight for age (n=80) r	Height for age (n=87) r	BMI for age (n=87) r
Birth weight	0.19	0.18	0.07
Immunization[b]	0.27*	0.25*	0.24*
Common childhood illness	0.15	0.25*	0.09
Dietary diversity	0.16	0.23*	0.18

[a] Pearson correlation; bSpearman correlation; *p < 0.05

DISCUSSION

Prevention of malnutrition among the refugee populations is one of the strategic objectives of UNHCR [18]. Despite the efforts to address malnutrition, the problem still persists especially among those residing in protracted refugee camps. Among Myanmar refugee children living in Thailand camps, 33.7% were underweight, 36.4% stunted and 8.7% wasted [19]. In another study on 957 Myanmar refugee children residing within camps along the Thailand/Myanmar border, 45.7% were stunted and 64.9% had iron deficiency anemia [10]. Beri-beri, due to thiamine deficiency, was not only reported to be prevalent among the Karen refugees settled in camps along the western border of Thailand but also a major cause of infant mortality in this population [9]. In a cross-sectional survey of refugee adolescents in the North Gaza Strip [11], undernutrition and overnutrition coexisted in that 17.9%, 9.7% and 49.6% of the adolescents were overweight, stunted and anemic, respectively. Poverty, poor sanitation, availability of high energy-dense foods, insufficient micronutrient-dense foods, physical inactivity, food beliefs and cultural practices are important determinants of malnutrition in these refugee populations.

Although the majority of Rohingya children in this study were living in poverty, their living conditions (rented low cost houses, flats and shop houses) were much better than that in the protracted refugee camps. However, due to poverty, the Rohingyas may be at greater risk of household food insecurity as well as living environment associated

with poor sanitation which could adversely affect the health and nutritional status of the children.

In general, the Rohingya children have relatively poor growth status compared to urban Malay primary school children [20] and preschool children from low income households in Kuala Lumpur [21]. The percentages of underweight, stunting and wasting among 6-9 year old Malay children [20] were 14.5 %, 16.7% and 9.2%, respectively. In this present study, 21.9% of Rohingya children aged 6-10 years were underweight, 12.2% stunted and 14.6% thin. Zalilah and Ang [21] reported that among preschoolers enrolled in Taman Sang Kancil preschools of City Hall Kuala Lumpur, 14.6% were underweight, 5.8% stunted and 4.6% wasted. The percentages of underweight, stunting and thinness in Rohingya children below 6 years of age were 17.9%, 7.6% and 12.8%, respectively. We also reported that 12.6% of the Rohingya children were at risk of overweight and overweight. Changes in eating habits and lifestyles associated with urban living could contribute to overweight and obesity in refugee population, not only in children but also in adults. Although the differences in growth attainment of Rohingya and Malay children could be due to different standards and indicators used for growth categorization, the differences could also reflect the social and economic constraints experienced by the Rohingya communities. Rohingya families may hesitate to seek health care services due to reasons such as fear of being detained, lack of access to health care services and high medical costs [8]. As many of the Rohingya adults have low education level or never attended school, they may have difficulty to understand the health information conveyed by health professionals. In addition, there may also be a language barrier that could prevent them from communicating with the health professionals.

Poor growth status of children has been associated with being male child [22, 23], insufficient household income [24, 25], low education level of caregivers [26, 27], large household size and high number of children [28]. In the present study, growth status of the Rohingya children was not significantly associated with any of the socio-demographic factors. Small sample size as well as homogeneity of sample socio-demographic characteristics could contribute to these non-significant findings.

We showed that Rohingya children with higher immunization score had better growth status. Complete immunization during childhood will reduce children's risk of getting common childhood infections. Sickness in children is always associated with loss of appetite and reduced food intakes which could lead to significant weight loss. Studies showed that children who had recent fever or diarrhea were more likely to be underweight and that children with complete immunization before age 12 months were less likely to be underweight [29, 30]. In addition, frequent and repeated infections in children which could be prevented by childhood immunization could adversely impact long term growth i.e stunting [24, 30].

Positive relationship between dietary diversity and child nutritional status has been consistently shown in many studies. In contemporary African communities, dietary diversity score was consistently and positively associated with various nutritional indicators (height-for- age, weight-for-age, weight-for-height, mid-upper arm circumference and triceps skinfold) of children aged 12 – 36 months [31]. Arimond and Ruel [32] reported that among children aged 6 - 23 months, dietary diversity was significantly correlated with children's height-for-age z scores, independent of socioeconomic status. In older children, several studies have also documented that diversity in children's diets reduced their risks of underweight and stunting [33, 34]. In a recent study among Orang Asli communities in Selangor [35], children with varied diets were more likely to have higher energy intake and less likely to be underweight.

This study is not without its limitations. As the categorization of immunization status of children and the scoring of common childhood illnesses were not validated prior to the study, these measurement approaches might not be accurate to reflect the actual health conditions of the children. Nevertheless, the significant correlations between nutritional status with immunization status and childhood illnesses observed in this study provided some support to the validity of these measurement approaches. The small sample size and the use of purposive sampling in this study could limit the generalization of the study findings to the Rohingya population in this country. Finally, there might be errors or biases related to recall information. Despite these limitations, this study is the first to report on health and nutritional status of the Rohingya children in Malaysia.

CONCLUSION

Our study showed that the nutritional status of Rohingya children was associated with immunization status, dietary diversity and childhood illnesses. Children with better immunization record, had variety of foods in the diets and were less frequently sick, were more likely to have better nutritional status. Refugee population in Malaysia may hesitate to seek health care services due to fear of being detained, unaffordable health care costs, language and cultural barriers, lack of transportation as well as discrimination by health personnel. In addition, having no permanent jobs and low or no education may further constraint the refugees in their health seeking behaviors and understanding of health and nutrition information. These barriers could put the refugees, especially women and children at greater risks of health and nutritional problems. To improve health and nutrition of refugee population in Malaysia, there should be concerted efforts by various parties to ensure that the refugees have access to free education, affordable health care services as well as employment opportunities.

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