Nutritional Status and Infant and Young Child Feeding (IYCF) Practices among Buhid Mangyan Tribe, Occidental Mindoro Philippines

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Abstract: Nutritionally adequate and safe complementary feeding starting from the age of 6 months up to 59 months is one of the effective intervention to reduce infant and child morbidity and malnutrition. This study aims to determine the nutritional status of children ages 6-59 months and their caregiver's infant and young child feeding (IYCF) practices of the Buhid community in Rizal, Occidental Mindoro.

The design used in this study was a descriptive cross-sectional carried out between December 2016-February 2017. A survey questionnaire was utilized as an instrument in this study. It includes an anthropometric survey of 6-59 months old and infant and young child feeding practices using WHO and UNICEF IYCF indicators. Vaccination, vitamin A supplementation and deworming coverage were also measured.

Findings revealed a prevalence of global acute malnutrition (GAM) at a critical level. There is a low but significant prevalence of stunting and underweight among children. There is a good infant and young feeding practice in the community except for the minimum acceptable diet during complementary feeding. Lastly, there is low BCG and measles vaccination coverage in the community that could be a threat to the impending disease outbreak.

Keywords: IYCF, nutritional status, global acute malnutrition, Buhid, marasmus, vaccination coverage.

INTRODUCTION

WHO and UNICEF adopted the global strategy for IYCF in 2002 to refocus attention on the impact of feeding practices on nutritional status, growth and development, health and survival [1]. WHO and UNICEF's recommendations for optimal infant feeding are exclusive breastfeeding for the first 180 days (6 months) an infant receives only breast milk from his or her mother or a wet nurse, or expressed milk and no other liquids or solids, not even water, with the exception of oral rehydration solutions, drops or syrups consisting of vitamins, mineral supplement or medicine [2,3]. Nutritionally adequate and safe complementary feeding starting from the age of 6 months with continued breastfeeding up to 2 years of age or beyond-when breast milk is no longer sufficient to meet the nutritional requirement of infants, other foods and liquids are needed, along with breast milk. The target range is generally taken to be six months to 23 months of age [4]. Universal access to infant and young child feeding (IYCF) practices, particularly optimal breastfeeding practices, as one of the most effective interventions to reduce infant and young child mortality, morbidity and malnutrition have gained increased recognition in recent years [5].

Nutritional status was defined as the condition of health of a person that is influenced by the intake and utilization of nutrients. When there is a lack or excess intake of one or more nutrients and/or faulty utilization of nutrients in our body, it leads to the state of imbalance in the body. This condition is known as malnutrition. Underweight, stunting, wasting and overweight are used to measure nutritional imbalance resulting in undernutrition and overnutrition. Child growth is internationally recognized as an important indicator of nutritional status and health in populations. The percentage of children with a low height for age or stunting reflects the cumulative effects of undernutrition and infections since and even before birth. This measure can, therefore, be interpreted as an indication of poor environmental conditions or long-term restriction of a child's growth potential. The percentage of children who have low weight for age or underweight can reflect wasting (i.e. low weight for height), indicating acute weight loss, stunting, or both [6].

Globally, poor breastfeeding and complementary feeding practices are still widespread. Worldwide, it is estimated that only 34.8% of infants are exclusively breastfed for the first six months in life. The Philippines ranks 9th among countries with the highest number of stunted children, and there is modest progress on stunting [7]. Stunting prevalence remains high, considering 33.4% of children under-5 years old nationwide in 2015, showing no substantial progress

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since the early 2000s. Furthermore, three regions in the country considered with the highest prevalence of stunting are ARMM, Eastern Visayas and MIMAROPA especially in rural areas (38.1%) and in the lowest (poorest) quintile (49.2%). Government-led nutrition initiatives do not meet expected results, and the situation is being given more considerable attention [8]. Food security for infants and young children is not yet perceived as a major problem in most high-income countries. However, studies of the short- and long-term health risks of inadequate breastfeeding indicate that breast milk substitutes fail to meet the objectives of the Rome Declaration on World Food Security as "sufficient, safe and nutritious food that meets dietary needs and food preferences for an active and healthy life". A high rate of breastfeeding is a marker of the cultural appropriateness and utilization of food for infants and young children, as well as its supply. Yet without the social, legal and economic rights that protect breastfeeding, infants do not have a secure supply of food [9]. The feeding environment of young children may be a risk factor contributing to childhood malnutrition. More importantly, a study indicated that decline in the quality of children's diets starts from around one year of age and continues throughout childhood, adolescence and into young adult [10]. Ensuring the nourishment for IYCF is having food criteria such as food availability, access to food, utilization of food and stability/sustainability to obtain food security. Children who have received good nutrition in the first year of life gets better health as he/she gets older; good nutrition among children has good outcome not only the health status but also to the national health and productivity. Food security for infants and young children emphasizes the relationships between the supply, availability and affordability of all infant foods and recognizes the work of breastfeeding women as food producers. A food security framework includes food utilization and efficiency that will be critical for the world's future capacity to feed infants and young children optimally. New ways of conceiving systems of governance are required to manage the emerging challenges from resource limitations and a less-regulated, globalized trade environment for infant foods [9,11].

The six tribes of Mangyan in Occidental Mindoro are living below the poverty threshold and generally are lacking in basic educational, nutritional and health care support. The Mangyans may experience almost similar difficulty in securing food at the household level. However, due to cultural variation status of food insecurity and coping mechanism employed may vary across tribes [12]. In relevance to the Sustainable Development Goals by 2030 specifically for SDG 2: end hunger, achieves food security and improved nutrition, and promote sustainable agriculture; and SDG 3: Ensure healthy lives and promote well-being for all at all ages [13].

This study aims to determine the nutritional status of children ages 6-59 months and their caregiver's infant and young child feeding (IYCF) practices of the Buhid community in Rizal, Occidental Mindoro.

METHODS

The study was conducted in Sitio Bato Singit in Barangay Manoot, Municipality of Rizal.

The study design used was descriptive cross-sectional carried out last December 2016 – February 2017. The 6-59 month children are included as the sample of the study and enrolled through purposive sampling during Operation Timbang of the Barangay Health Station of Manoot. The respondents of IYCF practices were:

1.   mother of a child;

2.   father of a child; or

3.   caregiver of a child.

Instrument

A survey questionnaire was utilized as an instrument in this study. The questionnaires consist of 2 sections: The first section involves the anthropometric survey of 6-59 months old. The anthropometric questionnaire also includes an introduction and consent statement, questions on selected household characteristics like access to health and nutrition programs and services such as consultation, vitamin A supplementation, deworming, childhood vaccination. Anthropometric measurement gathered was height, weight and mid-upper arm circumference (MUAC) and bilateral oedema.

MUAC measurement was taken from children 6-59 months old using MUAC tapes for children. MUAC was measured on the left arm of the children. In getting the MUAC, the midpoint of the left arm must first be identified by bending the arm at 90 degrees and then locating the tip of the shoulder blade and tip of the elbow. The midpoint then lightly marked with a pen,

then the arm was put to a relaxed position. The MUAC tape then carefully position around the arm, making sure that it is not too tight or too loose. MUAC measurements of children were recorded in millimetres.

The presence of bilateral edema was determined among children 6-59 months old. Using the thumb finger of both hands, light pressure applied to both feet for three seconds. Edema is present if an imprint on both feet were left for a few seconds on the part of the foot where pressure was applied. If edema is detected, it was recorded in the questionnaire with a "yes" for the presence of edema or a "no" for none.

The second part of the instrument will consist of IYCF contained questions adopted from UNICEF [14] and USAID [15] on breastfeeding and complementary feeding and consumption of certain food items. This information was asked one questionnaire per child for every respondent. Furthermore, the questionnaire was administered to the mother of the child or the main caregiver who is responsible for child feeding.

Data Analysis

For the analysis of data, the continuous demographic variables of the respondents were determined using means and standard deviations. The categorical demographic variables will be analyzed using the frequencies and percentage breakdown. Furthermore, the anthropometric data will be analyzed using the latest version of the Emergency Nutrition Assessment (ENA) 2011 [16]. The ENA software calculates the Z-scores for weight-for-height (WH), height-for-age (HA) and weight-for-age (WA). Using Z-scores about the WHO Child Growth Standards, the following cut-offs were used to determine the prevalence of wasting, stunting and underweight [17].

To analyze the infant and young child feeding practice in the community, the following indicators were calculated:

1. Proportion of infants 6-9 months who received breastmilk and a solid or semi-solid food. Solid and semi-solid foods are defined as mushy or solid foods, not fluids.

2. Proportion of infants 6-8 months who receive solid, semi-solid or soft foods

3. Proportion of children 12-15 months old who are fed breastmilk

4. Proportion of children 6-23 months who receive foods from 4 or more food groups

5. Proportion of breastfed and non-breastfed children 6-23 months who receive solid, semi-solid or soft foods (but also including milk feeds for non-breastfed children) the minimum number of times or more

6. Proportion of children 6-23 months of age who receive a minimum acceptable diet (apart from breastmilk)

7. Proportion of children 6-23 months old who receive an iron-rich food or iron-fortified food that is specially designed for infants and young children or that is fortified in the home.

Table 1: Cut-Off Points for the Definition of Global, Moderate, and Severe Acute Malnutrition using WHZ and MUAC

Classification of Acute Malnutrition	Weight-for-Height Z-Scores	MUAC cutoff
Global	< -2 and/or bilateral edema	<12.5 cm and/or edema
Moderate	< -2 SD and > -3 SD, no edema	<12.5 cm and >11.5 cm
Severe	< -3 SD and/or bilateral edema	<11.5 cm and/or edema

Table 2: Cut-Off Points for the Definition of Stunting and Underweight using HAZ and WAZ.

Height-for-Age		Weight-for-Age	
Classification	Z score	Classification	Z score
Stunted	< -2 SD	Underweight	< -2 SD
Moderately Stunted	< -2 SD and > -3 SD	Moderately Underweight	< -2 SD and > -3 SD
Severely Stunted	< -3 SD	Severely Underweight	< -3 SD

Table 3:   Profile of the Children 6-59 Months

Age (months)	Boys		Girls		Total	
	n	%	n	%	n	%
6-17	8	57.1	6	42.9	14	26.4
18-29	11	50.0	11	50.0	22	41.5
30-41	7	58.3	5	41.7	12	22.6
42-53	0	0.0	1	100.0	1	1.9
54-59	3	75.0	1	25.0	4	7.5
Total	29	54.7	24	45.3	53	100.0

Ratio (Boy: Girl) 1.2.
Mean ± SD 25.7 ± 13.21.

RESULTS

A total of 53 children ages 6-59 months were included in the study as shown in Table **3**. The mean age is 25.7 (SD = 13.21), which means they are toddlers.

Table **4** revealed the prevalence of 17% acute malnutrition (based on weight-for-height z-scores) among Buhid Mangyan, which considered critical based on the WHO classification system using rates of Global Acute Malnutrition (GAM). In contrast, using the MUAC cutoff score, it revealed a low prevalence of global malnutrition of 3.8%. Moreover, the results also showed 15.1% of moderate malnutrition among the sample that can be due to a low weight-for-height (wasting) or a low height-for-age (stunting) or to a combination of both. Based on the figures, both boys

and girls are affected by malnutrition. Based on the result of the study (shown in Table **5**), it reveals that more than half of the children in the community are stunted.

As shown in Table **6**, the core indicator of IYCF revealed progressing IYCF practices as compared to the National Nutrition Survey such as introduction of solid, semi-solid or soft foods (100%), continued breastfeeding (100%), minimum dietary diversity (86.7%), minimum meal frequency for non-breastfed (100%), minimum acceptable diet for breastfed (75%) and consumption of iron-rich or iron-fortified foods (76.7%). Furthermore, the minimum acceptable diet was very low practised in the Buhid community and not observed for most of the non-breastfed children ages 6-23 months. It is mostly due to non-breastfed children ages 6-23 months only eat 3 meals and lower in a day.

Table 4:   Prevalence of Acute Malnutrition by Sex

Classification	All n = 53	Boys n = 29	Girls n = 24
Based on weight-for-height z-scores (and/or edema)			
Prevalence of global malnutrition (<-2 z-score and/or edema)	(9) 17.0 % (9.2 - 29.2 95% C.I.)	(5) 17.2 % (7.6 - 34.5 95% C.I.)	(4) 16.7 % (6.7 - 35.9 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no edema)	(8) 15.1 % (7.9 - 27.1 95% C.I.)	(4) 13.8 % (5.5 - 30.6 95% C.I.)	(4) 16.7 % (6.7 - 35.9 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or edema)	(1) 1.9 % (0.3 - 9.9 95% C.I.)	(1) 3.4 % (0.6 - 17.2 95% C.I.)	(0) 0.0 % (0.0 - 13.8 95% C.I.)
Based on MUAC cut off's (and/or edema)			
Prevalence of global malnutrition (< 125 mm and/or edema)	(2) 3.8 % (1.0 - 12.8 95% C.I.)	(0) 0.0 % (0.0 - 11.7 95% C.I.)	(2) 8.3 % (2.3 - 25.8 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no edema)	(2) 3.8 % (1.0 - 12.8 95% C.I.)	(0) 0.0 % (0.0 - 11.7 95% C.I.)	(2) 8.3 % (2.3 - 25.8 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or edema)	(0) 0.0 % (0.0 - 6.8 95% C.I.)	(0) 0.0 % (0.0 - 11.7 95% C.I.)	(0) 0.0 % (0.0 - 13.8 95% C.I.)

The prevalence of edema is 0.0 %.

Table 5:   Prevalence of Stunting and Underweight

	n	Percentage (%)	Confidence Interval
Based on height-for-age z-scores (n=51)*			
Prevalence of stunting (<-2 z-score)	28	54.9	41.4 - 67.7
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	10	19.6	11.0 - 32.5
Prevalence of severe stunting (<-3 z-score)	18	35.3	23.6 - 49.0
Based on weight-for-age z-scores (n= 53)			
Prevalence of underweight (<-2 z-score)	20	37.7	25.9 - 51.2
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	12	22.6	13.5 - 35.5
Prevalence of severe underweight (<-3 z-score)	8	15.1	7.9 - 27.1

The prevalence of edema is 0.0 %.
*height-for-age z-scores out of range excluded in the analysis.

Table 6:   Infant and Young Child Feeding (IYCF) Indicators in Sitio Bato Singit

Indicators	Proportion	
	Current Study	**Nutrition Survey (FNRI, 2016)**
Timely complementary feeding	67.7	80.5
Introduction of solid, semi-solid or soft foods	100	65.3
Continued breastfeeding	100	48.4
Minimum dietary diversity	86.7	15.5
Minimum meal frequency		
Breastfed	85.7	99.0
Non-Breastfed	100	88.2
Minimum acceptable diet		
Breastfed	75	5.0
Non-Breastfed	0.0	8.1
Consumption of iron-rich or iron-fortified foods	76.7	40.1

As shown in Table **7**, vaccination coverage was very low among 59 and below Buhid community children. There was a low coverage of BCG vaccine (37.7%).

Table 7:   Coverage of Vaccination, Vitamin A and Deworming

Indicators	Percentage
BCG (for 0-59 months) n=53	37.7%
Measles (for 9-59 months) n= 52*	48.1%
Vitamin A (for 6-59 months) n = 53	81.1%
Deworming (for 6-59 months) n=53	81.1%

* total sample of eligible target for measles vaccination.

DISCUSSION

Malnutrition refers to deficiencies, excesses or imbalances in a person's intake of energy and/or nutrients [18]. Malnutrition commonly affects all groups in a community, but infants and young children are the most vulnerable because of their high nutritional requirements for growth and development.

Childhood Global Acute Malnutrition (GAM) is a sum of moderate acute malnutrition (MAM) and severe acute malnutrition (SAM) which commonly exists in 8% of the childhood population in developing countries [19]. Maternal knowledge of nutrition sought to be related to SAM and MAM. Many studies have shown

that there is an increase in SAM incidence with maternal and paternal illiteracy. Furthermore, some factors also increase the chance of global acute malnutrition such as hygiene measures, feeding habits, immunization, seeking treatment at the right time [20].

Statistical theory shows that in a well-nourished population, only 0.13% of children will have a weight-for-height less than -3 SD, giving a specificity of more than 99% for this cut-off. Stunted growth reflects a process of failure to reach linear growth potential as a result of suboptimal health and/or nutritional conditions. High levels of stunting are associated with poor socioeconomic conditions and increased risk of frequent and early exposure to adverse conditions such as illness and/or inappropriate feeding practices [21]. Based on the MUAC cut off, acute malnutrition was only observed among girls (8.3% of the total population). Global acute malnutrition was more concentrated among countries with high gender inequality compared to those with lower gender inequality [22].

The study revealed reveals that more than half of the children in the community are stunted as compared to the stunting rate in national level (33%) and MIMAROPA region (40%) [23]. Stunting is mainly due to inequality of access to nutritious food, a long period of hunger, and a lack of nutrition during the first 1,000 days of life.

In another analysis, comparing the weight and the age, it shows the prevalence of 37.7% underweight among children. Based on the WHO, underweight refers to a composite form of undernutrition that includes elements of stunting and wasting. It is defined as the percentage of children aged 0-59 months whose weight for age is below minus two standard deviations minus three standard deviations (severe underweight) from the median of the WHO Child Growth Standards [21]. However, in the absence of significant wasting in a community, similar information is provided by weight-for-age and height-for-age, both reflect the long-term health and nutritional experience of the individual or population. The result of the current study on the prevalence of underweight is far worst the national rate (19.9%) and in MIMAROPA (27.5%) [23].

In addition, it was revealed an existing case of marasmus (1.9 %) in the community. Marasmus is a type of starvation that occurs at any age; it is due the child is getting enough energy and protein from his regular diet to meet his nutritional needs [24,25]. It also found out that protein-energy malnutrition (PEM) was more found in the families of low socioeconomic status, feeding practices, lower education level of the mother and number of children in the family [26]. A paper highlighted that stunting is a better goal than underweight. It is an excellent measure of the health, diet and care provided to children during the 1000 days from conception to age two. Although it is not quite as predictive of mortality as underweight, it is much more predictive of economic outcomes [27].

The study indicated that the core indicator of IYCF revealed progressing IYCF practices as compared to the National Nutrition Survey such as introduction of solid, semi-solid or soft foods (100%), continued breastfeeding (100%), minimum dietary diversity (86.7%), minimum meal frequency for non-breastfed (100%), minimum acceptable diet for breastfed (75%) and consumption of iron-rich or iron-fortified foods (76.7%). The proportion of timely introduction of complementary feeding among Buhid children was lower compared to the national score. Most of the caregivers of the children in the community did not start complementary feeding in time in this study. Infants were given complimentary feeding early (<6 months). A study revealed that the proportion of complementary feeding started at six months was lower in a low-income community. Introduction of complementary feeding at six months of age is very crucial for proper preventing malnutrition in infants [28].

The result shows that vaccination coverage was very low among 59 and below Buhid community children. There was a low coverage of BCG vaccine (37.7%) that was far below the national coverage of 80% [21]. BCG vaccination gives protection against Mycobacterium that could cause tuberculosis, leprosy and meningitis. The measles vaccination coverage (48.1%) was also lower compared to the 99% national threshold. Based on another findings, meeting vaccination coverage is important to prevent the impending outbreak of the disease. Incomplete immunization can put children at greater risk of acquiring an ailment. The percentage of children showing severe forms of infection was significantly lower in the vaccinated children compared to the number of unvaccinated children suffering from severe forms of the disease. Measles immunization campaigns can serve to rapidly increase demand for measles immunization while targeting hard-to-reach people with additional interventions capable of reducing mortality in children under five years old [29]. Deworming and Vitamin A coverage was high in the community. This is

because of the bi-annual program of the health department.

CONCLUSIONS

The following are the conclusions based on the findings of the study:

The majority of the sample are toddlers, and there is an acceptable sex ratio in the community. Global acute malnutrition is critically prevalent in Buhid community of Sitio Bato Singit. If quantifying the prevalence using MUAC cutoff, global malnutrition is prevalent among girls. Furthermore stunting and underweight was significantly prevalent in the Buhid community of Sitio Bato Singit. Marasmus also occurs in the community. Infant and young child feeding indicators are being practised in the community except to minimum acceptable diet on non-breastfed children. There are low BCG and measles vaccination coverage in the community, which could lead to an impending outbreak of disease. With this, the study recommends that since most of the children in the community were toddlers, encouragement and engagement of the caregivers on feeding should also be sought for research. Another, implementation of both development programs that focus on the prevention of underweight and stunting and emergency programs that focuses on the prevention and treatment of acute malnutrition. There is also a need to integrate different nutrition programs into an acceptable and accessible strategy to combat global acute malnutrition, to stunt and to waste incidences, especially when implementing complementary and therapeutic nutrition packages. Lastly, it is important to intensify education and social, behavioural modification strategies on the importance of access to vaccines.

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