

Prevalence Of Wasting Amongst Under-Five Children In Hayin-Mai Community In Giwa Local Government Area Of Kaduna State

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Abstract: The high mortality rate among under-five is considerably the highest. Prevalence of wasting among under-five in Hyin-mai community in Giwa local government area, Kaduna state. House listing was carried out to ensure adequate coverage of the community. The survey was carried out using systematic random sampling technique and thirty eight (38) children were used for the survey based on probability proportional to size. A total of thirteen (13) housing units, fifteen (15) households and fifty (50) eligible children were recorded. Collected data was analysed using Emergency Nutrition Assessment (ENA) software. Malnutrition by sex, age, oedema and the use of MUAC tape were based on Weight-for-Height Z-score (WHZ) respectively. 2.6% overall moderate wasting was observed for boys and girls, 4.8% of girls wasted and no boy was wasted. 44.70% of the children were within the WHO range while 18.40% were overweight and 10.50% were obese. Children between 42-53 months were moderately wasted at 12.50% while 6-17, 18-29 and 30-41 months were moderately wasted at 75%, 60% and 60% respectively which is at WHO range (>+1SD). Nutritional intervention is needed in this community to further reduce malnutrition in children and nutrition education should be given to care givers.

I. INTRODUCTION

The mortality rate among under-five children is considerably higher than for any other group. It is particularly high during food insecurity, diseases or during emergency situation. The Synergy of high prevalence of malnutrition and increase incidence of communicable diseases can place a population in a state of jeopardy. Growth and development of children are determined by the quality of food they eat. Balanced and adequate diets are required for proper cell functioning, rapid growth, development of good immune system and normal brain functions in humans, especially children because they are the most vulnerable group. To achieve the Millennium Development Goals (MDG) for child survival and the prevention of malnutrition, adequate nutrition and health during the first several years of life is fundamental (Behrman *et al.*, 2006).

Malnutrition is responsible for most problems faced by under-five children in developing countries and can be defined as the insufficient, excessive or imbalanced consumption of nutrients. The term malnutrition therefore,

refers to both under-nutrition and over-nutrition. Under-nutrition is the outcome of inadequate intake of nutrients. The effects of under-nutrition include; low weight for one's age (underweight), low height for one's age (stunting), low weight for one's height (wasting), and deficiency in vitamins and minerals (hidden hunger) (UNICEF, 2006). The effects of malnutrition on human performance, health, and survival have been the subject of extensive research for several decades and studies show that malnutrition affects physical growth, cognitive development, reproduction, and physical work capacity. It also leads to morbidity and mortality (Velleman, 2013). Malnutrition is responsible for at least 35% of under-5 deaths (WHO, 2006).

Wasting (acute malnutrition) is defined as weight-for-height with Z-score below minus two standard deviations from the median weight-for-height of the standard reference population. Under-nutrition is the common form of malnutrition in developing world and it may exist if a person consumes a poor diet. According to the World Health Organization, malnutrition is a threat to global public health.

The nutritional status of women is vital for the health of her unborn child. Women's nutrition is used as a proxy indicator of household food security. Malnutrition, therefore contributes to more than half of all under-five childhood deaths throughout the developing world. The associated effects of poverty, inadequate household access to food, infectious disease, and inadequate breastfeeding and complementary feeding practices often lead to illness, growth faltering, nutrient deficiencies, delayed development, and death, particularly during the first two years of life. (UNICEF, 2012). There is a universal consensus on the importance of infant and young child feeding as a key determinant of child nutrition. Maternal and child health nutrition (MCHN) programs also commonly include activities to address infant and young child feeding (WHO, 2003).

Hence, to measure nutritional status of individuals, the use of nutritional anthropometric indicators is suitable because it provides information on the nutritional status of children and can also be used as an indirect measure of the quality of life of the entire community or population.

STATEMENT OF THE PROBLEM

Nigeria was ranked 8th in the world for under-five mortality (WHO, 2003). Under-five malnutrition is still a major problem in many developing countries. Although exclusive breastfeeding from birth to six months of age and complimentary practices to twenty four months of age has been recommended by UNICEF for optimal survival and growth but only 17% of infants less than six months of age are exclusively breastfed (Behrman *et al.*, 2006). The poor breastfeeding and inadequate complementary feeding explains the protein energy malnutrition level in children as they grow older.

Malnutrition is still high in Nigeria with stunting at 37%, underweight at 29% and wasting at 18% (NDHS, 2013). The nation has a national data on malnutrition but has limited data of the prevalence rate of malnutrition in cities and communities, specifically Hayin-Mai community.

JUSTIFICATION OF STUDY

Children who are wasted have lower resistance to infection and are more likely not to celebrate their fifth birthday (WHO, 2012). This study will provide data that can be used for prompt intervention where necessary to help prevent malnutrition.

AIM

The survey was carried out to assess nutritional status of under-five children in Hayin- Mai, Giwa Local Government Area of Kaduna State.

SPECIFIC OBJECTIVES

- ✓ To assess the weight and height of under-five children in Hayin-Mai community.
- ✓ To determine the mid-upper arm circumference (MUAC) of under-five children in Hayin-Mai community.

- ✓ To check for the presence of oedema in under-five children in Hayin-Mai community.

II. LITERATURE REVIEW

A. DEFINITION OF NUTRITION

Nutrition focuses on the role of nutrients, which are defined as substances that the body cannot make on its own and include things like carbohydrates, proteins, fats and oils, vitamins, minerals and water. Basically nutrition consists of food we take in and how they are used up in the body, which is metabolism (Marie R, 2008).

B. IMPORTANCE OF NUTRITION IN CHILDREN

The early years are very important for laying the foundations of good nutrition. The nutritional deficiencies created at this stage may result in diminished cognitive skills and lifelong eating patterns that may cause disorder later in life leading to obesity (Manary, 2008). Nutrition is important for everyone, but it is especially important for children because it is directly linked to all aspect of their growth and development. Good nutrition also helps promote a better quality of life. A well nourished child will be more active and enjoy high level of health. There is a universal consensus on the importance of infant and young child feeding as a key determinant of child nutrition. Maternal and child health nutrition (MCHN) programs also commonly include activities to address infant and young child feeding. Appropriate feeding practices are complex and age-specific, and the need for improved indicators to better assess infant and young child feeding (IYCF) is widely recognized (WHO, 2006)

C. WHAT IS MALNUTRITION?

Malnutrition, on the other hand, is a dangerous condition that develops when the body does not get enough nutrients to function properly. It can be caused by lack of food, an unbalanced diet or insufficient nutrients. It can also be described as a situation resulting from not eating enough food, eating too much food or not absorbing the right amount of nutrients that is able to sustain health. The World Bank says that malnutrition affects about 792 million people worldwide, of which a one-third of them are children. Childhood hunger affects one out of every four children in United States, with as many as 17 million children at risk of malnutrition (WHO, 2003). The malnutrition of children (0-59 months) is a public health concern in Africa, particularly in Sahelian countries. In spite of better agro climatic conditions and agricultural production in many Sahelian countries, the nutritional status of children under-five continues to deteriorate (Maria *et al.*, 2014).

D. FORMS OF MALNUTRITION

Malnutrition takes different forms in children; it can be in form of stunting, wasting, marasmus, kwashiorkor, underweight or overweight. Wasting is one of the main short

term effects of malnutrition in children. This condition can hinder a child's ability to grow normally, leaving both his height and his weight below normal when compared with children of the same age within the same environment. Wasting is not permanent and a child may achieve normal or acceptable range body weight if he is well nourished. This form of malnutrition can adversely hinder brain development and intellectual capacity in early stages of life. Marasmus is a severe protein deficiency that can develop as result of malnutrition. It is characterized by a lack of nearly all nutrients, particularly protein and calories. Marasmus is characterized by severe weight loss, thin and papery skin that is sometimes darker than normal, pronounced hair loss, a pinched facial expression and long periods of apathy. Kwashiorkor, which is another form of malnutrition, is an acute type of protein-energy deficiency that is common in children who are malnourished. It differs from marasmus in that calorie intake can be sufficient, but protein intake is severely restricted. Symptoms of kwashiorkor include; discolored brittle hair that has a copper sheen, rashes, water retention, a distended belly caused by bloating, an enlarged liver and apathy. If left untreated, this condition can lead to coma and eventually death. Overweight and Obesity are other forms of malnutrition commonly found in developed countries. This occurs when a person consumes more than the recommended amount of certain nutrients. People who consume more calorie than their body use each day are at a high risk of gaining weight and developing weight related problems such as heart disease, type 2 diabetes, certain cancer and greater risk of infections.

E. WHAT IS WASTING?

Wasting, also known as wasting syndrome, refers to the process by which a debilitating disease causes muscle and fat tissue to "waste" away. Wasting is sometimes referred to as "acute malnutrition" because it is believed that episodes of wasting have a short duration, in contrast to stunting, which is regarded as chronic malnutrition. According to the latest UN estimates, an estimated 52 million children under 5 years of age, or 8%, were wasted in 2011. The vast majority, about 70%, of the world's wasted children live in Asia, most in South-Central Asia.

Wasting or thinness indicates in most cases a recent and severe process of weight loss, which is often associated with acute starvation and/or severe disease. However, wasting may also be the result of a chronic unfavourable condition. Provided there is no severe food shortage, the prevalence of wasting is usually below 5%, even in poor countries. The Indian subcontinent, where higher prevalences are found, is an important exception. A prevalence exceeding 5% is alarming given a parallel increase in mortality that soon becomes apparent. On the severity index, prevalences between 10-14% are regarded as serious, and above or equal 15% as critical. Typically, the prevalence of low weight-for-height shows a peak in the second year of life. Lack of evidence of wasting in a population does not imply the absence of current nutritional problems: stunting and other deficits may be present.

The WHO Global Database on Child Growth and Malnutrition uses a Z-score cut-off point of <-2 SD to classify

low weight-for-age, low height-for-age and low weight-for-height as moderate undernutrition, and <-3 SD to define severe under nutrition. The cut-off point of >+2 SD classifies high weight-for-height as overweight in children.

CAUSES OF WASTING

Wasting can be caused by an extreme low energy intake, nutrient losses due to infection, or a combination of low intake and high loss. Infections and conditions associated with wasting include tuberculosis, chronic diarrhea and AIDS. Caretakers and health providers can sometimes contribute to wasting if the patient is placed on an improper diet. Voluntary weight loss and eating disorders are excluded as causes of wasting. Other causes are;

- ✓ Feeding Practices: Lack of exclusive breastfeeding, inadequate complementary child feeding and a general lack of vital nutrients are major causes of wasting amongst under-five children. Children need to be fed diets which meet the minimum requirements in terms of frequency and diversity in order to prevent undernutrition.
- ✓ Sanitation: Research on a global level has found that the proportion of wasting is closely linked with water, sanitation and hygiene (WASH).

F. INDICATORS OF NUTRITIONAL STATUS

- ✓ Children: Weight-for-height (WFH) serves as an indicator for checking nutritional status. In infants under 24 months, recumbent (supine) length is used. WFH as % of median reference value is calculated this way:

$$WFH = \frac{\text{weight of a given child}}{\text{median weight for a given child of that height}} \times 100$$

Cutoff points may vary, but <80% (close to -2 Z-score) is often used.

- ✓ Adults:
 - Body Mass Index (BMI) is the quotient between weight and height squared (kg/m^2). An individual with a BMI < 18.5 is regarded as a case of wasting.
 - Percent of body weight lost (an unintentional loss of 6% or more in 6 months is regarded as wasting).

III. METHODOLOGY

A. STUDY AREA

The field work was carried out at Hayin-Mai community in Giwa Local Government Area of Kaduna state. Giwa Local Government Area is about 3,350 km^2 and lies between 11 $^{\circ}$ 00' - 11 $^{\circ}$ 30'N and 7 $^{\circ}$ 00' - 7 $^{\circ}$ 45' E. It is located in north west of Zaria in Kaduna state (Ajala *et al.*, 2007).

B. STUDY POPULATION

Children under-five residing in Hayin-Mai community.

C. SAMPLE SIZE

The sample size was calculated using the following formula:

$$n = z^2 \times p (1-p) / d^2$$

Where; n = Required sample size

Z = Confidence level at 95 % (1.96)

P = Prevalence

d = Margin of error at 5% (0.05)

D. SAMPLING PROCEEDURE

House listing was carried out to ensure adequate coverage of the community. The survey was then carried out using systematic random sampling technique after house-listing and 38 children were used for the survey based on probability proportional to size. A total of 13 housing units, 15 households and 50 eligible children were recorded.

E. INCLUSION CRITERIA

Children between ages 0-59 months were included for the study.

F. EXCLUSION CRITERIA

Physically challenged children and those above 59 months of age were excluded from the study.

G. STATISTICAL ANALYSIS

The collected data was analysed using Emergency Nutrition Assessment (ENA) software.

H. ETHICAL CONSIDERATION

The consent of the district and community head of Hayin Mai was consulted by Nutrition Postgraduate Coordinator through the Head of Department of Biochemistry, Ahmadu Bello University Zaria, Kaduna State.

I. MATERIALS

- ✓ Height measuring board
- ✓ Seca digital scale
- ✓ Heightometer
- ✓ MUAC (Mid Upper Arm Circumference) tape
- ✓ Writing materials
- ✓ Anthropometric forms

IV. RESULTS

A. PREVALENCE OF ACUTE MALNUTRITION BY SEX BASED ON WEIGHT-FOR-LENGTH/HEIGHT Z-SCORES (WHZ) AMONGST CHILDREN IN HAYIN-MAI, GIWA LGA, KADUNA STATE

Table 4.1 and Table 4.1.1 showed the prevalence of acute malnutrition by sex in the community. About 2.6% overall

moderate wasting was observed for both boys and girls with 4.8% of girls wasted while none of the boys was wasted. 44.70% of the children were within the World Health Organization (WHO) acceptable range (>+1SD) while 18.40% were overweight and 10.50% were Obese.

| Gender Number | Weight for Length/Height Distribution (WHZ %) | | |
|---------------|---|--------------------------|--------------------------|
| | Severe Wasting (<-3SD) | Moderate Wasting (<-2SD) | Acceptable range (>+1SD) |
| Girls 21 | 0.00 | 4.80 | 42.90 |
| Boys 17 | 0.00 | 0.00 | 47.10 |
| Overall 38 | 0.00 | 2.60 | 44.70 |

(<-3SD), (<-2SD), and (>+1SD) represents severe wasting, moderate wasting and acceptable range based on WHO reference standard respectively.

Table 4.1: Prevalence of acute malnutrition by gender based on weight-for-length/height z-scores (WHZ) in Hayin-Mai, Giwa LGA, Kaduna state

| Gender | Number | Weight for length/height Distribution(WHZ%) | | |
|---------|--------|---|--------------------|---------------|
| | | Acceptable range (>+1SD) | Overweight (>+2SD) | Obese (>+3SD) |
| Girls | 21 | 42.90 | 14.30 | 4.80 |
| Boys | 17 | 47.10 | 23.50 | 17.60 |
| Overall | 38 | 44.70 | 18.40 | 10.50 |

(>+1SD) (>+2SD) and (>+3SD) represents acceptable range, overweight and obesity based on WHO reference standard respectively.

Table 4.1.1: Prevalence of Overweight and obesity by gender based on weight-for-length/height z-scores (WHZ) amongst children in Hayin-Mai, Giwa LGA, Kaduna state

B. PREVALENCE OF ACUTE MALNUTRITION BY AGE BASED ON WEIGHT-FOR-LENGTH/HEIGHT Z-SCORES (WHZ) AMONGST CHILDREN IN HAYIN-MAI, GIWA LGA, KADUNA STATE

Table 4.2 and Table 4.2.2 show the prevalence of acute malnutrition by age. Children 42-53 months of age were observed to be moderately wasted at 12.50% while children from 6-17months, 18-29months, 30-41 months of age were moderately wasted at 75%, 60% and 60% respectively which was within the World Health Organization (WHO) acceptable range (>+1SD).

| Age (months) | Number of children | Weight for Length/Height Distribution (WHZ%) | | |
|--------------|--------------------|--|--------------------------|--------------------------|
| | | Severe Wasting (<-3SD) | Moderate Wasting (<-2SD) | Acceptable range (>+1SD) |
| 6-17 | 12 | 0.00 | 0.00 | 75.00 |
| 18-29 | 5 | 0.00 | 0.00 | 60.00 |
| 30-41 | 5 | 0.00 | 0.00 | 60.00 |
| 42-53 | 8 | 0.00 | 12.50 | 0.00 |
| 54-59 | 3 | 0.00 | 0.00 | 0.00 |

(<-3SD) (<-2SD) and (>+1SD) represents severe wasting, moderate wasting and acceptable range based on WHO reference standard respectively.

Table 4.2: Prevalence of Wasting By Age Based On Weight-For-Length/Height Z Scores (WHZ) Amongst Children In Hayin-Mai, Giwa LGA, Kaduna State

| Age (Months) | Weight for Length/Height Distribution (WHZ%) | | |
|--------------|--|--------------------|---------------|
| | Acceptable range (>+1SD) | Overweight (>+2SD) | Obese (>+3SD) |
| Total number | | | |
| 6-17 | 12 | 75.00 | 33.30 |
| 18-29 | 5 | 60.00 | 0.00 |
| 30-41 | 5 | 60.00 | 60.00 |
| 42-53 | 8 | 0.00 | 0.00 |
| 54-59 | 3 | 0.00 | 0.00 |

(>+3SD) (>+2SD) and (>+1SD) represents obesity, overweight and acceptable range based on WHO reference standard respectively.

Table 4.2.2: Prevalence of overweight and obesity by age based on weight-for-length/height z scores (WHZ) amongst children in Hayin-Mai, Giwa LGA, Kaduna state

C. DISTRIBUTION OF ACUTE MALNUTRITION AND OEDEMA BASED ON WEIGHT-FOR-HEIGHT Z-SCORES (WHZ) AMONGST CHILDREN IN HAYIN-MAI, GIWA LGA, KADUNA STATE

No case of bilateral pitting oedema was observed and no case of severe malnutrition was also observed based on weight-for-height z-scores and the presence/absence of oedema as shown in Table 4.3.

| | WHZ | Number (%) |
|---|-------------|-------------|
| Marasmic (Oedema absent) | <-3 z-score | 0 (0.00) |
| Marasmic kwashiorkor (Oedema present) | <-3 z-score | 0 (0.00) |
| Kwashiorkor (Oedema present) | ≥3 z-score | 0 (0.00) |
| Not severely malnourished (Oedema absent) | ≥3 z-score | 38 (100.00) |

Table 4.3: Distribution of acute malnutrition and oedema based on weight-for-height z-scores (WHZ) amongst children in Hayin-Mai, Giwa LGA, Kaduna state

WHZ (Weight-for-Height z-scores). Distribution based on NCHS reference standard values for Children from 6 to 59 months.

D. PREVALENCE OF ACUTE MALNUTRITION BY AGE BASED ON MID-UPPER ARM CIRCUMFERENCE (MUAC) CUT OFF'S AMONGST CHILDREN IN HAYIN-MAI, GIWA LGA, KADUNA STATE

Table 4.4 below indicates that no case of severe malnutrition based on the mid upper arm circumference (MUAC) cut-off point at <11.5mm was observed.

| Age (Month) | Total Number | Severe wasting (<11.5mm) | Moderate wasting (≥11.5mm <12.5mm) | Normal (≥12.5mm) |
|-------------|--------------|--------------------------|------------------------------------|------------------|
| | | Number (%) | Number(%) | Number(%) |
| 6-17 | 12 | 0(0.00) | 0(0.00) | 12(100.00) |
| 18-29 | 5 | 0(0.00) | 0(0.00) | 5(100.00) |
| 30-41 | 5 | 0(0.00) | 0(0.00) | 5(100.00) |
| 42-53 | 8 | 0(0.00) | 0(0.00) | 8(100.00) |
| 54-59 | 3 | 0(0.00) | 0(0.00) | 3(100.00) |
| Total | 33 | 0(0.00) | 0(0.00) | 33(100.00) |

Table 4.4: Prevalence of acute malnutrition by age based on MUAC cut off's amongst children in Hayin-Mai, Giwa LGA, Kaduna state

Distribution based on NCHS reference standard values for Children from 6 to 59 months. mm represent millimetre.

V. DISCUSSION, CONCLUSION AND RECOMMENDATION

A. DISCUSSION

A total of 38 children aged 6-59 months were studied. Sex distribution was 17 males and 21 females. The study recorded moderate wasting at 2.6% which is an improvement compared with the national figure which stands at 18% (NDHS, 2013) and 21% for Kaduna state as reported by UNICEF in 2009. It was also observed that children between the range of 42-53 months had moderate wasting as compared with children within the range of 6-41 months and 54-59 months; this may be as a result of the work load of care givers especially mothers who have to devote more time to breastfeed and care for younger children. Some women lack information about appropriate care and feeding practices (Maria, 2014). To this effect women need to be supported physically, financially and socially by family and community members to do what is best or what is needed. There was no observed case of severe malnutrition which may be attributed to the cultural and socio-economic practices of the people of Hayin-Mai community as reported by Ajala *et al.*, (2007) who documented that most people in Giwa LGA owned free-range livestock and farmlands. Moderate malnutrition at 4.8% observed among the females in the community surveyed is not consistent with other studies that indicate more malnutrition in males than females (NDHS, 2003). This might be as a result of the higher number of females used in this study. Other causes might be attributed to underlying factors of malnutrition which include:

Inadequate household food security, lack of maternal and child care and lack of health services access and healthy environment (UNICEF, 2006).

The long-term success in improving the nutritional status of children that were observed to be moderately wasted, overweight or obese requires addressing some of the listed factors that allow malnutrition to persist.

B. CONCLUSIONS

This study showed moderate acute malnutrition (wasting) amongst under-five children in Hayin-Mai community, Giwa LGA of Kaduna state. To this effect nutritional intervention is needed in this community to further reduce the percentage of malnourished children.

C. RECOMMENDATIONS

The following recommendations are being forwarded:

- ✓ Nutrition education should be given to the caregivers.
- ✓ Dietary diversification should be encouraged.
- ✓ Hygienic feeding practices should be encouraged.

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