

# An Investigation of the Factors associated with Malnutrition Among the Under-five Children: A Case Study of Chamilala Rural Area Under-five Children

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## Abstract

### *Background*

According to 2014 Zambia Demographic Health Survey (ZDHS), stated that malnutrition is one of the major causes of mortality and morbidity among under-five children in Sub-Saharan Africa. To understand factors associated with malnutrition among under-five children, a study was conducted in Chamilala area of Nyimba District in Eastern Province – Zambia.

### *Method*

Purposive sampling method was used based on simple random sampling of twenty (20) under-five children and convenient sampling method of thirty (30) under-five children respectively. Purposive sampling method was selected due to usefulness of respondents in this study. Convenient sampling was used because of availability of respondents. Statistical Package for social Sciences (SPSS) and Microsoft Excel Computer software package were used in analyzing as well as descriptive statistics, tables, figures results were generated.

### *Results*

Stunted growth was found to be the highest malnutrition condition with the highest prevalence (50%) followed by under-weight (34%) and lastly wasting (10%). Results also showed that children aged one to two years were likely to be underweight than those aged above two years. From the study, poor nutrition causes malnutrition. This is a result of poor diet in children's feeding programme. The poor diet

comes because, firstly, some farmers grow only crops. This creates deficiency in protein supply in children. Secondly, for farmers in mixed farming, they do not have enough knowledge in how to use crops grown and livestock reared for better nutrition for their children. Consequently, children of crop farmers were more likely to be stunted than their counterparts with mothers/guardians in mixed farming (growing crops and rearing livestock at same time). No significant differences with wasting among under-five children in the district although the prevalence was 24% lower than that of children underweight.

### *Conclusion*

The study is essential pointing out the causes of malnutrition in Under-five children. Poor diet is the main cause of malnutrition. This poor diet is mostly a product of not having a balanced diet and not practicing mixed farming. Were mixed farming is not done, low knowledge on how to use crops and livestock to generate balanced diet cause malnutrition in under-five children in Chamilala, District of Nyimba. The author recommends exclusive breastfeeding and intake of balanced diet especially those prepared using available local foods. Mixed farming is essential in fighting malnutrition in rural areas. Furthermore, special arrangement should be put in place to educate parents on importance of using crops and livestock to improve on nutrition of under-five children.

**Key Words:** Childcare, Strategy, Mixed Farming, Breastfeeding.

## Background

The World Health Organization (WHO) in recent report estimated that 178 million malnourished children globally and at any given moment, 20 million of these who are suffering from the severe form of malnutrition. Malnutrition contributes between 3.5 and 5 million annual deaths among the under-five children. UNICEF estimated about 195 million children suffering from malnutrition across global. This consequently affects the intelligence level of children, their behavior and school performance. The impaired mental development is taken as the most serious long-term handicap associated with under-five malnutrition. In Sub-Saharan Africa, 41% of under-five children are malnourished and deaths from malnutrition are increasing on daily basis in the region.

In Zambia, malnutrition remains a serious health and welfare problem affecting the under-five children to whom it contributes significantly to mortality and morbidity. According to Zambia Demographic and Health Survey (ZDHS) 2013/2014 five in ten Zambian children under-five of years (40%) are stunted (short for their age (6%) are wasted (thin for their height), and (15%) are underweight (low weight for their age). Indeed, these statistics may not be different from Chamilala, in Nyimba District. Worthy to note is that Zambian Government has put in place a number of initiatives aimed at reducing the prevalence of malnutrition in the country. 2010/2014 Zambia Food and nutrition policy reform, the Zambia vision of 2015-2025 National Development Plan to reduce stunting. Little improvement on under-five nutrition indicators has been realized for example the decline of malnutrition from 25.1% in 1992 to 15% in 2014 (ZDHS-2014). A number of questions has been raised by Scholars and NGOs in the past a decade about the pertinent role of providing nourishment to the under-five children, even SDGs number one (1) and two (2) respectively emphasized on needs to eradicate malnutrition elucidate strategies that can be towards the prevention malnourished children with current stunting rates of 40%, it is

unlikely that Zambia will have the SDG target of 20% by the end of 2030. Considering that 70% of Zambia's population is dependent on agriculture form their livelihood and 90% of farmers are smallholders, understanding the impact of agriculture on nutrition becomes imperative. Given the number of studies on malnutrition among under-five children in developing countries, there is need to examine if similar factors with malnutrition among under-five children in Zambia particularly in Chamilala, Nyimba District. In normal circumstances, zero to one-year child, height: 58-60metres and weight 13kilograms, two years- height:60-70 meters and weight:17 kilograms, three years- height:70-78 meters and weight: 21kilograms and four years Height: 80-88 meters and weight: 25kilograms. This study was conducted to assess the impact of good nutrition among the under five Children, evaluate the impact of malnutrition, find out the system weaknesses that propel malnourish and find out the available actions that can be taken to manage nutrition on the under-five children as well as to assess the nutritional status of under-five children and to ascertain the prevalence childhood malnutrition, establish the relationship; i) between demographic factors and malnutrition, ii) between socio-economic factors in malnutrition among the under-five children. The hypothesis tested were; i) there was a relationship between demographic factors and malnutrition among the under-five children, ii) there was also a relationship between socio-economic factors and malnutrition among the under-five children.

## Method

The principal factors which covered the research design outlined the descriptive methods and tools, techniques engaged in gathering data and analyzing of data used in this study. In this study the most effective and efficient data collection methods and methodology was used to assess the nutrition status and factors associated with malnutrition among the under-five children, a purposive sampling based on two stages;

simple random – chosen by chance of the respondents, twenty under-five children, convenient on the basis of availability of respondents, thirty under-five children and sample size of 50 respondents were obtained among mothers/guardian of the under-five within Chamilala rural area of which five respondents from each village, ten villages were covered. Five health professionals from Chamilala clinic (a Clinic Officer, an Environmental Health Technologist, and three Nurses) were engaged in taking anthropometry measurements for the under-five children. The full methodology and sampling procedures undertaken during data collection can be found in the dissertation. Child variables that included age, sex, height and weight were entered on Statistical Package for Social Sciences (SPSS) software and Microsoft Excel Computer software package as well as nutrition module was used to generate measurements indices of height-for-age, weight-for-age and weight-for-height. The indices generated were compared with standard and references values for growth references to obtain the z-score (an indicator of how far a measurement is from median, also known as standard deviation)

For this study, three indices of malnutrition that included stunting, underweight and wasting were determined among all the children whose height-for-age z-score was below minus 2 standard deviations from the median of the reference population were classified as stunted, similarly under-weight and wasted. Underweight for age –z-score less than minus 2 standard deviation from the median of the reference population were regarded as underweight, similarly all children under-five years whose weight for height z-scores were less than minus 2 standard deviation were regarded as wasted. The nutrition indicators of stunting, wasting and underweight were entered on the computer programme and emerged with demographic and socio-economic data for analysis.

## **Ethics**

Clearance was obtained from the chief, His Royal Highness Chief Nyalugwa and his indunas to conduct the study. A written and signed informed consent was obtained from the parents and guardians for the participation of their children in the study. Respondents were assured that the information was for intervention and academic purposes only. There were no blood samples taken from the respondents and the study did not pose any danger to them. The data collected did not have personal information like names and besides the variables were coded for confidentiality purposes. The author also obtained a clearance and official permission from Information and Communication University (ICU) Research Department to undertake this study.

The population study indicates how the research population was narrowed to fifty. The headcount- 3,567, 41%, central statistics office- 2,882, 32%, Target Population 1,496, 17% households – 757, 9% and sample size - 50, 7%.

## **Results**

### **Background Characteristics**

The background characteristics are divided into demographic factors and levels of malnutrition. The independent variables entered included; population and sample, sex of child, age of child, child malnutrition levels, households' income level, views on the role of good nutrition, factors that influence nutrition strategies and policy design and response rates presented below:

### **Demographic Factors**

More than half of the under-five children in the study were females and the majority were aged 2 – 3 years old, this is probably due to the high number of females in Zambia than males. Findings shows that twenty-seven (27) out of fifty (50) were female representing fifty-four percent (54%) and twenty-three (23) out of fifty (50) which is forty-six percent (46%) males.

The findings, also observed that fifty-two percent (52%) of the under-five in Chamilala had high number. Having bigger number of the under-five in that range of years is what any stakeholder that wants to take interest in survey would pick. There is a sizeable number of the under-five who are zero to one-year-old (28%) who may need attention, these are critical months compared to 2-4years old also contend that it is not only the question of being in this range but also the health wise was good. It is seen that the majority age are two to three years of age. Study findings further, indicated a significant between age of the child and malnutrition. Results indicates that growth stunted was found to be the most malnutrition condition with the highest prevalence (50.0%) in Chamilala followed underweight (34.0%) and wasting (10.0%) respectively. The study showed that slightly more females were stunted compared to Males. For wasting and underweight, females were equally more wasted and underweight respectively than their male counterparts despite the fact that there was no significant relationship between sex of the child and malnutrition and 4 out of 50 under-five children representing 8% were health. The details of the findings on the demographic factors among the under-five children are presented in Table 1.

**Table 1 - Demographic Factors of the Under-five Children**

Demographic Factors (n = 50)	Frequency	Percentage (%)
Sex of Child		
Male	23	46
Female	27	54
Age of the Child (Months)		
0 -1-year-old	14	28
2 -3 years old	26	52
4 years old	10	20
Levels of Malnutrition Among Under-five Children		
Stunting	24	48
Wasting	5	10
Underweight	17	34

## Socio-Economic Factors

Education is a key factor that influence growth and development. According to Nawagamuwa and Viking (2003), low level of education and high illiteracy rate are some of the basic characteristics of the factors of rural mothers causing them to expose their under-five children to malnutrition. Most mothers received primary level education and quite a good number had never been to school. 19 out of the fifty (50) respondents interviewed, representing (38.0%) had no formal education, 26(52.0%) indicated that they had basic education, 5 (10.0%) had secondary education and tertiary education. The occupational status of dwellers in rural area settlement is another factor that has been found to influence the growth of malnutrition. A study by the Global Development Research Centre

(GDRC) (2003) concluded that remote areas are occupied by the poor, especially the unemployed. The GDRC (2003) stressed that unemployment status of remote people cause them to depend on seasonal food and build sub-standard structures which do not meet building regulations of the proper village set ups. This study also presents the occupational distribution of the respondents. Contrary to the GDRC (2003) findings; Melese (2006) observed that in habitants of rural settlements are rather self-employed because of their low educational background. To Melese (2006), their low educational level does not permit them to meet the requirements of many job opportunities so it forces them to be engaged in their own small-scale trading activities to make a living. From Table below it is evident that the majority (27or54.0%) were Crop farmers, six respondents (12.0%) were mixed farmers. The types of occupation observed at Chamilala rural area did not confirm Melese’s (2006) assertion that villagers are usually characterized by crop farmers. The research also indicates that there is a significant relationship between parents’ occupation and stunting among under-five children. Under-five children whose parents are in well paid jobs were unlikely to be stunted unlike their counterparts whose parents are crop farmers. The findings showed fifty-four percent (54%) crop farmers out of fifty questionnaires administered only eighteen percent (18%) were Business/Civil Servants and sixteen percent (16%) handcrafts. The respondents with monthly income below k1000.00 per month were the majority (54.0%) followed by those above K1000 - (28.0%). Respondents with income level within the range of K1000 were 9 representing 18.0%. The above k1000 mostly were the business/civil servants of Chamilala. This distribution clearly showed the uneven shared of resources. Given the achieved overall response rate, the researcher was confident that 100% attained would be good

representations of views of the larger population as it carries an acceptable level of reliability and validity; details are presented in Table 2.

**Table 2**  
**Socio-economic Factors of the Under-five children**

<b>Socio-economic factors (n = 50)</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Mothers Levels of Education</b>		
No education	19	38
Primary	26	52
Secondary+	5	10
<b>Mothers’ Occupation</b>		
Crop Farmers	27	54
Mixed Farmers	6	12
Business/Civil Servant	9	18
Handcraft	8	16
<b>Monthly Income of Respondents (ZMK)</b>		
Above 1000	14 (28%)	
Between 1000	9 (18%)	
Below 1000	27 (54%)	

## **Views on the role of nutrition, factors that influence strategy and policy design and response rates**

The results have been obtained with regard to the opinion of the heads of households on the competency in nutrition which argued their point at the strategic level of nutrition management in Chamilala. They equally agreed, that nutritional partner strategy and impact is also part of the measurement of nutritional performance, this is impressive given that most households have in principle embraced the role of nutrition but have actually not done much in the implementation. Ninety percent (90%) of Nutrition metrics and strategies do agree that nutrition has good impact on the under-five children's growth process. As pointed out in the review of relevant literature in chapter two, nutrition like other profession need a strong educational background in order to be successful. That education, however, has to be varied.

The nutritionist and members involved in scaling up nutrition have high expectations of their nutritional staff and nutrition functions. Studying the traditional aspects of nutrition is important but equally important learning from experience in nutrition. The majority of respondents (100%) agreed that nutrition is a strategic partner in the attainment of nutritional goals and however, (30%) disagreed that households are linked with strategic objectives. They further stated the part of the problem that has not been easy to quantify the influence of good nutrition on the under-five children's growth. The existing nutritional measures do not fully capture the strategic nutritional drivers like that of eradicating malnutrition which needs more interventions and efforts. Research findings indicate that most of the respondents agreed with statement that "factors that influence nutrition strategies and policy designs lies on the development level of the area and the

top leaders". Already this is bolstered by the fact that, respondents feel the level of development directly affect nutrition policy design and since development comes with management, in a way leader are directly influencing these policies.

This is in line with the nutrition fact that is ultimately, personnel take responsibility over running of the nutrition affairs of the system including design of all nutritional outreach programme policy strategies. Given the achieved overall response rate, the researcher was confident that 100% attainment would be good representative of views of the larger population as it carries an acceptable level of reliability and validity. All sample were equitably represented in the response rate attainment and this falls within the generally acceptable response rate of hundred percent. The research was guided and based on the five main objectives. The first Objective was to assess the prevalence of malnutrition and evaluate the role of strategic nutritional function in attainment of Chamilala nutrition goals and objectives. It was assumed by the researcher that improved nutrition function has impact on the overall attainment of Nutrition objectives for the under-five Children. The second Objective was to assess the role Mothers/Caregivers play in curbing Malnutrition in the attainment of achieving goals objectives in terms of well-balanced diet Food for the Under-five children. The third objective was to establish what factors influence the design and implementation of improved nutrition policies and practices and it was assumed that those who put more efforts in nutrition alone play a crucial role in the attainment of the required goals and objectives. The fourth objective was to establish the effects of nutrition strategies on the attainment of Good Nutrition Goals in Chamilala and lastly to formulate feasible policy recommendations for making Nutrition an effective tool in improving the welfare of Chamilala under-five Children's performance. No. of the mothers'/guardians' education were stunting, underweight and

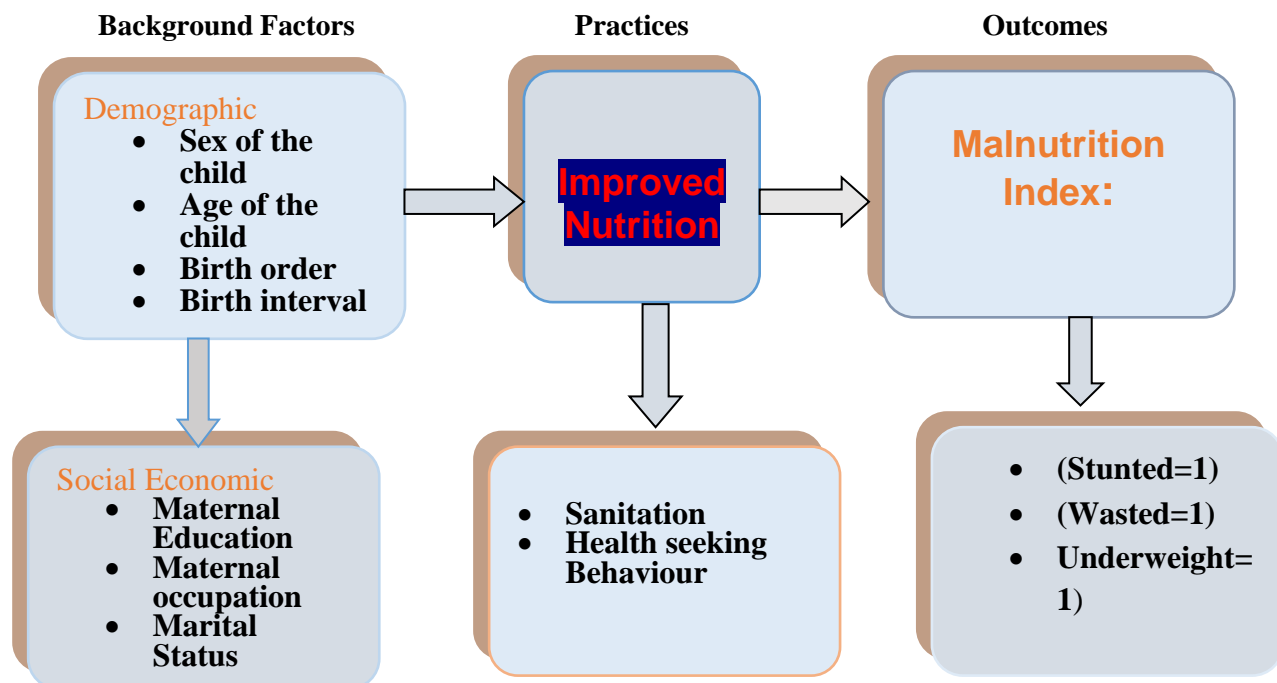
wasting were statistically significant. Findings also indicate that there is significant relationship between guardians'/mothers' occupation and stunting among under-five children.

## Conceptual Framework

This shows that in developing countries and in particular in Sub-Saharan Africa, under-five children malnutrition is normally determined by a large number of factors to the extent that sometimes it becomes difficult to predict the risk factors. Such factors act through number of interrelated proximate determinants to bring about under-five malnutrition that is stunting,

underweight and wasting. The demographic and socio-economic factors such as age of a child, birth order, mother's age at birth, mother's education level, marital status, as well as maternal occupation work through proximate variables like during of breastfeeding, nutrition, sanitation and mother's health seeking behaviors influence under-five children. With modification, the UNICEF conceptual framework on nutrition strategy and child survival was adopted for the study. Some of the variables in UNICEF conceptual framework were not applicable to the study design adopted hence were not adopted in the paper for instance inadequate health facilities.

*Conceptual framework showing factors associated with malnutrition among under-five children:*



*Source Modified and adopted UNICEF conceptual framework on nutrition, 1998*

Study findings indicated a significant relationship between age of child and malnutrition. Children aged 36-48 months were found less likely to be underweight (or 0.76) than their counterparts who were 12

months and below in Chamilala. Similar findings have been reported at national level where proportion of weight of children is lowest among 36-48 months old and height among 6-8 months old. Other studies in

Vietnam, India, Nigeria, Uganda and Kenya have reported similar findings that children are weaned especially after exclusive breastfeeding in the first six months, some women go back for work and devote less time to the care of their children. The findings are however contrary to the study in Ethiopia that found out that underweight had a positive linear relationship with age of a child. Furthermore, maternal occupation emerged as a significant factor that could be associated with under-five stunting within Chamilala area. Children from mothers who were mixed farmers were found (0.12) times less likely to be stunted than children whose mothers were crop farmers engaged in crops and live stocks are believed to supplement the nutrition value of their children with cow milk and other milk products which consequently reduces the risk of stunting unlike crop farmers. According to study in Botswana, crop cultivators were more likely to have stunted children. Similarly, a study done in Vietnam found out that children from mothers who were crop cultivators had increased risk of stunting because they rarely get time to care for their children hence end up leaving them under the care of elder siblings so in the case of Chamilala. In Olwedo, Mworozu and Bachou found some mothers particularly peasant farmers in cases failed to provide complementary feeding to their children because they could not afford. This factor therefore, proposes that economic engagement of the mother that particularly promotes extended separation of the child from primary caregiver may be detrimental consequently resulting into malnutrition especially stunting.

However, observations from other studies suggest that women engaged in crop cultivation compared to informal business maybe a reflective of better resources and child care practices within households particularly those suitable child care.

Worthy to note is that the above studies conducted elsewhere do not specifically compare children from crop farmers with those mixed farmers on stunting. The present study reports on the level of malnutrition as well as the factors that could be associated with malnutrition among under-five children of Chamilala remote area in Nyimba District. Given a substantial number of 50 respondents were studied; the study may be regarded as a reasonable reflection of nutritional status of the under-five children in Chamilala. Worthy to note also is that the study reveals that malnutrition is a serious public health problem that affects 50%(stunting), 10%(wasting) and 34%(underweight) then 6% (healthy child) – gains weight and height according to the normal growth standard deviation (SD) line with three (3). The findings are slightly higher than the Zambia National figures of stunting at 45%, wasting 5% and 34% underweight. Among the study limitations, dataset used missed out some variables of interest on child malnutrition that included the duration of breastfeeding and Body Mass Index (BMI) of the mother, BMI is as the result of height and weight. The sample size of 50 respondents was relatively small hence could have had an effect on the outcome of the study.

## Recommendations

The study recommends exclusive breastfeeding and proper complementary feeding especially among under-five three years. In line with UNICEF and WHO recommendation, there is need for exclusive breastfeeding during the first six months of life and thereafter semi-solid complementary foods are introduced up to at least two years or more. This consequently reduces on underweight children who are mostly aged less than three years in Chamilala.

The study also recommends a special arrangement for mothers engaged in cultivation to have their children breastfed regularly by



having their babies brought to them, mothers should ensure that proper nutrition is given to their children. This may contribute to a reduction in stunting especially among children of crop farmers who were found to have increased levels of malnutrition than the rest of the children with mothers of other occupations. There is need for a bigger study to be carried out in the area of Chamilala covering more children to establish significant factors like education of mother, sex of child, birth interval, age of mother and marital status since most of them were found significant in the literature review.

Zambia needs to make renewed efforts to overcome the serious and impeding development by decreasing the factors associated to malnutrition such as stunting, wasting and underweight in the under-five children.

## Conclusion

Results from the analyses confirm that age of a child and maternal occupation could be some of the factors associated with malnutrition among under-five children in Chamilala. The study therefore underscores the age groups that could be prone to malnutrition challenges as well as the particularly occupations among women/guardians that pose a risk of malnutrition to the under-five children. This than could give focus to policy-makers in designing of strategies aimed at combating malnutrition among children below five years. It should be noted however, that some other factors could be associated with malnutrition among the under-five children and not necessarily the age of a child or even mothers' occupation for example, unemployed who breastfeeds her child could have a well feed child. Similarly, on the age of a child, it could be that majority of the underweight children were just under a specific age group and not

necessarily associated with malnutrition condition.

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## Footnotes

## Competing interest

The author declares that she has no competing interests.

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