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**The Influence of Feeding Practices on Under-Five
Nutrition Status in Mbinga District, Tanzania**

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The Influence of Feeding Practices on Under-Five Nutrition Status in Mbinga District, Tanzania

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Abstract

Purpose: This study assessed the influence of feeding practices on under-five nutrition status in Mbinga District, Tanzania.

Materials and Methods: A cross sectional study involved 150 heads of households whose children aged 0 - 59 months were assessed to determine their anthropometric measurements Weigh for Age Z-scores, Height for Age Z-scores and Weight for Height Z-scores. A structured questionnaire was administered to collect data from heads of the households. Data were coded and analysed by ENA for SMART, Statistical Package for Social Sciences (SPSS) programme and STATA. Results showed that, 42% of the children were stunted, 33% were wasted, and 25% were underweight.

Findings: Moreover, results of ordered probit regression model showed that

exclusive breastfeeding, meal frequency and food dietary diversity were positively influencing the nutrition status while household size was negatively influencing the nutrition status of the under-five. The study concludes that, there are high rates of stunting, wasting and underweight in the study area. Further, poor child feeding practices have positive influence on anthropometric status of the under-five.

Implication to Theory, Practice and Policy: It was recommended that nutrition education should be provided to community members on appropriate child feeding practices and family planning.

Keywords: *Feeding Practices, Under-Five, Malnutrition*

1.0 INTRODUCTION

Undernutrition is a universal public health problem in both children and adults globally. It is not only a public health concern but it is an impediment to global poverty reduction, productivity and economic growth (Dukhi, 2020). The under-five children are among the most vulnerable groups although it affects both women, elderly and youth (WHO and UNICEF, 2018) Africa still experiences a malnutrition burden among children aged under-five years (Jayne *et al.*, 2019). Sub-Saharan Africa bears one of the highest burdens of undernutrition. In 2016, more than one-third of stunted children (38%) and more than one-quarter of wasted (27%) children lived in sub-Saharan Africa. However, a more detailed look into the distribution of undernutrition within sub-Saharan Africa shows that Eastern Africa (36.7%) has a higher prevalence of stunting compared to Western Africa (21.4%), Central Africa (32.5%), and Southern Africa (28.1%). While Western Africa (8.5%) has a higher rate of wasting than Central Africa (7.3%), Southern Africa (5.5%), and (6.5%) in Eastern Africa (FAO *et al.*, 2018).

In Tanzania, the under-five malnutrition remains one of the country's greatest human development challenges (Khamis *et al.*, 2019). Despite displaying a seemingly 'low' and 'acceptable' rate of acute malnutrition, the burden of undernourished under-five children is one of the highest in the East African region (Agho *et al.*, 2019). The causes of undernutrition are multifaceted but failure to adhere to under-five feeding practices remain a strong predictor especially in most of areas which are food secured in Tanzania (Khamis *et al.*, 2019; Mtoi and Nyaruhucha 2019; Aloyce 2018; Kulwa *et al.*, 2006). Furthermore, there is a little information regarding the influence of feeding practices on under-five nutrition status especially in southern agricultural zones of Tanzania. Therefore, this current contributes to generation of new knowledge regarding the association of feeding practices such as initiation of breastfeeding, complementary feeding as well as meal frequency and dietary diversity on the nutrition status of the under-five children. Moreover, this study was set to explore the influence of feeding practices on under-five nutrition status in Mbinga District, Tanzania.

Nutritional interventions have been developed and implemented in Tanzania by the Ministry of Health (MOH) to reduce child undernutrition. Such as (IYCF) protocols, sanitation, deworming, vitamin A supplementation, and health education (TFNC, 2012). Thus, despite these interventions, child undernutrition still remains a developmental challenge in Tanzania (Khamis *et al.*, 2020). This is evidenced by Tanzania Demographic and Health Survey report which revealed that the prevalence of chronic undernutrition (stunting) was 34.4%, acute malnutrition (wasting) was 4.5%, and underweight was 13.6% (Kashaija *et al.*, 2018; Khamis *et al.*, 2019; URT, 2019). The most affected regions with a prevalence of stunting exceeding 40% are: Ruvuma (41.0%), Iringa (47.1%), Rukwa (47.9%), Kigoma (42.3%), Njombe (53.6%) and Songwe (43.3%). However these regions are among the big food crop producers in Tanzania; such as maize and legumes (URT, 2019).

The under-five malnutrition reduces life expectancy, causes poverty, impaired physical and mental growth leading to poor brain and school development hence affecting community and national development (USAID, 2017). Previously, studies have been conducted in Tanzania regarding undernutrition for instance; (Khamis *et al.*, 2019; Kulwa *et al.*, 2016; Kejo *et al.*, 2018; Mdimu *et al.*, 2020). However, these focused more on the institutional determinants, nutritional status and food security at household level. It is not clear as to what extent feeding practices can contribute in addressing the under-five nutrition status in Mbinga district, Tanzania.

2.0 MATERIALS AND METHODS

This study was conducted in Mbinga district from January to March, 2022. Mbinga is one of the six districts in Ruvuma region, namely: Nyasa, Mbinga, Songea Urban, Tunduru, Songea Rural and Namtumbo districts (URT, 2012). Mbinga was strategically selected for this study from a number of reasons, among others, are; (i) it is found within the regions which are highly affected by undernutrition of the under-five with the stunting rate of 41% in Tanzania (URT, 2019), and (ii) it is important and occupies the largest area for growing food crops such as maize, beans, cassava, millet and potatoes in Ruvuma region however childhood undernutrition is not yet controlled (Wineman *et al.*, 2020).

Research Design

The author employed non-experimental design particularly cross sectional research design to collect both qualitative and quantitative data where primary data were collected from household heads in the field using questionnaires structured with couple of questions also the key informants interviewed using checklist containing relevant questions. Also accessed potential secondary data by reviewing relevant documents including strategic plan, journals, and water research reports and published papers.

Furthermore, this study explored the relationship between independent variables and the dependent variable. The independent variables were feeding practices (breastfeeding, complementary feeding and dietary diversity) and the dependent variable was underfive nutrition status as indicated by number of stunted, wasted, underweight and normal children.

Similarly, the testable hypothesis with respect to objective four was;

H₀: There is no relationship between feeding practices and under-five nutrition status in Mbinga District.

Sampling and Sample Size

Sampling Techniques

Purposive sampling was used to select three wards; Mpapa, Maguu and Nyoni which had relatively higher prevalence of stunting. One village was randomly selected from the wards including Mitawa, Wanyu and Likwera. At village level the study sampled 150 households in which number of households differed from one village to another depending on the population size as received from the Village Executive Officer. Thereafter, households were selected by using snow ball sampling technique whereby few households having under-five children were purposively selected and heads of the households were asked to recommend other households that meet the prescribed criteria.

Population Sample

The sample size (n) of the study was 150 heads of the households who were obtained by using Cochran's (1977) for unknown population basing on the fact that the population size of the households with under-five children in the study area was not known;

$$n = \frac{z^2 qp}{e^2}$$

Where:

n = sample size when population is greater than 10,000

z = Standard normal deviation, set at 1.225 corresponding to 95% confidence level,

p = proportion in target population estimated to have a particular characteristic; if it is not known, 50% is used.

$q = 1.0 - p = 0.5$

d = degree of accuracy desired, set at 0.05

Thus, $n = 3.0^2 (0.5 \times 1 - 0.5) / 0.05^2 = 150$

Data Collection, Processing, Analysis and Presentation

The quantitative data was collected using household survey whereby semi-structured questionnaires as a tool with items containing both closed-ended and open-ended questions were administered to heads of the households. The questionnaire was used to elicit factual information on background variables (age, sex, marital status, education, household size, occupation and head of household), child characteristics such as; age, sex, height and weight. Further, it was used to obtain information regarding breastfeeding practices, complementary feeding, dietary diversity and meal frequency for the under-five at household level.

The justification of using questionnaire was because it was appropriate for collecting views from a substantial number of household heads (150) on the influence of feeding practices on under-five nutrition status. The questions were asked in as logical order as possible in order to avoid misleading the minds of the respondents. Moreover, the researcher ensured that the questions flow in the sequence of the objectives of the study and the research questions so that the responses answer the research questions clearly. Unlike other methods, the household survey speeds up data collection process because the researcher reached a large number of respondents in a fairly short period of time (Nnko, 2017).

Furthermore, the data were then edited, compiled, classified and summarized. This process was conducted using ENA for SMART and IBM-SPSS through which the author applied descriptive statistics and inferential statistics where by ordered probity regression model was used to identify the existing influence of feeding practices on under-five nutrition status, which is an ordinal variable. The analyzed data results have been presented by using graphs, charts and tables to convey a meaningful interpretation and discussion of the findings.

Data Validity and Reliability

The instruments for this study (questionnaire and interview checklist) were pre-tested. The pre-test was aimed at determining whether the questions are clear, unambiguous to the study participants. Some adjustments to the questions in terms of language used, content and flow were made in response to the observed weaknesses of the tools. A pilot test was done to 20 respondents randomly selected in Luhangarasi Ward, which was not sampled for the study. Therefore, the respondents who were involved in the pilot test were not included in the actual household surveys. To ensure reliability of the responses, the questionnaire was made simple and strait forward. In this study, the researcher was careful in collecting data, analyzing and processing data from respondents. He maintained ambiguity, less complications and relevance when formulating a questionnaire.

Similarly, the use of both primary and secondary sources of data by using different types of data collection instruments such as Questionnaire, interview and documentary sources was designed to measure the same thing in order to check reliability. Furthermore, the use of non-probability sampling techniques such as purposive and snow ball sampling allowed the researcher to select the respondents based on the knowledge of the population its elements and research objectives.

3.0 FINDINGS

Characteristics of Respondents

The study involved 150 heads of households from three wards of Mbinga District. The study was conducted in a manner that both men and women having different age, sex, education, occupation and economic status were involved.

Prevalence of Undernutrition Among the Underfive in the Study Area

The nutritional status of the under-five children was determined in Mbinga District. Figure 1 shows the distribution of stunted, underweight, normal and wasted children. Out of 150 children who were studied, 42% were stunted, 33% were wasted, and 25% were underweight. Similar results were also revealed during the interview with District Nutrition Officer who asserted that;

“...childhood undernutrition involving stunting is perceived normal as one of the processes in child growth and development. It is sometimes perceived as a result of witchcraft from wicked people...” (KII, 18th March, 2022). Generally, the prevalence of undernutrition in the studied sample was higher than the national prevalence rate which is 31.8% for stunted, 13.7% for underweight and 4.5% for wasting (URT, 2019).

Similarly, undernutrition was also higher than that reported in Africa. Agho *et al.* (2019) observed that, 30.7% of the children in Africa were stunted, 14.4% were underweight while 5.4% were wasted. In West Africa, 31.8% of the children were stunted, 20.1% were underweight while 10% were wasted. In Southern Africa, 30.6% of the children were stunted, 10.7% were underweight while 4.1% were wasted. In Central Africa, 28.8% of the children were stunted, 12.8% were underweight while 6.7% were wasted.

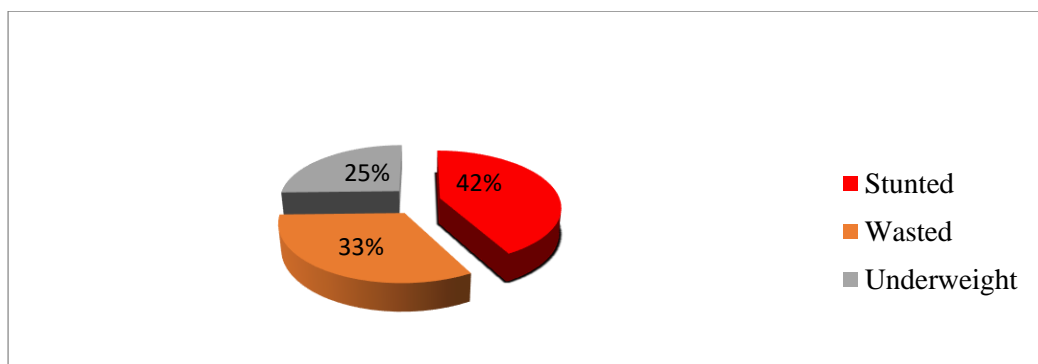


Figure 1: Distribution of Stunted, Underweight and Wasted Children (N=150)

Determinants of Feeding Practices on Under-Five Nutrition Status

Furthermore, the ordinal probit regression was used to analyse the determinants of the under-five nutrition status which is shown in Table 1. The signs of coefficients from ordinal probit regression

analysis were used to discuss the direction of the relationship (positive/negative) between independent variables and the dependent variable. As specified in the model, the dependent variable was under-five nutrition status while the independent variables were age of a child, sex of a child, household size, early initial breastfeeding, exclusive breastfeeding, extended breastfeeding, complementary feeding, types of complementary foods, food dietary diversity and meal frequency.

Table 1: Ordered Probit Regression Results on the Determinants of U/5 Nutrition

| Predictor | Coef. | Std. Err. | z | P>z |
|--|-------|-----------|-------|-------|
| Household Size (in number) | -.396 | .214 | 1.86 | 0.063 |
| Early Initial breastfeeding (1=within 1 hr) | .041 | .433 | 0.09 | 0.925 |
| Exclusive Breastfeeding (1= 6 months and above) | .925 | .424 | 2.18 | 0.029 |
| Extended Breastfeeding (1=within 2 years) | -.375 | .719 | -0.52 | 0.602 |
| Complementary Food (1=Yes) | -.279 | .497 | -0.56 | 0.575 |
| Complementary Food Types (1=Recommended type) | .410 | .703 | 0.58 | 0.560 |
| Food Dietary Diversity (1=recommended groups) | 1.009 | .574 | -1.76 | 0.079 |
| Meal frequency in number per day (1=4 meals and above) | .585 | .306 | 1.91 | 0.056 |
| <i>Number of observation</i> | | 149 | | |
| <i>Log likelihood</i> | | -94.451 | | |
| <i>LR chi2(10)</i> | | 20.19 | | |
| <i>Prob > chi2</i> | | 0.027 | | |
| <i>Pseudo R2</i> | | 0.097 | | |

The results from this study shows that exclusive breastfeeding was statistically significant at $p < 0.05$ level and positively influenced the under-five nutrition status (Table 1). This designates that exclusively breastfed children were more likely to have good nutrition status while non-exclusively breastfed children were more likely to be stunted, wasted and underweight. These findings coincide with Chipungahelo (2015) who found that the most undernourished children were those who had never exclusively breastfed.

Results from Table 1 show that meal frequency was statistically significant at $p < 0.1$ level and positively influenced the under-five nutrition status. This implies that children who consumed four meals and above per day were more likely to have good nutrition status while those who were taking less than four meals per day were more likely to be stunted, wasted and underweight. These findings are supported by Megersa *et al.*, (2015) who found that under-five nutrition status in Borana, Southern Ethiopia were positively associated with meal frequency consumed by under-five children per day.

Household size was statistically significant at $p < 0.1$ level and negatively influenced the under-five nutrition status (Table 1). This indicates that increase of members of household decrease the likelihood of children to be stunted, wasted and underweight. These findings imply that size of the household determines food availability and ability of caregivers to ensure appropriate feeding of the under-five children. These finding are supported by Minja *et al.* (2021) who found that the risk of a child to be undernourished increases significantly with increasing number of own siblings within the household.

Food dietary diversity is a measure of food consumption that reflects household access to a variety of foods, and is also a proxy for nutrient adequacy of the diet of the under-five children. Table 6 shows that food dietary diversity was statistically significant at $p < 0.1$ level and positively influenced the under-five nutrition status. This indicates that consumption of a diverse diet was significantly associated with a reduction of stunting, wasting and being underweight in children. The likelihood of being stunted, wasted and underweight was found to decrease as the number of food groups consumed increased in the study area. The study findings concur with Khamis *et al.*, (2019) who found that children who did not receive the MDD had a significantly higher likelihood of being stunted and underweight. Therefore, from these findings, we reject the null hypothesis which stated that, there is no relationship between feeding practices and under-five nutrition status and accept the alternative hypothesis that there is positive relationship between feeding practices and under-five nutrition status.

4.0 CONCLUSION AND RECOMMENDATIONS

Conclusion

The prevalence rate of stunting, wasting and underweight was high in the study area. Poor child feeding practices have positive influence on anthropometric status while family size has negative influence on anthropometric status of the under-five. The findings show that exclusive breastfeeding, meal frequency and food dietary diversity were positively influencing the nutrition status while household size was negatively influencing the nutrition status of the under-five.

Recommendations

It is recommended by the author that: Tanzania's Ministry of Health and other stakeholders should formulate strategies for educating mothers both in the health facility and in the community on the importance of adhering to the recommended age of introduction of complementary feeding, meal frequency, and dietary diversity. Also, health care providers should be informed on the low proportion of adherence to the recommended complementary feeding practices so that they can discuss with mothers/caregivers the importance of optimal complementary feeding practices during ANC, delivery, postnatal visit and also during child growth monitoring and vaccination visits.

Likewise, community members should be empowered economically so that they can be able to achieve minimum dietary diversity, diverse complementary foods and sufficient meal frequency for the under-five children at household level. In addition, lactating mothers, husbands or any other caregivers should adhere to exclusive breastfeeding for the under-five within the recommended six months of birth and start giving complementary foods after six months, observe a continued breastfeeding within two years of birth and improve dietary diversity and meal frequency in order to improve under-five nutrition status. Moreover, there is a need to educate community members on the use of family methods in order to control household size. It is because this study found that increase of the household size increases the likelihood of under-five children to be stunted, wasted or underweight.

Disclaimer

The products used for this research are commonly and predominantly use products in my area of research and country. There is absolutely no conflict of interest between the author and producers

of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the author.

Competing Interests

Author has declared that no competing interests exist.

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APPENDIX

Appendix I: Questionnaire for Individual Heads of Households

A dear participant, my name is Kastory Abel Mbunda a master degree student in Community Development from Tengeru Institute of Community Development. I am conducting a research on "*The influence of community participation on under-five nutrition status in Mbinga district.*" Therefore I would like to ask you some questions about this topic, your cooperation is important for accomplishment of this work and I assure you that the information to be obtained will be used only for research purpose and confidentiality of personal characteristics will be ensured. I am interested in your views on the said issue and this will take about 30 minutes of your time. Thank you in advance.

REGION: RUVUMA

DISTRICT: MBINGA

WARD:

VILLAGE:

DATE:

Socio-Demographic Information

Answer the Questions by Choosing Correct Response(S) among the Options Provided;

| S/n | Question | Options |
|-----|-----------------------------------|--|
| 1 | Age of respondents |(years) |
| 2 | Sex | 1. Female 2. Male |
| 3 | Marital status | 1. Single 2. Married-monogamous 3. Married -polygamous 4. Widowed 5. Divorced |
| 4 | Education level (years in school) | 1. Informal education 2. Primary education 3. Secondary education 4. University education |
| 5 | Household size |(number of members) |
| 6 | Head of the household | 1. Father 2. Mother |
| 7 | Main occupation | 1. Farmer 2. Employed 3. Unemployed 4. Business 5. Others (specify)..... |

Section A: Food Security at Household Level

| | | |
|----|--|---|
| 8 | Is food available in your household? | 1. Yes 2. No |
| 9 | What is the status of food available at your home? | 1. Sufficient 2. Average 3. Insufficient |
| 10 | What kind of food available at your household? | 1. Maize 2. Cassava 3. Maize and cassava 4. Millet 5. Others (specify)..... |
| 11 | Have you ever experienced food shortage in your household? | 1. Yes 2. No |
| 12 | If Yes, for how long? |(months) |
| 13 | What are determinants of food availability in your area | 1. Crop cultivation 2. Animal keeping 3. Commercialization |
| 14 | How is food accessible to your household? | 1. Family farm harvests 2. Purchasing food 3. Food donation 4. Others (specify)..... |
| 15 | Do you keep animals? | 1. Yes 2. No |
| 16 | What kind of animals do you keep? | 1. Cattle 2. Chicken 3. Others (specify)..... |
| 17 | Do you cultivate food crops? | 1. Yes 2. No |
| 18 | What are types of food crops do you cultivate? | 1. Maize 2. Cassava 3. Millet 4. Maize and cassava 5. Yams 6. Others (specify)..... |
| 19 | How many bags do you produce per hectare? | 1. 1 to 5 bags 2. 6 to 10 bags 3. 11 to 15 bags 4. More than 15 bags 5. Others (specify)..... |
| 20 | How many bags do you store for food after harvesting? |(bags) |

| | | |
|----|--|---|
| 21 | What are number of meals do you take per day? | <ol style="list-style-type: none"> 1. One 2. Twice 3. Three times 4. Four times |
| 22 | Do you normally prepare special food for under-five children? | <ol style="list-style-type: none"> 1. Yes 2. No |
| 23 | Do you purchase special food for under-five children? | <ol style="list-style-type: none"> 1. Yes 2. No |
| 24 | How many times do under-five children take meal per day? | <ol style="list-style-type: none"> 1. One 2. Twice 3. Three times 4. Four times 5. Five times |
| 25 | How long (Time) do under-five take from one meal to another? | <ol style="list-style-type: none"> 1. Three hours 2. Four hours 3. Five hours 4. Six hours 5. No specific time |
| 26 | What are forms of food diversity your household consume? | <ol style="list-style-type: none"> 1. Ugali, meat, fruits 2. Ugali, fish, fruits 3. Ugali, beans, fruits 4. Ugali, beans, vegetables 5. Porridge, potatoes and banana 6. Milk, cassava, potatoes. 7. Others (specify)..... |
| 27 | In preparation of the following foods what amount used per meal? | <ol style="list-style-type: none"> 1. Ugali in kg..... 2. Rice in kg..... 3. Banana in bunch..... 4. Meat in kg..... 5. Sweet potatoes in kg..... |

Section B: Feeding Practices for Under-Five Children

| | | |
|----|--|---|
| 28 | Was your child ever breastfed? | 1. Yes 2. No |
| 29 | Is the child exclusively breastfed? | 1. Yes 2. No |
| 30 | If Yes, how many months was the child exclusively breastfed? |months |
| 31 | If the child is no longer breastfeeding, at what age did she stop? |months |
| 32 | At what age did you start giving fluids and foods (complementary food) other than breast milk to your child? |months |
| 33 | What types of complementary foods did you start giving your child? | 1. Plain porridge 2. Porridge with milk 3. Porridge with groundnuts 4. Porridge with egg 5. Cow's milk only 6. Plain water 7. Fresh or industrial juice 8. Vegetable or meat soup 9. Powdered or fresh milk 10. Food made from grain |
| 34 | How often in the past 7 days the child consumed food items from the following food groups? | 1. Staple foods (freq/week.....) 2. Legumes, lentils, nuts (freq/week.....) 3. Milk and dairy products (freq/week.....) 4. Flesh foods (freq/week.....) 5. Poultry products (freq/week.....) 6. Fruits and vegetables (freq/week.....) |

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