FACTORS INFLUENCING NUTRITIONAL STATUS OF CHILDREN BELOW 24 MONTHS IN NJOMBE REGION, TANZANIA

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FACTORS INFLUENCING NUTRITIONAL STATUS OF CHILDREN BELOW 24 MONTHS IN NJOMBE REGION, TANZANIA

By

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A Dissertation/Thesis Submitted in (partial) Fulfilment of the Requirement for the Degree of Master of Science (Applied Epidemiology) of Muhimbili University of Health and Allied Sciences

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CERTIFICATION

The undersigned certify that they have read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled Factors Influencing Nutritional Status of Children below 24 Moths in Njombe Region Tanzania, in partial fulfilment of the requirement for the degree of Master of Science in Applied Epidemiology of Muhimbili University of Health and Allied Sciences.

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DECLARATION AND COPYRIGHT

I, **Deograsia Bakari** declare that this **dissertation** is my own original work and that it has not been presented and will not be presented to any other university for similar or any other degree award.

Signature..   Date..

ACKNOWLEDGEMENT

DEDICATION

To my lovely family,

Mr. Lazaro Manyama - my husband and my lovely children, **Felix and Alex** for their understanding and patience all the time, they have always been by my side giving support and taking care of some of my family responsibilities, Their true unconditional love has given me strength and strong believe in myself. They have taught me great lesson in life through their patience and great understanding.

To my spiritual father,

Reverence Christian Goya Lupindu-who has supported and guided me spiritually and morally, he has been the source of inspirational and gave me strength when I thought of giving up. I will always appreciate everything that he has done to me and my family.

I also dedicate this work and give special thanks to my uncle **Mr Oliver Linje** and his family for always being available for me and letting me stay in their family anytime when I needed place to stay during my studies.

This great achievement is special for all of you.

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ABBREVIATIONS

BF	Breast Feeding
GBV	Gender Based Violence
HAZ	Height for Age Z-score
HFA	Health For All
IPV	Intimate Partner Violence
MoHCDGEC	Ministry of Health Community Development Gender Elderly and Children
MUAC	Mid Upper Arm Circumference
MUHAS	Muhimbili University of Health and Allied Sciences
PAF	Proportional Attributable Fraction
PDHS2	Pakistan Demographic and Health Survey
PHC	Primary Health Care
RCH	Reproduction and Child Health
REC	Research and Ethical Review Committee
TFNC	Tanzania Food and Nutrition Centre
TNNS	Tanzania National Nutrition Survey
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WAZ	Weight for Age Z-score
WHO	World Health Organization

DEFINITION OF TERMS

Exclusive breastfeeding.

Exclusive breastfeeding means that the infant receives only breast milk. No other liquids or solids are given; not even water- with the exception of oral rehydration solution, or drops/syrups of vitamins, minerals or medicines.(1)

Complementary feeding.

Is defined as the process starting to feed the child when breast milk alone is no longer sufficient to meet the nutritional requirements of infants and therefore other foods and liquids are needed, along with breast milk. WHO recommends that infants start receiving complementary foods at 6 months of age in addition to breast milk. Initially, they should receive complementary foods 2–3 times a day between 6–8 months and increase to 3–4 times daily between 9–11 months and 12–24 months.(2,3)

Stunting.

Is defined as a child who falls below -2 standard deviation for height-for-age. It is reflected by the deficits in height- for-age and it would not be expected to change in short period of time making it a good indicator of chronic malnutrition.(4)

Underweight.

Underweight is defined as children falling below -2 standard deviations for weight-for age. It is usually reported in age specific groups and it is liable to change very quickly as it can be influenced by short term effects e.g. diseases, change in food types or feeding frequencies(4)

Wasting.

It is defined as children falling below -2 standard deviations for weight-for-height plus children with oedema. It is measured by using weight for height. (4)

ABSTRACT

Introduction

The burden of malnutrition remains high across the world and young children are among the most affected group. Tanzania is among the countries with very high levels of malnutrition (≥30%) and Njombe is among the regions with high prevalence (53.6%) exceeding the national average.

Objective: To determine factors influencing nutritional status of children aged below 24 months in Njombe region.

Methods: A cross sectional study employing both quantitative and qualitative methods was conducted involving children aged 6 to 23 months. Respondents were a random sample of mothers with children in specified age range. Structured questionnaires were used to collect data on socio-demographic and feeding practices; anthropometric data were collected through measurements. Under-nutrition was based on Z-scores indices below $-2SD$ of the reference population. Bivariate and multivariate log-binomial regression model were used to determine the association between nutritional status and independent variables. Qualitative data were obtained through focused group discussion and in-depth interviews and analyzed thematically.

Results: Forty one percent of the assessed children were under-nourished, (40%) were stunted, underweight (1.2%), and wasted (3.5%). Under nutrition was associated with sex of a child where female had lower risk (aRR=0.80,95%CI:1.06,2.00),age group, where those aged 18-23Months had higher risk (aRR=1.42,95% CI:1.04,1.93), birth weight with those with low birth weight being more likely to be undernourished (aRR=1.55,95% CI:1.22,1.97) and marital status with widowed/divorced mothers being more likely (aRR=1.46,95% CI:1.13,2.01) to have undernourished children. Moreover, children who were not breast feeding had higher risk (aRR=1.55, 95%CI: 1.03, 1.40**)** and fathers higher education (aRR=0.46, 95% CI 0.31, 0.68) was associated with reduced risk of under nutrition. Multiple responsibilities, lack of male partners' support, and big family to take care for were reported as reasons hindering effective breast feeding up to 24 months of age.

Conclusion and recommendations: This study confirms that malnutrition is still a problem in Njombe region. Health education with emphasis on the importance of breastfeeding and male participation in care of the children should be done.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background information

Nutritional status refers to the interpretation of information obtained from the methods of nutrition assessment.(4) This is influenced profoundly by dietary intake which in-turn is influenced with feeding practices, socio-economic and demographic factors and illness that can interfere with feeding. Nutritional status is a major determinant of child's health and survival Thus, poor feeding practices is among the factors that may lead to malnutrition which is one of the most serious health problems affecting infants, and children.(5)

Globally, the burden of malnutrition remains high across the world, with its effect seen affecting most of the world's population at some point in their lifetime, from infancy to old age.(6) It affects all people from different geographical areas including the riches and the poor across all age groups making it a universal problem and it's found to be responsible for more ill health than any other cause. (5)

While anyone can experience malnutrition, young children are among the most affected group with reported multiple burdens. Globally, 150.8 million are stunted, 50.5 million are wasted and 38.3 million are overweight. (5)

The median proportion of stunting in the WHO African regions is reported to be 31.3%, and despite the reported decrease globally, stunting decreased in only six countries across the region and has been seen to be on rise in every part of the Africa. It has increased by 1.4 million children in Eastern and Southern Africa and by 6.5 million children in West and Central. (5)

Good nutrition in the first 1,000 days (from conception up to the child's second birthday) is vital to establishing a child's future health, with impacts that last into adulthood. Nutrition is the fuel that drives a child's early development. During these first 1,000 days the brain grows more quickly than at any later time in a person's life, and a child needs the right nutrients at the right time to feed her brain's rapid development. There are three crucial

stages in the first 1,000-days: pregnancy, infancy and toddlerhood. At each of these stages, nutrition is important to developing a child's physical growth, protecting them from illness and chronic disease and building healthy eating habits.(7)

Despite of short term consequences like increased risk of diseases due to weakened immune system, Malnutrition has life-long consequences in children and can lead to impaired cognitive development, resulting in low school performance and lower earning as adults, which in turns affects national economical growth and development.(7)

To curb the problem, many strategies need to be implemented based on Sustainable Development Goals (SDGs), Several strategies that have been introduced include "breastfeeding week" to promote early initiation of Breast-feeding (within one hour of birth) and continued exclusive breast feeding for six months, emphases on use of family planning for child spacing aiming at allowing the mother more time for caring the baby at least for two years and immunization for children less than five years for building immunity, and to prevent diseases that may result in malnutrition. (1,8)

Tanzania is among the countries with high levels of malnutrition among children under five years, where there are about 31.8% with chronic malnutrition in the country; a prevalence which is considered "very high" (≥30%) according to the new WHO prevalence threshold and thus a public health concern.(8)

Tanzania Southern highland regions are among the regions with high malnutrition rates especially under nutrition; higher than the national average; Ruvuma (41.0%), Iringa (47.1%), Rukwa (47.9%) Njombe (53.6%) and Songwe (43.3%).(9)

The government is working with UNICEF and other partners to implement a mult-sectoral nutritional response; scale up high impact nutrition interventions and services; and respond to the nutritional needs of children in the country. Working through local partners, UNICEF ensures that the most marginalized and poorest households in Mbeya, Njombe, Iringa, Songwe and Zanzibar are targeted with messages and promotion of infant and young children feeding and care practices.(10)

Despite the available strategies and interventions malnutrition is still very high in Tanzania and Njombe region and this study demonstrate the socio-cultural factors that have strong influence on nutritional status of children in Njombe region.

1.2 Problem Statement.

Tanzania is among developing countries with high magnitude of malnutrition; where malnutrition is reported to be endemic with approximately 3 million stunted under five children; and the country is reported to be among the 10 most affected countries with high prevalence of malnutrition among children less than 5years.(11,12)

Severe stunting was found in 10.0 % of children countrywide, though the level of stunting was considered "very high" (≥30%) in 15 out of 26 regions in Tanzania mainland where Njombe is among the regions with very high prevalence of malnutrition despite being among the highly food producing regions in the country.(8)

The survey conducted by TFNC shows significant geographical variations in the magnitude and factors influencing nutritional status of children in Tanzania. (13)

Mother's educational level, birth weight of the child, introduction of complementary feeding and frequency of feeding have reported to have an influence on children's nutritional status, other factors includes household income, family size, sex and size of the child, maternal age and her occupational status, Exclusive Breastfeeding (EBF) and geographic zone.(8,12,13)

In Tanzania like in other developing countries, data on nutritional status is mainly based on the periodic demographic and health surveys. As a result, there is limited information on levels, causes of child malnutrition and factors influencing malnutrition.

Therefore, this study aims at identifying the socio-demographic factors, feeding practices and male partner characteristics and behaviors that have an influence on nutritional status of children below 24 months in Njombe region.

1.3. Conceptual Framework

The etiology of malnutrition in children is very complex involving interactions of multiple determinants that include biological, cultural and socio-economic influences as it has been shown on the malnutrition framework established by UNICEF 1990.(14)

In the UNICEF framework, malnutrition is viewed as a manifestation of a multi-sectoral development problem that can be analysed in terms of the immediate, underlying and basic causes. The immediate causes are inadequate dietary intake and infectious disease; the underlying causes are household food insecurity, inadequate maternal and child care and inadequate health services and health environment; the basic causes include formal and non-formal institutions, political and ideological superstructure, economic structure and potential resources. (14)

For the purpose of this study, we will look into inadequate dietary intake as an immediate cause where inquiry on type of food, duration of breast feeding, and feeding practices will be made, socio-demographic characteristics and male partners characteristics will also be investigated as underlying causes at the household level.

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┌─────────────────────────────────┐                    ┌────────────────────────────┐
│ Independent Variables           │                    │ Outcome Variable           │
│                                 │                    │                            │
│ Sociodemographic factors        │                    │  Under nutrition           │
│ Age, sex birth weight of a child│                    │ -Stunting                  │
│ Socio-cultural factors          │ ───────────►       │ -Wasting                   │
│ -Breastfeeding practice         │       ▲            │ -Underweight               │
│ -Weaning practices              │       │            └────────────────────────────┘
│ -Frequency of feeding           │       │
│ -Type of food given             │       │
│ -Who assist in feeding?         │       │
│ Male partners characteristics/  │       │
│ Behaviours                      │       │
│ -Polygamies                     │       │            ┌────────────────────────────┐
│ -Alcohol intake                 │       │            │ Intermediate variables     │
│ -Breastfeeding habit            │       └────────────│ Sociodemographic           │
└─────────────────────────────────┘                    │ factors                    │
                                                        │ Age, education,            │
                                                        │ occupation, marital status │
                                                        │ of the mother/caretaker    │
                                                        └────────────────────────────┘
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Figure 1: Conceptual framework for factors influencing nutritional status of children below 24 months in Njombe, Tanzania.

1.4. Rationale of the Study.

The results obtained from this study will help people in Njombe TC and Wanging'ombe DC to develop strategies to address the problem of under-nutrition among children below 24 months of age. Also the information will support the local Government to re-think and prioritize strategic areas that need extra attention to reduce the number of children with under-nutrition in their community.

1.5. General Research question.

What are the factors influencing nutritional status of children aged below 24 months in Njombe region?

1.5.1. Specific Research questions

1. What are the socio-demographic factors influncing nutritional status of children below 24 months in Njombe region?

2. What are the feeding practices of children below 24 months in Njombe region?

3. What are male characteristics and behaviouirs influencing on nutritional status of children below 24 months in Njombe region?

1.6. Objectives.

1.6.1 Broad Objective

To determine factors influencing nutritional status of Children aged below 24 Months in Njombe Region in Tanzania.

1.6.2. Specific Objectives.

1. To estimate nutritional status of children aged below 24 months of age in Njombe region.

2. To investigate Socio-demographic factors influencing nutritional status of children aged below 24 months in Njombe region.

3. To assess children feeding practices and their influence on nutritional status of children below 24 months in Njombe region.

4. To explore male partners' characteristics and behaviours influencing nutritional status of children aged below 24 months in Njombe region.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1. Conceptualization of nutritional status

Nutritional status of children is an indicator of the level of development and future potential of the community. Thus, nutritional status of infants and children below two years of age is of particular concern since the early years of life are crucial for optimal growth and development of a child as an individual.(6) The importance of good nutritional status in health and socio economic development was fully recognized at the Alma-Ata Convention in Russia and Primary Health Care (PHC) declaration and was made an objective of Health for All (HFA). Promotion of food supply and proper nutrition was listed as one of the major elements of PHC in 1978.(15) However, poor nutritional status is still a problem globally and the progress to tackle malnutrition in its all forms remains unacceptably slow.(6)

2.2. Nutritional status of children.

Globally, malnutrition in its all forms remains high; despite some reduction, still 150.8 million under five children are stunted, 50.2 million wasted and about 20 million are born underweight.(6) Trends in malnutrition vary significantly within countries with other countries experiencing decrease while others increase and just fewer than 50% of countries are on track to meet at least one of the nine targets, however none is on target to meet all the nine target goals.(6)

The United States reported to have successfully attained significance reduction level of under-nutrition among under five children, where stunting is 3.5% which is less than 21.9% global estimate and the prevalence of wasting is 0.4% also less than the global prevalence of 7.7%.(6)

In Africa though stunting among children appears to decrease in percentage from 38.3% to 30.3% in 2000 to 2017, the actual number of stunted children has risen.(5) The number of stunted children has seen to rise in every part of the African regions; it has been increased by 1.4 million in Eastern and Southern Africa and by 6.5 millions in West and Central.(5)

Study done in Ethiopia, the prevalence of stunting among under-five was reported at 43.1% and wasting is 16.2% which is greater than the developing country average of 25% and 8.9% respectively. (16)

In East Africa malnutrition in children under five years of age can be contrasted from county to county; In a study done in Uganda the prevalence of stunting, underweight and wasting was 23.8%, 24.1% and 21.6% respectively.(17) Another similar study in Kenya reported the prevalence of stunting among under-five children of 39%, underweight prevalence of 18.1% and that of wasting is 7.1%.(18)

In Tanzania, stunting among children below 5 years has significantly decreased from 34.7% to 31.8% in 2014-2018 though the levels are still high in 15 regions including (53.6%) Njombe. Nevertheless, approximately 3 million under-fives are stunted and the prevalence of underweight 14.6% is higher than in 2014(13.4%). (11)

Several studies have been done with some similar finding, a study done at Nzega district shows the prevalence of stunting among under-five children is 26.1%, prevalence of underweight is 11.7% and of wasting is 6.5%.(19)

Another similar study was done in Kilimanjaro where the prevalence of stunting was reported to be high at 44.2% and underweight was reported at prevalence of 19.1%.(20)

In Kilosa, the study was done with the aim of comparing the magnitude of malnutrition between the high land and the low-land areas within the district, where the highlands appeared to have significantly high magnitude as compared to the low-land areas; stunting, underweight and wasting was 64.5, 22.4 and 1.4% respectively in the highlands and 41, 11.5 and 2.5% in the low land areas.(21) Chamwino district in Dodoma reported slightly lower magnitude of 14.6, 4.5 and 2.3% prevalence of stunting, underweight and wasting respectively.(22)

Many studies done involving children under five, there is a need to investigate children below 24 months critical age, this time period harbors the greatest opportunity to provide optimal nutrition to ensure normal development and also it is the time of greatest brain vulnerability to any nutrient deficit.

2.3. Factors influencing nutritional status of children

Several studies have been done in and outside the country aiming at assessing different factors influencing nutritional status of children with the purpose of setting specific interventions. Globally, the factors tend to vary in different counties or even between geographical areas within the same country.(16–21)

Socio- demographic characteristics of the mother

In a study done in Brazil, it was seen that stunting and underweight was strongly associated with the house hold income, number of people in the house hold, number of antenatal visit done by the mother and geographical residence whereby residing in rural areas found to be associated with under-nutrition.(23) In a study done in Iran, house hold income, sex of the child, maternal educational level, family size and unsafe water were reported to be the strong determinants of nutritional status of children .(24)

Another study in Sri Lanka concluded that parents' educational level, economic status and health habits has influence in nutritional status of the children.(25)

In African regions similar studies found similarity in factors influencing nutritional status of children, in studies done in Uganda age of the child, poor health, prolonged breastfeeding, family social economic status, educational of the mother, consumption of low energy and age of the mother were found to have an association and children of peasant mothers were likely to be under nutrition as compared to children from pastoralist families.(26,27)

Another similar study done in Arusha reported that young age of the mother was strongly associated with malnutrition of the children; 71% of cases their mothers aged between 17-22 as compared to 7.8% of the controls.(28)

Demographic characteristics of a child.

In a study that was done in Iran, among other factors sex of the child was reported to be a strong determinant of the nutritional status of the child were being a male child had increased odds of being stunted. (24)

In a study done in Bukina fasso the results showed that child sex, age and size at birth were significantly associated with under nutrition status among children, and regarding stunting

status, the results found that older male children were more likely to be stunted compared with the reference group.(29)

In Uganda it was observed that there were few underweight children aged between 13-59 months as compared to those aged 12 months or below and the relationship was significant (P=0.041) and stunting was observed more among children at birth order 3-4.(30)

In Tanzania as reported from analysis of TDHS 2015-2016 data, a higher proportion of boys were consistently stunted compared to their counterparts and 48% of low birth weight children became stunted compared to 31% of those who were born with normal birth weight.(11)

There is few published study in Njombe to ascertain the influence of socio-demographic characteristics on nutritional status among children below 24 months.

2.3.1. Feeding practices

There is evidence that adequate nutrition in early years is a cardinal importance for determining infants' growth and development as well as for prevention of diseases in adulthood. In addition, breastfeeding is considered a necessary and sufficient for an infant until 6 months, and that is imperative that it continues throughout the complementary feeding up to the age of 24 months.(31)

Ideally, infants should be breastfed within one hour of birth, breastfed exclusively for the first six months of life and continue to be breastfed up to 2 years of age and beyond. Starting at 6 months, breastfeeding should be combined with safe, age-appropriate feeding of solid, semi-solid and soft foods,(32–34) also children's caring practices play an important role in the development of child health right from birth.(34)

Any factors interfering to children caring practices and or their proper feeding may be associated with malnutrition to the child which may in turn interfere with the child's development. (33,34)

WHO recommends that children start receiving complementary foods at 6 months of age in addition to breast milk whereby initially, they should receive complementary foods 2–3

times a day between 6–8 months and increase to 3–4 times daily between 9–11 months and 12–24 months.(2)

In a study done in Ethiopia indicated that Breast feeding associated with reduced odds of wasting and underweight while introducing complementary food at 6 months reduced odds of stunting.(35)

Several studies done to assess the association between feeding practices and nutritional status investigated on exclusive breast feeding and age on initiation of complementary foods where the findings shows clear evidence of strong association; early weaning before 4 months is associated with stunting and wasting.(36–38)

One study done in Mbeya region; reported that 19% of children who were early weaned before 4 months were severely stunted and non was severely stunted among those weaned at the age of 6 months and association was significant. (39)

There is increasing recognition that optimal complementary feeding depends not only on what is fed, but also on how, when, where, and by whom the child is fed,(32) that is the reason to why it is important to assess the practice in Njombe where the magnitude of malnutrition has reported to be very high.

2.3.2.   Male partners' characteristic and behaviours.

In most of our families in Africa, males are the decision makers and are the ones who have controls in all aspects concerning family issues making them important people for determining the family health wellbeing and development in general.

Understanding their characteristics and how they can influence nutritional status of children is of paramount importance, however, less have been done. A community based study on determinants of acute malnutrition among under-fives that was done in Nepal reported that, children whose fathers were illiterate had higher odds of being malnourished compared to children whose fathers were literate. (40)

In a study that was done in Bangladesh among children admitted to a diarrhoea treatment facility, the analysis revealed that children with acute severe malnutrition were more likely than controls to have a father with no or a low paying job.(41)

Another similar study was done in New Guinea, and it was reported that fathers of the malnourished children were of lower educational status, were more likely to be unemployed and more likely to drink alcohol compared with those of the control children. (42)

In a study done in Arusha, fathers of 37% of cases reported to have not received formal education compared to 16% of the controls and fathers of cases were less likely to report complete secondary and tertiary education.(28)

There are no documented study findings on male partners' characteristics and behaviours that have strong influence on nutritional status of children below 24 months in Njombe.

CHAPTER THREE

3.0 METHODOLOGY

3.1. Study site

This study was conducted in two districts of Njombe region; namely Wanging'ombe district and Njombe Town council.

Njombe region borders Iringa Region in the north, Morogoro Region in the east and Ruvuma region in the south. In the south-west; Njombe region is bordered by The Republic of Malawi via Lake Nyasa and part of Mbeya Region, while in the west the borders are shared with Mbeya Region again. The region lies between latitude 08° 50' and 10° 30' south of the equator and between longitude 33° 45' and 35° 45' east of Greenwich. Njombe region has an area of 24,994 km2 and is divided into four Administrative Districts (Makete, Njombe, Ludewa and Wanging'ombe) and six Local Government Authorities (Njombe DC, Njombe TC, Makambako TC, Makete DC, Ludewa DC and Wanging'ombe DC).

According to 2012 national census Njombe Region has a total population of 702,097 people (329, 593 males and 372,738 females).(43) The region is predominantly rural with 76% of its population living in rural areas and 81% are farmers.(43)

The region has a total of 304 health facilities whereby 16 are hospitals, 34 health centres and 254 dispensaries. Of all the facilities, 246 are owned by the Government, 46 are Faith Based Organisation facilities, 8 privates and 4 Parastatal owned facilities.

Wanging'ombe district council and Njombe Town Council were randomly selected to represent the region in the study. Together the two selected districts has a total population of 292,039.

As in other parts of the region, the two selected districts have a cool climate, fertile soil and reliable rainfall which are favourable conditions for agriculture enabling high production of maize, beans and Irish potatoes as staple food. As for cash crops, timber, tea, coffee and electric poles are produced at large amounts. Horticultural crops in the area include

avocados, peas, apples, plums, peaches, oranges and mangoes production. Njombe is among the National food basket as is ranked among the top 5 regions with high food production.

Despite this, the region has high prevalence of malnutrition where the prevalence of under-nutritional is above the national level. While severe stunting is reported to be 10% countrywide, the prevalence is very high in Njombe at 53.6%. (11)

3.2. Study design.

Cross-sectional study was conducted by employing both qualitative and quantitative methods of data collection. For the purpose of generating data on nutritional status of children in the study area and determining the associated factors, the quantitative research method was applied. On the other hand, to explore child feeding practises and male partners' characteristics and behaviours that have strong influence on nutritional status of children in the community, the qualitative approach was used.

Both Focused group discussion and in-depth interviews were employed as they complement each other in obtaining in-depth information about a community thought and opinions in several perceptive about the same topic.(44)

3.3. Study population.

The study consisted of three study populations

1. The study targeted all children aged 6-23 months old attending RCH clinics in selected facilities.
2. Mothers of the children aged 6-23 months attending RCH Services at the study facilities in Njombe region.
3. Male clients who attended at the health facilities either to seek health care services or who escorted their partners to the clinics and who are already fathers (had a child or children of their own).

3.3.1. Inclusion criteria.

- ➢ All children aged 6-23 months old attending RCH clinic services for growth monitoring in selected health facilities were included in the study, together with their mothers.
- ➢ Male clients who attend for health services or who escorted their partners for services (not necessarily to be the father of the selected children) were also be included.

3.3.2 Exclusion criteria.

- ➢ Children with physical deformities that hinder measurement of length during data collection time
- ➢ Mothers who were ill or unable to communicate were excluded from the study.
- ➢ Also male clients who were unable to communicate were excluded from the study.

3.3. Sample size estimation and sampling procedures for quantitative part

3.3.1 Sample size estimation for children

Sample size was determined by using a single proportion calculation formula

Sample size (n) = $Z^2 \times p (1-p)/d^2$

Where z= standard normal deviate corresponding to the significance level. (=1.96 for 95% confidence level)

P= 31.8%, estimated prevalence of chronic malnutrition in the country. (8)

d= margin of error (5%)

n=$\underline{1.96^2 \text{ x } 0.318 \text{ x } 0.682}$

$\qquad 0.06^2$

$\qquad$ n=231

Considering design effect of 2 and 10% non-response rates, the final sample size for this study was 514.

3.3.2. Sampling technique.

A mult-stage cluster sampling method was used to enrol the participants in the study. First stage unit was the districts where the sampling frame was all the six local administrative districts in the region. Wanging'ombe and Njombe Town Council were randomly selected. Second stage units were all the health facilities in the two districts where a total of 10

facilities were selected; five (5) from each of the 2 districts).The sampling frame were obtained from the health facility registry in the MOHCDGEC and from the regional district secretary. A list of facilities that provide Reproductive and Child Health services (RCHs) children growth monitoring clinic services was obtained from each district. The facilities with high volume (>30 children attendance RCHs attendance per day) were listed and selection was done randomly using lottery method. Ilembula hospital, Kipengele health centre, Wanging'ombe health centre, Makoga dispensary and Palangawanu dispensary were selected from Wanging'ombe district council. From Njombe Town Council, one hospital (Kibena hospital), one health centre (Njombe health centre) and three dispensaries (Mjimwema, Muungano and Idundilanga) were selected.

Finally, in the selected facilities, children aged from 6 to 23 months were randomly selected during their regular RCHs attendance visits at the selected health facilities. Eligible children were assigned unique number from 1 up to the last child and then the study units were obtained by simple random sampling. Whenever there were twins, one of them was selected randomly for inclusion in the study.

3.4 Sample size estimation and sampling procedures for qualitative part
Mothers were selected by purposefully sampling and the parity was used as a criteria for selection. Three focused group discussions consisting of 6-8 mothers were conducted. Male clients attending services at the selected facilities or those who escorts their partners were conveniently selected. The sample size was determined based on theoretical saturation (the point in data collection when new data no longer bring additional insights to the research question) during data collection. (45)

3.5. Data collection procedures.

3.5.1. Data collection for quantitative methods.
A structured-interviewer-administered questionnaire was used for quantitative data collection. The questionnaire was developed using the relevant literature based on the objectives of the study. It was developed in English and later translated into Kiswahili; the commonest spoken language in the study area and it was used to collect information on demographic and socioeconomic factors for the mother and male partner characteristics.

Children's demographic characteristics and anthropometric measurements were recorded in the interview forms after taking the measurements.

The Swahili version was used to interview mothers/caretakers of study participants. Pre-test was done in Kigoma region in February 2021 to test the validity of the questionnaires. Following pre-testing, Questions were revised and modified for better understanding and some questions were removed as they were seen to be irrelevant to the study objectives.

3.5.2. Data collection on qualitative methods

Data were collected through FGD and in-depth interview using a semi-structured interview guide. . A social scientist who is good at conducting qualitative study with good techniques to probe for more information and clarifications to obtain rich data did exploration and the participants were given adequate time to share in details about their understanding, practices and opinions on male characteristics and behaviours that might have an influence on nutritional status of children in their community. Data were recorded by tape recorders and by writings.

3.5.3. Measurements.

The anthropometric variables used in this study are weight, height and mid-upper arm circumference (MUAC).To measure the weight of a child, the weighing scale was placed on a flat floor and standardized to zero at the start of each day and the children were asked to stand on the scale for their weight to be displayed. To measure children who were not able to stand alone, their weight were measured by using the hanging scale and the weight was recorded. In all cases, the scale was read to the nearest 0.1 kg with minimal/light clothing and no shoes.

Height of the child was measured to the nearest 0.1cm with the child in the upward upright position, with legs stretched to a full extent and feet at right angles with legs in the height board. Recumbent length was measured for children who could not stand. In this case, the child was placed horizontally on a wooden measuring board. The child was placed facing upward with the head toward the fixed end and the body parallel to the long axis of the board. The child's knees was pressed onto the board so that the legs will lay straight and the toes pointing directly upward, and then, the movable footboard was brought to rest

firmly against the heels and measured to the nearest 0.1 cm.(46) The height/length board Baby/infant L-hgt mea.system/SET-2 supplied by UNICEF was used for the measurement.

Mid upper arm circumference was measured by marking the midway between shoulder tip and the elbow tip on the vertical axis of the upper arm with the arm bent at right angle and between the lateral and medial surface of the left arm, then the arm circumference through the marked point was measured by using the non-stretchable MUAC tape manufactured by GPC (Global Product Compliance) Medical Limited in India, care was taken to make sure that the tape fitted comfortably around the child's arm. (46,47)

 Age of the child was collected from the mother and counter-checked by RCH cards for confirmation. The anthropometric data of the children were stored using Microsoft access and then exported to STATA, version 15, for further analysis. Z-scores of nutritional indices; Weight-for-Age (WAZ), Weight-for- Height (WHZ), and Height-for-Age (HAZ), were calculated using the WHO Multicenter Growth Reference Standard. Finally, children were classified as stunted, underweight, and wasted when the HAZ, WAZ, and WHZ scores were less than −2 standard deviations (SD), respectively. On the other hand, children were classified as overweight when WHZ scores were greater than 2. Children who were stunted, underweight, or wasted were classified as undernourished.

3.5.4. Training of Data collectors:
Two registered nutritionists and two social workers were assigned data collection work as assistants. Before the start of data collection the selected assistants received one day training on data collection process and proper data filling.

3.6. Variables.
3.6.1. Dependant variable.
3.6.2. Independent variables.
Independent variables included: Exclusive breastfeeding history, initiation of complimentary foods, the type of food given to the child daily, how frequently is the child feed and if the child is feeding in his or her own plate or share the plate with other siblings. Parent's educational level and occupational status, marital status, alcohol intake and number of sexual partners were also among the independent variables.

3.7. Instruments for data collection.

Instruments and equipment's necessary for data collection during the study were:

a) Weighing Machine: - Weighing machine with the capacity of 100kg and having the least count of 0.1Kg. (2pieces)

b) Height measuring scale standiometer):- 2 Pieces

c) MUAC Tape: - For measuring mid-upper arm circumference (2piece)

Continuous supervision was done by the principal investigator on daily bases where the completeness of filling the questionnaires and inconsistence of data were checked and corrected for.

Qualitative data collected from FGDs and in-depth interviews were transcribed and coded daily soon after collection.

3.8. Data Analysis

3.8.1. Data management

The principal investigator was responsible for quality checks of all questionnaires. Inconsistencies were identified each day during data collection and if any error or missing information was recorded, immediate follow up were done.

3.8.2. Descptive Data Analysis

Quantitative data from respondents were compiled, cleaned, edited, coded and sorted manually and then entered into EPI info 7. Data analysis was done by using stata 15. Anthropometric indices were calculated using the 2006 WHO Multicenter Growth Reference. Frequency distribution tables, graphs and cross tabulation of explanatory and outcome variable were done.

3.8.3. Bivariate and multivariate analysis

3.8.3.1. Log Binomial Analysis

The collected data were stored in Microsoft access database. Then, the data were exported to STATA, version 15, for further analysis. Both bivariate and multivariate log binomial regression models were used to identify variables associated with nutrition status among children. Log binomial regression model is used to determine the relationship between binary (dichotomized) outcome variable and set of independent variables. Variables with a p value less than 0.2 in the bivariate analysis were fitted into the multivariate log binomial

regression model to control the possible effect of confounding. Both Crude Risk Ratio (CRR) and Adjusted Risk Ratio (ARR) with the corresponding 95% Confidence Interval (CI) were calculated to show the strength of association and the multi-collinearity among factors were checked and each factor in the model had a variance inflation factor(VIF) of less than 1.5. Finally, in the multivariate analysis, variables with a p value less than 0.05 were considered statistically significant. The general multivariable log binomial regression model is given as:

$$\log_e \pi(x) = \beta_0 + \beta_1 x_1 + \ldots\ldots + \beta_p x_p$$

Where, $\pi(x)$ is the chance of having event of interest; in our case, it is chance of being undernourished; $x_i 's$ are covariates (factors) and $\beta_i 's$ are their respective parameters. The results of the model are presented in the form of a regression parameter estimate and estimated Risk Ratio (RR). The estimated RR, determined by taking the exponent of the regression parameter estimates, shows the increase or decrease in the likelihood of being undernourished for subjects at a given level of the independent variable as compared to those in the reference category. An estimate of RR > 1 indicates that the likelihood of being undernourished for children at a given level of the independent variable is greater than that for the reference category. Similarly, an estimate of RR < 1 specifies that the chance of being undernourished for subjects at a given level of independent variable is less than that for the reference category.

3.8.3.2. Qualitative data analysis

Qualitative data was transcribed, coded and sorted manually and then analyzed thematically by using analysis procedures as suggested by Braun and Clarke in 2006. (44,45) namely data transcription and familiarization generating initial codes, searching for themes, themes review, naming and defining themes and finally report production. Moreover, after analysis, data were presented by using participants' verbatim quotes.

3.9. Ethical Considerations.

Ethical clearance was obtained from the Institution Review Board (IRB) at Muhimbili University of Health and Allied Sciences. Permission to conduct the study was obtained from regional and District officials in the region after presenting an introduction letter from MUHAS. Informed consent was obtained from each participant prior to the interview after detailed explanations of the study purpose and ensuring that the information obtained from the participant will be kept confidential. Before the interviews, the objectives of the study were clearly explained to the participants and written informed consent was obtained, and confidentiality was assured.

CHAPTER FOUR

4.0 RESULTS

4.1. Demographic characteristics of the study population

4.1.1. Demographic characteristics of the children

The study recruited a total of 513 children with age ranges between 6 to 23 months and their median age was 14 months and interquartile range of 17 months. Of the assessed children, 265(51.7%) were females. Children aged 6-11 months contributed the high proportion 192(37.4%) and those aged 18+ months had the least contribution 149(29.0%). The majority 477 (93%) were born with birth weight of 2.5kg or above and 383 (74.9%) were still breast feeding. Most 396(77%) of the children involved in the study were the only under-five children in their families. Table 1 shows baseline characteristics of participated children.

Table 1: Baseline characteristics of the children.

Variable	Frequency	Percent	Median	IQR
Sex of child				
Female	265	51.66		
Male	248	48.34		
Age of child(months)			14	17
6-11	192	37.43		
12-17	172	33.53		
18+	149	29.04		
Child birth weight			3.4	
<2.5	36	7.02		
2.5+	477	92.98		
Number of under five				
In the house				
1	396	77.19		
2	112	21.83		
3	5	0.97		
Child still breast feed				
No	128	25.05		
Yes	383	74.95		
District				
Njombe TC	243	47.37		
Wanging'ombe	270	52.63		

4.1.2. Demographic characteristics of caretakers of the children

Interviewed mothers' age ranged from 16 to 48 years with median age of 27 years. About 255 (49.7%) of them were aged between 23-29 years and 335 (65.3%) were married. The majority 306 (59.7%) had attained primary education level and 356(69.4%) were not employed. With regard to the fathers, their age ranges between 20 to 51 years with median age of 31 years. About 320(62.5%) of them had no formal education and 267(52.2%) were not employed. Table 2

Table 2: Socio-demographic characteristics of caregivers of the children

Variable	Frequency	Percent
Mother age		
16-22	95	18.52
23-29	255	49.71
30+	163	31.77
Mother education level		
No formal education	44	8.58
Primary education	306	59.65
Secondary and above	163	31.77
Mother occupation		
Employed in unskilled manual work	137	26.71
Employed in skilled work	20	3.90
Not employed	356	69.40
Marital status		
Cohabiting	50	9.75
Divorced	37	7.21
Married	335	65.30
Single	67	16.96
Widowed	4	0.78
Parity		
1-3	438	85.38
4-5	65	12.67
6+	10	1.95
Father age		
20-26	112	22.09
27-33	217	42.80
34+	178	35.11

Variable	Frequency	Percent
Father education level		
No formal education	24	4.69
Primary education	320	62.50
Secondary and above	168	32.81
Father occupation		
Employed in unskilled manual work	199	38.94
Employed in skilled work	45	8.81
Not employed	267	52.25
Household size		
1-4	234	45.79
5+	277	54.21

4.2. Nutritional status of the children.

Of all 513 children, 301 (58.7%, 95% CI 55.8%-61.3%) were found to have normal nutritional status. Under nutrition was observed in 211 (41.3%, 95% CI 37.1%-45.7%); whereby 101 (19.6%) were over-nutrition (Overweight). Stunting was the most prominent form of under-nutrition at 40% (95% CI 36.6%-44.3%) prevalence, 1.2% were wasted and 3.5% were underweight and 16 (3.1%) had more than one form of under nutrition .As Shown in figure 2.
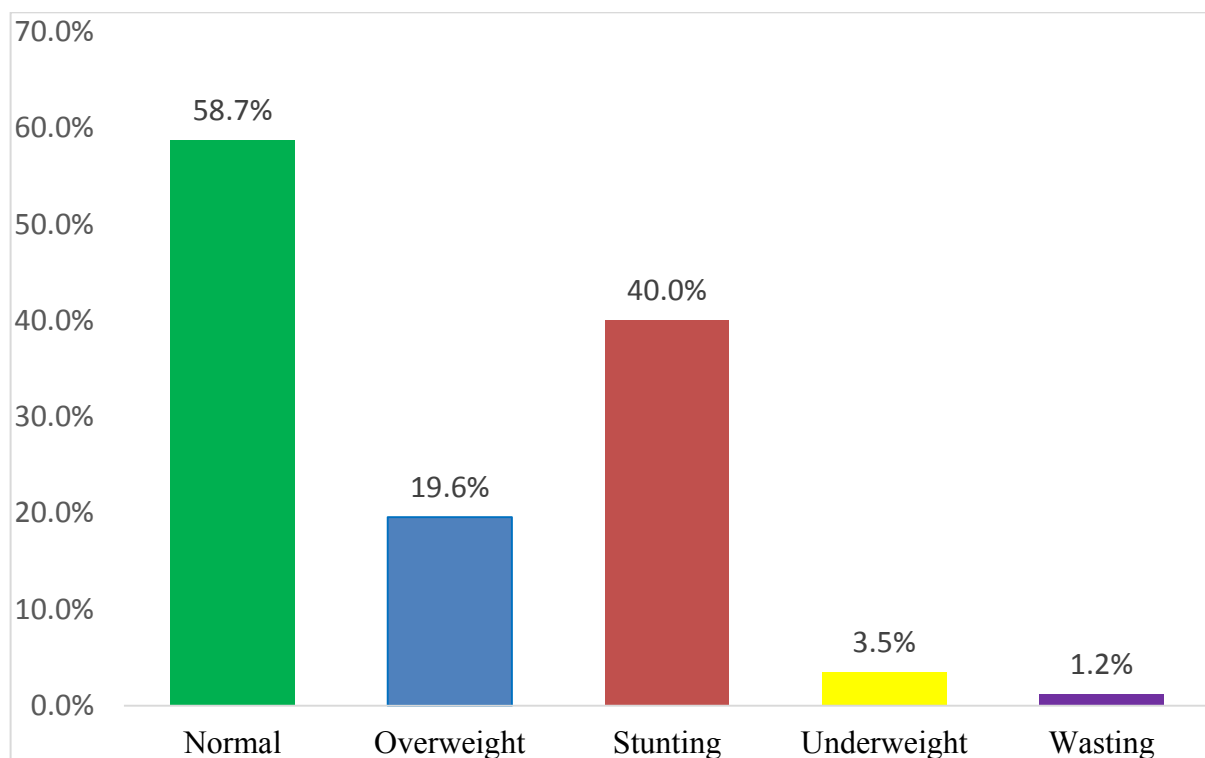
Figure 2: Nutritional status of children aged below 24 months of age in Njombe region

4.3. Socio-demographic factors associated with nutritional status among children.

Table 3 displays the results of binary and multiple log binomial model for factors associated with nutritional status among children aged below 24 months. The results of the fitted model revealed that sex, age, and birth weight of the children were significant factors associated with under nutrition. Female children were significantly less likely to be under nourished as compared to male children (aRR=0.80, CI 95% 0.66, 0.97). The findings also revealed that children aged 18-23 months (aRR=1.42, CI 95% 1.04, 1.93) were significantly more likely to be undernourished in comparison to children aged 6-11 months. The adjusted risk ratio of having under nutrition for children with birth weight of less than 2.5 kg was 1.5 times that of children with birth weight of at least 2.5 kg (aRR=1.55, CI 95% 1.22, 1.97). The findings also revealed that children of the Divorced/windowed (ARR=1.46, 95% CI 1.06, 2.00) were having significantly greater adjusted risk of being under nourished in comparison to children of the married counterparts. Table 3

Table 3: Socio-demographic factors associated with nutritional status among children

Variable	Normal N(%)	Under-nutrition N(%)	Crude		Adjusted	
			RR (95%CI)	P-Value	RR (95%CI)	P-Value
Mothers age						
16-22	61(64.2)	34(35.8)	Ref		Ref	
23-29	143(56.1)	112(43.9)	1.23(0.91,1.66)	0.185	0.94(0.87,1.78)	0.256
30+	97(59.5)	66(40.5)	1.13(0.82,1.57)	0.460	0.78(0.98,2.06)	0.328
Mother education level						
No formal education	19(43.2)	25(56.8)	Ref		Ref	
Primary education	170(55.6)	136(44.4)	0.78(0.58,1.04)	0.091	0.89(0.65,1.21)	0.428
Secondary and above	112(68.7)	51(31.3)	0.53(0.37,0.76)	< 0.001	0.75(0.49,1.14)	0.185

Mother occupation status						
Not employed	199(55.9)	157(44.1)	Ref		Ref	
Employed	102(64.7)	55(41.3)	0.76(0.59,0.98)	0.032	0.94(0.71,1.25)	0.631
Current Marital status						
Married	234(60.8)	151(39.2)	Ref		Ref	
Single	49(56.3)	38(43.7)	1.31(0.99,1.73)	0.058	1.26(0.95,1.67)	0.092
Divorced/ windowed	18(43.9)	23(56.1)	1.64(1.21,2.24)	0.002	1.46(1.06,2.00)	0.021
Sex Of a Child						
Male	128(51.6)	120(48.4)	Ref		Ref	
Female	173(65.3)	92(34.7)	0.69(0.55,0.85)	0.001	0.80(0.66,0.97)	0.022
Age(Months)						
6-12	139(72.4)	53(27.6)	Ref		Ref	
12-17	94(54.7)	78(45.35)	1.64(1.24,2.18)	0.001	1.27(0.65,1.65)	0.079
18-23	76(51.0)	73(49.0)	1.81(1.37,2.40)	< 0.001	1.42(1.04,1.93)	0.026
Birth weight						
< 2.5	9(25)	27(75)	2.01(1.60,2.51)	< 0.001	1.55(1.22,1.97)	<0.001
2.5+	292(61.2)	185(38.8)	Ref		Ref	0.038
Under-five in the House						
1	243(61.4)	153(38.6)	Ref		Ref	
2+	58(49.6)	59(50.4)	1.33(1.06,1.67)	0.011	1.23(0.99,1.51)	0.051

District						
Njombe TC	158(65.0)	85(35)	Ref		Ref	
Wanging'ombe	143(53.0)	127(47)	1.34(1.10,1.21)	0.006	1.67(0.94,1.44)	0.154
Facility level						
Hospital	72(72.7)	27(27.3)	Ref		Ref	
H/c	133(62.8)	79(37.2)	0.80(0.20,1.13)	0.083	0.47(0.47,2.10)	0.653
Dispensary	96(47.5)	106(52.5)	1.21(0.54,1.14)	0.072	1.08(0.76,1.91)	0.435

4.4. Assessment of child feeding practices in Njombe region

4.4.1. Breast feeding practices

The study found that 365 (71%) of participants practiced exclusive breast feeding to their children; 53% started on complementary foods at the age of 6 months, about 29% were given complimentary food below 6 months and 18% were started at the age above 6 months; cereal plain (maize) Porridge was the most (83%) first food given whereas milk/formula were started on only 1% of the children as their first complementary food and 74% of the children were still breast feeding. Table 4

Table 4: Summary Statistics for Feeding Practices of Children in Njombe Region.

Variable	Frequency	Percent
Practice Exclusive breast feeding		
No	148	28.85
Yes	365	71.15
Age of the child started given other additional food		
Less than 6 months	148	28.85
At 6 months old	273	53.22
More than 6 months	92	17.93
The first type of food introduced to child		
Plain Cereal Porridge	427	83.24
Cereal porridge mixed with milk/ground nuts	77	15.01
Milk/formulas	5	0.97
Vegetable soup/fruit juices	6	1.17
Others	2	0.39
The child still breast feeding		
No	131	25.54
Yes	382	74.46

On assessing the influence of feeding practices on under nutrition, the study found that children who were not breastfeeding were 1.55 times more likely to be undernourished as compared to those who were breast-feeding.

Table 5: Feeding practices of the children associated with under nutrition: Results of Unadjusted and Adjusted log binomial regression model

Variable	Normal N(%)	Under-nutrition N(%)	Crude		Adjusted	
			RR (95%CI)	P-Value	RR (95%CI)	P-Value
Child Still BF						
Yes	241(62.9)	142(37.1)	Ref		Ref	
No	59(46.1)	69(53.9)	1.49(1.21,1.85)	< 0.001	1.55(1.03,1.40)	0.020
Feeding frequency						
1-2	39(70.9)	16(29.1)	Ref		Ref	
3-4	228(56.4)	176(43.6)	1.49(0.98,2.29)	0.064		
5+	34(62.9)	20(37.1)	1.27(0.74,2.18)	0.038		
Who assist feeding						
Mother	267(59.6)	181(40.4)	Ref		Ref	
Sibling	8(89.0)	1(11)	0.89(0.76,0.93)	0.161	0.66(0.83,1.12)	0.301
House maid	16(88.9)	2(11.1)	1.06(0.79,1.41)	0.680		
Feed on his own	32(82.1)	7(17.9)	0.86(0.92,1.03)	0.247	0.69(0.48,1.08)	0.442
Feed on own plate						
Yes	278(66.6)	139(33.3)	Ref		Ref	
No	44(45.8)	52(54.2)	0.86(0.49,0.99)	0.247	0.73(0.69,1.04)	0.423

Table 6: Emerged Themes.

The following table summarizes the emerged themes from FGDs and II on the two major objectives namely; assessing child feeding practices in Njombe region and exploring male partners' characteristics and behaviours that may influence nutritional status of children aged below 24 months in Njombe region.

Theme	Sub-theme	Descriptions	Codes
CHILD BREAST FEEDING PRACTICES	Frequency of child breast feeding	The participants are flexible on breasting feeding depending on the of the demands of the child and according to their ages	• Any time he/she need/flexible (5) • More when young, less when get old
	Duration for breast feeding	It is felt that no specific time is allotted for breast feeding, however kids' satisfaction is taken into account	• No specific time • Upon kids satisfaction (3)
	Indicators for child breast feeding satisfaction	Child satisfaction is recognized when the breasts are empty and the child stops sucking hence ends up with a sleep	• When feeling sleepy • Stop sucking and Start playing with the breasts (6) • When the breast is empty
	Type of food given to children	Juice and any other type of food cooked for the other family members	• Anything cooked for family members (3) • Boiled potatoes • Porridge • Vegetable soup and fruits juice
	Alternative people to be breast fed	Other kids who are breast fed include a child whose parent is dead while she /he is too young but sometimes 4 year sibling twice or thrice	• A left over kid due to the death of his /her mother • No one due to diseases (4) • Sometimes 4 year sibling twice or thrice
	Factors hindering the woman to practice effective up to 2 years of age	Cultural orientation and poverty account for the failure of women to practice effective up to 2 years of age	• Excessive use of alcohol • Lack of nutritious food for mother • Lack of support from male

			partners • Becoming busy with family issues due to a large family
MALE PARTNERS BEHAVIOURS	Reasons for male partners' breastfeeding	The participants felt that male breastfeeding helps in preventing from other diseases, as a way of showcasing love but sometimes a way of coping with a western way of life	• Coping from western world • Getting antibodies to prevent from transmission of diseases (3) • Stress removers and relaxation • Takes it as an act of love • To test the flavour (2)
	Participants' opinions on male partners' breast feeding	The participants thought the bahaviours is barbaric and not appropriate	• Not appropriate /Very bad (8)
	Effects of male partners' breast feeding on children	Male breastfeeding can lead to malnutrition to the child, and poor health	• Frequent diarrhoea • Poor child growth (3) • Weak child as milk become inadequate hence malnourished (4)
	Reasons for breastfeeding a male partner	A fear of domestic violence, a proof for a true love are felt to be major the reasons for women engagement in male partners breastfeeding	• Fear of divorce • Fear of being beaten (2) • Proof for love to their male partners • Over playing with breasts for pleasure

4.4.2. Duration of breastfeeding

Of those who stopped breast feeding (N=131), the majority 98 (74.8%) stopped at the age of 12-18 months while 14(10.7%) were stopped below 12 months. **Figure 4**
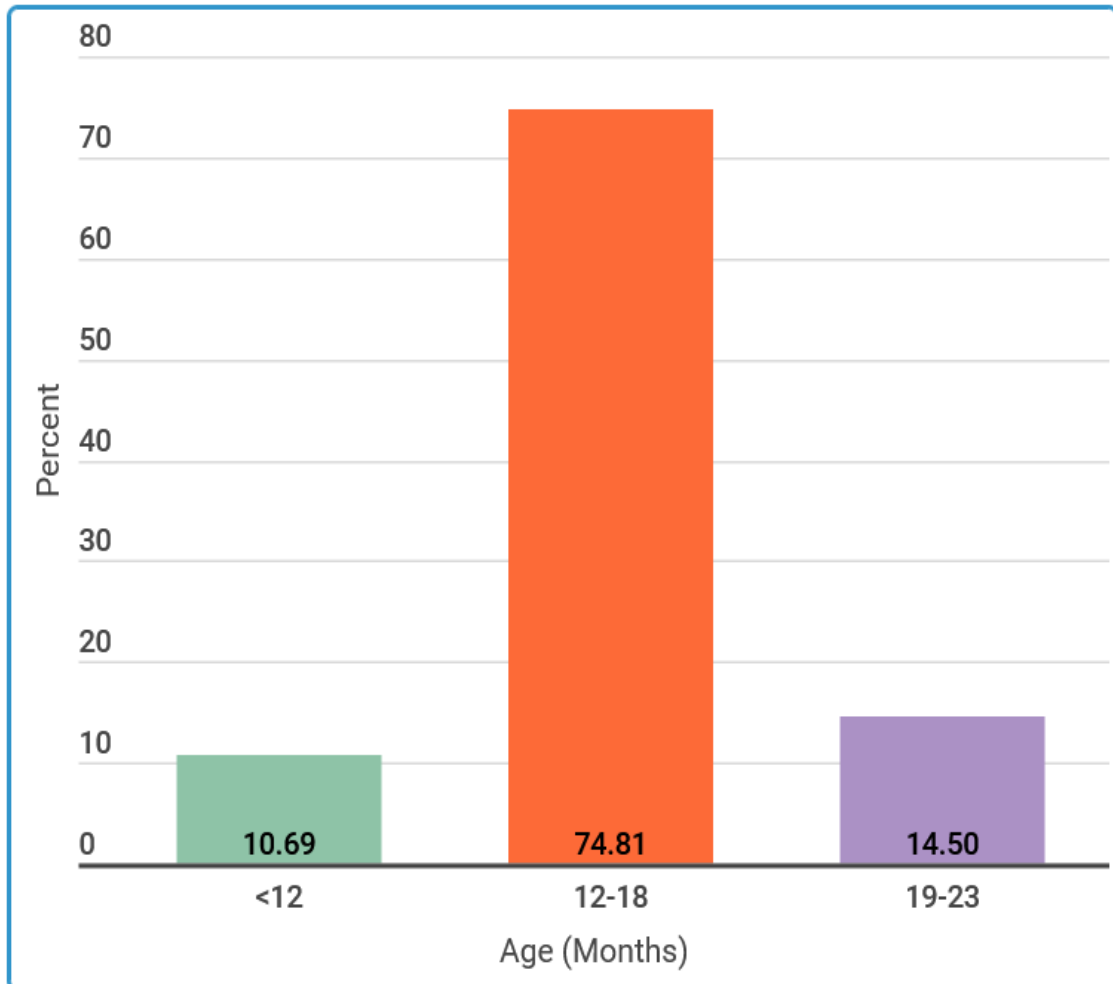
Figure 3: The age stopped breast feeding the child, N=131

This context was more explored in qualitative part, on more exploration for the duration of breastfeeding; it was revealed that cultural orientation and poverty account for the failure of women to practice effective breast feeding practice for a child up to two years of age. Specifically, it was mentioned that some male partners use alcohol excessively. The participants also identified that some mothers lack enough nutritious food something that make them fail to get sufficient breast milk for their children. Besides, some male partners become less supportive to the female counterparts in terms of economic activities. Women get busy with economic activities in order to be able to take care of large families. As a

result, they get little time for an adequate breast feeding. In this context, one of the participants highlighted that:

> *I wish I could breast feed my children until they get two years old, however I fail to do so since I become busy with life related activities. I am the one who spend, much time looking for foods for my kids. My husband is less supportive in this case, he drinks alcohol excessively and he does not have time for family so I have to try my best to make sure that my kids get food (FGDs with a woman, April, 2021).*

Similar sentiments were also shared by other respondents in her remarks:

> *Mhh... You know our family is quite big, so as a family care taker, I need also to be very busy. I have to go here and there to get something that can help me feed my family. In this context, I get little time to stay at home to breast feed my child, and because of that I breast feed my kids for at least one year (FGDs with a woman, April, 2021).*

4.4.3. Type of food given to children who had stopped breastfeeding

On exploration to the type of food given to children who stopped breast feeding, most of the participants reported to give family food to their children; such foods include boiled potatoes, porridge and vegetable soup and fruits juice. Also rice with beans was among the food mentioned. In subscribing to this line of thinking, one of the respondents said:

> *Mh.... I don't cook a specific type of food for my kids, whatever is cooked for the family on that day, the kids use the same. For example, if I prepare some juice, soup, tea, porridge and any other, the children use the same. Even rice with beans my children eat very well (FGDs with woman, April, 2021).*

4.4.4. Frequency of feeding to children who had stopped breastfeeding

To ensure adequate nutrition, children need to be given age-appropriate solid foods together with fruits/fruit juices at least 5 times per day when stopped to breastfeed. In this study it was observed that 82% of children are given family meals 3-4 times per day and only 16% of care givers reported to give food 5 times or more to their children after stopping breastfeeding. Figure 5 shows the findings.
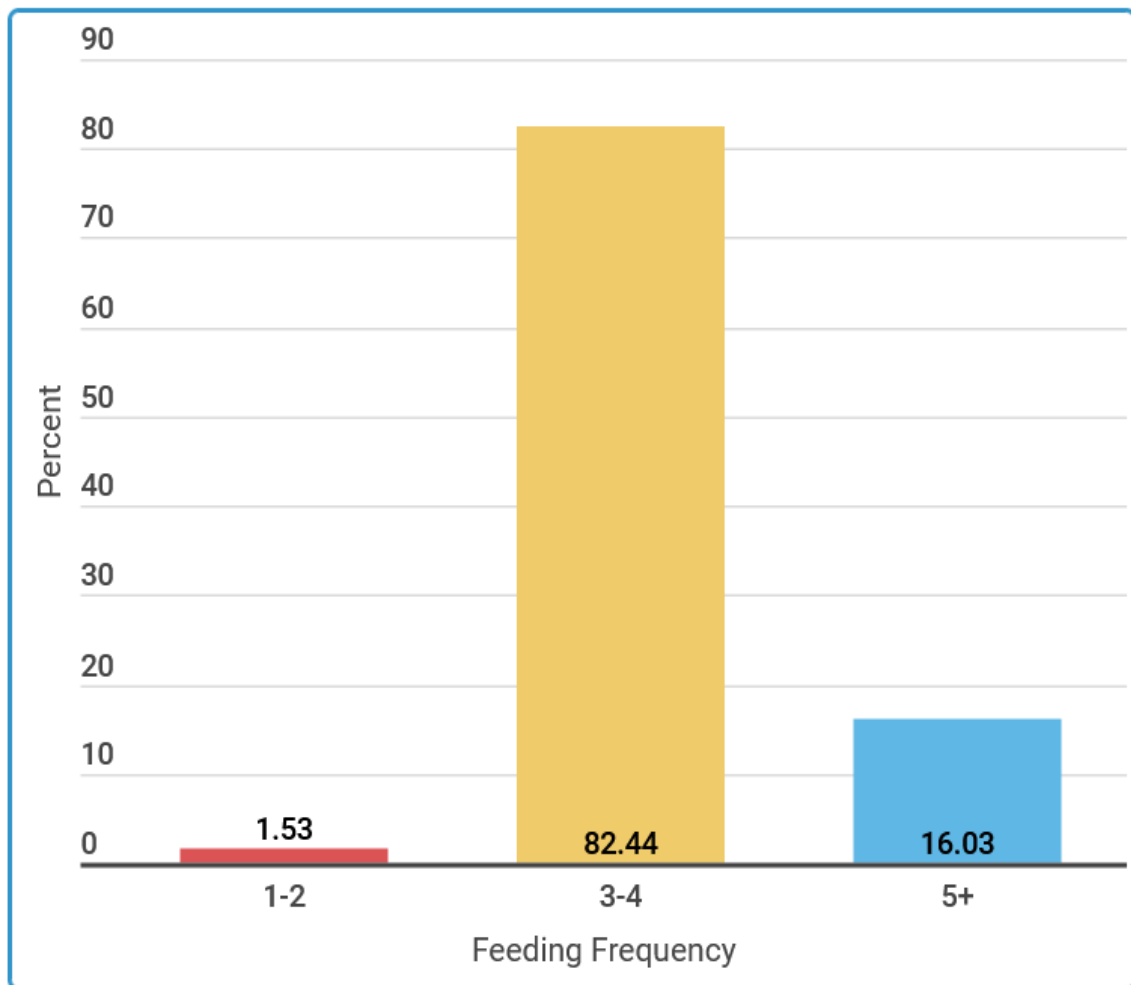
Figure 4: Number of times per day feed the child who stopped breast feed, N=131.

On frequency of child breast feeding, the participants felt that they are flexible on their breasting feeding depending on the demands of the child and according to their ages. They mentioned that children are breast fed whenever they show demand. Similarly, it was expressed that the children are breast fed more when they are young and less when they get old. The following quotation from one of the participants suffices to emphasize the above point:

> *On my side, I always breastfeed when I realize that my child demands to breast feed. I tend to be very much flexible on breastfeeding my child. However, sometimes I think when my child is at the young age I find important to breast feed him as frequently as possible comparing to the child with one year or above (FGDs with woman, April, 2021).*

Also, among the child breastfeeding practices carried out by the women, duration for breast feeding came to light. It is felt that no specific time is allotted for breast feeding, however kids' satisfaction is taken into account. From the FGDs, it was noted that a mother stops to breastfeed a child when the child shows satisfaction. While asked how can a mother knows if a child is satisfied, it was stated that child satisfaction is recognized when the breasts are empty and the child stops sucking hence ends up with a sleep. Regarding a child's satisfaction, one of the participants had this to say:

> *I personally realize a child is satisfied with breast milk when I find that he stops sucking and thus staring at me. Sometimes the child decides to play with breast until he /she gets sleepy. Also when I find that my breasts are empty, I know that my child is full-up and hence satisfied (FGDs with woman, April, 2021).*

4.5. Male partners' characteristics and behaviours influencing nutritional status of children

On assessing male partners characteristics and behaviours, 239(46.6%) respondents said that their partners drinks alcohol and 30% of those were reported to drink very often(nearly every day).On isssues of poligamism102(19.9%) reported to have been married in poligamy families. On trying to explore the male habits of breastfeeding milk from their partners, 206(40.1%) of the respondents reported to have heard of the habbit whereby most of them 67.5% heard it from the media reports and 45% from around the community.Morever, 5(0.97%) reported to have breast feed their male partners. See table 6

Table 7: Male partners' characteristics and behaviors.

Male partners' characteristics	Frequency	Percent
Alcohol drink		
No	274	53.41
Yes	239	46.59
Frequency of drinking		
Vey often	74	30.96
Rarely	157	65.69
Occasionally	8	3.35
Number of wives/sexual partners of your partner have		
Only one	332	64.72
Two	88	17.15
More than two	14	2.73
I don't know	79	15.40
Heard of male partner who breast feed milk from their partner		
No	307	59.84
Yes	206	40.16
Source of information (n=206)		
From close friend or relative	7	3.40
From other women who reported to breast feed her partner	2	0.97
From the Community around	93	45.15
From the media reports	139	67.48
Ever breast feed your male partner while breastfeeding		
No	508	99.03
Yes	5	0.97
Partner ever asked you to breast feed your milk		
No	493	96.10
Yes	20	3.90

On analysis of the male partners characteristics and behavior, the study also found that children whose fathers had attained secondary education and above had (ARR=0.46, 95% CI 0.31, 0.68) less risk of being under nourished compared to children whose fathers did not attain formal education.

Table 8: Male partners' characteristics and behaviors influencing nutritional status of children: Results of Unadjusted and Adjusted log binomial regression model.

Variable	Normal N(%)	Under nutrition N(%)	Unadjusted		Adjusted	
			CRR(95% CI)	P- Value	RR(95% CI)	P-V value
Age of the father						
20-26	68(60.7)	44(39.3)	Ref	Ref		
27-33	125(57.6)	92(42.4)	1.08(0.82,1.42)	0.591	1.09(0.88,1.34)	0.598
34+	103(57.9)	75(42.1)	1.07(0.80,1.43)	0.633	1.13(0.93,1.48)	0.643
Father education level						
No formal education	8(33.3)	16(66.7)	Ref		Ref	
Primary education	177(55.3)	143(44.7)	0.67(0.49,0.91)	0.011	0.61(0.23,1.61)	0.316
Secondary and above	116(69.1)	52(31.0)	0.46(0.32,0.67)	< 0.001	0.46(0.31,0.68)	< 0.001
Father occupation status						
Not employed	146(54.7)	121(45.3)	Ref		Ref	
Employed in unskilled manual work	122(61.3)	77(38.7)	0.87(0.69,1.80)	0.206	1.08(0.85,1.38)	0.525
Employed in skilled work	32(71.1)	13(28.9)	0.56(0.33,0.95)	0.030	0.86(0.47,1.59)	0.635
Male partner drink alcohol						
No	174(63.5)	100(36.5)	Ref		Ref	
Yes	127(53.1)	112(46.9)	1.63(1.36,1.43)	0.031	1.14(0.92,1.41)	0.235

On more exploration on males partners' characteristics and behaviors concerning sucking the breast milk of their wives, the emerged phenomena were categorized into three sub-themes namely perceived triggers for male partners' breastfeeding, participants' attitudes on male partners' breast feeding, and effects of male partners' breast feeding practices on children.

Regarding the perceived triggers for male partners' breastfeeding, the focus was to explore the factors pushing the women to breast feed their male partners. The triggers for male partners' breastfeeding were also sought from male partners (husbands) themselves. In this respect, it was noted that there are several aspects making women to breastfeed their husbands. The first cited aspect is intercultural Misconception. Men reported to see other men from western culture who suck their partners breast and they interpret as breastfeeding, but those men are not breast feeding as they suck while the female partner do not have a small breastfeeding child. It was also mentioned that women may be breastfeeding their partners because of fearing domestic violence. The participants expressed that their fear of being beaten by their husbands may influence them to breastfeed their partners. Also, the participants felt that breast feeding male partners may be done as a proof of true love. This in participants' opinions helps in strengthening marriage.

It also became evident from the interviews that males believe that breast milk have nutrients which are helpful in fighting against dangerous diseases and that may be the motive of male partners breastfeeding. This was reported by male participants. In addition, the male partners' practice of overplaying with breast of their wives was associated with male breast feeding. It was also unveiled that some males take breastfeeding as an act of relaxing after being tired with the daily activities.

In this context, one of the women who reported to breastfeed her partner had this to report:

My partner likes to overplaying with my breasts and sucking them, so he get used to that habit. Now he cannot stop even when I have a baby to breastfeed
he also breastfeed (II with a woman, April,2021)

Another woman was quoted saying:

> *Mhh...It is funny, sometimes we decide to breast feed our husbands as an indication of a true love. You know men like to see that they are loved by their wives. They always need to be shown through actions including breast feeding. If a man asked for it you have to do that even if you have a small child to show your love for him and the marriage bond get strengthened (FGDs with a woman, April, 2021).*

Similarly, an interview with one of the male partners also reported:

> *We believe that breast milk has got nutrients which are good for fighting against dangerous diseases. I also heard that breast milk is very testy and make men feel relaxed.*
>
> *I sometimes trust that this culture is from western countries, so sometimes we just imitate as others in those countries do as we see in movies or what we hear from stories. On my opinion, I think those western people they don't suck when women are breastfeeding. (An interview with a male partner, April, 2021).*

Further to this, participants' attitudes on male partners' breast feeding emerged as one of the important sub themes in this direction; generally, male partners' breastfeeding was thought as a bad thing in the community. The participants thought that male breastfeeding behaviours is barbaric and is not acceptable in our community. This feeling was reported by one woman in her remarks:

> *For any reason, breastfeeding male partner is not acceptable and it passes on a very bad culture to our future generation. We take care of our big family day and night and after coming back home, again we should breast feed our husbands this is indeed barbaric (FGDs with a woman, April, 2021).*

Moreover, regarding effects of male partners' breast feeding on children, it was generally trusted that male breastfeeding is harmful to the health condition of the kids. The women believed that breastfeeding can lead to malnutrition to the child, and continuous poor health. Specifically, it was stated that male breast feeding can lead to frequent diarrhoea, poor child growth, and the likelihood of a child to be weak as milk become inadequate hence malnourished. Regarding the effects of male partner's breastfeed to the health of children, one of the participants had this to say:

Generally speaking, male partner's breastfeeding is harmful to the wellbeing of the children. Male breastfeeding make the woman breast empty. This in turn makes the child malnourished as she or he does not get sufficient milk. There is also likelihood of taking infectious diseases from a father to the kid (FGDs with a woman, April, 2021).

CHAPTER FIVE

5.0 DISCUSSION OF THE STUDY RESULTS

5.1. Nutritional Status of Children Below 24 Months.

This study found that the prevalence of under-nutrition is 41.3% among the study population and 40% of the children assessed for nutritional status were stunted. Though the study observed low magnitude of underweight and wasting of 3.5% and 1.2%, stunting was observed at high levels than the reported developing countries and national average of 25% and 34% respectively(5,8)

The differences observed on the magnitude of underweight and wasting may be contributed by the age differences among the comparing reports as this study involved younger children aged 6 to 23 months while the reported developing countries average and the national involved children from 0 to 59 months old. Also, there are interventions to curb the problem of malnutrition in Njombe that might have contributed to the decline in the prevalence of underweight and wasting among the study population hence they are the measures of acute form of malnutrition

The observed findings are in line with what was reported in similar studies that was done in Ethiopia. (35) Another similar findings was reported in a study that was done in Kenya were undernutrition was reported at 42% and stunting was the most prominent at 39% (48) and the other which was done in Kilimanjaro,(20). Though other similar studies done in and outside of the country reported slightly lower levels of stunting; Uganda 23.8%, Nzega 26.1% and Chamwino. (19,22) Another similar study done in Kilosa reported very high prevalence of undernutrition and stunting at 66% and 64.5% respectively in highland areas within the district.(21)

The observed differences within the African countries and even among different regions within the country,may explain the significant geographical variations in the magnitude and factors influencing nutritional status of children as it was observed in a survey conducted by TFNC. (8)

5.2. Factors Influencing Nutritional Status of Children

5.2.1. Social demographic factors.
The study reported that children from divorced/ widowed mothers had higher risk ratio of being stunted as compared to children of the married mothers. This may be due to failure of the said mothers to get support and afford to get the required adviced nutritious food for their children. These findings differs with others; in Iran and Sri Lanka martenal eduaction and occupational status were among the reported factors(24,25) In another studies that was done in Uganda and Kenya, education of the mother, family socioeconomic factors and occupational status of the mother were among the reported factors(18,27,30). In Arusha also the study reported simiar observation and the age of the mother was an added factor where the majotrity of the cases from mothers aged between 17-22 years (28). These differences may be attributed by the differences in model used, as all of the reported studies used the logistic regrssion model which reported the assocciation in odds ratio while in this study the log binomial regression model was used and the association between variables are reported in risk ratios.Though the two models can be used in the analysis of the cross-sectional study, log binomial is appropriate analysis for common outcome (>10% prevalence).

5.2.2. Demographic Characteristics of a Child
The results of the adjusted analysis revealed that sex, age, and birth weight were significant factors associated with under-nutrition among children. Female children were significantly less likely to be under-nourished as compared to male children These findings were also reported in other similar studies.(19–21,42,49)

In Tanzania, as reported by TDHS 2015-16, high proportion of boys were under nourished and stunted as compared to theirs girls counterpart (p< 0.001) and 48% of LBW children became stunted (11). This may be explained by the increase in demand of nutritious food to children as they get older and transitioning from weaning from breast feeding as we can see the increase in the magnitude of stunting as children grows. More investigation on reasons to why male children are more at risk of being under nourished as it has been reported in most of the studies done in different parts of the World.

5.2.3. Feeding Practices

On assessing the feeding factors, the study found that children who were not breastfeeding were 1.15 times more likely to be undernourished as compared to those who were breast-feeding; (aRR=1.15, 95% CI 1.03,1.40).Similar findings was reported in Ethiopia were breastfeeding associated with reduced odds of malnutrition.(35)

Other several similar studies show early initiation of complementary foods before 4 months is associated with stunting(26,42,49) Another study in Mbeya, reported 23% of children who were started on complementary foods before the age of 4 months malnourished and 19% of them were severely stunted and none was stunted among those who started food at 6 months. This supports the fact that breast milk has adequate amount of all the needed nutrients for children up to 6 months and thus emphasis should be made to maintaining exclusive breast feeding for 6 months and initiation of appropriate age specific semi-solid foods together with continuing breastfeeding up to 24 months as recommended to allow children grow well (39).

In qualitative, it was reported that most children were given family meals with no any other added meals for them; lack of male partners support, multiple economic activities and large family to take care of are the factors that were seen to contribute on failure to continue to breastfeed children up to 24 months.

5.2.4. Social demographic Characteristics and behaviours of the Father

The study also found that children whose fathers had secondary education or higher were significantly less likely to be under nourished compared to children whose fathers had no formal education. The study also found that children whose fathers drinks alcohol had increased risk of being under-nourished compared to children whose fathers does not drink alcohol though the association was not significant . This might explain the importance of education, as mothers and caretakers who are educated can easily understand and follow the instructions on taking care and feeding their babies as given by the nurses or healthcare workers .Also, in classes people are taught on different groups of food and their importance; the knowledge that can one carry and use when preparing food for their children later when they have children. Moreover, misuse of small obtained resources in alcohol consumptions results in failure to provide adequate nutritious food for the children.

The findings are in line with what was reported in a study that was done in New Guinea where malnourished(stunted)children were more likely to have low educated, unemployed fathers who drinks alcohol regularly.(50) Another similar study reported 37% the malnourished children had fathers who did not receive formal education compared to 17% of the controls.(28)

On exploration of male breast feeding behaviors it was noted that some women reported to be asked to breast feed their partners and some reported to breast feed. Though very few 5(0.97%) women reported to have breastfeed their male partners, the habit is reported to have significant contributing to the nutritional status of children. It was observed that 3 out of 5 children whose mothers reported to have been breastfeeding their partners were malnourished.

5.3. Strengths and limitation of the study
This study is cross-sectional that is able to infer association between studied factors and nutritional status of children below 23 months. However, the findings results should be considered with the following limitations.

1. Recall bias
Some participants may have had difficulty to remember occurrence of some of the factors enquired in the study, e.g the age started supplementary feeding, stop to breastfeed the child. The effect of this bias would thus underestimate or overestimate the association observed. However, question were arranged to stimulate recall and the young child was recruited when the mother had more than one child and child feeding history for the past 24 hours was asked for.

2. Social desirability bias
Some respondents may had reported some answer in a way they deem to be more socially acceptable than would be their "true" answers as some of the questions were sensitive which might report low magnitude, especially on questions related to male partners behaviours. However, the participants were assured of the confidentiality and that they will not be judged by their answers and no names or any identification of the respondent was recorded to encourage them to be truthful.

CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATION

6.1 Conclusion.

Under-nutrition; mainly stunting is still a problem in Njombe region. Fathers' educational level, marital status of the mother, age and sex of the children, birth weight and exclusive breast feeding for six months were the significant observed factors that have influence on nutritional status of children below 24 months.

Lacks of support from male partners, big families and multiple responsibilities are among the reasons hindering women to practice effective breast feeding.

6.2 Recommendations

The following are the recommendations for alleviating the magnitude of stunting among children aged below 24 months in Wanging'ombe district and Njombe town Council, Njombe region.

1. To conduct a monthly nutritional day where health care workers will provide health education on what and how to prepare meals for their children by using the common food available in the society.

2. The councils to strengthen education campaigns on male involvement in child care with special attention to assisting women to get proper and adequate nutritious food and food supplements during pregnancy and support breast feeding practices by providing women adequate time

3. Health care providers to give individualized health education to caregivers on child feeding practice and importance of exclusive breast feeding for six months.

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Appendices

Appendices 1: Informed Consent Form- English Version.

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES

ID- NO

Consent to Participate in a Research

Greetings! My name is...From the Muhimbili University of Health and Allied Sciences carrying out a research aimed at determining factors influencing nutritional status of children below 24 months in Njombe region, Tanzania.

Purpose of the Study

This study has the purpose of identifying socio-cultural behaviors and other factors that might be contributing to the high prevalence of malnutrition among children in Njombe region thus helping the policy makers in their plans to curb malnutrition in the area.

I volunteer to participate in a research or study knowing that: -

1. My participation is voluntary, and I understand that I will not be paid for it.
2. I am aware that I have the right to withdraw and discontinue participation at any time.
3. I understand that participation involves being interviewed by researchers and during the interview the required data will be recorded.
4. I have been assured that my identity and the information obtained from this interview will not be disclosed and that my confidentiality as a participant in this study will remain secured. Subsequent uses of records and data will be subject to standard data use policies which protect the anonymity of individuals and institutions.
5. However, the access to the above-mentioned information is strictly open to only the researcher involved.
6. I understand that this research study has been reviewed and approved by the institutional ethical Committee of Muhimbili University and for further queries can contact the committee.
7. I have read and understood the explanation provided to me, I have had my entire question and answered to my satisfaction, and I voluntarily agree to participate in this study.
8. I have been given, a copy of this consent form

Signature ……………………………… Date……………………………………

Who to contact:

If you ever have questions about this study, you should contact the study coordinator **Deograsia Bakari** of Muhimbili University of Health and Allied Sciences,
 P.O.Box 65001, Dar es Salaam. If you ever have questions about your rights as a participant, you may call
Chairperson of the Senate Research and Publications Committee,
Telephone No. 2150302- 6 or 2152489.
P.O. Box 65001
DAR ES SALAAM.

Statement/ Declaration by the investigator

I …………………..……………………………………………..declare that:

I have provided the document having the information about the proposed research/study and have explained the same. I have encouraged the participant to ask questions and answered to all the queries of the participant patiently. After the discussion I am satisfied that the participant has adequately understood about the information provided. I have /have not used a translator in this process.

Print name of principal investigator ……………………………

Signature of principal investigator ……………………………….

Date ………………………….

Statement/ Declaration by the translator

I ………………………………………………………………declare that:

I am proficiently in participant's native language and have agreed to be the translator. I have assisted the principal investigator in explaining the document having the information about the proposed research /study in participant's native language. The participant was encouraged to ask questions and answers to all the queries were addressed patiently. I have assisted in the factual translation of the information provided to me. After the discussion I am satisfied that the participant has adequately understood about the information provided.

Print name of Translator ……………………………….

Signature of Translator ……………………………….

Date ………………………….

Appendices 2: Informed Consent Form- Kiswahili Version

CHUO KIUU CHA AFYA NA SAYANSI SHRIKISHI MUHIMBILI.

Na. ya Fomu

Fomu ya ridhaa kushiriki kwenye Utafiti

Ridhaa kushiriki kwenye utafiti

Salamu! Jina langu ni _____ Ninafanya utafiti juu ya sababu zinazowez kusababisha tatizo la lishe duni kwa watoto walioko chini ya umri wamiezi 24 katika mkoa wa njombe.

Madhumuni ya utafiti

Lengo la utafiti huu ni kuchunguza sababu zinazopelekea watoto kupata tatizo la lishe duni katika maeneo ya mkoa wa Njombe, matokeoya utafiti huu yatasaidia viongozi wetu na watunga sera mbalimbali kuweza kutunga sera na mipango itakayosaidia kupunguza tatizo la lishe duni kwa watoto katika mkoa wa Njombe.

Nimeridhia kushiriki katika utafiti huu nikitambua kuwa: -

1. Ushiriki wangu ni wa hiari na kuwa sitalipwa kwa ajili ya ushiriki.
2. Nina haki ya kuamua kujitoa au kutoendelea na utafiti huu wakati wowote.
3. Ushiriki wangu utakuwa ni wa mahojiano baina yangu na mtafiti na wakati wa mahojiano mtafiti atakuwa akichukua taarifa kwenye karatasi.
4. Nimehakikishiwa utambulisho na taarifa nitakazozitoa zitakuwa ni siri.
5. Matumizi ya taarifa zilizotolewa hapo juu ni kwa anayefanya utafiti huu na si vinginevyo.
6. Natambua kuwa utafiti huu umeridhiwa na kupitishwa na kamati ya tafiti na machapisho wa chou kikuu Muhimbili kwa maelezo ya ziada unaweza kuwasiliana na mwenyekiti wa kamati hiyo kupitia mawasiliano hapo chini.
7. Nimesooma na kuelewa maelezo yaliyotolewa, na kupatiwa majibu ya maswali niliyouliza na kujiridhisha, kwa hiari yangu nimeridhia kushiriki.
8. Nakiri kupewa nakala ya fomu hii.

Sahihi …………………………… Tarehe……………………………………………

Kwa mawasiliano:

Kama una swali lolote kuhusiana na utafiti huu tafadhali wasiliana na Mtafiti Mkuu anayeratibu utafiti huu Ndugu **Deograsia Bakari** (Simu; 0754 540155 au 0712 895016).
Kwa maswali zaidi unaweza kuwasiliana Mwenyekiti wa Kamati ya Utafiti na Machapisho wa Chuo Kikuu cha Afya na Sayansi Shirikishi Muhimbili.
Simu Na. 2150302- 6 au 2152489.
S.L.P 65001
DAR ES SALAAM

Tamko la mtafiti

Mimi …………………..……………………………………………..nakiri kwamba:

Nimetoa nyaraka yenye taarifa sahihi pamoja na maelezo sahihi kuhusu utafiti nitakaoufanya. Nimeruhusu maswali kutoka kwa mshiriki na kumpatia maelezo/ majibu sahihi ya maswali bila kumshurutisha. Najiridhisha kuwa mshiriki ameelewa kutokana na maelezo sahihi niliyompatia. Nimetumia / sijatumia mkalimani.

Jina la mtafiti ……………………………

Sahihi ya mtafiti ………………………………

Tarehe…………………………

Tamko la mkalimani

Mimi …………………………………………………………………nakiri kwamba:

Ninaelewa vizuri lugha asili ya jamii hii na ninakubali kuwa mkalimani. Nimemsaidia mtafiti kutafsiri nyaraka zenye maelezo kuhusu aina ya utafiti unaotarajiwa kufanyika kwa mshiriki kwa lugha asili. Mshiriki waliruhusiwa kuuliza maswali na majibu ya maswali yote yaliyoulizwa yalijibiwa kwa weledi bila shurutisho. Nimesaidia kutafsiri maelezo yaliyosemwa kwangu kutoka kwa mshiriki. Na baada ya majadiliano najiridhisha kuwa mshiriki ameelewa kutokana na maelezo niliyompatia.

Jina la mkalimani ……………………………

Sahihi ya mkalimani ………………………………

Tarehe ………………………

Appendices 3: Questionnaire English version.

   a) Identification information

   Name of the district...............................

   Name of the health facility......................................

   Health facility level.............................

   Facility ownership (Tit the appropriate)

   (i)   Government

   (ii)   FBO

   (iii)   Private

   Date of the Interview......................................

(a)Demographic Information

1. What is the age of the child (in months)...............(Check Date of birth of the child on RCH card).

2.   What is the sex of the child................

3. What was the child's birth weight..............(Check on RCH card).

4. Weight of the child today (weigh the child) ....

5. Height / Length of the child in cm......

6. MUAC of the child...............................

   Demographic information of the parents (Ask the mother)

7. How old are you now? (Age last birthday).....................

8. What is the highest level of education did you attain?

   (i)   No formal education

   (ii)   Primary level education

   (iii)   Secondary level and above

9. What is your Occupational Status?

   (i)   Not employed

   (ii)   Employed in unskilled manual work(self, small business, tailoring, food vendors, etc)

   (iii)   Employed skilled work (offices, managerial)

10. What is your marital status?

    (i)   Married

    (ii)   Single

    (iii)   Divorced

    (iv)   Cohabiting

    (v)   Widowed

11. How many times have you given birth (Parity of the mother)

    (i)   1 to 3 times

    (ii)   4 to 5 times

    (iii)   More than 5 times

12. How many children do you have?

    (i)   1 to 3 children

    (ii)   4 to 5 children

    (iii)   More than 5 children

13. What is the birth order of (Mention the name of the child) this particular child?

    (i)   One to three

    (ii)   Four to five

    (iii)   Above fifth

14. What is the age of the father? (Age last birthday) ....

15. What level of education did his/ her father attain?

    (i)   No education

    (ii)   Primary education

    (iii)   Secondary and above

16. What is the Occupational Status of the father

    (i)   Not employed

    (ii)   Employed in unskilled manual work(self, small business, tailoring, food vendors, etc)

    (iii)   Employed skilled work (offices, managerial)

17. How many people live in your house? ....

18. How many children below 5 years live in your house? ....

b) Feeding Practices.

19. Did you practise exclusive breast feeding for your child?(Tick against the correct answer)

    (i)   Yes

    (ii)   No

20. If yes, at what age did you start giving other additional foods to the child?

    (i)   Less than 6 Months

    (ii)   At 6 Months

    (iii)   At the age more than 6 Months

21. What type of food did you introduce first to your child?

    (i)   Still on exclusive breast feeding

    (ii)   Plain cereal porridge

    (iii)   Cereal porridge mixed with milk/ ground nuts

    (iv)   Milk/ formulas

    (v)   Vegetable soup/ fruit juices

    (vi)   Others (Mention)....................................

22. Is the child still breast feeding?

    (i)   Yes

    (ii)   No

23. If answered No in question Number 22, at what age did you stop breast feeding the child?

    (i)   At the age less than one year

    (ii)   1 year to less than 1 year and a half

    (iii)   1 year and a half to 2 year

24. If the child has stopped to breast feed, what other foods do you give to the child? (May be more than one options)

    (i)   Family meals

    (ii)   Plain cereal porridge

    (iii)   Cereal porridge mixed with milk/ ground nuts

    (iv)   Milk/ formulas

    (v)   Vegetable soup/ fruit juices

    (vi)   Others (Mention)....................................

25. How many times per day do you feed the child

    (i)   5 times and above

    (ii)   3 to 4 times

    (iii)   1 to 2 times

26. Does the child eat from his/her own plate or in the same plate with other siblings?

    (i)   Alone in own plate

    (ii)   Same plate with other sibling

27. Who assist the child on feeding?

    (i)   Feeds on his/her own

    (ii)   Get assistance from other elder sibling

    (iii)   Get assistance from mother

(c)Male partners characteristic (Ask the mother)

28. Does your partner drink alcohol?

    (i)   Yes

    (ii)   No

29. If yes, how often does he drink alcohol?

    (i)   Very often/Nearly everyday

    (ii)   Rarely/Not more than once per week

    (iii)   Occasionally/On family ceremonies

30. How many wives/ sexual partners does your partner have?

    (i)   Only one

    (ii)   Two

    (iii)   More than two

    (iv)   I don't know

31. Have you ever heard of male partners who breast feed milk from their wives/ partners?

    (i)   Yes

    (ii)   No

32. If yes, where did you hear about it?

    (i)   From a close friend or relative

    (ii)   From other women who reported to breast feed her partner

    (iii)   From the community around.

(iv)   From the media reports.

33. Have you ever breast feed your male partner while you also have a small child who is also breast feeding?

(i)   Yes

(ii)   No

34. Have your partner ever asked you to breast feed your milk?

(i)   Yes

(ii)   No

35. Have you ever asked your partner to breast milk from your breast while you also have a baby who still breast feeding?

(i)   Yes

(ii)   No

Appendices 4: Dodoso kwa lugha ya Kiswahili.

A) Taarifa za awali za utambuzi

Jina la Wilaya.........................

Jina la kituo cha kutolea huduma...................................

Aina/ Ngazi ya kituo.................................

Kituo kinamilikiwa na nani?

(i)   Kituo cha serikali

(ii)   Kituo cha taasisi ya kidini.

(iii)   Kituo Cha mtu Binafsi.

Tarehe ya mahojiano..............................

B) Taarifa muhimu za mtoto na wazazi

1. Mtoto ana umri gani (andika kwa miezi) ....Tarehe ya kuzaliwa(Hakiki kwenye kadi ya kliniki kupata tarehe ya kuzaliwa)

2. Je, mtoto ni wa jinsia gani...............

3. Mtoto alizaliwa na uzito kiasi gani(angalia kadi ya klinic) ....

4. Uzito alionao mtoto kwa sasa (mpime mtoto uzito).............

5. Urefu/ Kimo cha mtoto katika cm........

6. Unene kuzunguka mkono wa mtoto ....

   Taafrifa muhimu za wazazi (aulizwe mama wa mtoto)

7. Mama una umri wa miaka mingapi?...........

8. Umesoma hadi darasa la ngapi?

(i)   Hajasoma

(ii)   Elimu ya msingi

(iii)   Elimu ya sekondari au zaidi

9. Unafanya shughuli/kazi gani za kujiingizia kipato?

(i)   Hajaajiriwa

(ii)   Amejiajiri kwa kazi sio za ofisi (biashara ndogondogo,ufundi,mama lishe n,k)

(iii)   Ameajiriwa kwa kazi za ofisini (mwalimu,utawala n.k)

10. Hali yako ya ndoa ni ipi?

(i)   Nimeolewa

(ii)   Sijaolewa

(iii)   Tumetengana

(iv)   Ninaishi na mwanaume bila ndoa

(v)   Mjane

11. Umezaa mara ngapi

(i)   Mara 1 hadi 3

(ii)   Mara 4 hadi 5

(iii)   Zaidi ya mara 5

12. Kwa sasa una watoto wangapi?

   (i)   Mtoto mmoja hadi watatu.

   (ii)   Watoto wanne au watano

   (iii)   Watoto zaidi ya watano

13. Mtoto huyu ni wangapi katika kuzaliwa?

   (i)   Mtoto wa kwanza hadi watatu

   (ii)   Mtoto wanne au watano kuzaliwa

   (iii)   Zaidi ya watano kwa kuzaliwa

14. Baba wa mtoto ana umri wa miaka mingapi?..............

15. Baba wa mtoto amesoma hadi darasa la ngapi?

   (i)   Hajasoma

   (ii)   Elimu ya msingi

   (iii)   Elimu ya sekondari au zaidi

16. Baba wa mtoto anafanya kazi gani?

   (i)   Hajaajiriwa

   (ii)   Amejiajiri au kuajiriwa kwa kazi zisizo za ofisini

   (iii)   Ameajiriwa kwa kazi za ofisini

17. Idadi ya watu wanaoishi katika nyumba yako ni wangapi?................

18. Kwenye nyumba yako/ mji wako kuna jumla ya watoto wangapi wenye umri chini ya miaka mitano?......................

C) Namna ya ulishwaji wa mtoto

19. Ulimnyonyesha mtoto wako maziwa yako bila kumpa kitu kingine chochote alipokuwa mchanga?

(i)   Ndiyo

(ii)   Hapana

20. Kama jibu ni ndiyo, Mtoto alianza kupewa vyakula vya ziada/kulikiza akiwa na umri gani? (Weka alama ya tiki kwenye jibu sahihi)

   (i)   Kabla hajatimiza miezi 6

   (ii)   Alipokuwa na umri wa miezi 6

   (iii)   Umri wa zaidi ya miezi 6

   (iv)   Hakunyonyeshwa maziwa ya mama.

21. Mtoto alianzishiwa vyakula aina gani vya kulikiza?

(i)   Hajaanzishiwa

(ii)   Uji wa mahindi

(iii)   Uji wa mahindi uliochanganywa na mazia/karanga

(iv)   Mazia ya ng'ombe/kopo

(v)   Supu ya mboga /Juisi ya matunda

(vi)   Vyakula vingine(taja)....................................

22. Je Mtoto anaendelea kunyonya?

(i)   Ndio

(ii)   Hapana

23. Kama jibu ni hapana kwa swali la 22, mtoto aliachishwa kunyonya akiwa na umri gani?

(i)   Kabla ya umri wa mwaka mmoja

(ii)   Umri kati ya mwaka mmoja hadi mwaka mmoja na nusu

(iii)   Umri kati ya mwaka mmoja na nusu hadi miaka miwili

24. Ni vyakula gani vya ziada anavyopewa mtoto kwa sasa?

(i)   Vyakula vya familia

(ii)   Uji wa mahindi

(iii)   Uji wa mahindi uliochanganywa na maziwa/karanga

(iv)   Maziwa ya ng'ombe au ya kopo

(v)   Supu ya mbogamboga au juisi ya matunda

(vi)   Vyakula vingine (vitaje)...............................

25. Mtoto analishwa chakula mara ngapi kwa siku?

(i)   Mara 5 au zaidi

(ii)   Mara 3 hadi 4

(iii)   Mara1 hadi 2

26. Je mtoto anakula katika sahani yake mwenyewe au katika sahani moja pamoja na ndugu zake?

(i)   Katika sahani yake mwenywe

(ii)   Katika sahani moja pamoja na ndugu zake

27. Nani huwa anasaidia mtoto wakati wa kula?

(i)   Anakula mwenyewe haitaji kusaidiwa

(ii)   Anasaidiwa na ndugu yake

(iii)   Anasaidiwa na msichana wa kazi

(iv)   Anasaidiwa na mama yake

D) Sifa na tabia za mwenza/ baba

28. Mwenzi wako anakunywa pombe??

(i)   Ndio

(ii)   Hapana

29. Kama jibu ni ndio, anakunywa kwa kiasi gani?

(i)   Kila mara/ karibu kila siku

(ii)   Mara chache/Sio zaidi ya mara moja kwa wiki

(iii)   Mara chache mno/kwenye sherehe na matukio ya kifamilia

30. Mwenzi wako ana wake au wapenzi wangapi?

(i)   Mmoja tu

(ii)   Wawili

(iii)   Zaidi ya wawili

(iv)   Sifahamu

31. Umewahi kusikia kuwa kuna wanaume wanaonyonya maziwa kutoka kwa wake/ wenza wao?

(i)   Ndio

(ii)   Hapana

32. Kama jibu ni ndio, Je ulisika habari hizo kutoka kwa nani?

    (i)   Ndugu au rafiki wa karibu

    (ii)   Wanawake wengine waliowahi kunyonyesha wenzi wao

    (iii)   Kutoka katika jamii inayonizunguka

    (iv)   Kutoka katika vyombo vya habari

33. Wewe mwenyewe umewahi kumnyonyesha mume/mwenza wako maziwa wakati ukiwa una mtoto mdogo anayenyonya?

(i)   Ndio

(ii)   Hapana

34. Mwenzi wako amewahi kuomba kunyonya maziwa yako wakatiukiwa una mtoto mdogo anayenyonya?

    (i)   Ndio

    (ii)   Hapana

35. Wewe mwenyewe umewahi kumuomba mume wako anyonye maziwa yako wakati ungali una mtoto mdogo anayenyonya?

(i)   Ndiyo

(ii)   Hapana

Appendices 5: Focused Group Discussion guide-English version
Part A: General knowledge about malnutrition.

1. What do you understand about malnutrition

   Probes- Wasted children

   -Underweight

   -Stunted children

2. How can you identify a malnourished child?

Probes - By checking weight

   - By being told (HCWs)

   -

3. What are the possible causes of malnutrition among children below 2 years old in your community?

4. What are the advantages of breast feeding?

Probes - Prevents diseases

   - Adequate nutritional requirements

   - Cheap/readily available

   - Easy preparation

Part B: Breast feeding practices

5. How often do you breastfeed the child?

6. For how long do you breastfeed the child per each feed?

   Probe- What makes the woman to stop breastfeeding

7. How do you know the child is fully satisfied?

8. What other food is usually given to the child?

   Probes- Milk

   - Porrage

   - Family meals, vegetable soup, fruit juices

9. Who else can breast feed your milk?

   Probes- partner

   - Other siblings

Part C: Challenges and promoters of breastfeeding

10. From your understanding and experience in this community, what factors can prohibit/hinder the woman to practice effective exclusive breast feeding and breast feeding a child up to 2 years of age

Probes- Work,

- Inadequate milk
- Partners

11. What are the things that encourages the woman to breastfeed her child?

Part D: Male partners behaviours

12. What is your opinion on the behaviour of male partner's breast feeding from their partners while they also have a child to breastfeed?

13. From your understanding, what are the reasons that could make male partners want to breast feed milk from their wives

14. What are the effects of that behaviour to children?

15. What is your opinion about women who breastfeed their male partners while they also have a breastfeeding baby

16. What are the reasons that could lead to a woman breastfeed her male partner while she also have a baby who needs her breastmilk

Appendices 6: Dodoso kwa ajili ya majadiliano kwenye kikundi-Kiswahili

Sehemu A: Uelewa wa jumla kuhusu lishe ya mtoto mchanga

1. Unalielewaje tatizo la lishe duni kwa watoto?
   Ni nini hasa maana yake- Udumavu
       - Kukonda
       - Uzito mdogo kuliko umri
2. Unawezaje kumtambua mototo mwenye tatizo la upungufu wa lishe?
   Dodosa - Kwa kumpima uzito
       - Kwa kuelezwa na mtoa mhudumu wa afya
       -
3. Katika mazingira na jamii yetu, ni vitu gani vinaweza kusababisha tatizo la lishe duni kwa watoto wenye umri chini ya miaka miwili?
4. Maziwa ya mama yana faida zipi?
   Dodosa- Yana kinga
       - Yanavirutubisho muhimu kwa motto
       - Yanapatikana kirahisi
       - Hakuna maandalizi kuyapata

Sehemu B: Ulishaji wa mtoto

5. Unamnyonyesha mototo wako mara ngapi kwa siku?

6. Unanyonyesha motto kwa muda gani?
       -Kitu gani kinakufanya umtoe motto kwenye nyonyo

7. Vitu gani vinakufanya ujue kuwa sasa mototo wako ameshiba?

8. Ni vyakula gani vingine unavyompatia mtoto?
   Dodosa kuhusu-uji

       - Maziwa

       - Chakula cha familia

       - Supu ya mboga za majani/ juisi ya matunda

9. Ni nani mwingine anayeweza kunyonya maziwa yako?

   Dodosa- mtoto mwingine

       - Mwenza

Sehemu C: Vitu vinavyoweza kumsaidia au kumzuia mama kunyonyesha vizuri

10. Kwa jinsi unavyofahamu na uzoefu wako katika jamii hii, vitu gani vinavyoweza kusababisha mama ashindwe kunyonyesha mtoto kwa miezi sita bila kumpa chakula kingine na kuendelea kunyonyesha hadi umri wa miaka miwili?

11. Je, unafikiri ni vitu gani vinaweza kumfanya mama anyonyeshe vizuri

Sehemu D: Tabia za mwenza zinazoweza kuathiri unyonyeshaji

12. Una maoni gani kuhusu wanaume wanaonyonya maziwa ya wake zao wakati wana watoto wanaonyonya?

13. Kwa jinsi unavyoelewa, ni sababu gani inayoweza kumfanya mwanaume kutaka kunyonya maziwa ya mke/ mpenzi wake?

14. Nini madhara ya wakina baba kunyonya maziwa ya wake zao?

15. Nini maoni yako kuhusu akina mama wanaonyonyesha maziwa waume au wenzi wao na wakati huo wana watoto ambao wanahitaji pia kunyonya

16. Ni sababu zipi zinaweza kumsababisha mama kunyonyesha maziwa mume au mwenza wake na wakati huo huo akiwa ana mtoto mdogo anayehitaji kunyonyeshwa

Appendices 7: Ethical Clearance

UNITED REPUBLIC OF TANZANIA

MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY

MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES

OFFICE OF THE DIRECTOR - RESEARCH AND PUBLICATIONS

Ref. No.DA.282/298/01.C/   Date: 11/02/2021

Ref. No.DA.282/298/01.C/   Date: 11/02/2021

MUHAS-REC-02-2021-491

Deograsia Bakari,
MSc Applied Epidemiology,
Shool of Public Health and Social Sciences
MUHAS

RE: APPROVAL FOR ETHICAL CLEARANCE FOR A STUDY TITLED: FACTORS INFLUENCING NUTRITIONAL STATUS OF CHILDREN BELOW 24 MONTHS IN NJOMBE REGION, TANZANIA

Reference is made to the above heading.

I am pleased to inform you that the Chairman has on behalf of the University Senate, approved ethical clearance of the above-mentioned study, on recommendations of the Senate Research and Publications Committee meeting accordance with MUHAS research policy and Tanzania regulations governing human and animal subjects research.

APPROVAL DATE: 11/02/2021
EXPIRATION DATE OF APPROVAL: 11/02/2022

STUDY DESCRIPTION:
Purpose:
The purpose of this cross sectional study is to determine factors influencing nutritional status of Children below 24 Months in Njombe Region in Tanzania.

The approved protocol and procedures for this study is attached and stamped with this letter, and can be found in the link provided:
https://irb.muhas.ac.tz/storage/Certificates/Certificate%20-%20305.pdf and in the MUHAS archives.

The PI is required to:

1. Submit bi-annual progress reports and final report upon completion of the study.

2. Report to the IRB any unanticipated problem involving risks to subjects or others including adverse events where applicable.

3. Apply for renewal of approval of ethical clearance one (1) month prior its expiration if the study is not completed at the end of this ethical approval. You may not continue with any research activity beyond the expiration date without the approval of the IRB. Failure to receive approval for continuation before the expiration date will result in automatic termination of the approval for this study on the expiration date.

4. Obtain IRB amendment (s) approval for any changes to any aspect of this study before they can be implemented.

5. Data security is ultimately the responsibility of the investigator.

6. Apply for and obtain data transfer agreement (DTA) from NIMR if data will be transferred to a foreign country.

7. Apply for and obtain data transfer agreement (DTA) from NIMR if data will be transferred to a foreign country.

8. Apply for and obtain material transfer agreement (MTA) from NIMR, if research materials (samples) will be shipped to a foreign country,

9. Any researcher, who contravenes or fail to comply with these conditions, shall be guilty of an offence and shall be liable on conviction to a fine as per NIMR Act No. 23 of 1979, PART III section 10 (2)

10. The PI is required to ensure that the findings of the study are disseminated to relevant stake holders.

11. PI is required to be versed with necessary laws and regulatory policies that govern research in Tanzania. Some guidance is available on our website https://drp.muhas.ac.tz/.

Dr. Bruno Sunguya
Chairman, MUHAS Research and Ethics Committee

Appendices 8: Introduction Letter to the Authorities

UNITED REPUBLIC OF TANZANIA
MINISTRY OF EDUCATION, SCIENCE AND TECHNOLOGY
MUHIMBILI UNIVERSITY OF HEALTH AND ALLIED SCIENCES
OFFICE OF THE DIRECTOR – POSTGRADUATE
STUDIES

In reply quote;
Ref. No. HD/MUH/T.821/2019

15th February, 2021

The Regional Administrative Secretary,
P.O. Box 668,
NJOMBE

Re: **INTRODUCTION LETTER**

The bearer of this letter is Deograsia Bakari, a student at Muhimbili University of Health and Allied Sciences (MUHAS) pursuing MSc. Applied Epidemiology.

As part of her studies she intends to do a study titled: *"Factors Influencing Nutritional Status of Children Below 24 months in Njombe Region, Tanzania."*

The research has been approved by the Chairman of University Senate.

Kindly provide her the necessary assistance to facilitate the conduct of her research.

We thank you for your cooperation.

Ms. Sharifa Kamby
For: DIRECTOR, POSTGRADUATE STUDIES

cc: Dean, School of Public Health and Social Sciences, MUHAS
cc: Deograsia Bakari

9 United Nations Road; Upanga West; P.O. Box 65001, Dar Es Salaam: Tel. G/Line: +255-22-2150302/6; Ext. 1015; Direct Line:+255-22-2151378;Telefax:+255-22-2150465;E-mail:dpgs@muhas.ac.tz;Web:https://www.muhas.ac.tz

Appendices 9: Letter of Permission to Collect Data

JAMHURI YA **MUUNGANO WA TANZANIA**
HALMASHAURI YA MJI WA NJOMBE
(Barua zote zitumwe Kwa Mkurugenzi wa Mji)

MKOA WA NJOMBE
Simu Na: 026 - 2782755

Unapojibu tafadhali taja
Kumb.Na.NTC/TMO/N/V0L11/82

S.L.P. 577,
NJOMBE.

12 / 3 / 2021

MGANGA MFAWIDHI
HOSPITALI / KITUO CHA AFYA
....
NJOMBE MJI.

YAH: UTAMBULISHO WA MWANAFUNZI DEOGRASIA BAKARI.

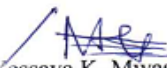Tafadhali husika na kichwa cha habari hapo juu.

Ofisi ya mkurugenzi imepokea barua yenye kumb.Na.HD/MUH/T.821/2019 ya tarehe 15/02/2021 yenye mada tajwa hapo juu.

Kwa barua hii, namtambulisha Deograsia Bakari kuwa ni mwanafunzi wa chuo kikuu kishiriki cha sayansi Muhimbili, anayesoma shahada ya uzamili na anafanya utafiti katika kituo chako juu ya "Factors influencing Nutritional Status of Children below 24 Months in Njombe Region Tanzania.".

Hivyo unaombwa kumpa ushirikiano wakati wa kufanya utafiti huo katika kituo chako.

Mawasiliano juu ya utafiti huu yafanyike kupitia kwa Mratibu wa Lishe **Marselina John Mtitu (NTC)** kwa namba 0765-915291 au barua pepe **mtitumarselina@gmail.com**

Nakutakia utekelezaji mwema.

Dr. Yessaya K. Mwasubila
Kny: Mkurugenzi
Halmashauri ya Mji
NJOMBE.

Kny: MKURUGENZI
HALMASHAURI YA MJI
NJOMBE

Nakala:
1. Mkurugenzi - H/ Mji Njombe - Aione kwenye jalada.