

**FACTORS ASSOCIATED WITH CHRONIC MALNUTRITION IN MAZOWE
DISTRICT, MASHONALAND CENTRAL PROVINCE, 2012**

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ABSTRACT

Introduction: The rate of stunting in Zimbabwe was recorded as 35% in 2012. Mashonaland Central Province recorded 2168 cases of malnutrition and 964(44%) were from Mazowe District, despite the fact that the district has the best in terms of food security. The objective was to determine the factors associated with chronic malnutrition in Mazowe District in 2012.

Methods: A 1:1 unmatched case control study was carried out in health facilities in Mazowe District to determine the factors associated with chronic malnutrition. A case was defined as a mother or caregiver of any child <5years in Mazowe district who is chronically malnourished registered in the malnutrition register at the health facility and is stunted (children whose height for age z score is below -2 standard deviation from the median of the reference population) during the period January 2012 and December 2012. A control was defined as mother or caregiver of any child less than five (5) years who was suffering from conditions other than malnutrition and was not stunted, during the period January 2012 to December 2012 in Mazowe District. Interviewer administered questionnaires were used to collect data from both cases and controls and Epi Info 3.5.1 statistical software was used to analyze data.

Results: A total of 78 cases and 78 controls were enrolled into the study. Factors independently associated with chronic malnutrition were; a child who had diarrhea in the last three months (adjusted OR=6.33, CI 2.8-14.00) and failing to breastfeed because of pressure of work (adjusted OR=3.37, CI 1.1-10.00). Fever was a significant risk factor (adjusted OR=3.57, CI 1.84-6.90).

Conclusion: Chronic malnutrition was associated with diarrhea, failure to breastfeed and fever in Mazowe District. We recommend early treatment of diarrhea, childhood illness and promotion of breastfeeding in Mazowe district. Mothers were given health education on breastfeeding.

Key words: chronic malnutrition, children under five years, Mazowe District

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CHAPTER 1

INTRODUCTION

1.1 Background Information

Malnutrition remains among the most devastating problems facing the majority of the world's poor and needy and continues to dominate the health of the world's poorest nations. Nearly 30% of humanity; infants, children, adolescents, adults and older persons in the developing world are currently suffering from one or more of the multiple forms of malnutrition^{1,2}. Some 49% of the 10.7 million deaths among under-five children each year in the developing world are associated with malnutrition^{1, 3}. In the developing world, one out of every five persons is chronically undernourished and about 200 million children less than five years of age suffer from protein energy malnutrition.

Geographically, over two-thirds (72%) of the world's malnourished children live in Asia (especially South Asia). This figure compares with the 25.6% found in Africa and only 2.3 in Latin America. An estimated 182 million children under 5 years of age, representing 32.5% of all preschool children in developing countries, are malnourished when measured in terms of height for age (i.e. stunted). Despite the general worldwide reduction in food insecurity Africa's food security and nutrition security is growing worse^{3, 4, 5}. Food security is regular access to ample quantity and quality of safe, nutritious food that meets dietary needs as food preferences of individuals and communities. Despite the general worldwide reduction in food insecurity, Africa's food security and nutrition situation is growing worse. Africa has been experiencing several episodes of acute food insecurity causing immense loss of life and livelihoods over the past decade. African countries have collectively made the least progress towards achieving the Millennium development goal of reducing hunger, by 2015 and currently close to one third of its

population lives in chronic hunger^{3,6}. In particular the Sahel and horn of Africa regions in the West and East Africa are experiencing the worst food security and are facing malnutrition.

One in every three children in Zimbabwe suffers from chronic malnutrition, according to a new study by the United Nations Children's Fund and the country's public health authorities^{1,3}. The Situational Analysis on the status of women and children rights concluded that malnutrition could contribute to more than 12 000 deaths a year in the country¹. Nutritional status of young children in Zimbabwe has declined since 1994 according to data from the three Zimbabwe Demographic Health Survey (ZDHS) carried out to date. In 1994 the rate of stunting in Zimbabwe was 21% and this rate increased to 26% in 1999. During the 2005-2006 ZDHS the rate further increased to 29% and currently as revealed in the 2010-2011 ZDHS the stunting rate is now 32% for Zimbabwe which is above the national target of not more than 10% stunting rate.

Although, food insecurity is associated with prevalence of malnutrition, in Mazowe district of Mashonaland Central Province, there was high prevalence of malnutrition despite a high food security. This study seeks to find the factors associated with malnutrition in Mazowe district.

1.2 Problem Statement

Mashonaland Central Province was experiencing an increasing trend in stunting which was 17% in 1994 and 27% in 1999. The 2005-2006 ZDHS, found that 29% of children under five were stunted while the 2009 -2011 ZDHS revealed a stunting rate of 35%. Of the 2168 recorded cases of malnutrition in Mashonaland Central Province in 2012, 954(44%) were from Mazowe district. Over the past five (5) years almost 50% of malnutrition cases were emanating from Mazowe district. According to Zimbabwe Vulnerability Assessment Committee (ZIMVAC) survey Mazowe district had the highest in terms of food security in the province in the last five years

recording, 100% food security in 2012, 2011 and other preceding years it was above 85%². Despite being regarded as food secure, the prevalence of malnutrition remains high in Mazowe district. We need to understand why malnutrition still persists in Mazowe district. World Health Organization (WHO) defines food security as both physical and economic access to food that meets people's dietary needs as well as their food preferences.

CHAPTER 2

2.0 LITERATURE REVIEW

Malnutrition

Malnutrition is the condition that occurs when the body does not get enough nutrients. It is a condition which occurs when there is a deficiency of certain vital nutrients in person's diet. The lack of nutrients in the body results in reduced growth and poor health⁷. Malnutrition commonly affects children and the elderly. Several nutrition disorders may develop depending on which nutrients are lacking. Malnutrition can also occur if one does not eat enough food. In some cases malnutrition is very mild and causes no symptoms. However, sometimes it can be so severe that the damage done to the body is permanent, even though one survives. Some of the symptoms of malnutrition include fatigue, dizziness and weight loss. In children other symptoms include poor weight gain, slowing of growth, irritability, apathy and anxiety⁸.

Chronic and acute malnutrition

Wasting (acute malnutrition) and stunting (chronic malnutrition) are different forms of malnutrition. Chronic malnutrition or stunting is another form of growth failure. Chronic malnutrition occurs overtime unlike acute malnutrition⁴. A child who is stunted or chronically malnourished often appears to be normally proportioned but is actually shorter than normal for his or her age. Stunting starts before birth and is caused by poor feeding practices, poor food quality as well as frequent infections which can slow down growth⁷. Wasting or acute malnutrition results from acute shortage of food and it is reversible with feeding and has relatively high mortality.

Global implication of malnutrition

According to Food and Agriculture Organization of the United Nations (FAO) the number of people globally who were malnourished stood at 923 million in 2007 an increase of over 80 million since 1990-92 period^{4,9}. Worldwide malnutrition is found to be the most important cause of illness and death affecting large population of children and pregnant women¹⁰. According to the WHO by 2015 prevalence of malnutrition worldwide will be 17.6% and a large number of malnourished populations will be from developing countries in Southern Africa. In addition 29% will have stunted growth due to poor nutrition^{2, 11}. Malnutrition kills 300 000 individuals worldwide each year and is responsible for about half of all death in young children and it increases the risk of infection with diarrhea, malaria, measles and respiratory tract infections in children².

Factors associated with malnutrition

Many studies have been done on the factors associated with malnutrition in different study settings using different study designs. Poverty, natural disasters, political problems have been found to be associated with malnutrition¹⁰. Many studies have attributed the incidence of malnutrition as a result of food insecurity particularly in resource poor settings where access to food is difficult. Other factors which have been found to be significantly associated with malnutrition include; dietary intake, disease related factors, socio-economic factors and knowledge of the care giver on good nutrition.

Socio-economic factors

The distribution of wealth has been found to be associated with malnutrition in those groups who have limited access. Usually the marginalized groups have limited income that is not enough to purchase food. Research by Save the Children in Bangladesh, Ethiopia, Myanmar and Tanzania has shown that those who did not have enough money for a nutritious diet, let alone clothes and health access were likely to be malnourished¹².

Saito K et al had similar findings in which children whose father's occupation was a laborer were 2.28 times more likely to develop malnutrition as opposed to civil servants and other professionals. The possible explanation is the fact that, there is limited access to money and hence poverty sets in and as such the family cannot afford nutritious food⁶. Rabede et al ,in their study on maternal risk factors for childhood malnutrition in the Mazowe district of Zimbabwe, concluded that to reduce childhood malnutrition in the rural areas, reduced maternal workload and increased decision making power, better access to health care plus more access to land and higher income are all critical issues³.A further research into these factors is therefore necessary taking into cognizance that the level of malnutrition in Mazowe district continue to go up despite such recommendations.

Care givers' knowledge

Knowledge of the caregiver on nutrition affects the nutrition status of the child and this varies according to local people's perception views and level of awareness. Many studies have come up with different conclusions about the knowledge of care givers and incidence of malnutrition, and hence health care seeking behavior.

Saito K et al, in their study of maternal knowledge of malnutrition and health-care seeking attitudes in rural South India, defined severe malnutrition as less than 60% of expected weight

for age in children. Furthermore, they noted that knowledge of the roles of lack of food or nutrition in mild marasmus-kwashiorkor mixed malnutrition was significantly higher among controls (59%) than cases (35%), but there were no significant differences in health seeking behaviors¹³. In general, mothers from this area did not regard medical care as appropriate intervention for malnutrition or measles. Only 28% of the mothers indicated they would seek medical care for nutrition. Conversely, medical care was considered indicated for diarrhea, colds and worms^{13,14}. These findings indicate a need for intensive nutritional programmes.

Infant and Young Child Feeding (IYCF) practices

Early initiation of breastfeeding, exclusive breastfeeding for the first six months of life followed by continued breastfeeding for up to two years and beyond with adequate complementary foods is the most appropriate feeding strategy for infants. If IYCF practices are not adhered to due to various commitments or practices there is risk of malnutrition for children under the age of five years.

Sharmia et al in their study of IYCF practices in Bangladesh found out that those children belonging to women garment workers were 10 times at risk of not being exclusively breastfed compared to children belonging to housewives. They were also significantly more wasted and stunted. It is also necessary to find out whether the same scenario prevails in Mazowe district. Belkeziz N, in their study on influence of a short duration of breast-feeding on malnutrition in children in Morocco, found out those mothers with higher levels of education breastfed their children for a shorter time than mothers who had received less education and who did not generally work outside the home¹⁵, however there were no statistical significant differences in the incidence of malnutrition. Malnutrition was observed in children belonging to lower classes who had been breastfed during a short period (i.e. less than three months)⁸.

Rayhan Israt MD, had findings in which both the bivariate and multivariate analysis indicated size of baby at birth as an important risk factor for all three categories of malnutrition (stunting, wasting and underweight)¹². Babies who were less than 2.5kg at birth had two times higher risk of being stunted than those who were equal to or greater than 2,5kg at birth. Prevalence of wasting and underweight were also remarkably high among low birth weight children⁸.

Cultural Practices, Knowledge and dietary intake

Peter O et al, in their study on Culture and feeding practices: Major underlying causes of childhood nutrition in developing countries (Nigeria), gave an example that, from a cultural point of view, among some major ethnic groups, the concept of healthy child is taken to mean “fat baby”¹⁶. In view of this, food items that are believed will increase the size and weight of the baby such as cassava, maize and yam flour are considered good. Because of traditional cultural food practices, legumes and oil seeds such as beans, groundnuts and melons seeds are sparingly consumed. Nursing mothers in most of the countries in the region have not been making use of existing local sources as complementary feeds not because of poverty but traditional beliefs and cultural food practices¹⁷.

Water, Hygiene and Sanitation

Ibrahim AMM et al, in their study on the impact of feeding practices on prevalence of under nutrition among 6-59months aged children in Khartoum, wanted to understand the relationship between feeding practices and prevalence of stunting, wasting and underweight among 6-59months aged children^{9,18}. They found out that the most important factors that were reported to significantly affect nutritional status were improper washing of raw food(9%),not washing hands after coughing(65%), not washing hands after handling rubbish(11%) and raw food coming mixed with ready-to-eat food (58%).Furthermore, hygienic practices were found to be associated

with malnutrition ,as they found out that mothers/care givers did not cover their mouth and nose after coughing (59%), purchasing pre-packed/processed children food without checking the expiry date and usage of public toilet by care givers (48%) had children who were malnourished. The study revealed that poor feeding practices may contribute to the higher risk of malnutrition in Khartoum¹⁰.

Cuesta J et al found out that access to water and sanitation has consistently increased the expected results on birth weight. Such effects however are not found to be statistically significant¹⁸. Having controlled for socio-economic, biological and health provision, access to safe water sources reduces the probability of low birth weight or birth weight stunting. Similarly, access to any sort of sanitary facility decreases the probability of birth weight stunting compared to no sanitary facilities being available to the household.¹³

2.1 Justification

Mazowe district has high food security but however it continues to record the highest prevalence of chronic malnutrition in Mashonaland Central Province in children under five years. This study aimed at looking at factors associated with chronic malnutrition in children under the age of five in Mazowe district. A study into the factors associated with chronic malnutrition may assist in identifying the underlying causes of chronic malnutrition and come up with recommendations to reduce the prevalence of malnutrition and hence prevent long term effects associated with chronic malnutrition. A further research into factors associated with chronic malnutrition was therefore necessary taking into cognizance that the level of malnutrition in Mazowe continue to go up despite recommendations which have been made by previous studies.

CHAPTER 3

3.0 OBJECTIVES AND HYPOTHESES

3.1 Research Question

What are the factors associated with chronic malnutrition in Mazowe district in children less than five years?

3.2 Broad Objective

To determine the factors associated with chronic malnutrition in Mazowe district.

3.3 Specific Objectives

- To find out the feeding practices for people in Mazowe District
- To measure the level of knowledge on nutrition in mothers or care givers of children less than five years
- To establish disease related factors associated with chronic malnutrition in Mazowe district
- To determine the health services factors associated with chronic malnutrition in Mazowe
- To find out the socio-economic factors associated with chronic malnutrition in Mazowe

3.4 Hypothesis:

Ho: A child with recurrent diarrhea was not associated with development of chronic malnutrition in children under the age of five years in Mazowe District.

H₁: A child with recurrent diarrhea was associated with development of chronic malnutrition in children under the age of five years in Mazowe District.

CHAPTER 4

METHODS AND MATERIALS

4.1 Study Design

1:1 unmatched case control study

4.2 Study setting

Health facilities in Mazowe District of Mashonaland Central Province

4.3 Study population: Mothers with children less than five years with child being treated at any clinic or hospital in Mazowe district

4.4 Definition of a Case

Mothers or caregivers of any child <5years in Mazowe district who was chronically malnourished registered in the malnutrition register at the health facility and was stunted (children whose height for age z score is below -2 standard deviation from the median of the reference population) during the period January 2012 and December 2012.

4.5 Definition of a Control

Mother or caregiver of any child less than five(5) years who was suffering from conditions other than malnutrition and whose height for age z score was not below -2 standard deviation from the median of the reference population ,during the period January 2012 to December 2012 in Mazowe District.

4.6 Inclusion and Exclusion Criteria

Case

Mothers or care givers who were resident in Mazowe for at least three months, with a child less than five years who was diagnosed with chronic malnutrition at the health facility.

Control

Mothers or care givers who were resident in Mazowe, with an under five child being treated for other conditions but malnutrition.

Exclusion criteria

Any mother or care giver whose under five child was being treated at the health facility for any condition and does not provide consent to take part in the study.

4.7 Sample and sampling procedures

Sample size calculation

Sample size was calculated using Stat Cal Epi Info Package, using assumptions based on a study by Saito K et al in which children whose father's occupation as a labourer were 2.28 more likely to develop chronic malnutrition. With a 95% confidence level, 80% power and 42% exposed the sample size was at least 96.

Sampling of health facilities

All the four hospitals in Mazowe were purposively sampled. This was done to ensure that all communities set up were represented as the district had four hospitals located in four distinct areas. Concession hospital was located in farms and newly resettled areas, Mvurwi hospital was located in town, Howard was near growth point and Rosa was located in the rural periphery.

Sampling of cases and controls

All the 78 cases were randomly selected from the malnutrition register at the four hospitals and confirmation of chronic malnutrition was by following up the child health card and cross checking. Cases listed in the register were assigned numbers. Computer generated random numbers were used to select the cases. Cases selected from each of the four different hospitals were proportionally selected based on the number of cases recorded. Mazowe district recorded 420 cases of chronic malnutrition in children under the age of five in 2012. Concession hospital accounted for 170(40%) Howard hospital 103(25%) Rosa Hospital had 89(21%) and Mvurwi had 58(14%). This meant of the total 78 cases selected 31(40%) of cases were randomly selected from Concession, 20(25%) cases were from Howard hospital, 16(21%) were from Rosa Hospital and 11(14%) were from Mvurwi area. Controls were selected from neighbours of cases whose children were less than five years and had never suffered chronic malnutrition. In houses which had more than one child to select for controls the lottery method was use used to select one control.

4.8 Data collection and analysis

Interviewer administered questionnaires were used to collect data on demographic characteristics, risk factors, details of illness and treatment given. The questionnaires were also used to assess knowledge, attitudes, and practices from cases and controls as appropriate.

4.9 Outcome variable

The outcome variable was chronic malnutrition.

4.10 Independent variables

The independent variables were grouped as follows; demographic characteristics, socio economic factors, maternal factors, health related factors and disease related factors.

4.11 Permission to carry out the study

Permission was sought from the Provincial Medical Director, Mashonaland Central Province, District Medical Officer Mazowe, Health Studies Office and Medical Research Council of Zimbabwe. (Appendix vi)

Ethical Consideration

Informed written consent was sought from all participants. The participants were privately interviewed and no information was disclosed to any other person. This was done to ensure that confidentiality was maintained.

4.12 Data processing and analysis

Epi Info 3.5.1 statistical software was used to analyze all the data collected. The same package was used to calculate odds ratios, confidence interval and p-values. Stratified analysis was also carried out to check and control for confounders and assess for effect modification. Multivariate analysis (logistic) regression was used to identify independent risk factors for malnutrition in Mazowe district.

CHAPTER 5

5.1 Results

The demographic characteristics of cases and controls in Mazowe District in 2012 are shown in Table 1 below.

Table 1 Demographic characteristic of cases and controls in Mazowe District in 2012

Variable		Cases (78) (%)	Control (78) (%)	p-value
Sex of child:	male	33(57.7)	45(42.3)	0.050
	Female	45(42.3)	33(57.7)	
Marital status	married	33(42.3)	64(82.1)	<0.001
	Single	20(25.6)	12(15.4)	
	Divorced	7(9.0)	1(1.3)	
	Co-habiting	6(7.7)	1(1.3)	
	widowed	12(15.4)	0(0.0)	
Religion:	Apostolic	22(28.3)	38(48.7)	0.002
	Christianity	25(32.1)	22(28.2)	
	None	17(21.8)	4(5.1)	
	Pentecostal	14(17.9)	10(12.8)	
	Muslim	0(0.0)	4(5.1)	
Education level:	primary	33(42.3)	22(28.2)	0.135
	secondary	43(55.1)	55(70.5)	
	None	2(2.6)	1(1.3)	
Median age(years) of parents/guardian		28(Q ₁ =17;Q ₃ =72)	24(Q ₁ =19;Q ₃ =49)	0.003
Median age (months) of infants		20(Q ₁ =6;Q ₃ =54)	24(Q ₁ =8;Q ₃ =60)	0.023

There was a statistically significant difference in marital status of mothers or care givers whose children developed malnutrition and those who did not ($p < 0.001$). On bivariate analysis, children of married (married and cohabiting) mothers or care givers were 0.20 (0.09; 0.45) times less likely to be chronically malnourished compared to children whose mothers or care givers were not married (single, divorced and widowed). Furthermore there was statistically significant difference in the religion of mothers or care givers whose children developed malnutrition and those who did not ($p < 0.002$). However, the sex of the children with malnutrition and those without malnutrition was not statistically significant ($p = 0.050$). Furthermore, there were no statistically significant differences in level of education of mothers whose children had chronic malnutrition and in those whose children did not. The median age of the parent or caregivers who were cases was 28 years with the interquartile range ($Q_1 = 17$; $Q_3 = 72$). The median age of parents or care givers who were controls was 24 years with the interquartile range ($Q_1 = 19$; $Q_3 = 49$).

The distribution of cases and controls by place of residence is shown by Table 2 below

Table 2: Distribution of cases and controls by area of residence from the four hospitals in Mazowe district in 2012

Variable	Cases (78) (%)	Control (78) (%)	p-value
Place of residence			
Communal area	14(18.2)	4(5.1)	0.0060
Growth Points	8(10.4)	22(28.2)	0.0001
Newly resettled areas	16(19.7)	6(7.7)	0.0700
Mining areas	2(2.6)	7(9.0)	0.0900
Old farms	21(27.3)	27(34.6)	0.0810
Town	17(21.8)	12(15.4)	0.1010

There were no statistically significant differences amongst cases and controls who were coming from newly resettled farms, $p=0.07$. There were also no significant differences amongst the cases and controls who were staying in old farms, $p=0.08$.

Child food intake factor which was associated with development of chronic malnutrition in children under five years in Mazowe district is shown in table 3 below.

Table 3 Child dietary and food intake factors which are associated with malnutrition in children under five in Mazowe district in 2012.

Variable	Cases 78(%)	Control 78(%)	OR	CI 95%	P-value
Child who frequently refuse to eat: YES	48(61.5)	21(26.9)	4.34	(2.09;9.08)	<0.001
NO	30(38.5)	57(73.1)	Ref		

Parents or care givers who reported that their children frequently refuse to eat were 4.3 times more likely to develop malnutrition than those who did not and this was statistically significant.

Disease related factors associated with development of chronic malnutrition in children under five years in Mazowe District in 2012 are shown in Table 4 below.

Table 4: Disease related risk factors associated with development of malnutrition in under-fives in Mazowe District in 2012.

Variable (child who suffered the mentioned disease in the last three months)		Cases 78(%)	Control 78(%)	OR	CI 95%	P- Value
Diarrhoea	YES	63(80.8)	27(34.6)	7.93	(3.81-16.48)	<0.001
	NO	15(19.2)	51(65.4)	Ref		
ARI	YES	44(56.4)	37(47.4)	1.43	(0.76;2.69)	0.262
	NO	34(43.6)	51(52.6)	Ref		
Fever	YES	51(65.4)	27(34.6)	3.57	(1.84;6.90)	<0.001
	NO	27(34.6)	51(65.4)	Ref		
Malaria	YES	18(23.1)	12(15.4)	1.65	(0.73;3.70)	0.223
	NO	60(76.9)	66(84.6)	Ref		
Soil transmitted helminths	YES	12(15.4)	5(6.4)	2.65	(0.89;7.94)	0.072
	NO	66(84.6)	73(93.6)	Ref		

Diarrhoea was a significant risk factor for development of chronic malnutrition in children under the age of five (OR=7.93; CI 3.81-16.48). Fever was also a significant risk factor for development of chronic malnutrition (OR=3.57; CI 1.84-6.90).

The table below (Table 5) gives the maternal/ guardian risk factors associated with development of malnutrition in under-fives in Mazowe District in 2012.

Table 5: Maternal/guardian risky factors associated with development of malnutrition in under-fives in Mazowe District in 2012.

Variable	Cases	Control	OR	CI 95%	P-value	
Mother/Guardian with physical disability	YES	22(31.9)	14(19.4)	1.94	(0.84;4.52)	0.090
	NO	47(68.1)	58(80.6)	Ref		
Mother who reports failure to breast feed because of pressure of work	YES	14(18.7)	9(12.5)	1.61	(0.65;3.98)	0.300
	NO	61(81.3)	63(87.5)	Ref		
Known HIV positive mother	YES	46(59.7)	33(42.3)	2.09	(1.10;3.98)	0.024
	NO	30(39.5)	45(57.7)	Ref		
Households which use drinking containers without lids	YES	39(50.0)	28(35.9)	1.79	(0.94;3.39)	0.075
	NO	39(50.0)	50(64.1)	Ref		

Mother who reported failure to breast feed because of pressure of work was a risk factor for development of chronic malnutrition (OR=1.61; 0.65-3.98). However, this association was not statistically significant.

Socio economic factors associated with chronic malnutrition are shown in Table 6 below.

Table 6: Socio economic factor associated with malnutrition in Mazowe District in under-fives in 2012

Variable (ways of supplementing income)		Cases	Control	OR	CI 95%	P-Value
Vending	YES	9(12.5)	14(18.7)	0.62	0.23-1.68	0.3000
	NO	63(87.5)	61(81.3)			
Farming own food	YES	33(42.3)	46(59.7)	0.48	0.24-0.96	0.0237
	NO	45(57.7)	30(39.5)			
Labour	YES	50(64.10)	27(34.62)	3.37	1.66-6.88	0.0002
	NO	28(35.90)	51(65.38)			
Food handouts	YES	20(25.64)	13(16.67)	1.72	0.74-4.06	0.1700
	NO	58(74.36)	65(83.33)			

Being a labourer was a significant risk factor associated with development of chronic malnutrition (OR=3.37; 1.66-6.88)

p=0.408) between cases and controls on knowledge of the causes of malnutrition and also on the knowledge of seeking medical care for malnutrition (p=0.259).

Health services factors related to malnutrition in children under five in Mazowe District in 2012 are shown in table 8 below.

Table 8: Health services factors related to malnutrition in children under five in Mazowe district in 2012

Variable	Cases	Control	P-value
Distance from health facility : more than 10 km	12(15.4)	19(24.4)	0.160
less than 10 km	66(84.6)	59(75.6)	
Satisfied by the services at the health facility: Yes	66(85.7)	68(89.57)	0.645
No	12(14.3)	10(10.43)	

There was no significant difference between cases and controls in terms of distance from health facilities (p=0.160) and satisfaction by services at health facilities (p=0.645)

Independent risk factors for development of chronic malnutrition are shown in table 9 below.

Table 9: Independent Risk factors for malnutrition in children under five in Mazowe District

Independent variable	Adjusted OR	95% CI	Coefficient	p-values
Child frequently refuse food	4.95	(2.17;11.3)	1.6	<0.001
Child who had diarrhea	6.33	(2.8;14.0)	1.8	<0.001
Failing to breast feed due to pressure of work	3.27	(1.1;10.0)	1.2	0.039

Children who frequently refuse food were 4.95 times likely to develop malnutrition than those who did not adjusted for having diarrhea in the past three months and parent who fail to breast feed due to pressure of work. Children with diarrhea in the past three (3) months were 6.33 times more likely to develop malnutrition than those who did not adjusted for children who frequently refuse to eat and parents who fail to breast feed due to pressure of work.

CHAPTER 6

6.1 Discussion

The finding on diarrhea as an independent risk factor for development of malnutrition has far reaching public health implications. Chronic diarrhea is one of the common gastrointestinal conditions that can impact a patient's nutrition status. Malnutrition is both a cause and consequence of ill health, with severe malnutrition; chronic diarrhea can persist due to impaired immune function and mucosal recovery. In Mazowe district diarrhea is common and results in increased mortality and morbidity in children under the age of five years. The study finding on diarrhea as risk factors for development of chronic malnutrition were consistent with those of Madzingira et al in Harare, in which diarrheal status for a child was associated with malnutrition¹⁹. Amhed, et al in India on multivariate analysis revealed that undernourished children were more likely to have suffered from diarrhea in the previous two weeks²⁰. In Mazowe district diarrhea was common and resulted in increased mortality and morbidity in children under the age of five years. In Mazowe district diarrhea was one of the main drivers of chronic malnutrition. There is need to prioritize treatment of diarrhea in children under the age of five so as to reduce chances of developing malnutrition. However, there are costs which have to be taken into account in the prevention and treatment of diarrhea. Mothers or care givers need to be educated on safe hygiene and use of proper sanitary facilities. This also entails supply of clean water and sanitary facilities. Mothers or care givers should seek treatment early when a child has diarrhea.

In this study fever was also found to be a significant risk factor for developing chronic malnutrition. Fever may have direct implications on chronic malnutrition. Fever may be associated with reduced appetite in children, increasing child's susceptibility to malnutrition. However, fever results from many underlying conditions which cause ill health in children. It is

in this regard that it is important to identify childhood illnesses early and an integrated approach is necessary to treat some of these illnesses which result in fever. These underlying infections such as sores in the mouth, vomiting or nausea can cause a child to refuse food and in this study children who frequently refuse food were at risk of developing malnutrition. Most children frequently refuse food and hence have the risk of developing chronic malnutrition. On the other hand a child can refuse particular food due to prior medical conditions that has in the past or in the present caused discomfort during eating.

Children who frequently refuse to eat might not be taking enough food in terms of adequate quantity and quality of both micro and macro nutrients. However, it still remains unclear what comes first chronic malnutrition or refusing to eat, as malnutrition can result in a child refusing to eat and vice versa. It is imperative that mothers encourage children to eat a balanced diet. The mothers can identify methods to encourage children to eat such as identifying favorite nutritious food for the child. Children can also eat better when they see other children eating, so in homesteads with many children, they can eat together. Questions should be raised about how to raise the appetite of the child. Food fortification in commonly consumed foods can also be ideal in averting chronic malnutrition. Food fortification is addition of micro nutrients to food and this can be addition of vitamin A and Vitamin B complex to sugar, oil, flour and mealie meal. However, addition food fortification is done by manufactures. Mothers should be encouraged to purchase fortified foods which have prepared nutrients which are added as premixes. Apart from that fortified foods can also be acquired through donors and the District Food Security and Nutrition Committee should apply for such food staff making it available for those in need. Law enforcement agents should also ensure that fortified food is available on the market with regards to Statutory Instrument 48 of 1996 in Zimbabwe.

Furthermore, it is important to identify childhood illnesses early such as diarrhea and fever which contribute to a child's poor feeding habit. Mothers should be encouraged to report to the health facility early whenever a child has signs and symptoms of diseases and refuse to eat. Health workers on the other hand need to be constantly trained to pick up child illnesses early and administer appropriate interventions.

Children whose parents sometimes fail to breastfeed because of pressure of work were at risk of developing chronic malnutrition. People in the newly resettled areas usually work in neighboring farms, where they are subject to long working hours so as to increase their earnings. The mothers in most of the farms do not practice express breastfeeding and most of the children are started on other types of food stuffs, during the six months in which children are supposed to be exclusively breastfed. Children are also given food which can not have nutritional value in the first six months of life. Most of the households do not have electricity to store milk in right conditions. Redebe et al also found out that working mother's children had 5.69 times chance of being malnourished²¹. Similar findings were reported in Democratic Republic of Congo by Kandala NB in which poor feeding practices were affecting child's growth. Programs to promote breastfeeding should target women in these harsh conditions to educate and reemphasize the importance of exclusive breastfeeding. Breastfeeding mothers who are laborers should be allowed breaks or periods to breastfeeding and should be discouraged from buying milk from the shelves.

7.1 Conclusion

Chronic malnutrition is independently associated with diarrhea, fever and failing to breastfeed children due to pressure of work are in Mazowe district.

7.2 Study Limitations

The study was limited to Mazowe District and hence the results might not be generalized to other districts

Children who were being treated at the clinics only and not referred to the four hospitals might have been missed and hence selection bias could have resulted.

7.3 Recommendations

1-Training mothers on participatory health and hygiene.

Nutritionist/Environmental Health Technicians

2-Educate mothers on the importance of breastfeeding

Health Promotion Officer (HPO)

3-Encourage mothers to report early for treatment of childhood illnesses

Community Health Nurse.

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APPENDICES

Appendix i: Questionnaire

Questionnaire number.....Date of interview...../...../.....

Tick in the appropriate box below.

Case []

Control []

A Demographic Characteristic

1. a) What is your Age _____
b) What is your relationship to the child.....
2. What is the sex of the child Male [] Female []
3. How old is the child.....
4. (a) What is your marital status? [married] [single] [co-habiting] [separated] [divorced]
5. (b) What type of job does your spouse do? Civil servant [] farm labourer [] self-employed [] employed in private sector []
6. What is your level of education? [Primary] [Secondary][Tertiary] [None]
7. What is your religion? [Apostolic][Orthodox][Pentecostal][Traditional][Muslim][None]
8. Are you employed? YES/NO if NO skip to 10
9. What type of employment [self] [informal][formal]
Please specify particular job.....
10. Which village do you come from? specify_____

B Household food security and dietary intake for under the age of five

11. a) Does your child have feeding problems [YES/NO]
b) If yes please describe.....
12. Is your child on a special diet [YES/NO]
If yes what type of diet.....
13. Does your child have food allergies [YES/NO]

If yes which foods.....

14 Does your child have trouble eating any of these foods?

Milk meats vegetables fruits

15 Does your child have any of these problems?

Sucking swallowing chewing gagging

Meals lasting longer than 30 minutes

16 Does your child have any of these problems?

Loose stool hard stool throwing up spitting up

17 Are you currently breastfeeding your child? [YES/NO]

18 If no at what age did you wean him/her.....

19 Have you ever used any infant feeding formula [YES/NO] If yes specify the type you used.....

20 a) How many meals did the members in your household less than 5 years old eat yesterday

none one two three four >5

b) Is this the number of meals these members eat in most of the days [Yes/No]

c) In the last twelve months, were there times that you ran out of food and could not afford to buy more? [YES/NO/DON'T KNOW]

d) How do you cope with feeding (child) when this happens?

Parent/guardian skips meals or eats less

Children/child skips meals or eats less

Cut down on variety of foods family eats

Seek help from relatives

Seek help from friends

Seek help from government/social security

Seek help from welfare agencies

Don't know

21 (a) Do you know what a balanced diet is? [YES] [NO]

(b) Over the last seven days in your household did your child consume the following food items?

Carbohydrates [YES/NO] determine by asking consumption of any one of the following Sadza, porridge, rice, potatoes, and food made from millet or wheat, bread, cereals, yams, cassava, roots or tubers

Proteins [YES/NO] determine by asking consumption of the following food items
Beef, goat, pork, poultry, eggs, fish, kapenta, beans

Minerals [YES/NO] determine by asking consumption of the following food items
Vegetables, fruits,

Fats [YES/NO] determine by asking the consumption of the following food items
Oils, fats, peanut butter

Fruits [yes/no]

22 (a) How often does your child eat meat?

Never [] rarely []times per weektimes per month don't know []

b) How many cups of milk does (child) usually drink in a day (1 cup =250ml)

none [] 1-2cups[] 2-3 cups [] 4+ cups[]

(b)How many serves of vegetables does your child usually eat each day (a serve=1/4 cup cooked vegetables)

<1 serve [] 2-3serves [] 4+seves []

(c)How many serves of fruit does your child usually eat each day (a serve=1 small piece or 1/2 cup of diced pieces)

Rarely [] <1 serve [] 2-3 serves [] 4+ serves []

(d)How many cups of water does (child) usually drink in a day? (1 cup=250ml)

.....cups per day per day

Don't drink water []

Don't know []

C Signs and Symptoms of malnutrition

23 Has your child ever been diagnosed of malnutrition? [YES][NO]

If yes when were they diagnosed?.....

24 Did they experience the following (tick in the appropriate box)?

Rapid weight loss or failure to weigh normally []

Failure to have normal growth []

Underweight []

Fatigue []

Dizziness []

Skin colour changes []

D Disease related factors

25 a)Have you ever suffered malnutrition before in your life [YES/NO]

c) Has your child ever taken plumpy nut before [YES/NO]

26 How many children have you had in your life one [] two [] three [] four [] five []
]more than five []

27 What age did you have your first child? <15yrs [] 15 ≤ 19 yrs [] ≥20yrs []

28 In your last pregnancy how many ANC visits did you make?

One [] two [] three [] four []

29 Do you use any of the following.(please tick in the appropriate box)

Cigarettes [] chew tobacco [] alcohol [] other drugs specify.....

30 (a)Have you had an HIV test before [YES/NO/Don't know]

(c) Do you suffer from any other chronic infection [YES/NO]

31 (a)Has your child ever been tested for HIV [YES/NO/can't tell you]

32 (a)Has your child ever suffered from any other disease in the last 3 months? [YES/NO]

(b) If yes did they suffer from any one of the following?

Diarrhoea []

Acute Respiratory infections []

Fever []

Malaria []

- Bilharzia
- Soil transmitted helminths
- Other specify.....

- 33 (a) Was your child vaccinated before? [YES/NO]
- (b) Did they receive vaccination in the following (tick where appropriate)
- BCG
 - Pentavalent 1
 - Pentavalent 2
 - Pentavalent 3
 - Measles
 - DPT and OPV.

34 Did he/she receive vitamin A supplementation? [YES/NO]

35 Where do you get your drinking water? Shallow well deep well borehole
 Dam/river tape water

(a) What sanitary facility do you use? pit latrine flash system bush

(b) Do you share with other people from other household? [YES/NO]

Socio-economic factors

36 (a) How many people live in your household

(b) How many children are under five years

37 What means of income do you have?.....

38 How much income does your family have in a month?

<\$50 50-100 100-200 >200

39 Do you supplement income by other means? [YES/NO]

40 How do you supplement your income?

41 Are there any times that you fail to breastfeed because of pressure of work [YES/NO]

42 What are the main sources of food in your household? (Tick where appropriate.)

- Own food production
- Purchases
- Remittances from outside Zimbabwe

- Remittances from inside Zimbabwe
- Grain loan scheme
- Non State Agencies Food assistance (In-kind, cash or vouchers)
- Labour exchange
- Borrowed
- Hunting and gathering
- Other specify.....

Knowledge and practices

- 43 (a) What do you think causes malnutrition?
 Lack of food not eating a balanced diet worms witchcraft/evil spirits
- (b) Do you think it necessary to seek medical care for a malnourished child[YES/NO]
- (c)Where do you go first if your child has the following? (Tick in the appropriate box)

Diarrhoea

Home remedy prophets or traditional healers clinic nowhere

Cold

Home remedy prophets or traditional healers clinic nowhere

Malnutrition

Home remedy prophets or traditional healers clinic nowhere

Measles

Home remedy prophets or traditional healers clinic nowhere

- 44 How long do think a baby should be breastfed?

Six months

Less than six months

More than six months

- 44 What type of drinking water storage facilities do you have

Container with lid

Container without lid

Container with narrow necks

- 45 Do you remove faeces by young children in the living area using hands[YES/NO]

Do you wash hands after touching infant faeces [YES/NO]

Do you use solvents or detergents after defecation [YES/NO]

Health services factors

42 How far do you stay from the clinic less than 10 km [] More than 10 km []

(c) Are satisfied by the services at the clinic? [YES/NO]

43 If no why.....

44 a) Have you received any information on malnutrition [YES/NO]

b) If yes where do you get the information?

Clinic [] VHW [] radio [] TV [] none []

Appendix ii: Shona Questionnaire

Gwaro remubvunzo..... Musi webvunzo.....

Tarai mubhokisi kuti munhu anorwara here nechirwere chekushaya kudya kwakakwana kana kuti kwete

Arikurwara[]

Haarware[]

A Zvinoenderana nemi

5. Mune makore mangani ekuberekwa.....
6. Mwana wenyu mwana hwai Mukomana [] Musikana[]
7. Mukuru zvakadii mwana wenyu.....
8. Makaroorwa here kana kuroora? [hongu] [kwete] [tinongogarisana] [takambosiyana] [takarambana] [ndakafirwa]
9. Ko murume wenyu anoita basa rei? Shandira hurumende [] shanda papurazi [] anozvishandira [] shandira makambani akazvimirira []
- 6 Makafunda kusvika papi? [Primary] [Secondary][Tertiary] [None]
- 7 Munopinda chitendero chipi? [positori] [vakirisitu] [dzemweya] [zvechivanhu] [machawa] [None]
- 8 Munoshanda here? [Hongu/kwete] vakati kwete endai pamubvunzo wesere(8)
- 9 Munaita basa remhando ipi? [ndozvishandira] [ndoshandira vamwe][ndinoshandira kambani]
Nyorai basa racho.....
- 10 Munobva dunhu rekwani? _____

B Kuwanikwa kwechikafufu nekudya mumba kwevana vari pasi pemakore mashanu

- 11 a)Mwana wenyu anonetseka kudya here [Hongu/kwete
b)Tiudzei zvaanoita.....

- 12 Mwana ane zvaanodya here zvakakoshera iye chete?

- 13 Pane chikafu chaasingadye here? [Hongu/Kwete] Ndechipi.....
- 14 Anonetseka here kudya zvinotevera? Mukaka [] nyama [] Muriwo [] michero []
- 15 Mwana wenyu anotambudzika here nezvizvi? Kuyamwa [] kumedza [] kutsenga []
 Kudya nguva yakareba []
- 16 Mwana anonetseka here nezvinotevera? Tsvina yakapfava [] tsvina yakaomarara []
 kurutsa []
- 17 Muchiri kuyamwisa here mwana uyu? [Hongu/Kwete]
- 18 Makamboshandisa here mikaka yemusitoro? [Hongu/Kwete]
- 19 Makamboshandisa mikaka yemuchitoro here? [Hongu/Kwete]
- 20 a)Nezuro makadya kangani? kamwe [] kaviri [] katatu [] kana kana pamusoro []
 b)Ndomadyiro amunoita zuva nezuva here?[Hongu/Kwete]
 c)Mumwedzi gumi nembiri yapfuura iyi pane pamakamboshaya chikafu zvachose here
 muma [Hongu/Kwete/Handizivi]
 d)Munoita sei kana zvadai?
 vabereki vanodya zvisihoma []
 vana vanomboshayawo zvekudya []
 munoregedza kumbidya zvakasiyana siyana []
 Munotsvaka rubatsiro kuhama []
 Munotsvaka rubatsiro kushamwari []
 Munotsvaka rubatsiro kuhurumende []
 Hamuzivi []
- 21 (a)Munoziva here nezve kudya kwakakwana kunovaka muviri [Hongu] [Kwete]
 (b)Mumazuva manomwe apfuura makadya here zvinotevera

Zvinopa simba [YES/NO]

Bvunzai kana vakadya chimwechete pane zvinotevera motara

Sadza, bota, mbatatizi, mambaira, chikafu chegorosikana mhunga, chingwa, mufarinya,
 midzi nezvimwewo zvinenge mbambaira

Zvinovaka murivi [YES/NO]

Bvunzai kana vakadya chimwechete pane zvinotevera motara
mombe, mbudzi, nguruve, huku, mazai, hove, matenba , bhinzi

Zvine munyu [YES/NO]

Bvunzai kana vakadya chimwe chete pane zvinotevera motara
Muriwo wemavheji, michero, muboora . zvimwe.....

Mafuta [YES/NO]

Bvunzai kana vakadya chimwechete pane zvinotevera motara
mafuta, dovi. Zvimwe.....

Zvinodzirira zvirwere

Michero [YES/NO]

- 22 (a) Mwana anodya nyama kangani pa vhiki? haadyi[] kairi [] katatu [] kanopfuura
katatu
- (b) Anowanzonwa mukaka wakawanda sei? Hapana [] kapu imwe kana mbiri []
makapu mana zvichikwidza []
- c) Kumuriwo anodya wakawanda sei pazuva?
Mbichana [] wakawandawo [] wakawandisa []
- d)Komichero anodya yawanda sei
mbichana [] yakawanda yakawandisisa[]
- e)Ko Mvura anomwa yakawanda sei pazuva.....

C Zviratidzo zvechirwere chekushaya kudya kwakakwana

- 23 Mwana wenyu akambobatwa nechirwere chekushaya kudya? [Hongu][Kwete][Hamheno]
Zvakaitika rini izvi?.....
- 24 Akabatwa zvinotevera here(tarisai mugwaro rekurapwa)
- | | |
|--------------------------------------|-----|
| Kupera miri kana kusarema zvakakwana | [] |
| Kutadza kunyatsokura | [] |
| Kusanyatsorema | [] |
| Kusanduka ruvara | [] |

D Zvinoenderana nechirwere

- 25 Makamborwara nechirwere chekushaya zvekudya paupenyu [Hongu/Kwete/Hamheno]
- 26 Makaita vana vangani muupenyu?
mumwe [] vaviri [] vatatu [] vana [] vashanu [] vanodarika vashanu
Pakati pemakore gumi nemashanu nemakumi maviri []
Pamusoro pamakore makumi mairi []
- 27 Makaita mwana wekutanga mune makore mangani? Pasi pe gumi neshanu [] Pakati pegumi neshanu ne gumi ne pfumbamwe [] pamusoro pemakumi mairi []
- 28 Pamaiva nepamuviri makaenda kangani kuchipatara?
Kamwe [] kaviri [] katatu [] kana []
- 29 Munomboita here zvinotevera? (tarai panoenderana)
Kusvuta fodya [] kutsenga fodya [] kunwa doro [] zvimwewo zvinodhaka.....
- 30 (a) Makambotariswa here utachiwana hwe HIV [Hongu/kwete/handikwanise kutaura]
(b) Makabatwa here neutachiona hwe HIV? Hongu [] kwete [] handizive [] hazvite nditaure []
(c) Pane zvimwe here zvamunorwara nazvo [Kwete/Hongu]
- 31 (a) Mwana akambotariswa here utachiona hwe HIV? [Kwete/Hongu/handingataure]
(b) Mwana wenyu ane HIV kana kuti haana? Hongu [] kwete [] handingataure []
- 32 (a) Ko mwana wenyu akamborwara here nezvimwe zvirwere mwedzi wapfuura? [Hongu/Kwete]
(b) Kana mati hongu tarai zvaakamborwara nazvo?
Manyoka []
Chikosoro kana dzihwa []
Kupisa kana kudziya muviri []
Malaria []
Bilharzia []
Makonye emudumbu []
Zvimwewo zvirwere.....
- 33 (a) Mwana wenyu akabaiwa here? [Hongu/Kwete]
(b) Tarisai kuti akabaiwa here pakadhi remwana motara kana pane zvotevera
BCG

Pentavalent 1
Pentavalent 2
Pentavalent 3
Measles
DPT and OPV.

- 34 Akadonhedzerwa here vitamin A? [Hongu/Kwete]
- 35 Mvura yenyu yekunwa munochera kupi? Tsime diki [] tsime hombe [] chibhorani []
Murwizi/mudhamu [] pombi [] tsime rakadzivirirwa [] tsime risina kudzivirirwa []
- (a) chimbuzi chenyu ndechemhando ipi? gomba [] chemvura yemumba []
musango []
- (b) Munochishandisa here nevamwe vanhu? [Hongu/Kwete]

Magariro neupfumi

- 36 Munogara muri vangani pano []
Pane vana vangani vari pasi pamakore mashanu []
- 37 Munowana sei mari.....
- 38 Munowana mari yakawanda sei pamwedzi?
Pasi pemakumi mashanu amadhora []
Pakati pamakumi mashanu nezana ramadhora []
Pakati pezana nemazana maviri amadhora []
Pamusoro pamazana maviri amadhora []
- 39 Pane zvamunoita here kuwedzera mari yenyu pamwedzi? [Hongu/Kwete]
- 40 Munowedzera sei mari yamunowana pamwedzi?
- 41 Munogara nguva yakareba sei muchitadza kuyamwisa mwana muri kubasa.....?
- 42 Chikafu chinobva kupi mumba menyu? Tarai zvinoenderana.
Tinorima toga
tinotenga
tinopiwa nehama dzirimuno muZimbabwe
Tinopihwa nehama dziri kunze kweZimbabwe
Chirongwa chekupa chibage chehurumende

NGO

Maricho

Kukumbira

Kuvhima kana kutsvaka michero musango

Zvimwewo.....

Ruzivo

43 (a) Munofunga kuti chirwere chekushaya kudya kwakwana chinokonzerwa neyi

Kushaya chikafu [] kusadya zvakakwana [] makonye [] kuroyana []

(d) Munofunga here kuti zvinebasa kuenda kuchipatara nechirwere chekushaya zvokudya

zvakakwana[Hongu,Kwete,Hamheno]

(e) Munoenda kupi kekutanga kana mwana waita **manyoka**

Tinomborapa kumba [] kumaporofita [] Chipatara [] hapana []

Dziwa

Tinomborapa kumba [] kumaporofita [] Chipatara [] hapana []

Kushaya kudya kwakakwana komuviri

Tinomborapa kumba [] kumaporofita [] Chipatara [] hapana []

Gwirikwti

Tinomborapa kumba [] kumaporofita [] Chipatara [] hapana []

44 Munofunga kuti mwana anofanirwa kuyamwiswa nguva yakareba sei?

Mwedzi mitanhatu []

Pasi pemwedzi mitanhatu []

Pamusoro pemwedzi mitanhatu []

44 Munofunga here kuti zvine basa kuita zvinotevera

Kugeza maoko musati mayamwisa. []

Kugeza muviri wese mabvakunoshanda musati mayamwisa []

Kutenga mikaka yemuzvitoro []

Zvinoenderana nechipatara

46 Munogara kure zvakadii nechipatara? pasi pe gumi rema km [] pamusoro pegumi rama

km []

(f) Munogutsikana here nekurapwa kuchipatara? [Hongu/ Kwete/Hamheno]

42 Kana mati kwete tipeiwo chikonzero.....

43 Munowana kupi ruzivo maererano nezvechirwere chekushaya kudya kwakakwana.

Chipatara

Mbuya utano

Wairesi

TV

TATENDA

Appendix iii: Consent form for patients

Factors associated with chronic malnutrition in Mazowe District, Mashonaland Central Province, 2012.

Investigator G Dandajena

Phone number(s) 0774225152

What you should know about this research study:

- We give you this consent so that you may read about the purpose and benefits of this research study.
- Routine care is based upon the best known treatment and is provided with the main goal of helping the individual patient. The main goal of research studies is to gain knowledge that may help future patients.
- You have the right to refuse to take part, or agree to take part now and change your mind later.
- Whatever you decide, it will not affect care in health facilities.
- Please review this consent form carefully. Ask any questions before you make a decision.
- Your participation is voluntary.

PURPOSE

You are being asked to participate in a study to determine factors associated with high levels of malnutrition in Mazowe district in children below five years. The purpose of the study is to establish the main reasons for malnutrition in children below the age of five. You were selected as a possible participant in this study because your child is malnourished or is being treated for other conditions at the health facility. There are about 156 participants for this study.

CONFIDENTIALITY

Any information that is obtained will not be traceable to you. You are not required to put your name on a questionnaire.

PROCEDURES AND DURATION

If you decide to participate, you will be asked to complete a questionnaire. This will take about 20 minutes.

BENEFITS AND/COMPENSATION

The information gathered will help Mazowe district, Mashonaland Central Province and the Ministry of Health to come up with some interventions that will be used to prevent and control malnutrition in children below five years. There are no direct benefits such as cash payments that will come from participating in this study.

VOLUNTARY PARTICIPATION

Participation in this study is voluntary. If you decide not to participate in this study, your decision will not affect your future relations with the Ministry of Health and Child Welfare, its personnel, and associated hospitals. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without penalty.

OFFER TO ANSWER QUESTIONS

GWARO RECHITENDERANO KUNE VACHAPINDA MUONGORORO

Munofara here? Ini ndinonzi Godfrey Dandajena ndirimudzidzi wegwaro repamusoro repa University ye Zimbabwe ndichibata ndirimudunhu rino Mashonaland Central.Ndirikuita ongororo pamusoro pechirwere chekudya zvisina kukwana zvinovaka muviri kwevana vari pasi pemakore mashanu. Kana paine zvamungada kuziva munofona panhamba dzangu idzi 0774225152

Zvamungade kuziva paongororo iyi

- Tinokupai gwaro rechitenderano kuti munyatsonzwisisa zvinangwa zveongororo ino,uye njodzi dzinogona kukukanganisai kana zvamunowana kana mapinda muongororo iyi.
- Kurapwa kurikuitwa mwana wenyu kwakaonekwa kuti ndiko kunokodzerana nechirwere chainacho. Ongororo irikuitwa kuti tiwane ruzivo pamusoro pekurapwa nekudzivirirwa kwechirwere chekushaya kudya kwakakwana muvana vari pasi pemakore mashano, kuti zvigobatsira vamwewo munguva inotevera.
- Hatina zvatinokuvimbisai kuti pane mubairo kana zvamungawane paongororo ino uye hatitarisire kuti panezvingakukuvadzei.
- Ikodzero yenyu kuramba kupinda muongororo ino, kana kutendera iye zvino, asi mozoramba nekufamba kwenguva muongororo.
- Zivai zvakare kuti kumbvuma kana kusabvuma kupinda muoongororo iyi hazvirivhirenge marapirwo amunoitwa pano kana kune zvimwe zvipatara.
- Nyatsoverengai munzwisisa gwaro iri. Kana paine mubvunzo, makasungunuka kubvunza.
- Kupinda kwamuchaita muongororo ino hakuzi kwechisimba uye hakumanikidzwe.

CHINANGWA CHETSVAKIRIDZO INO

Murikukumbirwa kuti mubatsire muongororo yezvikonzero maererano nechirwere chekushaya kudya kwakakwana kunovaka muviri muvana vari pasi pemakore mashanu mudunhu rino reMazowe . Masarudzwa kuti mupinde muongororo iyi sezvo mwana wenyu

ari pasi pemakore mashanu uye achirwara nechirwere chekushaya kudy a kwakakwana kunovaka muviri kana kuti mwana wenyu arikurwara nechimwewo chirwere chisinei nekudya kwakakwana. Tinotarisisira kuzobvunza vanhu vanokwana zana nemakumi mashanu nenhanhatu mudunhu rino reMazowe muongororo iyi.

ZVICHAITWA MUONGORORO INO

Kana makasununguka ndichakubvunzai mibvunzo. Zvinogona kutora maminiti anokwana makumi maviri.

ZVATINOTARISIRA MUONGORORO INO

Tinovimba kuti zvatichawana muongororo ino zvichabatsira matunhu emuno muMashonaland Central Province pamwechete nebazi rezveutano kuti ritsvake nzira dzekuti vana vadzivirirwe kana kurapwa kwezvirwere zvekushaya kudy a kwakakwana.

KUVIMBIKA KWEONGORORO INO

Kana mukapinda muongororo ino, muchasaina, asi zita renyu hatiridure panezvamunenge mataura kana zvabva kunemi muongororo ino.

KUSUNUNGUNUKA KWEONGORORO INO

Hamumanikidzwe kupinda muongororo ino. Haizi mhosva mukaramba kupinda, hazvizokanganisa hukama hwenyu nezvipatara kana makiriniki kana vashandi vacho. Kana mukati munoda kupinda muongororo ino, makasununguka kurega zvisina zvazvinokukanganisai.

KUPINDURWA KWE MIBVUNZO

Makasununguka kundibvunza kana paine mibvudzo yamusina kutsonzwisisa.

MVUMO

Kusayina kwamuchaita panzvimbo inotevera zvinoreva kubvuma kuti maziviswa maererano nezveongororo ino, hamuna kumanikidzwa kuva nechokuita nayo, uyezve kuti zvamaudzwa zvaita kuti mugone kunyatsonzwisisa zvamuri kukurudzirwa kuita uye muchitaura zvamunoziva. Zvamunenge matizivisa patsvakiridzo ino zvichabvumidza ini pamwe nevarairidzi vangu kuti tizvishandise mutsvakiridzo ino chete.

Zita re Mupinduri (Nyorai Zvinooneka)..... Zuva.....Nguva.....

Runyorwo rweMuongorori.....Zuva.....Nguva.....

Hukama hwemumiriri wemupinduri [*hapasi pevanozvipindurira voga*]

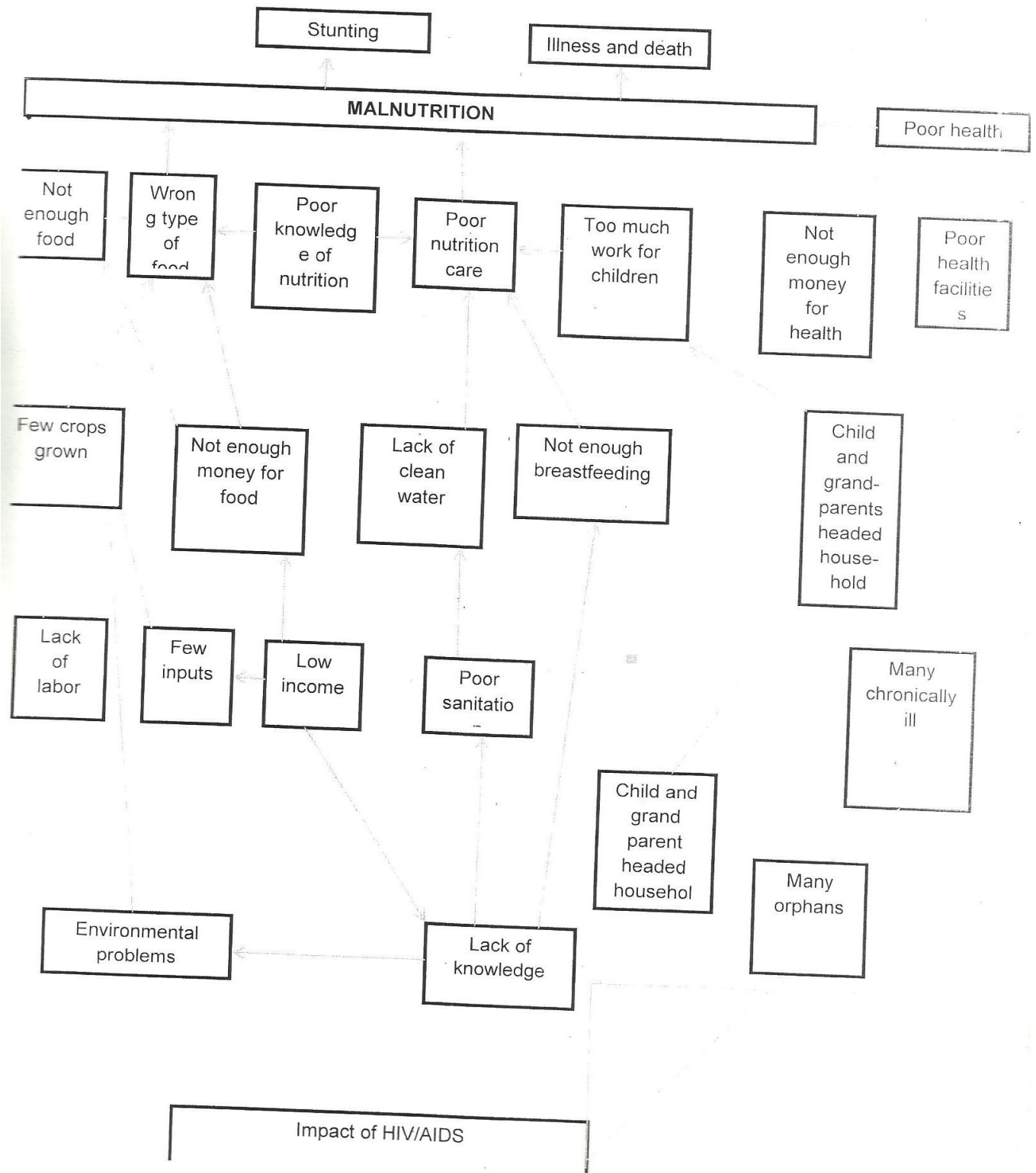
Runyoro rwemupi hweumbowo (kana achida)

Runyoro rwemushandi ari kupihwa mvumo

MUCHAPIHWA RIMWE GWARO RECHITENDERANO KUTI MUGARE NARO

Kana muine imwe mibvunzo isina kupindurwa nemuongorori, kana mibvunzo yakanangana nekubatwa kwamaitwa muongororo iyi, kana kodzero dzenyu, kana kusabatwa zvakana kwamunenge maitwa makasununguka kubata veMedical Research Council of Zimbabwe panhamba dzerunhare dzinoti,04-791792 ,vekuchikoro chezveutano kuUniversity of Zimbabwe panhamba dzinoti04-791992, kana mukuru wezveutano muno muMashonaland Central panhamba dzinoti 0271-6659

Appendix v :Conceptual Frame for malnutrition.



Appendix vi: Approval letter from Medical Research Council.

Telephone: 791792/791193z
Telefax: (263) - 4 - 790715
E-mail: mrcz@mrcz.org.zw
Website: <http://www.mrcz.org.zw>



Medical Research Council of Zimbabwe
Josiah Tongogara / Mazoe Street
P. O. Box CY 573
Causeway
Harare

APPROVAL

REF: MRCZ/B/542

06 August, 2013

Godfrey Dandajena
UZ Department of Community Medicine
P.O Box A178
Avondale
Harare

RE: Factors associated with prevalence of malnutrition in Mazowe District.

Thank you for the application for review of Research Activity that you submitted to the Medical Research Council of Zimbabwe (MRCZ). Please be advised that the Medical Research Council of Zimbabwe has **reviewed** and **approved** your application to conduct the above titled study.

This approval is based on the review and approval of the following documents that were submitted to MRCZ for review:-

- a) Study proposal
- b) Informed Consent Form (English and Shona)
- c) Questionnaires (English and Shona)

• **APPROVAL NUMBER** : MRCZ/B/542
This number should be used on all correspondence, consent forms and documents as appropriate.

- **TYPE OF MEETING** : Expedited
- **EFFECTIVE APPROVAL DATE** : 06 August 2013
- **EXPIRATION DATE** : 05 August 2014

After this date, this project may only continue upon renewal. For purposes of renewal, a progress report on a standard form obtainable from the MRCZ Offices should be submitted three months before the expiration date for continuing review.

- **SERIOUS ADVERSE EVENT REPORTING:** All serious problems having to do with subject safety must be reported to the Institutional Ethical Review Committee (IERC) as well as the MRCZ within 3 working days using standard forms obtainable from the MRCZ Offices or website.
- **MODIFICATIONS:** Prior MRCZ and IERC approval using standard forms obtainable from the MRCZ Offices is required before implementing any changes in the Protocol (including changes in the consent documents).
- **TERMINATION OF STUDY:** On termination of a study, a report has to be submitted to the MRCZ using standard forms obtainable from the MRCZ Offices or website.
- **QUESTIONS:** Please contact the MRCZ on Telephone No. (04) 791792, 791193 or by e-mail on mrcz@mrcz.org.zw

Other

- Please be reminded to send in copies of your research results for our records as well as for Health Research Database.
- You're also encouraged to submit electronic copies of your publications in peer-reviewed journals that may emanate from this study.

Yours Faithfully


.....
**MRCZ SECRETARIAT
FOR CHAIRPERSON
MEDICAL RESEARCH COUNCIL OF ZIMBABWE**



PROMOTING THE ETHICAL CONDUCT OF HEALTH RESEARCH

**Appendix vii: Approval letter from joint Parirenyatwa Hospital and
College of Health Sciences Research Ethics Committee (JREC)**



**Joint Parirenyatwa Hospital
And College of Health Sciences
Research Ethics Committee**



5th Floor College of Health Sciences Building
Telephone: +263 4 708140 Email: medirural@medsch.uz.ac.zw

University of Zimbabwe
College of Health Sciences

APPROVAL LETTER

Date: 24th July 2013

JREC Ref: 148/13

Name of Researcher: Mr Godfrey Dandajena

Address: University of Zimbabwe, Department of Community Medicine

Re: **Factors associated with high levels of malnutrition in Mazowe District, Mashonaland Central Province.**

Thank you for your application for ethical review of the above mentioned research to the Joint Research Ethics Committee. Please be advised that the Joint Research Ethics Committee has reviewed and approved your application to conduct the above named study.

- **APPROVAL NUMBER:** JREC/148/13
- **APPROVAL DATE:** 24th July 2013
- **EXPIRATION DATE:** 23rd July 2014
- **TYPE OF MEETING:** **Expedited Review**

This approval is based on the review and approval of the following documents that were submitted to the Joint Ethics Committee:

- a) Completed application form
- b) Full Study Protocol
- c) Informed Consent in English and/or appropriate local language
- d) Data collection tool version:

After this date the study may only continue upon renewal. For purposes of renewal please submit a completed renewal form (obtainable from the JREC office) and the following documents before the expiry date:

- a. A Progress report
 - b. A Summary of adverse events.
 - c. A DSMB report
- **MODIFICATIONS:**
Prior approval is required before implementing any changes in the protocol including changes in the informed consent.

- **TERMINATION OF STUDY:**

On termination of the study you are required to submit a completed request for termination form and a summary of the research findings/ results.

Yours Faithfully,



Professor MM Chidzonga
JREC Chairman