AFRICA UNIVERSITY
(A United Methodist Related Institution)

CARE-GROUP MODEL EFFECT ON NUTRITIONAL STATUS OF CHILDREN UNDER FIVE IN CHIREDZI DISTRICT

BY

EDLANE MHARIWA

A DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF PUBLIC HEALTH IN THE COLLEGE OF HEALTH, AGRICULTURE AND NATURAL SCIENCES

2022

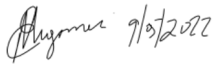
Abstract

Stunting amongst under-fives remains a challenge globally. About, 27% of all children under five are stunted in Masvingo province alone whilst 27.3% are stunted in Chiredzi. The Care Group Model was introduced to address food and nutrition insecurity for stunting reduction through addressing identified nutrition-related health issues in a focused way per district. Despite the positive expected outcomes of the Care Group Model for Chiredzi, it is unfortunate there are no robust evaluations of the impact of the Care Group Model in reducing rates of stunting in Chiredzi. This study was therefore aimed at determining the effect of the Care Group Model on nutrition status of children under five in Chiredzi District. A mixed methods approach which includes both qualitative and quantitative approaches was used. An unmatched case-control (1:4) was done reaching 234 participants (52 cases and 182 controls). A line list in which participants were systematically selected was obtained from four health facilities. Cases for the study were defined as Any child aged 6 to 23 months who was stunted (HAZ < -2SD). Data was collected for a period of 2 months. The results showed that there was low uptake of the Care Group Model by caregivers in the Chiredzi District with only 22 percent enrolled with most caregivers enrolled being female (80%). Sex of child (p= 0.049) and age of child (p=0.012) were found to be significantly different between the cases and controls. Caregivers of children with overall good knowledge (OR= 0.1; 95%CI: 0.02 – 0.4; p<0.010) were 90 percent less likely to develop stunting than those with poor knowledge. The main barriers for the implementation of the Care Group model were drought and food insecurity, low population coverage and poor stakeholder involvement. Enhancers were having a needs assessment research, social cohesion and human capital and resources. there was a significant association between access to safe sources of drinking water and stunting (OR=0.2; 95%CI: 0.1 – 0.4 ; p=0.040). Results also showed no association between stunting and child feeding practices. Being in the Care Group Model positively influenced overall knowledge, attitudes on EBF, access to safe drinking water as well as MAD. Being in the care group and having overall good knowledge (OR=0.2; 95%CI: 0.0 – 0.9) and being in the care group and access to safe sources of drinking water (OR= 0.4; 95%CI: 0.3 – 0.9) were both associated with stunting. Children with caregivers participating in Care Groups are 80 percent less likely to develop stunting compared to those with parents who are not participating. Care Groups in Chiredzi facilitated stunting reduction in children under five through giving knowledge and behaviour change in terms of WASH especially use of safe drinking water. There is need for strong collaborating with MOHCC and other government stakeholders throughout implementation for the purposes of sustainability and continuity of the program.

Keywords: Care Group, stunting, under five, nutrition status, Chiredzi

Declaration

I declare that this dissertation proposal is my original work except where sources have been cited and acknowledged. The work has never been submitted; nor will it ever be submitted to another university for the award of a degree.

Edlane Mhariwa		
Student's Full Name	Student's Signature	Date
Dr E. Mugomeri		
Main Supervisor's Full Name	Main Supervisor's Signature	Date

Copyright

Acknowledgement

I would like to acknowledge my Academic supervisor and field supervisor, Mr Chikaka and Mr Magaisa for their guidance and making this proposal possible. I also appreciate the DMO and District Nutritionist, Dr Dhlandhlara and Mr Matimbira respectively for supporting me and giving me direction. I would like to also appreciate the support from my mentor, Mr Siameja for encouraging me when I wanted to give up.

Dedication

I would like to dedicate this to my mother, Angela Mariwa, you have always been my pillar and support system. It is only because of your unwavering support and prayers as a mother that I can never give up.

List of Acronyms and Abbreviations

AUREC	Africa University Research Ethics Committee
CGM	Care Group Model
CGVs	Care Group Volunteers
FNC	Food and Nutrition Committee
FNSC	Food and Nutrition Security Committee
FNSP	Food and Nutrition Security Policy
HH	Household
IYCF	Infant and Young Child Feeding
MAD	Minimum Acceptable Diet
MCBM	Multi-sectoral Community Based Model
NAZ	Nutrition Action Zimbabwe
NGO	Non- Governmental Organisation
NNS	National Nutrition Strategy
PLA	Participatory learning and Action
VHWs	Village Health Workers
WFNSC	Ward Food and Nutrition Security Committee

Definition of key terms

Complementary feeding refers to the process starting from 6 months to 24 months when breast milk alone is not sufficient enough to meet the nutritional needs of infants and therefore other foods and liquids are needed in addition to breast milk (World Health Organization, 2019).

Exclusive breastfeeding means that an infant receives only breast milk for the first 6 months of life with no other liquids or solids and not even water with the exception of oral rehydration solution, medicines or supplements (World Health Organization, 2019).

Minimum acceptable diet is a combined indicator that illustrates the proportion of infants and young kids in age range of 6 to 23 months who receive both minimum meal frequency and minimum dietary diversity the proceeding day (World Health Organization, 2021).

Minimum dietary diversity is an indicator which shows the percentage of children 6-23 months who consume at least 5 food groups or more (including breast milk, grains, roots/tubers, legume and nuts; dairy, flesh food, eggs, vitamin A rich food and other fruits and vegetables) in the preceding day (World Health Organization, 2021).

Minimum meal frequency is the proportion of breastfed and non-breastfed children 6-23 months of age who receive solid, semi-solid, or soft foods or milk feeds the minimum number of times or more (World Health Organization, 2021).

Stunting is noticed when a child has a height for age that is more than two standard deviations below the WHO Child Growth Standards median (World Health Organization, 2015)

Table of Contents

List of Tables

List of figures

List of Appendices

CHAPTER 1 INTRODUCTION

1.1 Introduction

Malnutrition means bad nutrition, including both over and undernutrition. Malnutrition aside from undernutrition and overnutrition encompasses micronutrient deficiencies. Overnutrition is a situation where dietary energy intake by an individual is surplus to dietary requirements, while undernourishment is typified by a state of insufficient food intake that fails to match dietary needs (Roser & Ritchie, 2019). Undernourishment can manifest itself as four outcomes that is underweight, stunting, wasting and micronutrient malnutrition (Roser and Ritchie, 2019). Stunting in children under 5 years of age is a result of poor nutrition and or health conditions in an area and has negative consequences on cognitive development (Ekholuentetale, Barrow, Ekholuenetale, & Tudeme, 2020). The author further states growth failure is prominent between 6 and 23 months of age, during which period poor infant and young child feeding (IYCF) practices and disease drive stunting in low-income settings.

The Care Group Model is a participatory community-level nutrition education groups which delivers health education using a multiplier effect. It is based on the ecological model and shows that individual behaviour is a product of overlapping individual, social and environmental influences and captures efforts to both stimulate individual change whilst influencing the social context in which the individual is in. it therefore uses this model to manipulate the different contexts to stimulate behaviour change amongst caregivers of children under five. This study will assess the effect of the Care Group Model in improving nutrition outcomes at community level. This study seeks to track how far the

model has managed to meet this objective as the Care Group Model was implemented in Chiredzi District. In this chapter, the report is going to state the evaluation questions, program description and objectives. The results of this study will help inform public health authorities of Zimbabwe and Chiredzi District with reference to attained benefits. It will suggest possible improvements and provide direction for future activities The Care Group Model has been widely implemented in other countries such as Malawi, Zambia and Sudan. In Zimbabwe the MOHCC and other partners started implementing this approach in 2013. The MOHCC is in the initial stages of expanding the approach to other districts and this study will provide evidence to support the initiative. This study therefore aims to determine the effect of the Care Group Model on the nutritional status of children under five in Chiredzi District.

1.2 Background to the study

Every country worldwide has been affected by one or more forms of malnutrition (World Health Organisation (WHO, 2019). Children under the age of five are, particularly at risk. Malnutrition, in all its forms, includes wasting (a child too thin for height), stunting (a child too short for age), underweight (a child with low weight for age) and deficiencies in vitamins and minerals (Black, Victora, Walker, Bhutta, Christian, Onis, Ezzati, Grantham-Mcgregor, Katz, Martorell, Uauy, 2013).

In 2020, approximately 250 million children under the age of five were estimated to be malnourished globally (148 million were estimated to be stunted, 46 million were estimated to be wasted and 39.8 million were obese or overweight (WHO, 2020). Malnutrition is among the leading risk factors for childhood illness and deaths worldwide

and is associated with over 60% of all deaths in young children (United Nations Development Group (UNDP), 2020). In addition, malnutrition increases health care costs, reduces productivity, and slows economic growth and in turn perpetuate the cycle of poverty and ill-health (Kalu & Etim, 2017; WHO, 2013).

Although there has been a global decline in malnutrition from 25 % in 2016 to 10% in 2019, sub-Saharan Africa has experienced the smallest relative decrease in prevalence(Viceisza, Aflagah, Abner, & Hippolyte, 2020). It has become imperative to address malnutrition in developing countries such as Zimbabwe as the developmental, economic, and social impacts of the global burden of malnutrition have a serious and long-lasting consequence for children, families, and poor communities (Perry et al., 2015; Viceisza et al., 2020).

For this research, the focus is on stunting resulting from chronic or recurrent undernutrition in children (Food and Nutrition Council of Zimbabwe, 2018). Stunting has been associated with poor socio-economic conditions, poor maternal health and nutrition, frequent illness and inappropriate infant and young child feeding and care in the first 1000 days of life (Black et al., 2013). Consequently, stunting holds children back from reaching their physical and cognitive potential. Poverty has been one of the major determinants of stunting as it amplifies the risk for and from stunting (Debela, Gehrke, & Qaim, 2021; Food and Nutrition Council ,2017; Ncube-Murakwani, 2021).

The 2010-2011 Zimbabwe Demographic Health Survey showed that 32% of children under 5 were stunted, 3% were wasted, 10% were underweight and 6% were overweight (Food and Nutrition Council of Zimbabwe, 2018). However, in 2018, the National

Nutrition Survey highlighted a decreased prevalence of malnutrition from 33.8% in 2010 to 26% in 2018 (Food and Nutrition Council of Zimbabwe, 2018). Nonetheless, Zimbabwe's rate of stunting remains high as compared to global standards. Absolute poverty where people live from hand to mouth is characteristic of many households in Zimbabwe such that the government and international organisations have launched several initiatives to tackle the problem over the years (Kalu & Etim, 2017) .

Two of the largest programmes have been the Community Food and Nutrition Programme; initiated in 1988 to improve food production and link it to feeding children at both community and household level (Food Security and Nutrition Network Social and Behavioral Change Task Force, 2014). Secondly, there was the National Food and Nutrition Security Policy (FNSP) launched in 2013 intending to promote and ensure adequate food and nutrition security for all people at all times in Zimbabwe (Food and Nutrition Council, 2017). The FNSP was later developed into the National Nutritional Strategy (NNS) 2014-2018, which aimed to ensure nutritional security through the implementation of interventions within a broad public health framework including health services, water, and sanitation (Food and Nutrition Council of Zimbabwe, 2018).

Despite the presence of the above-mentioned policies, implementation and coverage have been low especially in rural communities in Zimbabwe and the incidence of malnutrition continues to rise as highlighted in the Global Hunger Index report, 2018 with 38% of the population defined as chronically food insecure (Bwakura-Dangarembizi et al., 2021; Perry et al., 2015; Viceisza et al., 2020; Wright et al., 2001). The country remains among the poorest in the world according to the Poverty Assessment Survey, 2019.

1.3 Description of Intervention (Care Group Model)

One of the approaches that have been implemented to tackle the direct and underlying causes of malnutrition in rural communities in Zimbabwe has been the Care Group Model (CGM)(Perry et al., 2015). The basic structure of a Care Group Model is shown in *Figure 1*.

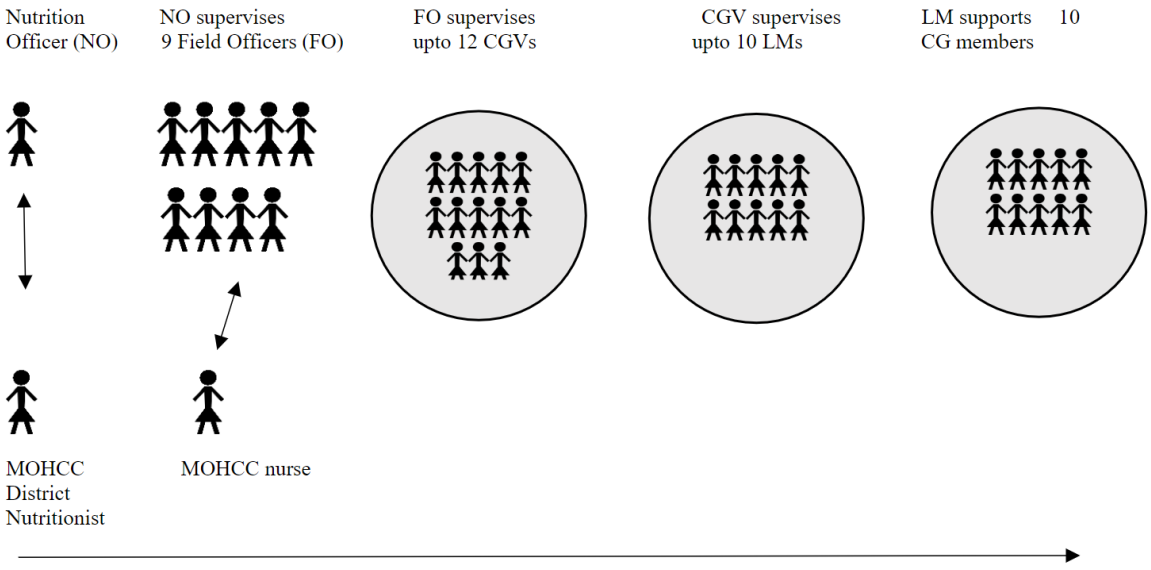


Figure 1: Structure of the Care Group Model (Ncube-Murakwani, Nyathi, Dzimba, Sijabulisiwe, & Moyo, 2020)

To achieve necessary nutritional impact, Care Groups are implemented in collaboration with the Ministry of Health staff (MOHCC), a nurse, nutritionist, field officers and Care Group volunteers (CGVs) that in turn work with the rest of the community (World Health Organization, 2013). Care Groups are defined as:

"Participatory community-level nutrition education groups consisting of up to ten members (including pregnant or lactating mothers and caregivers of young children) that meet regularly" (Perry, et al., 2015). The present research evaluates the Care Group Model

implemented through Multi-Sectoral Community Based Model (MCBM) programme and its operation in Chiredzi in improving the nutritional status of children under five years.

In the Manicaland and Masvingo Provinces of Zimbabwe, the Care Group Model, was promoted in 2012 and operated until 2020. The programme was implemented by a consortium of organisations led by the Food and Nutrition Council and other partners including UNICEF, the Food and Agriculture Organisation of the United Nations, community chiefs, Food and Nutrition Security committees (FNSC) at district, ward and village level, village health workers (VHWs), members of local community gardens and health clubs and volunteer village health workers (Food and Nutrition Council of Zimbabwe, 2018). The programme was initially rolled out in 4 districts which are Mutasa, Chipinge, Mwenezi and Chiredzi Districts with over 100 000 vulnerable households in these districts based on their stunting rates, poverty levels and other nutrition-related indicators (Food and Nutrition Council of Zimbabwe, 2018).

The aim was to address food and nutrition insecurity for stunting reduction through addressing identified nutrition-related health issues in a focused way per district (Food and Nutrition Council of Zimbabwe, 2018). The model included interventions in which multiple sectors converged on a demographic group vulnerable to undernutrition as well as nutrition-sensitive sectors (Food and Nutrition Council of Zimbabwe, 2014). Pooled resources ranged from communications regarding nutrition at the national and sub-national level to increase awareness, capacity and human resources, coordination, and collaboration action, sub-national delivery mechanisms, a combination of sectors, target groups,

monitoring and evaluation, advocacy accountability and finance (Food and Nutrition Council of Zimbabwe, 2014). The key elements of the Care Group Model included:

- Participatory planning at the community level to identify specific causes of stunting in each community.
- Targeting of nutritionally at-risk households (i.e., vulnerable pre-pregnant, pregnant, and lactating mothers, children under two years of age and adolescent girls) with nutrition-specific and nutrition-sensitive programmes.
- Developing community-based processes to empower adolescent girls, pre-pregnant and pregnant mothers.
- Achieving greater efficiencies in the delivery of services at the district, ward, and village level.
- Strengthening of monitoring and feedback mechanisms at different levels (Food and Nutrition Council of Zimbabwe, 2014).

The FNSCs worked in collaboration with VHWs to improve motivation and responsibility. VHWs were given an incentive paid every two months after the initial 8-weeks of training(Food and Nutrition Council of Zimbabwe, 2014). The VHWs trained and supported Lead mothers who then shared key messages each month and conducted home visits to enrolled households to offer tailored messaging and reinforce nutrition promoted practices (Food Security and Nutrition Network Social and Behavioral Change Task Force, 2014). Some wards have implemented the model ward strategy to serve as an example and motivation for other wards and districts (Akombi et al., 2017; Food and Nutrition Council of Zimbabwe, 2018). Thus, the Care Group Model has a multiplier effect allowing the

program to reach more beneficiaries at a low cost (Food and Nutrition Council of Zimbabwe, 2018)

1.3 Problem statement

Stunting has been identified as one of the major proximal factors for the poor physical and mental development of children under 5 years (Viceisza et al., 2020). Stunting predominantly occurs in the first 1000 days (0-23months) of life and continues to the age of five (Bwakura-Dangarembizi et al., 2021; Food and Nutrition Council of Zimbabwe, 2018; Wright et al., 2001).

According to the National Nutrition Survey report (2018), 27% of all children under five are stunted in Masvingo province alone whilst 27.3% are stunted in Chiredzi which is high as classified by WHO as it is within the range of 20 to less than 30% (UNICEF, WHO & World Bank Group, 2019). As a result, the province has recorded increased morbidity and mortality rate of 63% attributed to stunting (Food and Nutrition Council, 2017; Jr, Mondal, Rashidul, Sack, & Beth, 2012; ZIMSTAT & UNICEF, 2019).

The Care Group Model was introduced to address food and nutrition insecurity for stunting reduction through addressing identified nutrition-related health issues in a focused way per district (Food and Nutrition Council of Zimbabwe, 2018). Despite the positive expected outcomes of the Care Group Model for Chiredzi, it is unfortunate there are no robust evaluations of the impact of the Care Group Model in reducing rates of stunting in Chiredzi (Viceisza et al., 2020). It is, therefore, necessary to assess whether the increased

collaboration and focus on stunting reduction by the Care Group Model has had a clear positive impact on improving nutritional status in Chiredzi Districts.

1.4 Research Objectives

1.4.1 Broad Objective

The purpose of this study was to determine the effect of the Care Group Model on Nutritional status of children under five in Chiredzi Rural, 2013 – 2020.

1.4.2 Specific Objectives

i. Assess the knowledge of mothers and caregivers of under-five children on nutrition, infant and young child feeding.

ii. Identify the enhancers and barriers for the implementation of the Care Group Model.

iii. Determine if the Care Group Model influences the effect of optimum WASH, and infant and young child feeding knowledge, attitudes and practices on nutrition status

iv. Determine if the Care Group Model plays a role in improving nutritional status of children under five

1.5 Research questions

i. What are the knowledge levels of the mother/caregivers of under-five children on nutrition, infant and young child feeding?

ii. What are the barriers and enhancers for the implementation of the Care Group Model in Chiredzi District?

iii. How does the Care Group Model influence the effect of optimum WASH, infant and young child feeding knowledge, attitudes and practices on nutrition status?

iv. Does the Care Group Model have an effect on nutrition status of children under five?

1.6 Significance of the study

The study looked at whether or not the Care Group Model was an effective intervention to positively change the knowledge, attitudes, and practices of the women of childbearing age and care givers in terms of nutrition. These positive changes can significantly address stunting as a form of chronic malnutrition as caregivers in the Care Group Model get nutrition education whilst in the first 1000 days window can adopt and increase the uptake of the promoted maternal, infant and young child feeding practices. The international community has placed stunting as the indicator of choice for measuring progress towards reducing malnutrition because evidence suggests that this measure of malnutrition reveals chronicity and impaired brain development (Black et al., 2013; Dangour et al., 2013; Food Security and Nutrition Network Social and Behavioral Change Task Force, 2014; Webb & Kennedy, 2014).

This study got input from the beneficiaries of the service, and this is useful in informing programming. It was, therefore, necessary to assess whether the increased collaboration and focus on stunting reduction by the Care Group Model has had a clear positive impact on nutritional status in the district. The study identified the barriers and/or enhancers that deter social progress of IYCF practice uptake and assist NGOs and other humanitarian organizations in deciding the form and level of intervention necessary to ensure the social

functioning of caregivers and their children, also resulting in a deeper body of knowledge of the experiences of caregivers with the Care Group Model.

1.7 Delimitations of the study

The research was done in Chiredzi District and the results of the study apply to the area under study.

1.8 Limitations of the study

Respondent bias was a limitation that could not be ruled out. To minimize error, data collected using structured questionnaires was triangulated using focus group discussions. The 24-hour recall which was used to assess dietary diversity is not considered to be representative of habitual diet at an individual level but this methodology is good enough for assessing diet in a large group.

CHAPTER 2 REVIEW OF RELATED LITERATURE

2.1 Introduction

This chapter will show a review of related literature. Reviewing related literature is done, so as to get a broad understanding of the information that is available in relation to the problem under investigation, in-line with the objectives of the study. This chapter will examine findings from related literature, such that we are able to note similarities and differences in these studies so that we come up with explanations which can inform this study.

2.2 Theoretical Framework

Through the lens of interventions implemented to tackle health problems within a society, several factors including organisational change, partner engagement and community behavioural change need to be identified (Parkhurst, Ettelt, & Peters, 2018). These attributes can be explained through the Socio-ecological framework where contemporary health promotion involves more than simply educating individuals about health practices but also an interaction of efforts to change organisational behaviour and physical and social environment of communities at different levels in society (Smith et al., 2014). Figure 2.3 illustrates how various levels of influence interlap to affect population health.

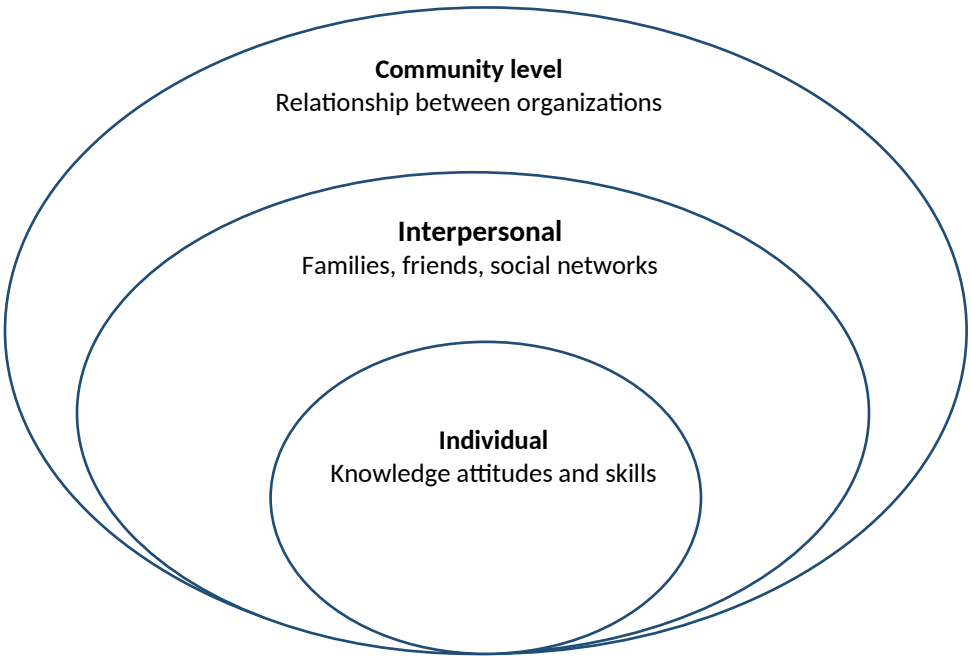


Figure 2: Adaptation of Socio-ecological framework (Barbara C. Lee, Casper Bendixsen, Amy K. Liebman & Susan S. Gallagher, 2017)

2.3 Relevance of the Theoretical Framework

A socio-ecological perspective shows the advantages of multilevel interventions that overlap and combine behavioural and environmental components (multi-sector operation) (Smith et al., 2014). It acknowledges the relationship of several factors that influence child and maternal health outcomes and describes the interactions between individuals and their social environment. It shows how the best interventions for public health are those that take into consideration a wide range of perspectives. Positive health behaviour may be difficult to promote in a community if one does not consider how there are other factors that influence behaviour change of an individual or the community as a whole.

2.3.1 Individual factors

Individual factors encompass the knowledge, attitudes, skills and beliefs that one may have. The persons gender, their economic status, age, race, ethnicity level of education amongst other things can influence how the individual sees themself (Packard, 2018). This is especially important to consider as for example if a caregiver in the Care Group Model has financial constraints they may be unable to access adequate healthcare which is of great importance in the first 1000 days. Issues such as lack of caregiver knowledge in knowing the importance of positive health seeking behaviour may affect how a pregnant mother may not see the need to go for early booking for antenatal care or even understand that they need an extra meal to facilitate growth of their baby so that they do not have a low-birth-weight baby who is already at risk of developing stunting.

Barriers that take place at this level are personal as one's characteristics are the ones which inhibit the adoption or uptake of the positive behaviour. The Care Group Model looks to capacitate an individual through trainings and home visits which are one on one discussions with a behaviour change volunteer (lead mother or CGV) to negotiate for behaviour change when it comes to nutrition and WASH practices.

2.3.2 Interpersonal factors

At this level the relations one has and the social circle that they are part of has an impact on their behaviours. Their families, friends and their beliefs are key in influencing their behaviour as such influence can take place whether the individual is aware or is unaware. This is seen for example with the diet of a child. A child has no contribution to what they consume as they are unable to provide their own food, so what they eat is according to

what the provider has bought. If in a household the provider buys mealie meal and vegetables and there is a lack of dietary diversity the child will only be able to eat what is there and with time develop malnutrition.

Another example is how traditions or beliefs have myths that say there are certain foods that are not to be eaten by children e.g. eggs as they will become thieves in boys or that girls will reach puberty early. Such myths have a negative impact on the dietary diversity and minimum acceptable diet of a child which in turn contributes to malnutrition. By targeting the circle of influence of an individual the Care Group Model looks to enrich the knowledge of those around an individual or caregiver so that not only the individual get knowledge alone but those around them are able to gain the same knowledge so that it does not inhibit the process of positive behaviour adoption of the target group.

2.3.3 Community factors

Communities are made up of close business centres, neighbours and even infrastructure. Sometimes one may want to change but their community does not provide an enabling environment or resources for change. Most barriers to change take place at community level.

Community structures play a vital role in how people behave, what they adopt and what beliefs they hold on to. An example of how these are important can be seen in the presence or absence of community gardens or community water points for example which all influence childhood stunting. Because not everyone is financially capable to have a water source in their home in rural areas these help in promoting dietary diversity through the various fruit and vegetables that they can grow. They water points provide for access to

safe water so that individuals especially children are not at risk of diseases if they consume unsafe water. The WFNSC ensures that such structures are advocated for when there are donor activities or there are key developmental issues that are taking place in the ward ensuring both good nutrition and good hygiene and sanitation practices.

2.4 Literature review on stunting and implementation of the Care Group Model

Over the past 10 years, studies have shown that the prevalence of childhood stunting in Masvingo is on the rise (Black et al., 2013; Dangour et al., 2013; Food and Nutrition Council of Zimbabwe, 2014; Lelijveld et al., 2016). Attributed leading factors indicated were poverty, mother's nutrition, child feeding practices and poor sanitation (Food and Nutrition Council of Zimbabwe, 2014). For the current review, the above-mentioned contributing factors will be implored in more detail. When controlling for additional factors it was found that poverty, health, parent characteristics, household decision making and child feeding practices were significantly associated with stunting in children under five (Food and Nutrition Council, 2017). Poverty and malnutrition are interlinked in Masvingo; thus, it is important to address both the relationship of poverty, household characteristics and those of the child (i.e., caregiver nutrition, child feeding practices and care) when targeting programs related to child malnutrition (Food and Nutrition Council, 2017).

2.4.1 Poverty

In Zimbabwe, poverty is among the leading factors of childhood stunting (Black et al., 2013). According to the 2015 Poverty Atlas, all districts in Masvingo have a poverty prevalence of more than 50 percent. The province is a commercial centre for cattle

ranching and agriculture (grains, cotton, tobacco, fruit, and sugar) (ZIMVAC, 2019). There is also gold and asbestos mining in the vicinity (ZIMVAC,2019). However, despite the economic activity, poverty prevalence across districts remains high. The poverty prevalence in Masvingo seems to be linked to limited rainfall, which in turn hinders agriculture and livestock production and impacts food security (Food and Nutrition Council of Zimbabwe, 2018). An assessment conducted by the Zimbabwe Vulnerability Assessment Committee (ZIMVAC) in 2019 found that 48 % of households in Masvingo were food insecure and the rate of stunting stood at 27%, the same level as the overall stunting rate in the country. For this research, poverty definition was taken from the Zimbabwe Demographic and Health Survey (ZDHS) 2015 where poverty referred to

"a household (HH) that is in the bottom quantile of the wealth-index distribution".

The bottom quantile of the wealth index indicates a state of absolute poverty characterised by scarcity of requirements such as shelter, running water, clothes, water, and the overall income of the household is insufficient to meet the average standard of living (Viceisza et al., 2020). Explored further, the interrelationship between poverty-related causes and consequences of child stunting could be explained by the UNICEF conceptual framework(1990). The framework outlines the relationship among immediate causes such as inadequate dietary intake, poor sanitation, and diseases. Secondly are the underlying causes such as inadequate access to food, care for mothers and children and health services, and an unhealthy environment (Food and Nutrition Council of Zimbabwe, 2018). Thirdly are the basic causes such as inadequate education, formal and non-formal institutions, political ideologies, economic structures, and a lack of potential resources

(Food and Nutrition Council of Zimbabwe, 2018). Hence it is all these factors that are recognised and defined as dimensions of poverty.

A study was conducted in Masvingo to explore the relationship between poverty and household characteristics. Results from the survey showed that poor households were less likely to own agricultural assets as compared to non-poor households (Viceisza et al., 2020). As discussed in some previous works of literature, agriculture is the main source of livelihood for the people in Masvingo (Perry et al., 2015; Viceisza et al., 2020, 2020; Wright et al., 2001). As a result, lack thereof consequently leads to food insecurity and an increased likelihood of malnutrition (47% vs 28% in non-poor HHs) (Viceisza et al., 2020).

Many researchers have documented the incontrovertible correlation between illiteracy and poverty (Brown, 2019; Rytter, Kolte, Briend, Friis, & Christensen, 2014). Some studies suggest that higher maternal education is among the factors that protect children from stunting (Debela et al., 2021). As far as we know, poor HHs were likely to have a head who had no schooling (22% vs 9% from non-poor HHs) (Zimbabwe National Statistics Agency, UNICEF & The World Bank,2015). In addition, the age of the caregiver was found to be correlated to poverty. However, results from the baseline MCBM survey highlighted that age of the mother was weakly associated with stunting in children, suggesting a moderate increase in stunting as the children surveyed in the baseline study were born later in the mother's life (Mafa, 2014).

2.4.2 Infant and Young Child Feeding practices

As noted earlier, 27.3% of children in Chiredzi are stunted (Food and Nutrition Council of Zimbabwe, 2018). One of the risk factors of stunting is the low birth weight (Wright et al., 2001). It has been documented those children who are small at birth tend to be four times as likely to be stunted (Akombi et al., 2017). Findings have therefore summarized that size at birth is significantly associated with stunting, with stunting decreasing with the child's size at birth (Wright et al., 2001). This points to a permanent component of stunting among children.

Many health interventions have promoted exclusive breastfeeding for up to 6months to promote growth and development (World Health Organization, 2013). Findings from the baseline MCBM survey showed that 18% of mothers reported feeding their infants' alternative foods other than breastmilk in the first three days after delivery (Food and Nutrition Council, 2017). For those that were breastfeeding approximately 44%, the frequency decreased by age such that breastfeeding was frequent during the first month of life and by the time the child got to 5months, at most half of the mothers interviewed reported to have stopped exclusive breastfeeding (Food and Nutrition Council of Zimbabwe, 2014).

Most studies also reveal that malnutrition among under-five children is greater among boys than girls (Grantham-McGregor, Fernald, Kagawa, & Walker, 2014). The reason to this is not well established in most literature but it is believed that boys are more influenced by environmental, societal and cultural norms than the girls (Grantham-McGregor, Fernald, Kagawa, & Walker, 2014). Some studies argue that this could be due to the fact that girls are

mostly at home assisting their mothers with kitchen duties thus increasing the availability of food for girls compared to their male counterparts who are often actively playing (Bhutta, et al., 2013).

World Health Organisation recommends complementary feeding for children 6 months to 23 months and a sufficient diet meeting the acceptable minimum requirements for children 2 years and above (WHO, 2013). Overall food consumption patterns in Chiredzi households are low with more than half of the households able to afford at most 3 meals or less (Food and Nutrition Council of Zimbabwe, 2018).

To improve nutrition, Care Groups aid the promotion of dietary diversity for mothers, caregivers, and young children. Several studies have been conducted to establish the relationship between dietary diversity and child malnutrition (Black et al., 2013; Dangour et al., 2013; Food and Nutrition Council of Zimbabwe, 2014; Food Security and Nutrition Network Social and Behavioral Change Task Force, 2014). In those studies, a consistent positive relationship has been shown to exist between dietary diversity and child nutritional status; as diversity increased, nutritional status improved (Black et al., 2013; Dangour et al., 2013; Food and Nutrition Council of Zimbabwe, 2014; Food Security and Nutrition Network Social and Behavioral Change Task Force, 2014).

Conversely, lower dietary diversity was associated with poor nutritional outcomes in children; especially among poor communities because their diets are primarily comprised of starchy food and include little or no proteins and vitamins (Food and Nutrition Council, 2017). Some studies have shown no association between IYCF indicators and stunting. This was related to the study being done during the lean season with significant changes in

dietary diversity as most households rely on their own agricultural production of food (Anin, Saaka, Fischer, & Kraemer, 2020). Rakatomanana, Gates, Hildebrand, & Stoecker (2017), argued that the reason for no association is because the 24 h-recall does not allow the investigator to capture the whole situation of feeding practices. The questions only consider the feeding practices of the previous day, no matter how the infant had been fed in the past, as long as the caregivers had appropriate feeding practices the previous day, they will still be compliant with the indicator (Rakatomanana, Gates, Hildebrand, & Stoecker, 2017).

There are challenges noted in literature stemming from cultural and religious beliefs and practices. The major challenge in the baseline study was the issue of Apostolic sects requiring members to seek healing via prayer and reject conventional medicine (Brown, 2019). For example, in some parts Chiredzi District, unmarried women, pregnant women and uncircumcised men were previously not allowed to eat eggs and chicken (Food and Nutrition Council of Zimbabwe, 2018).

2.4.3 Maternal health

Mothers play a major role than fathers or males in caring for the child. Regarding maternal health, and the relation to child nutrition, researchers considered attained education level, antenatal care, place of delivery and child illness and immunization (Food and Nutrition Council of Zimbabwe, 2018). The baseline study showed that approximately 64% of mothers were below 30 years of age, while 18% of them reported first pregnancy when they were below the age of 18 (Food and Nutrition Council of Zimbabwe, 2014). To note, close to half of the mothers interviewed had at most primary education with approximately 4% reporting not having received any formal education (Dangour et al., 2013).

Maternal undernutrition during growth and development is one factor that influences stunting in the sub-Saharan region (World Health Organization, 2015). Malnourished pregnant women give birth to undernourished babies and children to these mothers are mostly stunted (Stover, Hardee, Ganatra, Moreno, & Horton, 2016). Studies shows that improved dietary intake of women before and during pregnancy as well as when lactating not only improves maternal health, but also makes a significant contribution to the reduction of childhood stunting by decreasing the incidence of low-birth-weight babies (Ekholuentetale, Barrow, Ekholuenetale, & Tudeme, 2020).

Lack of income is another cause of stunting (Ekholuentetale, Barrow, Ekholuenetale, & Tudeme, 2020). Stunting has been directly linked to poverty, poor nutritious food consumption, disease and poor health status (Black, et al., 2008). Low maternal income puts mothers in a susceptible position as this hinders good feeding practices (Stover, Hardee, Ganatra, Moreno, & Horton, 2016). It has been noted that women with a better income usually have access to quality diets, better access to water and sanitation and medical care in most developing countries (Black, et al., 2008).

Maternal knowledge plays an important role in children's nutritional outcomes. Research shows that good maternal knowledge is of influence on better nutritional choices by mothers for their children under five (Bhutta, et al., 2013). Literature shows that educated mothers accept health knowledge better enabling them to make informed decisions concerning childcare (World Health Organization, 2021). Poor maternal education reduces the ability of mothers to process childcare related information. A mother's ability to help reduce family size and offer adequate and quality nutrition to the family is in relation to

adequate knowledge of good childcare practices and household wealth which is influenced by education (Bhutta, et al., 2013).

2.4.4 Water, Sanitation and Hygiene

Water, sanitation and hygiene (WASH) interventions play a key role in creating a healthy environment for communities, which in turn reduces disease incidence for children in the first 1,000 days and beyond (African Development Bank Group, 2021). Poor water, sanitation and hygiene can prevent children from obtaining the maximum nutritional value from the food that they eat and can result in prolonged stress for growing children, preventing them from becoming healthy adults (African Development Bank Group, 2021). Improvements to household water treatment sources and hand washing have been shown to have impact on nutrition outcomes and poor WASH practices influence food utilisation and may hamper children getting the best out of their food.

A study by Pickering, et al., (2019), showed a null effect of WASH interventions on linear growth. They attributed these finding to issues of household wellbeing as well as the baseline sanitation coverage which was very low and huge strides had to be made for interventions to be effective.

2.4.6 Care Group implementation

Overall, Care Groups have seen considerable growth. In 2010 14 NGOs had implemented Care Groups projects in 16 countries (Ncube-Murakwani, 2021). Five years later the number had grown to 25 NGOs and 28 different countries in all regions of the world (Kouam, 2014; Ncube-Murakwani, 2021; Ncube-Murakwani et al., 2020). In all cases, Care Groups work hand in hand with the Ministry of Health and Child Care (MoHCC) and

follow the MoHCC policies and strategies. Almost all of the Care Group projects implemented have been in rural areas of low-income countries, although several rural projects have had pockets of peri-urban populations (Ncube-Murakwani et al., 2020).

2.4.7 Care Groups as an example of participatory groups

Care Groups are an example of how programs are gradually learning to harness the power of households working together to improve their health and the health of their children (Ncube-Murakwani, 2021). Social groups have been in use now for decades, and well-delineated methods for engaging them and mobilizing them to deliver key evidence-based interventions that result in scientifically demonstrated improvements and achieve greater population coverage (Ncube-Murakwani, 2021; Ncube-Murakwani et al., 2020). A similar but distinct approach to engaging the power of groups of women is women's participatory learning and action (PLA) groups (Kouam, 2014). In this approach, a facilitator meets with women in a village, and together they discuss health recommendations for pregnancy, birth, and neonatal care and how they could apply them in their particular situation (Kouam, 2014; Mafa, 2014).

Although pregnant women and those with a new-borns are targeted, anyone in the village can attend the meetings. Robust evidence finds the approach can reduce maternal and neonatal mortality if there are an adequate number of facilitators to ensure high levels of service coverage (Food and Nutrition Council of Zimbabwe, 2018).

2.5 Summary

Many researchers have shown that factors such as poverty, child feeding care and practices, maternal nutrition and water and sanction factors are positively associated with

increasing stunting rates in Chiredzi. In so doing, it has been these drivers of stunting that the Care Group approach aimed to address and resolve. Hence, the current research seeks to assess whether the increased collaboration and focus on stunting reduction by the Care Group mode; has had a clear positive impact on improving nutritional status in Chiredzi Districts. By so doing the level of intervention necessary to meet the set national and global targets will be ensured.

CHAPTER 3 RESEARCH METHODOLOGY

3.1 Introduction

This chapter outlines the research methodology that was employed towards gathering empirical data for the research. The chapter delineates the research design, study location, study population, study variables, sample size, sampling procedure, research tools, data collection procedures, data management, data analysis and ethical considerations. For this study, the researcher opted for a mixed methods approach which has a quantitative, and a qualitative research methodology. This approach allows research participants to be central in the data collection process, thereby enabling the exploration of their knowledge, attitudes, and practices, and the interpretation of the same.

3.2 Research Design

The mixed methods approach which includes both qualitative and quantitative approaches was conducted in Chiredzi District from January to February 2022 to determine the effect of the Care Group Model on the nutritional status of children under five. A case control study was used for the quantitative part. This design was chosen as it reduces selection and information bias as cases and controls were sampled from the same population. The quantitative part of the study answered the research question on if the Care Group Model had an effect on the nutritional status of children under five in Chiredzi District. This helped to identify whether the Care Group Model had managed to have an effect or not on the knowledge, attitudes, and practices on nutrition. The qualitative part of the study answered the research question on the barriers and enhancers for the implementation of the Care Group Model in Chiredzi District.

3.2.1 Quantitative Approach

An unmatched 1:4 case-control study was conducted. A case was defined as any child aged 6 to 23 months who was stunted (HAZ < –2SD) . A control was any child aged 6 to 23months who was not stunted (HAZ≥ –2SD).

This type of methodological approach was chosen because it is analytical in nature, and it was able to fully examine if the implementation of the Care Group Model managed to improve the knowledge, attitudes, and practices of the care givers of under-five children and lead to stunting reduction. This was done by comparing children of caregivers who received the Care Group Model intervention with those who did not in the district in relation to stunting. To assess for stunting, the height and age of the last child of the care giver was used to assess for stunting and to assess for Minimum Acceptable Diet a 24-hour food recall of a child 6-23 months was administered.

3.2.2 Qualitative Approach

Creswell (1998), holds that, qualitative research entails the "inquiry process of understanding based on distinct methodological traditions of inquiry that explore a social or human problem where the researcher builds a complex, holistic picture, analyses words, detailed views of informants , and conduct the study in a natural setting ". The natural setting in the context of this study was Chiredzi District.

The researcher used the qualitative methodology because the nature of this study was not only non-numerical but also about effectiveness of the Care Group Model. As aptly spelt out by McNabb, (2010), qualitative research "is used to describe a set of non-statistical inquiry techniques and processes used to gather data about social phenomena".

Further, the qualitative methodology was ideal for this study because it provided detailed narratives and contextualized perceptions, impressions of primary caregivers of under-fives and community Care Groups as direct implementers of the model who were purposively sampled and interviewed in this study. It assisted in unpacking and exploring not only effectiveness of the model but rather underlying problems leading to continued stunting amongst children under five in Chiredzi.

In soliciting views from community Care Groups, this study expected that qualitative methodology through use of interviews would provide space for the researcher to observe and interpret findings in juxtaposition to body language of respondents, as well as physical nutritional status of children beneficiaries of the model.

3.3 Study site

This study was conducted in Chiredzi District. This was the operational area and implementation focus area of the Care Group Model by Nutrition Action Zimbabwe. Chiredzi District is part of Masvingo province with an approximated population size of 276 000 according to the 2012 population census. The district consists of 32 rural wards and 8 urban wards (Food and Nutrition Council of Zimbabwe, 2018). A total of 26/32 (81%) rural wards in the district implemented the Care Group Model. Some parts of the districts are covered with resettlement wards in areas previously zoned as either game reserves or commercial farms (Food and Nutrition Council of Zimbabwe, 2018). For the purpose of this research, the resettlement wards were not considered as they did not have traditional leadership structures to align with the MCBM guideline. The district was chosen as the Care Group Model pilot study had already been implemented in the area.

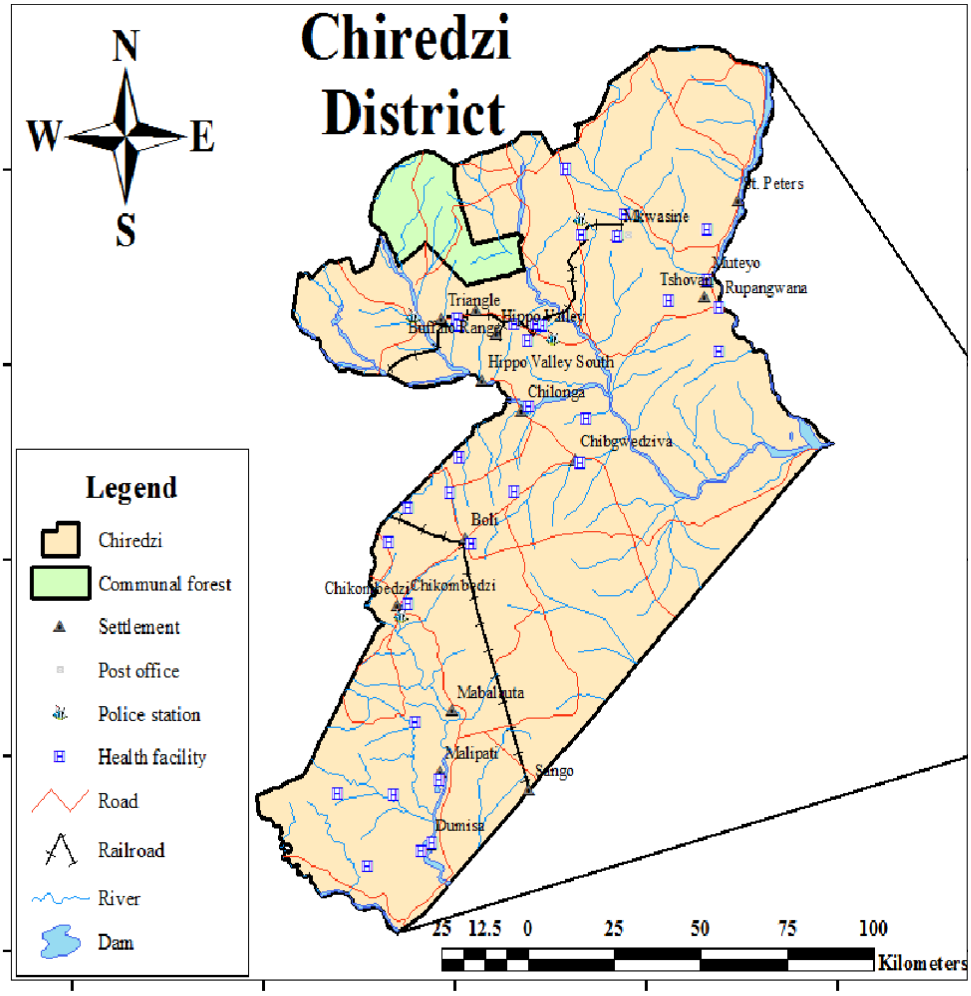


Figure 3: Map of Chiredzi

3.4 Study Population

The study population consisted of growth monitoring registers, mothers, and care givers of under-five children, NAZ implementation staff, MOHCC personnel and the Ward Food and Nutrition Security Committees (WFNSC).

3.4.1 Inclusion criteria

- A mother or caregiver of an under-five child in Chiredzi District.

3.4.2 Exclusion criteria

- A mother or caregiver of an under-five child in the district but was incapacitated to fully participate in the study (physical, emotional, or mental).

3.5 Sample size

3.5.1 Cases and controls

The Fleiss formula embedded in the Epi Info version 7 was used to calculate the sample size. Assuming 52% exposure in the cases, and 30% exposure in the controls, 95% confidence interval, power of study of 80%, and an Odds Ratio of 2.52 based on a study by Wondemagegn, Wolde and Seid (2016) in Ethiopia, where those who were breast fed for a short time were 2.52 times more likely to develop stunting compared to those who were not, and a refusal rate of 5%. The calculated sample size was 48 cases, and 189 controls. The study recruited 52 cases and 182 controls.

3.5.2 Key informants

The District Nutritionist , the Nutrition Action Zimbabwe (NAZ) Nutrition Officer, the NAZ Social Behaviour Change Communication specialist were key informants. Two focus group discussion made up of 8 people each were conducted with the Ward Food and Nutrition Security Committees (WFNSCs). The WFNSCs are comprised of the Agricultural extension officer, ward councillor, village heads from the different villages as well as VHWs.

3.6 Sampling procedure

3.6.1 Cases and controls

High volume health facilities (4) were purposively sampled from the 4 regions in Chiredzi District. Through the use of line lists from the growth monitoring register from the health facilities, a total census of cases (52) stunted children between January 17 to February 7, 2022, was conducted. Line lists extracted from the facility and village health workers were merged and assigned numbers. A total of 182 control participants were randomly selected based on criteria of having a child between the age of 6 to 23 months in the household. Systematic random sampling was used in which the k^{th} value was calculated (n/N) from 396 participants and an interval of 2 was determined. Simple random sampling was used to select the first participant between 0 – 2 on the line list.

3.6.2 Key informants

Four service providers namely the District Nutritionist, the Nutrition Action Zimbabwe (NAZ) Nutrition Officer, the NAZ Social and Behaviour Change Communication specialist, and two WFNSCs were purposively included as key informants.

3.7 Data collection instruments

Being both qualitative, and quantitative in nature, the research employed qualitative and quantitative methods to gather data for the study. For the qualitative part of this study an in-depth semi-structured interviewer-administered questionnaire and participant observation were used for the key informant interviews, and the focus group discussions to

determine the effects of the Care Group Model on nutritional status of children under five in Chiredzi Rural.

A structured interviewer-administered questionnaire was used for the quantitative part of the study to collect data from the cases, and controls. The tool captured the demographic characteristics of caregivers of children under five, their knowledge, attitudes, and practices on nutrition. The tool also captured the demographic characteristics, and anthropometric measures of the child aged 6 to 23 months.

3.7.1 Study Variables

Table 1: Dependent and independent variables

Independent variables	Dependent variable
Age Marital status Parity Religion Infant feeding practices Knowledge of Nutrition Availability of a Blair toilet or improved pit latrine Source of water Home water treatment Attitudes Child`s age Child`s height Mid upper arm circumference Minimum acceptable diet	Stunting

3.8 Pretesting of tools

Pretesting of the tools was done in ward 18, Hippo Valley with 6% of the study population (3 cases, 12 controls). This ward was not part of the study. Pretesting enabled the researcher to check whether respondents understood the questionnaire.

3.9 Data collection procedure

Quantitative data was collected by administering the questionnaire for caregivers of children under aged 6 to 23 months (Appendix 1) within each household using KoBo collect. Qualitative data was collected through the use of a focus group discussion tool (Appendix 3) and in-depth interviews with key informants to get richer responses and allow more valuable insights (Appendix 5).

3.10 Data analysis

Data was extracted from KoBo using Microsoft Excel and first checked for completeness and consistency.

3.10.1 Qualitative

All the data that was gathered through in-depth semi-structured interviews and participant observation as well as through FGDs was interpreted, processed, analysed using manual thematic coding. Upon completion of interviews, the researcher carefully transcribed all interviews. All the data was secured and stored as transcripts and field notes. Coding of the data followed and this was done by mapping and grouping recurring issues and ideas. Coding involved a four layered ranking of data characterized by reading and conceptualizing the text of the interviews, data reduction, abstraction and thematising. Hennink et al (2009) assert that coding is the process of cautiously going through the

research data, identifying critical recurring emerging issues and according to each issue an appropriate code. Through all these processes, the codes were consolidated into a codebook.

3.10.2 Quantitative

STATA version 15 was used to generate medians, frequencies, and proportions. Bivariate analysis and multivariate logistic regression was performed to determine if implementing the Care Group Model had any effect on the knowledge, attitudes, and practices of mothers or caregivers of children under five. All statistical calculations were made at 95% confidence interval, and the significance level was set at $p<0.05$. Four questions were asked to assess the knowledge of the women of childbearing age. The knowledge assessment was scored out of a total score of 18. A 3-point Likert scale was used to categorise the knowledge of the caregivers. Caregivers who scored a total score of less than 9 were classified as having poor knowledge, those with a score of 9 –14 were classified as having good knowledge, and those scoring at least 15 were classified as having excellent knowledge.

Bivariate analysis was performed, where variables were measured against the outcome of interest: Minimum Acceptable Diet - a dichotomous (Yes/No) variable. Odds ratios were calculated from the bivariate analysis and their 95% confidence intervals were recorded. To control for confounding and identify independent factors, multivariate analysis using a stepwise backwards logistic regression model was performed. All variables with a *p-value* $\leq$ *0.25* were included in the logistic regression model (Varkevisser, Pathmanathan, &

Brownlee, 2003). All variables with a *p-value <0.05* were considered to be statistically significant.

3.11 Ethical considerations

Permission to conduct the study was sought from the District Medical Officer, and the Africa University Research and Ethics Council. Written and informed consent was obtained from the study participants. Confidentiality of records was assured at all times by not including the study participants` names on the questionnaires and keeping all study material including after the study safe and secure. Participation was voluntary and participants were able to withdraw from the study at any time during the study. All COVID-19 prevention protocols were adhered to.

CHAPTER 4 DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

4.1 Introduction

The core variables in this chapter include data presentation, data analysis and data interpretation. The chapter will outline all the information from the field research and gathered using the research questionnaire, structured interview, and Focus Group Discussion. Gwimbi and Dirwai, (2003) hold that data analysis makes sense out of large amounts of raw data. Through data analysis (bivariate and multivariate) the researcher easily summarized gathered data using tables and graphs to determine the effect of the Care Group Model in improving nutritional status of children under 5 in Chiredzi District. The ensuing is a detailed presentation, interpretation and analysis of the research findings.

4.2 Demography of Respondents

4.2.1 Enrolment in Care Groups

The researcher sampled and interviewed 234 respondents for the study and the results in figure 5 below indicates that 17 percent of the respondents (17 percent female) were enrolled in the Care Group Model while 59 percent of the females were not enrolled.

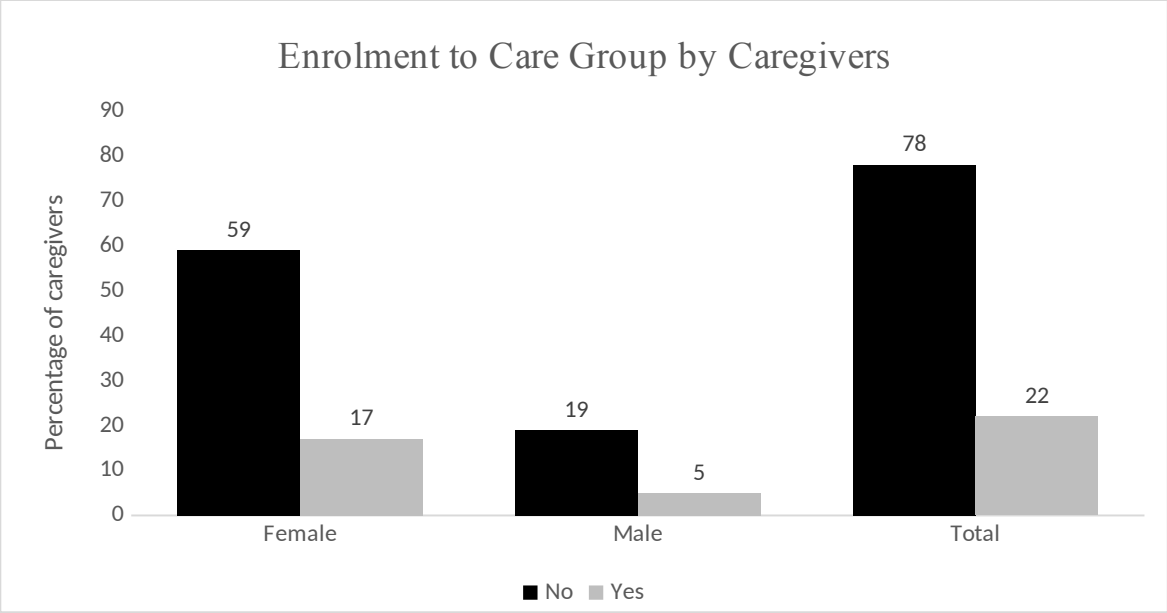


Figure 4: Enrolment to Care Group (N=234)

The results showed that there was low uptake of the Care Group Model by caregivers in the Chiredzi District with only 22 percent enrolled. The results show that 5 percent of the men took part in these activities, however for the Care Group to be effective and reduce the incidence of malnutrition among the children under five years, it is of paramount importance that both male and female caregivers are educated and trained on maternal health aspects.

4.2.2 Socio-demographic characteristics of the respondents

Most of the caregivers that enrolled for the Care Group Model were females (80%) while in the control group, 76 percent of the caregivers were the females as shown in table 3 below. The results are in tandem with the African cultural norm that mothers are responsible for bearing children and taking care of them while men provide for the household (Food and Nutrition Council, 2018). The gender of the caregiver does not significantly influence the choice to enrol in the Care Group Model (p=0.870).

The wealth index quantile reveals that 28.9 percent of the caregivers who had stunted children were rich while 38.4 percent were average in terms of wealth, while in comparison to the control group most of the caregivers, 34.6 percent, were rich while 31.9 percent were in the average quantile. The comparison indicates most of the caregivers with stunted children were average or poor whereas in the control (not stunted) group the wealth index quantile approaches an equal distribution from the poor to the rich. Though the difference is not significant between the 2 groups ($p>0.05$) it shows aligns with empirical evidence which has shown that the wealth level of the caregivers has a major influence on the malnutrition of children under five years (Viceisza et al., 2020).

The median age for stunted children were 17 months old with an interquartile range of 14 to 22 months old with 57.7 percent being male while the children who were not stunted had a median age 14 months with 56.6 percent of them being female. The results indicate that the child's sex ($p=0.049$) and the child's age(0.012) there are significant differences between the cases and controls.

Table 2: Sociodemographic characteristics of the respondents

	Case N=52 n (%)	**Control N=182 n (%)**	**P value**
Sex of caregiver			
Female	40 (76.9)	138 (75.8)	0.870
Male	12 (23.1)	44 (24.2)	
Caregiver's education			
None	7 (13.5)	24 (13.2)	
Primary	20 (38.5)	60 (33.0)	0.436
Secondary	24 (46.1)	83 (45.6)	
Tertiary	1 (1.9)	15 (8.2)	
Wealth index quantile			
Poor	17 (32.7)	61 (33.5)	
Average	20 (38.4)	58 (31.9)	0.625
Rich	15 (28.9)	63 (34.6)	
Age of caregivers			
15 - 24	8 (15.4)	28 (15.4)	
25 - 34	20 (38.5)	62 (34.1)	0.763
35 - 44	15 (28.8)	48 (26.3)	
45 and above	9 (17.3)	44 (24.2)	
Child sex			
Female	22 (42.3)	103 (56.6)	0.049
Male	30 (57.7)	79 (43.4)	
Child age in months, median (IQR)	17.0 (14 – 22)	14.0 (10 – 20)	0.012*
Religion			
Apostolic	23 (44.2)	70 (38.4)	
None	5 (9.6)	16 (8.8)	0.463
Orthodox	22 (42.3)	76 (41.8)	
Other	2 (3.9)	20 (11.0)	
Household size, mean (Sd)	6.7 (2.9)	7.6 (3.5)	0.113
Source of income			
Salary	7 (13.5)	30 (16.4)	
Farming	22 (42.3)	80 (44.0)	0.077
Remittances	7 (13.5)	43 (23.6)	
Other	16 (13.7)	29 (16.0)	

* shows significant difference between cases and controls ($p<0.05$)

Table 3 above shows that most of the caregivers of the cases were of Apostolic and Orthodox religion (44.2 % and 42.3 % respectively) and the results are similar to the control group where approximately 38.4 % and 41.8 % are of Apostolic and Orthodox

religion respectively. Literature has shown that religion has a significant influence nutritional status of children (Food and Nutrition Council of Zimbabwe, 2018), however, the results of this study reveal that the religion of the mothers was similar across the two groups.

Farming is the way of life in the rural areas of Zimbabwe and Chiredzi is no exception as the results indicate that 42.3 percent of the cases came from farming households which is similar to about 44 percent of the mothers in the control group depended on farming as their source of income. Moreso, a notable number of mothers indicated that their source of income is remittances 14 % and 24 % for the cases and controls respectively. This is contributed by family members who go to South Africa and Mozambique to seek work as Chiredzi is close to these country borders.

4.3 Association between knowledge and stunting

Approximately 21 percent of caregivers in the cases reported knowing the benefits of breasting compared to 40 percent in the control group, which is double that of the cases, knew the benefits of breastfeeding as shown in table 3. There is a significant difference between caregiver knowledge about the benefits of breastfeeding and stunting (OR=0.4; 95%CI: 0.2 – 0.8; p=0.014) implying that children with caregivers who know the benefits of breastfeeding were 60 percent less likely to get stunting than those who did not know the benefits of breastfeeding.

Most caregivers in the cases (86.5%) did not know the recommended IYCF practices compared to 63.7 % of caregivers in the control group that did not know the IYCF

practices. The results indicated that the caregivers in the control group had better knowledge of the recommended IYCF practices than caregivers in the cases (OR=0.3; 95%CI: 0.1 – 0.6; p<0.010). This showed that caregiver's knowledge on the good IYCF practices did assist in how the caregivers took care of the children to their children not being stunted.

Table 3: Association between knowledge and stunting

	Case N=52 n (%)	**Control N=182 n (%)**	**OR (95%CI)**	**P value**
Danger signs for taking a child to a hospital				
Those who know	37 (71.2)	128 (70.3)		
Those who do not know	15 (28.8)	54 (29.7)	1.0 (0.5 – 2.1)	0.908
Benefits of breastfeeding				
Those who know	11 (21.2)	73 (40.1)		
Those who do not know	41 (78.8)	109 (59.9)	0.4 (0.2 – 0.8)	0.014*
Recommended IYCF practices				
Those who know	7 (13.5)	66 (36.3)		
Those who do not know	45 (86.5)	116 (63.7)	0.3 (0.1 – 0.6)	<0.010*
Dietary diversity				
Those who know	14 (26.9)	105 (57.7)		
Those who do not know	38 (73.1)	77 (42.3)	0.3 (0.1 – 0.5)	<0.010*
Overall, Knowledge				
Good knowledge	2 (3.9)	51 (28.0)	0.1 (0.0 – 0.4)	<0.010*
Poor knowledge	50 (96.1)	131 (72.0)		

Table 3 results reveal that approximately 26.9 percent of the caregivers of the cases knew about dietary diversity in comparison to approximately 57.7 percent of mothers in the control group who also knew about dietary diversity. The results indicate that the association between knowledge of dietary diversity and stunting is statistically significant

(OR=0.3; 95%CI: 0.02 – 0.4; p<0.010) implying that children of mothers/caregivers with knowledge of dietary diversity have less likelihood of stunting.

Overall, knowledge and stunting have a statistically significant relationship (p <0.010) at a 5 percent significance level. This means that caregivers of children with overall good knowledge (OR= 0.1; 95%CI: 0.02 – 0.4; p<0.010) were 90 percent less likely to develop stunting than those with poor knowledge. These results are supported by the results from the KII. All respondents shared how knowledge dissemination on nutrition and IYCF practices were done vigorously through the Care group meetings and caregivers knew the exact behaviour which were being promoted and the behaviours they had to adopt.

4.4 Barriers and enhancers to Care Group Model implementation

Another key objective of this research was to determine barriers and enhancers to implementation of the Care Group Model. It emerged consistently in this report that the following are the barriers and enhancers to full scale implementation of the Care Group Model in Chiredzi.

4.4.1 Barriers of implementation of the Care Group Model

- **Drought and food insecurity:** Key informants' interviews revealed that progress instigated by the Care Group Model is most times dwindled by the elevated levels of food insecurity in Zimbabwe. According to the Chiredzi District Nutritionist and the WFNSC focus group discussion, the fact that Chiredzi is in natural region five has a negative impact on food security. *"This area is characterised by high temperatures, poor soils and low rainfall. This has been the trend especially in the past 2 years*

where rainfall has been very erratic and therefore agricultural production is very low. The VHWs and volunteers may give knowledge on nutrition and dietary diversity but when a household has no access to the food needed, they cannot adopt the promoted IYCF practices which then leads to stunting."

- **Low population coverage of interventions:** One of the important reasons for lack of progress was cited as low population coverage of interventions. *"During program inception and beneficiary selection, a lot of caregivers showed interest in the program, attending meetings for the first few months but when they realised that there were no incentives the majority dropped out leaving only a few attending these meeting. We realised that there was a lot of donor syndrome which we had to work on,"* said the NAZ Nutrition Officer. This shows how buy in and coverage of the intervention became low which affects sustainability.
- **Poor stakeholder involvement:** During the implementation of the program, stakeholder involvement was identified as being low. This included the community structures e.g. village heads, governments stakeholders and even other NGOs. *"We were told of the program during program inception but when trainings were done, we were not part of them making monitoring or support difficult. So when the project ended, caregivers also stopped meeting as the NAZ implementation team which was following up on them had left the district and we had no capacity or know how on where to pick up from them, so the impact of the intervention diminished,"* said an Agricultural extension officer during one FGD.

4.4.2 Enhancers of implementation of the Care Group Model

- **Needs Assessment Research:** Key informant interviews indicated that at inception of all Care Group Models at community level, it is essential to conduct an in-depth nutrition needs assessment as this is critical towards mapping already existing nutrition behaviours and gaps thereof.
- **Social cohesion (Socio-ecological framework):** As advanced by the socio-ecological framework discussed in chapter 2.3 of this report, social cohesion was also highlighted as a key factor that enhances the Care Group Model. Care Group approach recognises and epitomises the value of reaching the 'Sphere of influence around the mother', that is other family members (grandmothers, husbands, mother in laws etc). They are reached through a home visits that are open for them to attend. The LM becomes an important part of the social support system for the neighbour women.
- **Human capital and resources**: Human resources were identified as being of paramount importance, to contribute to the success and quality of the Care Group Model.

4.5 Association between Care Group Model, attitudes and practices on stunting

4.5.1 Association between attitudes and stunting

Furthermore, to determine the effect of the Care Group Model on WASH and infant and young child feeding, the study investigated the association between attitudes and stunting. Expectedly, among the controls, most of the caregivers do not believe that bad spirits cause malnutrition, 90.4 percent, and for those in the cases, 92.2 percent, also don't believe in this as shown in table 4 below.

Table 4: Association between attitudes and stunting

	Case N=52 n (%)	Control N=182 n (%)	OR (95%CI)	P-value
Believes in exclusively breastfeeding				
Yes	28 (53.8)	112 (61.5)	0.7 (0.4 – 1.4)	0.319
No	24 (46.2)	70 (38.5)		
Believes bad spirits cause malnutrition				
Yes	5 (9.6)	16 (8.8)	1.1 (0.3 – 3.1)	0.855
No	47 (90.4)	166 (92.2)		
Believes in breastfeeding up to 2 years				
Yes	32 (61.5)	126 (69.2)	0.7 (0.4 – 1.3)	0.297
No	20 (38.5)	56 (30.8)		

Approximately 53.8 percent of caregivers amongst cases believe in exclusive breastfeeding compared to about 61.5 percent of mothers in the control group. Moreso, 61.5 percent of caregivers from the cases believe in breastfeeding for up to 2 years. Therefore from the above results, there is no significant difference between attitudes of the cases and controls as all p values are greater than 0.05.

4.5.2 Association between WASH practices and stunting

As shown in Table 5 that there is a significant association between access to safe sources of drinking water and stunting (OR=0.2, 95%CI: 0.1 – 0.4, p=0.040). The results imply that improvement to household portable water is likely to significantly reduce stunting of the children under five years as WASH interventions influence food utilization and may enhance children getting the best out of their food.

About 67.3 percent of the caregivers/mothers in of cases had access to safe sources of drinking compared to 51.1 percent from the control group. The results indicate that those

who had access to safe water were 80 % less likely to have a child who was not stunted compared to those who did not have safe access to safe drinking water.

*"Upon the inception and implementation of the care group model in our ward, a number of households adopted deep wells which were covered giving household members access to safe drinking water. A lot of us used to get water from the canals because we thought our water table was really low but once one person dug a well, others started copying and helping each other as groups. Deep wells are now a trend thanks to the home visits and support by care groups and their members. I think the care group approach has changed young mothers in our ward,"*49-year-old female Village Health Worker, in Chiredzi.

The above statement attests to the effect of the care group model transforming access to safe water as well as knowledge of. An analysis of this prevalent theme in this report indicated a positive correlation between the care group approach and nutritional status of children under 5 in Chiredzi.

However, of concern is that 88.5 percent of caregivers of the cases and 85.2 percent of caregivers in the control group were without the presence of soap at the handwashing station which is the norm in most rural communities and especially in Chiredzi. Literature has shown that hand washing has an impact on nutrition outcomes (African Development Bank Group, 2021), therefore the absence of soap in the handwashing station threatens the hygiene and nutritional status of the children.

Table 5: Association between WASH and stunting

	Case N=52 n (%)	Control N=182 n (%)	OR (95%CI)	P-value
Access to safe sources of drinking water				
Yes	35 (67.3)	93 (51.1)	0.2 (0.1 – 0.4)	0.040*
No	17 (32.7)	89 (48.9)		
Presence of a sanitation facility				
Yes	33 (63.5)	117 (64.3)	0.9 (0.5 – 1.8)	0.913
No	19 (36.5)	65 (35.7)		
Presence of handwashing facility				
Yes	12 (23.1)	63 (34.6)	0.5 (0.2 – 1.2)	0.119
No	40 (76.9)	119 (65.4)		
Presence of soap at the handwashing station				
Yes	6 (11.5)	27 (14.8)	0.7 (0.3 – 1.9)	0.548
No	46 (88.5)	155 (85.2)		
Treat unsafe drinking water				
Yes	12 (23.1)	65 (35.7)	0.5 (0.3 – 1.1)	0.090
No	40 (76.9)	117 (64.3)		

Treatment of unsafe drinking water was statistically insignificant with a $p > 0.05$. the caregivers of cases who treat water were 23.1 percent whilst from the controls 35.7 percent were treating water.

4.5.3 Association between IYCF practices and stunting

Both cases and controls understand the importance of breastfeeding as shown in the results in table 6.for the cases and controls, 96.1 percent and 94.5 percent of the caregivers had breastfed their children with less than 6 percent in both cases having not breastfed their children. There was no statistical difference between the cases and contols as p value was 0.636. Early initiation of breastfeeding was rather low. Approximately 40.4 percent of caregivers of cases and 54.4 percent of the control's caregivers had practiced early initiation of breastfeeding. This difference was also statistically insignificant as $p > 0.05$.

Table 6: Association between Infant and young child feeding practices and stunting

	Case N=52 n (%)	**Control N=182 n (%)**	**OR (95%CI)**	**P value**
Child ever breastfed				
Yes	50 (96.1)	172 (94.5)	1.5 (0.3 – 6.8)	0.636
No	2 (3.9)	10 (5.5)		
Early initiation of breastfeeding				
Yes	21 (40.4)	99 (54.4)	0.6 (0.3 -1.1)	0.077
No	31 (59.6)	83 (45.6)		
Minimum Meal frequency				
Yes	45 (86.5)	164 (90.1)	0.7 (0.3 – 1.8)	0.464
No	7 (13.5)	18 (9.9)		
Minimum Dietary Diversity				
Yes	31 (59.6)	112 (61.5)	0.9 (0.5 – 1.7)	0.802
No	21 (40.4)	70 (38.5)		
Minimum Acceptable Diet				
Yes	21 (40.4)	82 (45.1)	0.8 (0.4 – 1.5)	0.550
No	31 (59.6)	100 (54.9)		

Approximately 86.5 percent of the caregivers from the cases indicted their children were getting the minimum meal frequency and 59.6 percent of mothers indicating that their children were getting minimum dietary diversity. The results are in comparison to 90.1 percent and 61.5 percent of children getting minimum meal frequency and minimum dietary diversity respectively from the caregivers in the control group. Minimum acceptable diet which is a composite indicator of MDD and MMF was also poor amongst cases and controls. Cases had a MAD of 40.4 percent whilst controls had a MAD of 45.1 percent. There was no statistical difference as well (OR=0.8; 95%CI: 0.4 – 1.5, p=0.550). The results all showed no statistical significance at 95 % confidence level and all p values were greater than 0.05. This showed that there was no association between stunting and child feeding practices.

4.5.4 Association of care group model and independent variables on stunting

A bivariate analysis was done using knowledge, attitudes and practices whilst holding the care group model constant to see if the care group played a part in an improvement in these in relation to the nutritional outcome of stunting. Below is a table which compares the influence of the Care Group presence and absence on the variables which were significantly associated with stunting.

Table 7: Bivariate analysis: Association of care group model and assessed independent variables on stunting

Characteristic variable	Bivariate OR (95% CI)	Model with care group &variable OR (95% CI)	Direction of OR change
Overall Knowledge			
Good knowledge	0.1 (0.02 – 0.4)	0.2 (0.0 – 0.9)*	Amplified
Poor knowledge	1	1	(significant)
Believes in exclusively breastfeeding			
Yes	0.7 (0.4 – 1.4)	1.3 (0.6 – 2.5)	Amplified
No	1	1	(insignificant)
Access to safe sources of drinking water			
Yes	0.2 (0.1 – 0.4)	0.4 (0.3 – 0.9)*	Amplified
No	1	1	(significant)
Minimum Acceptable diet			
Yes	0.8 (0.4 – 1.5)	1.0 (0.5 – 2.0)	Amplified
No	1	1	(insignificant)

Being in the Care Group Model positively influenced all variables placed in the model on stunting. These are overall knowledge, attitudes on EBF, access to safe drinking water as well as MAD. Though being in the Care Group positively influenced attitudes on EBF and MAD, there was no significant association with this on reducing stunting (OR=1.3 95%CI: 0.6 – 2.5), (OR = 1.0; 95%CI: 0.5 – 2.0). Those who were in the care group and had overall good knowledge were 80 percent less likely to have a child who is stunted compared to

those who had knowledge but were not in care groups. Those who were in the Care Group and had access to safe sources of drinking water were 60 percent less likely to have a child who is stunted compared to those who had access to safe water but were not in care groups. These results were statistically significant at 5 percent significance level.

4.6 Effect of the Care Group Model on stunting

4.6.1 Association between Care Group and stunting

Table 8: Bivariate analysis (unadjusted): Association between Care Group and stunting

	Case N=52 n (%)	Control N=182 n (%)	OR (95%CI)	P value
Care Group participant				
Yes	7 (13.5)	78 (42.9)	0.2 (0.1 – 0.5)	<0.010*
No	45 (86.5)	104 (57.1)		

From the results, 13.5 percent of the cases and 42.9 percent of the controls had caregivers who were in Care Groups. The larger population of cases (86.5 percent) were not part of care groups whilst controls only 57.1 percent were not part of Care groups. Children with caregivers participating in Care Groups are 80 percent less likely to develop stunting compared to those with parents who are not participating (OR=0.2; 95%CI: 0.1 – 0.5; p<0.010). The result was significant at 95 percent level of significance and $p < 0.05$.

4.6.2 Main variables associated with stunting

A hierarchical logistic regression was conducted to determine and rank variables according to their contribution within the model. The model consisted of all significant predictors

noted under each of the bivariate analysis. Though MAD was insignificant, it was included in this model because literature has shown the role that it plays on malnutrition.

Table 9: Multivariate Analysis (adjusted): Main variables associated with stunting

Characteristic Variable	OR (95%CI)	P value
Care group participant		
Yes	0.4 (0.2 – 0.9)	0.040*
No	1	
Knowledge level		
Good	0.2 (0.0 – 0.8)	0.034*
Poor	1	
Access to safe sources of drinking water		
Yes	0.5 (0.2 – 0.99)	0.040*
No	1	
Minimum acceptable Diet		
Yes	1.2 (0.6 – 2.3)	0.635
No	1	

Holding knowledge level, access to safe sources of water and MAD constant, those who were in the care group were 60 % less likely to have a child who is stunted compared to those who were not participating in care groups and the results were statistically significant at 5% significance level.

4.7 Summary

Most of the study participants were from the control group. Out of the socio demographic factors age and sex had a significant impact on stunting. Bivariate analysis was done on the independent variables and only overall knowledge, access to safe sources of drinking water were found to be associated with stunting. The Care Group model was also found to also

be associated with stunting leading to a decrease in the development of stunting. Holding the Care Group constant, these independent variables as well as MAD were assessed to see if the Care Group Model had any influence on them in reducing stunting in children under the age of 5. These variables were then further assessed to determine the magnitude of association, but MAD was also fitted into the model. All of them except MAD showed significant contribution to stunting reduction in children under the age of 5 years.

CHAPTER 5 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter presents recommendations and conclusion drawn from the data analysis and interpretation. The recommendations advanced can function as a driver towards enhancing the potency and effectiveness of the Care Group Model. Further, the recommendations will enable the policy makers and the program managers to plan for future interventions. The recommendations will be informed by the challenges which came from the findings and general problem highlighted by the key informants and beneficiaries. The main aim of this study was to determine the effect of the Care Group Model in improving the nutritional status of children under 5 in Chiredzi District. The Care Group approach presents a promising alternative to current strategies for delivering key nutrition messages geared for behavioural change in rural Zimbabwean communities.

5.2 Discussion

5.2.1 Demographic Characteristics of respondendts

Results on demographics show that 5 percent of the men took part in Care group activities. The low enrolment of men into Care Groups is an alarming concern as they have a significant contribution to maternal and child health. This was mainly attributed to the fact that Care Group meetings were mainly for women who were pregnant or lactating and men only benefited from them when home visits took place.

Age ($p= 0.01$) and sex ($p=0.04$) showed association with stunting. The results implied that male children are likely to be stunted as compared to their female counterparts. This aligns

with studies that show that malnutrition is more likely in boys than girls though the reason is not very established but it is attributed to the amount of time the girl child spends with their mother thus getting more time to eat unlike boys who enjoy playing and are more likely to be with the other children (Grantham-McGregor, Fernald, Kagawa, & Walker, 2014). Looking at age of those who were stunted they were much older and this is because most mothers do not breastfeed as much when children get older as they face a number of challenges such as being bitten which makes caregivers reluctant to breastfeed aligning with literature which speaks of the importance of breastfeeding and how it helps decreases the incidence of malnutrition in children (Food and Nutrition Council, 2017). The other attribution could be due to children having less time to eat as they are playing with others.

5.2.2 Association between knowledge and stunting

The association between knowledge and stunting is dependent on the trainings and home visits on IYCF provided to the mothers and caregivers. It is critically important for the caregivers/mothers to have sufficient knowledge about dietary diversity and recommended IYCF practices because of its important role in ensuring good child health. Overall, knowledge and stunting have a statistically significant relationship ($P < 0.01$) at a 5 percent significance level. The results show that knowledge about dietary diversity and recommended IYCF practices have a significant contribution to ensuring the nutritional status of children under five. The findings are similar to the findings by the World Health Organization, (2021) which argued that mothers health knowledge better enables them to make informed decisions concerning childcare and practices. The findings are similar to the findings by Smith et al., (2014) and the Food and Nutrition Council of Zimbabwe,

(2018) who argued that community Care Groups provide a platform to supplement educational approaches with efforts to change the social physical environment to support positive behaviour change. Thus, caregivers' behaviours are mediated by cognitions of what people know about childcare impacting how they act thereafter.

5.2.3 Barriers and enhancers to Care Group Model Implementation

Enhancers and barriers were identified through the key informant interviews. The needs assessment was critical as it helps the Care Group Model program identify the key behaviours to promote and ensure that the recommended behaviours or practices are contextual and culturally appropriate. Social cohesion also contributes hugely to ensuring an enabling environment around the mother, which may be an important precursor for adoption of promoted behaviours and practices. Evidence shows that people can change their behaviours to improve nutrition outcomes, especially when the environment in which they live and work supports those changes (Spring, 2017). the realization that when all family members are provided with the correct information by LMs, they (family members) can better support the mother during the period of infant and young child feeding. A key resource for effective implementation of Care Groups is to ensure a project has adequate, trained human resources or staffing to ensure a robust structure is in place. The human resources include Supervisors, Promoters, lead mothers, community health workers, and local health practitioners. In addition, resources for effective implementation of the Care Group program include financial resources to support quality trainings and support.

Drought and food insecurity is a barrier for the intervention. Literature supports how food consumption patterns in Chiredzi households are low with more than half of the

households able to afford at most 3 meals or less due to this. (Food and Nutrition Council of Zimbabwe, 2018). Unlike most emergency interventions where communities are given an incentive when they are part of an intervention e.g. food aid or social safety nets, the Care Group Model had a developmental focus which resulted in low population coverage. Perry et al., (2015) states that expanding coverage of key interventions and achieving documented reductions in maternal, neonatal, and child mortality will require approaches that are low-cost, effective, and feasible at scale over the longer term. Poor stakeholder involvement affects the sustainability of the program. this affects the continuity of a program after the implementing partner leaves leading to program collapse.

5.2.4 Association between Care Group Model, attitudes and practices on stunting

Attitude has a no association with stunting The result differs from the finding by the Food and Nutrition Council of Zimbabwe, (2018) which found that beliefs, especially among mothers who were apostolic, Pentecostal, or protestant their children are likely to be stunted. This lack of association was attributed to the spill over effect of the trainings and educational efforts from the care group to the community level which brings about a positive effect on the community child health. In some instances this was attributed to post program attitude which could have been adopted as mothers had stopped meeting in care groups and sharing information and the lack of home visits to keep encouraging the good attitudes and encourage mother on the promoted nutrition behaviours especially when they could be facing a hard time with adoption of the behaviours.

According to the African Development Bank Group, (2021) poor water, sanitation, and hygiene can prevent children from obtaining the maximum nutritional value from the food

that they eat and can result in prolonged stress for growing children, preventing them from becoming healthy adults. The results of the study support these findings in terms of access to safe sources drinking water. Presence of a sanitation facility, handwashing facility, soap at handwashing station and treatment of water were all not associated with stunting. The results are attributed to different levels of wealth between the cases and controls and poor sanitation coverage in the District. Wealth hinders access to chemicals to treat drinking water and most community members who use unsafe drinking water do not like boiling water as they claim it is not palatable. Pickering, et al., (2019) supports these findings as the study also showed no association between stunting and WASH

According to the results there were no association between IYCF practices and stunting which is different from what the majority of literature attests to which show a consistent positive relationship between dietary diversity and child nutritional status. This study was done during the lean season, which is a period between the planting and harvesting period and characterised by household food stock depletion. During this time most households have poor dietary diversity, whether cases or controls thus no association was found. A study by Anin, et al., (2020) supports these results as it states that during the lean season there are significant changes in dietary diversity as most households rely on their own agricultural production of food. Rakatomanana, Gates, Hildebrand, & Stoecker (2017), argues that the reason for no association is because the 24 h-recall does not allow the investigator to capture the whole situation of feeding practices as it only look at the previous days which is the limitation of the 24hr food recall.

5.2.5 Effect of the Care Group Model on stunting in children under five years in Chiredzi District

The study has established that consistent access to nutrition information through models such as Care Groups is important for the health of both the caregiver and the child. The results showed an association between being part of the care group and stunting. Care Groups advise mothers of good nutrition and hygiene, and adoption of the good practices leads to reduced stunting. Though individuals not affiliated to support groups might have basic information regarding child nutrition, Care Groups are capacitated with equipment that assist in assessing and monitoring children's nutrition status such as middle upper circumference taps (MUAC).

Results show that being in the care group amplifies the effects of most independent variables (overall knowledge, attitudes on EBF, access to safe drinking water as well as MAD). Though knowledge and access to safe sources of water were the only ones significantly associated with stunting, the benefit of the care group approach can be seen. The other two variables were insignificant due to factors discussed previously but the amplification by the care group model show how it has a positive impact on nutritional status of children under five.

5.3 Locating the effects of the Care Group Model in the Socio-ecological framework

The socio-ecological theoretical framework informed the analysis in this research. Through the lens of interventions implemented to tackle health problems within a society, several

factors including organisational change, partner engagement and community behavioural change need to be identified (Parkhurst, Ettelt, & Peters, 2018). These attributes can be explained through the Socio-ecological framework where contemporary health promotion involves more than simply educating individuals about health practices but also an interaction of efforts to change organisational behaviour and physical and social environment of communities at different levels in society (Smith et al., 2014). This resonates well with the findings of this research in that, community nutritional behaviour was to a greater extent influenced and shaped by ideas and practises sprouting from the Care Group mothers and care givers.

A socio-ecological perspective shows the advantages of multilevel interventions that overlap and combine behavioural and environmental components (multi-sector operation) (Smith et al., 2014). It shows how the best interventions for public health are those that take into consideration a wide range of perspectives. This also dovetails well with the findings of this thesis. It emerged in this thesis that there were environmental factors and components like the homogeneity of the Chiredzi community climatic region, and social cohesion amongst community members played a critical role in the success of the Care Group Model. The social cohesion in the community enabled the swift cross pollination of ideas, knowledge as well as copying of best practises regarding appropriate nutrition and WASH behaviour. Through the social cohesion, mothers were able to function as referrals to each other The net effect was a reduction in malnutrition rates, thus a stark improvement in the nutrition status of children under 5 in Chiredzi. Key informant interviews with the District nutritionist also confirmed this and attributed the decrease in stunting in Chiredzi

to the Care Group Model in a multi-sector operational environment as advanced by the socio-ecological framework.

Further, the socio-ecological framework model posits that positive health behaviour may be difficult to promote in a community if one does not consider how there are other factors that influence behaviour change of an individual or the community as a whole. For instance, the Care Group Model works to reduce stunting by engaging all levels of influence from the Ministry of Health, Non-Governmental Organisations (NGOs), Chiefs, Food and Nutrition Security Committees (FNSCs), VHWs, health clubs and the community (Food and Nutrition Council of Zimbabwe, 2018). This was not the case with Chiredzi District. This would have played a significant role in augmenting the effectiveness of the Care Group Model and led to sustainability of the intervention.

At the community level, the model offers frameworks for implementing multi-dimensional approaches to promote healthy behaviours (mentorship, model wards, training) (Food and Nutrition Council of Zimbabwe, 2018). They supplement educational approaches with efforts to change the social physical environment to support positive behaviour change. Thus, caregivers' behaviours are mediated by cognitions of what people know about child care impacting how they act thereafter (Smith et al., 2014). However, household knowledge is not necessarily sufficient to produce most behaviour changes to reduce stunting in children such that interventions at a higher level of the hierarchy then provide policies, guidelines, and resources to influence perceptions, motivations, build skills and social environments that influence positive behaviour (Food and Nutrition Council of Zimbabwe, 2018).

5.4 Conclusion

Care Groups in Chiredzi facilitated stunting reduction in children under five through giving knowledge and behaviour change in terms of WASH especially use of safe drinking water. The environment and the fact that the study was done in the lean season affected IYCF practices which showed the need to encourage drought resistant crops in the area and to also encourage food preservation so that dietary diversity is attained all year. Multi sectoral involvement through the life of a program should also be encouraged for sustainability purpose, post program implementation. The Care Group model has proven that it does greatly curb malnutrition particularly stunting in children under 5 in Chiredzi District.

5.5 Recommendations

The following recommendations were advanced by research participants and an analysis of empirical data gathered in the study. The recommendations have been clustered into recommendations to NAZ, and recommendations to MoHCC.

5.5.1 Recommendations to NAZ

- Behaviour change is a process that takes time, and capacity building on counselling and negotiation skills cannot be overemphasised. The emphasis on behaviour change remains key throughout the Care Group training curricular, with use of behaviour change concepts informing Care Group session delivery.
- Strong collaboration with MOHCC (Nutritionist and EHTs) from the onset of the Care Group Model, and throughout implementation was critical.

- Effective utilization of locally available resources can enhance the realization of promoted behaviours. Pregnant, lactating mothers and caregivers of children under 2 years should be sensitized on Indigenous and locally available foods to enhance their food and nutrition status. Recipes formulated during cooking demonstrations should be documented for future referencing.

5.5.2 Recommendations to MoHCC

- Financing for the Care Group Model is from international development agencies like UNICEF. There is need for the Government of Zimbabwe (GoZ) to direct more funding towards this robust community-based intervention. Financial resources will amplify the effectiveness and impact of the Care Group Model.
- There is need for continued capacitation of governance structures through provision of monitoring and support visit resources.
- The nutrition governance structures (WFNSC) would have to take an active role in ensuring smooth reporting is conducted. There would also be a need for the VHWs to coordinate with the nearby HF to ensure that the statistics are included in the normal health reporting system.

References

African Development Bank Group. (2021). *The banking on nutrition partnership progress report 2015 - 2020.* Cairo: African Development Bank Group.

Akombi, B. J., Agho, K. E., Hall J, J., Merom, D., Astell-Burt, T., & Renzaho, A. M. (2017). Stunting and severe stunting among children under-5 years in Nigeria: a multilevel analysis. *BMC Pediatrics, 17*(1), 15. doi:https://doi.org/10.1186/s12887-016-0770-z

Anin, K. S., Saaka, M., Fischer, F., & Kraemer, A. (2020). Association between nfant and young child feeding indicators and nutritional status of chiledren (6 - 23 months) in northern Ghana. *Nutrients, 12*(9), 2-19. doi:https://doi.org/10.3390/nu12092565

Bhutta, Z. A., Das, J. K., Rizvi, A., F, G. M., Horton, S., Webb, p., & Black, R. E. (2013). Evidence-based interventions for improvement of maternal and child nutrition: what can be done and at what cost? *The Lancet, 9890*, 452-477. doi:https://doi.org/10.1016/S0140-6736(13)60996-4

Black, R. E., Allen, L. H., Bhutta, Z. A., Caulfield, L. E., Onis, d. O., Ezzati, M., . . . Rivera, J. (2008). Maternal and child undernutrition: global and regional exposures and health consequences. *The Lancet, 371*(9608), 243-260. doi:https://doi.org/10.1016/S0140-6736(07)61690-0

Black, R. E., Victora, C. G., Walker, S. P., Bhutta, Z. A., Christian, P., de Onis, M., . . . Group, M. a. (2013). Maternal and child undernutrition and overweight in low-income and middle-income countries. *The Lancet, 382*(9890), 427-451. doi:https://doi.org/10.1016/S0140-6736(13)60937-X

Brown, R. (2019). *Multi-sectoral nutrition programming: a review of current literature and evidence.* Harare: Emergency Nutrition Network.

Bwakura-Dangarembizi, M., Dumbura, C., Amadi, B., Ngosa, D., Majo, F. D., Nathoo, K. J., . . . team, t. H.-S. (2021). Risk factors for postdischarge mortality following hospitalization for severe acute malnutrition in Zimbabwe and Zambia. *The American Journal of Clinical Nutrition, 113*(3), 665-674. doi:https://doi.org/10.1093/ajcn/nqaa346

Creswell, J. W. (2013). *Qualitative inquiry and research design: choosing among five approaches.* London: Sage Publications.

Dangour, A. D., Kennedy, E., & Taylor, A. (2013). Commentary: the changing focus for improving. *Food and Nutrition Bulletin, 34*(2), 194-198. doi:https://doi.org/10.1177/156482651303400208

Debela, B. L., Gehrke, E., & Qaim, M. (2021). Links between maternal employment and child nutrition in rural Tanzania. *American Journal of Agricultural Economics, 103*(3), 812-830. doi:https://doi.org/10.1111/ajae.12113

Ekholuentetale, M., Barrow, A., Ekholuenetale, C. E., & Tudeme, G. (2020). Impact of stunting on early childhood cognitive development in Benin: evidence of a demographic and Health Survey. *Egyptian paediatric association gazette*, https://epag.springeropen.com/articles/10.1186/s43054-020-00043-x#citeas.

Food and Nutrition Council. (2014). *Baseline survey report for the multi-sectoral community-baased model for stunting reduction.* Harare: Food and Nutrition Council.

Food and Nutrition Council. (2017). *Drivers of stunting assessment Chiredzi district.* Harare: Food and Nutrition Council.

Food and Nutrition Council. (2018). *Zimbabwe National Nutrition Survey 2018.* Harare: Food and Nutrition Council.

Food and Nutrition Council. (2019). *Zimbabwe vulneraility assessment committee.* Harare: Food and Nutrition Council.

Food Security and Nutrition Network Social and Behavioral Change Task Force. (2014). *Care groups: a training manual for program design and implementation.* Washington, DC: Technical and Operational Performance Support Program.

Grantham-McGregor, S., Fernald, L. C., Kagawa, R. M., & Walker, S. (2014). Effects of integrated child development and nutrition interventions on child development and nutritional status. *Annals of the New York Academy of Sciences, 1308*(1), 11-32. doi:https://doi.org/10.1111/nyas.12284

Hennink, M., I, H., & A, B. (2011). *Qualitative research methods.* London: Sage Publications.

Kalu, R. E., & Etim, K. D. (2017). Factors associated with malnutrition among under five children in developing countries: a review. *Global Journal of Pure and Applied Sciences, 24*(1), 69-74. doi:https://dx.doi.org/10.4314/gjpas.v24i1.8

Kouam, E. C., Delisle, H., Ebbing, H. J., Israel, D. A., Salpeteur, C., Aissa, A. M., & Ridde, V. (2014). Perspectives for integration into the local health system of

community-based management of acute malnutrition in children under 5 years: a qualitative study in Bangladesh. *Nutrition Journal, 13*(22), 2-15. doi:https://doi.org/10.1186/1475-2891-13-22

Lee, B. C., Bendixsenc, C. G., Liebman, A. K., & Gallagher, S. (2017). Using the socio-ecological model to frame agricultural safety and health interventions. *Journal of Agromedicine, 22*(4), 298-303. doi:https://doi.org/10.1080/1059924X.2017.1356780

Lelijveld, N., Seal, A., Wells, J. C., Kirkby, J., Opondo, C., Chimwezi, E., . . . Kerac, M. (2016). Chronic disease outcomes after severe acute malnutrition in Malawian children (ChroSAM): a cohort study. *The Lancet, 4*(9), e654-e662. doi:https://doi.org/10.1016/S2214-109X(16)30133-4

Mafa, I. (2014). *Coping with poverty: a study of strategies adopted by single mothers in Chiredzi town, Zimbabwe.* East London: University of Fort Hare.

McNabb, D. E. (2010). *Research methods for political science: quantitative and qualitative approaches.* New York: Sharpe Inc.

National Cancer Institute. (2005). *The theory at a glance: a guide for health promotion practice.* Washington DC: Springer.

Ncube-Murakwani, P. (2021). A qualitative investigation of adolescent participation in Care Groups for improved maternal and child nutrition: experiences from rural Zimbabwe. *Journal of the World Public Health Nutrition Association, 12*(2), 32-47. doi:https://doi.org/10.26596/wn.202112232-47

Ncube-Murakwani, P., Nyathi, C., Dzimba, M., Sijabulisiwe, D., & Moyo, S. (2020). Is participation in care groups associated with enhanced diet quality amongst women and children? experiences from Zimbabwe. *Journal of the World Public Health Nutrition Association, 11*(3), 22-34. doi:https://doi.org/10.26596/wn.202011322-34

Packard, M. (2018). *Report on a review of social and behaviour change methods and approaches withing food for peace development food security activities.* Washington: Food and Nutrition Technical Assistance III Project.

Parkhurst, J., & Ettelt, S. H. (2018). *Evidence use in health policy making: an international public policy.* Cham: The Editors.

Perry, H., Morrow, M., Borger, S., Weiss, J., DeCoster, M., Davis, T., & Ernst, P. (2015). Care groups I: an innovative community-based strategy for improving maternal, neonatal, and child health in resource-constrained settings. *Global Health Science*

and Practice Journal, 3(3), 385-369. doi:https://doi.org/10.9745/GHSP-D-15-00051

Pickering, A. J., Null, C., Winch, P. J., Goldberg, M., Arnold, B. F., Prendergast, A. J., . . . Moulton, L. H. (2019). The WASH benefits and SHINE trial: interpretation of WASH intervention effects on linear growth and diarrhoea. *The Lancet, 7*(8), e1139-e1146. doi:https://doi.org/10.1016/S2214-109X(19)30268-2

Rakatomanana, H., Gates, G. E., Hildebrand, D., & Stoecker, B. J. (2017). Situation and determinants of infant and young child feeding indicators in Madagascer: analysis of the 2009 demographic and health survey. *BMC Public Health, 17*(812), 2-9. doi:https://doi.org/10.1186/s12889-017-4835-1

Roser, M., & Ritchie, H. (2019, November 3). *Hunger and undernourishment.* Retrieved from Our World in Data: https://ourworldindata.org/hunger-and-undernourishment

Rytter, H. J., Kolte, L., Briend, A., Friis, H., & Christensen, B. V. (n.d.). The immune system in children with malnutrition--a systematic review. *PloS One, 9*(8), e105017. doi:https://doi.org/10.1371/journal.pone.0105017

Stover, J., Hardee, K., Ganatra, B., Moreno, C. G., & Horton, S. (2016). *Reproductive, maternal, newborn, and child health: disease control priorities.* Washington DC: The World Bank.

United Nations International Children's Fund, World Health Organization & World Bank Group. (2019). *Levels and trends in child malnutrition.* New York: United Nations International Children's Fund, World Health Organization & World Bank Group.

United Nations Office for the Coordination of Humanitarian Affairs. (2020). *Zimbabwe humanitarian response plan.* Harare: United Nations Office for the Coordination of Humanitarian Affairs.

Varkevisser, C. M., Pathmanathan, I., & Brownlee, A. (2003). *Designing and conducting health systems research project volume 1: proposal development and fieldwork.* Amsterdam: KIT Publishers & International Development Research Centre.

Viceisza, A., Aflagah, K., Abner, J., & Hippolyte, K. (2020). *Poverty and malnutrition in Zimbabwe: findings from Masvingo province.* Washington, DC.: Research Technical Assistance Center.

Webb, P., & Kennedy, E. (2014). Impacts of agriculture on nutrition: nature of the evidence and research gaps. *Food and Nutrition Bulletin, 35*(1), 126-132. doi:https://doi.org/10.1177/156482651403500113

World Health Organization. (2013). *Guideline: updates on the management of severe acute malnutritiion in infants and children.* Geneva: World Health Organization.

World Health Organization. (2015, November 19). *Stunting in a nutshell*. Retrieved from World Health Organization: https://www.who.int/news/item/19-11-2015-stunting-in-a-nutshell

World Health Organization. (2019, February 26). *Appropriate complementary feeding* . Retrieved from World Health Organization: https://www.who.int/elena/titles/complementary_feeding/en/

World Health Organization. (2019, February 11). *Exclusive breastfeeding for optimal growth, development and health of infants*. Retrieved from World Health Organization: https://www.who.int/elena/titles/exclusive_breastfeeding/en/

World Health Organization. (2021). *Nutrition Landscape Information System*. Retrieved from World Health Organization: https://www.who.int/data/nutrition/nlis/info/infant-and-young-child-feeding

Wright, J., Vazé, P., Russell, G., Gundry, S. W., Ferro-Luzzi, A., Mucavele, P., & Nyatsanza, J. (2001). Seasonal aspects of weight-for-age in young children in Zimbabwe. *Public Health Nutrition, 4*(3), 757–764. doi:https://doi.org/10.1079/phn2000100

Zimbabwe National Statistics Agency & United Nations Children's Fund. (2019). *Zimbabwe multiple indicator cluster survey 2019, snapshots of key findings.* Harare: Zimbabwe National Statistics Agency & United Nations Children's Fund.

Zimbabwe National Statistics Agency. (2015). *Zimbabwe demographic and health survey.* Harare: Zimbabwe National Statistics Agency.

Zimbabwe National Statistics Agency and UNICEF. (2019). *Multiple indicator cluster survey 2019: findings report.* Harare: Zimbabwe National Statistics Agency & United Nations Children's Fund.

Appendices

Appendix 1 Questionnaire for caregivers of children under five

A: DEMOGRAPHICS

Questionnaire number:			
District name:			
Ward Name :		**Ward Number:**	
Village name:			
Date of Interview (DD/MM/YYYY)			

SECTION A: SOCIO-DEMOGRAPHIC INFORMATION	
Q 1	Gender [ ] Male [ ] Female
Q 2	Age in years [ ]
Q 3	Marital status [ ] Single [ ] Married [ ] Divorced [ ] Separated [ ] Widowed [ ] Other, specify
Q 4	What is your religion? [ ] Apostolic [ ] Orthodox [ ] Pentecostal [ ] Muslim [ ] None [ ] Other, specify
Q 5	What is your highest level of education? [ ] Never attended school [ ] Primary [ ] Secondary [ ] Tertiary
Q 6	How many are you in your household? [ ]<4 [ ] 4-6 [ ] ≥7
Q 7	Do you have chickens at your home? [ ] Yes [ ] No
Q 8	If yes to Q 7, How many do you have? [ ] <5 [ ] 5-10 [ ] >10 [ ] Don't know
Q 9	Do you have goats at your home? [ ] Yes [ ] No
Q 10	If yes to Q 9, How many do you have? [ ] <5 [ ] 5-10 [ ] >10 [ ] Don't know

Q 11	Do you have cattle at your home? [ ] Yes [ ] No
Q 12	If yes to Q 11, How many do you have? [ ] <3 [ ] 3-5 [ ] >5 [ ] Don't know
Q 13	What is your regular source of income at household level? [ ] Salary [ ] Farming [ ] Remittances from family members outside Zimbabwe [ ] Other, specify
SECTION B: STATUS	
Q 14	Did you get enrolled into the Care Group Model? [ ] Yes [ ] No
Q 15	Status [ ] Case [ ] Control
SECTION C: KNOWLEDGE ASSESSMENT	
Q 16	What danger signs show you should take a child to the hospital? [ ] Vomiting [ ] Convulsions [ ] Fever [ ] Poor growth [ ] Loss of appetite
Q 17	What are the recommended infant feeding practices? [ ] Exclusive breast feeding for the first 6 months [ ] Give complementary foods to all children from six months [ ] Continue breast feeding up to 2 years or beyond
Q 18	What are the advantages of giving a child breast milk? [ ] It contains exactly the nutrients the baby needs [ ] It is easily digested and efficiently used by the baby`s body [ ] It protects the baby against infections [ ] It is not costly like commercial infant formula [ ] Helps a mother and baby to bond
Q 19	What are the food groups that are supposed to be in the diet for the diet to be considered to be diverse? [ ] cereals [ ]vegetables [ ] fruits [ ] legumes/meat/fish/eggs [ ] milk/dairy products
SECTION D: ATTITUDES	
Q 20	Exclusive breast feeding is not good as breast milk is not enough for the baby. [ ] Yes [ ] No
Q 21	Malnutrition is caused by bad spirits. [ ] Yes [ ] No
Q 22	Breast feeding for at least two years is not feasible [ ] Yes [ ] No
SECTION E: WASH	
Q 23	What is the **MAIN** source of drinking water for the household **NOW? [ ]** Piped water system/ borehole/ protected spring/protected shallow wells [ ] Unprotected shallow well [ ] River/spring [ ] Earth pan/dam [ ] Earth

	pan/dam with infiltration well [ ] Other, specify ……
Q 24	Do you treat your water for domestic use? [ ] Yes [ ] No
Q 25	If yes to Q 24, how? [ ] Boiling [ ] Chlorine based tablets/chemicals [ ] Other, specify
Q 26	Where do members of your household **Mainly** relieve themselves? [ ] In the bushes, open defecation [ ] Neighbour or shared traditional pit/improved latrine [ ] Own traditional pit/improved latrine [ ] Others Specify
Q 27	Do you have a toilet? [ ] Yes [ ] No
Q 28	If yes to Q 27, Presence of hand washing station? [ ] Yes [ ] No
Q 29	Presence of soap/ash at hand washing station? [ ] Yes [ ] No
Q 30	Presence of soap/ash at hand washing station? [ ] Yes [ ] No
Q 31	Presence of a pot rack? [ ] Yes [ ] No

SECTION F: IYCF (6-23months)				
Q 32	Has (child's name) ever been breastfed? [ ] Yes [ ] No			
Q 33	Are you still breastfeeding *(child's name)*? [ ] Yes [ ] No			
Q 34	Was (name) breastfed yesterday during day and night? [ ] Yes [ ] No			
Q 35	Now I would like to ask you about (other) liquids or food that *(child's name)* may have had **yesterday during the day or at night.** I am interested in whether your child had the item even if it was combined with other foods. Did (child's name) eat:			
		Y	N	DK
A	Cereals and cereal products *(e.g. sadza, porridge made with maize meal, sorghum millet bread*, rice, or other foods/drinks (amahewu) made from grains?			
B	Vitamin A rich vegetables and tubers: Pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside?			

C	White tubers roots and plantains: potatoes, sweet potatoes, white yams, or any other foods made from roots?			
D	Dark green leafy vegetables: including wild ones + locally available vitamin A rich leaves such as traditional vegetables. Ex. Ulude ibhobola, blackjack (ucucuza), sweet potato leaves, rape, etc.			
E	Vitamin A rich fruits: Ripe mangoes, pawpaw, umbumbulu, umwawa, umgwadi, carrots, umkhemeswani or (*insert any other locally available vitamin A-rich fruits)*?			
F	Any other fruits or vegetables?			
G	Organ meat (iron rich):Liver, kidney, heart or other organ meats?			
H	Flesh meats and offals: Any meat, such as goat, chicken, rabbit, beef, pig, lamb, pigeon, duck, or mice?			
I	Eggs?			
J	Fish: Fresh or dried fish?			
K	Pulses/legumes, nuts: Any beans, peas, lentils, or nuts, or foods made from beans (indumba, soya (machunk), mazambani, omaqutha), peas (nsawawa), lentils or nuts (indlubu)?			
L	Milk and milk products: milk from cow or goat?			
M	Oils/fats: Any oil, fats, or butter, or foods made with any of these? Oil seeds e.g. pumpkin seeds, sesame seed, sunflower seeds? Oily fruit e.g. Avocado pear or coconut flesh? Animal fats?			
N	Sweets: Sugar, honey, sweetened soda or sugary foods such as chocolates, sweets			
O	Any other solid or semi-solid food? If yes, what? _____			

P	Insects, other small protein food? E.g amacimbi, izinhlwa, grasshoppers, caterpillars, etc.			
SECTION G: ANTHROPOMETRIC ASSESSMENT (children under five)				
Q 37	How old is (child's name) in months?			
Q 38	Measure the height : ……			
Q 39	Measure MUAC; ……..			

Appendix 2 Questionnaire for caregivers of children under five- Shona

Questionnaire number:			
District name:			
Ward Name :		**Ward Number:**	
Village name:			
Date of Interview (DD/MM/YYYY)			

SECTION A: SOCIO-DEMOGRAPHIC INFORMATION	
Q 1	Gender [ ] Murume [ ] Mukadzi
Q 2	Mune makore mangani ekuzvarwa? [ ]
Q 3	Zvekuroora kanakuroorwa/ Zvekuchata [ ] Hamusati machata/ Kuroora kana kuroorwa [ ] Makachata/ Makaroora kana kuroorwa [ ] Makarambana nemurume kana mudzimai wamakachata naye [ ] Makasiyana nemurume kana mudzimai wenyu [ ] Makafirwa nemumwe wenyu [ ] Pane zvimwe here zvamunogona kududzira mayererano nekuroora kana kuroorwa kwenyu/ Kuchata?
Q 4	Munonamata kukereke ipi? [ ] Mapostori [ ] Orthodox [ ] Pentecostal [ ] Muslim [ ] Hamunamati [ ] Kana pasina panedzandabvuna, ndeipi church yamunopinda?
Q 5	Makadzidza kusvika papi? [ ] Hamuna kumboenda kuchikoro

	[ ] Primary [ ] Secondary [ ] Tertiary
Q 6	Munogara muri vangani pamba pano? [ ]<4 [ ] 4-6 [ ] ≥7
Q 7	Munochengeta Huku pamba penyu here? [ ] Hongu [ ] Kwete
Q 8	Kana vadaira kuti hongu pana Q7, Munochengeta huku dzakawanda sei? [ ] <5 [ ] 5-10 [ ] >10 [ ] Handizive
Q 9	Munochengeta Mbudzi pamba penyu here? [ ] Hongu [ ] Kwete
Q 10	Kana vadaira kuti hongu pana Q9, Munochengeta Mbudzi dzakawanda sei? [ ] <5 [ ] 5-10 [ ] >10 [ ] Handizive
Q 11	Munochengeta Mombe pamba penyu here? [ ] Hongu [ ] Kwete
Q 12	Kana vadaira kuti hongu pana Q11, Munochngeta Mombe dzakawanda sei? [ ] <5 [ ] 5-10 [ ] >10 [ ] Handizive
Q 13	Munowanza kuwana mari yekushandisa pamba penyu kubva kupi? [ ] Pamuhoro wenyu wekubasa kwamunoenda [ ] kubva mukurima [ ] mari inotumidzirwa nehama kana ne shamwari kubva kunze kwenyika [ ] Dzimwe nzira dzamunowana nadzo mari dzisina kutaurwa dzingave dzipi
SECTION B: STATUS	
Q 14	Makapinda here muchirongwa chema Care Groups emuno munharaunda yenyu? [ ] Hongu [ ] Kwete
Q 15	Zvakamira sei? [ ] Case [ ] Control
SECTION C: KNOWLEDGE ASSESSMENT/ Kunongorora ruzivo	
Q 16	Ndezvipi zvinoratidzika pamwana zvinoita kuti mukaona munobva maenda naye kuchipatara? [ ] Kurutsa [ ] Kugwinha [ ] Kupisa muviri [ ] Kusakura zvakanaka [ ] Kusadya zvakanaka / Kusanzwa kuda kudya
Q 17	Ndezvipi zvinokurudzirwa patsika dzekupa vana chikafu?

	[ ] Kunyamwisa mwana mukaka chete pamwedzi nhanhatu dzekutanga kuberekwa [ ] Kupa mwana chikafu pamusoro pekuyamwisa chinozadzisa kudya kwanaka [ ] Kuramba muchiyamwisa mwana kusvikira makore maviri kana kupfuura
Q 18	Kuyamwisa mwana mukaka waamai kwakakosherei? [ ] Mukaka waamai une zvinovaka muviri zvakafanira [ ] Unokasika kugayiwa mudumbu [ ] Unobetsera kuchengetedza mwana kubva kuzvirwere zvakasiyana siyana [ ] Hautengeswe sezvinoitwa mukaka wemu gaba [ ] Unobetsera mai nemwana kuti vavake hukama
Q 19	Ndeapi mapoka echikafu anofanirwa kunge arimuchikafu anoita kuti titi chikafi chakanaka uye mune zvakasiyana-siyana? [ ] zviyo,mapfunde kana chibage [ ]muriwo [ ] muchero [ ] lnyemba kana bhinzi/nyama/hove/mazai [ ] mukaka kana chikafu chinogadzirwa nemukaka
SECTION D: ATTITUDES	
Q 20	Ichokwadi here kuti kuyamwisa mwana mukaka waamai chete kwakaipa sezvo mukaka waamai usina zvakakwana zvinovaka muviri? [ ] Hongu [ ] Kwete
Q 21	Ichokwadi here kuti kushaya zvokudya zvinovaka muviri zvinokonzerwa nemweya yakashata? [ ] Hongu [ ] Kwete
Q 22	Kuyamwisa mwana kusvika makore maviri zvinogoneka here? [ ] Hongu [ ] Kwete
SECTION E: WASH	
Q 23	Munowanepi mvura yamunonyanya kushandisa pano pamba parizvino?

	[ ] chitubu chakachengetedzeka/mugodhi wakavharwa zvakanaka [ ] mugodhi usina kuvharwa zvakanaka [ ] murwizi/chitubu [ ] Paivhu rekufukura/ mudhamhu [ ] Ivhu rekufukura/ mudhamu musinga chenese mvura zvakanaka [ ] Zvimwewo, tsanagurai ……
Q 24	Munemagadziriro amunoita mvura yenyu yamunoshandisa pano pamba here? [ ] Hongu [ ] Kwete
Q 25	Kana vati Hongu pana Q24, Munogadzira mvura yenyu sei? [ ] Kuifashaira [ ] Kuiisa mapiritsi ekuchenesa mvura here kana mushonga [ ] Imwewo nzira
Q 26	Vanhu vanogara pamba pano kusanganisira nemi kana vachida kuzvibatsira, vanowanzo shandisa nzira ipi? [ ] Vanoenda musango kana chero pakavanzika [ ] vanopinda muchimbuzi chegomba chevavakidzani [ ] Mune chimbuzi chenyu chegomba [ ] Pane kumwe here kwavanoenda, kungava kupi?
Q 27	Mune chimbuzi pano here? [ ] Hongu [ ] Kwete
Q 28	Kana vadaira kuti hongu pana Q27, Pane pekugezera mawoko here? [ ] Hongu [ ] Kwete
Q 29	Pekugezera mawoko wabva kuchimbuzi, Pane sipo kana madota here? [ ] Hongu [ ] Kwete
Q 30	Pane panochengeterwa mandiro kana mudziyo padhuze here [ ] Hongu [ ] Kwete
SECTION F: IYCF (6-23months)	
Q 31	(*Zita remwana*) akamboyamwa mukaka waamai / wenyu here? [ ] Hongu [ ] Kwete
Q 32	Muchiri kuyamwisa (*zita remwana*) here? [ ] Hongu [ ] Kwete
Q 33	(*Zita remwana*) akayamwa nezuro masikati nemanheru here?

	[ ] Hongu [ ] Kwete			
Q 34	Ndavekuda kukubvunzai chikafu chakadyiwa na (zita remwana) nezuro masikati nemanheru. Ndinoda kuzivakuti akadya chikafu chakaita sei uye chakasanganiswa nechipi. (*zita remwana*) akadya chikafu here nezuro?			
		Hongu	Kwete	Handizivi
A	Zviyo, mapfunde, sadza, porridge rehupfu kana mapfunde, nezvimwewo zvikafu zvakada kufanana, Zvinwiwa/ mahewu anogadzirwa nezviyo?			
B	Muriwo nezvicherwa zvine Vitamin A rich: Manhanga, makarotsi, squash, or mbambaira dzakaita yero kana orenji mukati?			
C	Chikafu chekuchera/ midzi : mbatatisi, mbambaira, madhumbe, nechimwewo chikafu chakaita semidzi?			
D	Mashizha emuriwo akasvibira: kusanganisira nyevhe, mutsine, moowa, kovho, tsunga, muboora neumwewo muriwo			
E	Muchero une Vitamin A: mango dzakaibva, mabopo, , pawpaw, hacha, matambaneimwewo muchero			
F	Pane umwe muchero kana muriwo here?			
G	Nyama yemukati memombe, mbudzi kana huku?			
H	Chero nyama yakaita seyembudzi, huku, tsuro, nguruve, hwai, dhadha kana mbeva?			
I	Mazai?			
J	Hove: Dzakaomeswa nedzisina kuomeswa?			

K	Bhinzi, nyimo, nyemba, nzungu, chikafu chakagzdirwa nebhinzi (soya (machunk), pizi, shuga bhinzi, nezvimwewo zvakada kuita seizvi			
L	Mukaka nechikafu chinogadzirwa nemukaka: mukaka wemombe here kana kuti wembudzi?			
M	Mafuta: chero mafuta, magarini, or kana chikafu chinogadzirwa nemafuta? Mafuta emumhodzi dzakaita sedzemanhanga, sesame, sunflower? Muchero unemafuta wakaita seavhokadho, coconut? Kana mafuta epanyama?			
N	Chikafu chakawanda shuga			
O	Pane chimwe chikafu here Kana chiripo ndechipi? _____			
P	Ishwa, hwiza, madora nezvimwewo zvakafanana naizvozvi			
SECTION G: ANTHROPOMETRIC ASSESSMENT (vana varipasi pemakore mashanu)				
Q 36	(*zita remwana*) ave nemwedzi mingani azvarwa?			
Q 37	Yera hurefu hwemwana …….			
Q 38	Yera MUAC yemwana ……..			

Appendix 3 Interview guide for the focus group discussions

1. How is the Care Group Model working here?

2. What do you see as your main achievements and successes?

3. What have been/are your main challenges?

4. How to you determine food and nutrition security priorities when finances are constrained?

5. How have different sectors and partners made their programmes more nutrition-sensitive?

6. What behaviour changes have you observed since the start of the Care Group Model?

Appendix 4 Interview guide for the focus group discussions - Shona

1. Zveboka re Care Group, zvirikushanda here?
2. Ndezvii zvamakabudirira nazvo kana kugona kuburikidza ne Care Group renyu?
3. Ndezvipi zvainyanya kunetsa kuti boka renu risaende kumberi?
4. Kana mari yenyu iri shoma, munoronga sei mashandisirwo emari yenyu?
5. Vashandi vehurumende nevamwewo vanouya ezvirongwa zvakasiyana siyana, vanotaura nezve chikafu chakanaka chinovaka muviri here muhurongwa hwavo?
6. Ndezvii zvinhu kana hunhu hwamunoona sehwachinja nekuda kwe Care Group?

Appendix 5 Key Informant Interview

A: DEMOGRAPHICS

Questionnaire number:			
District name:			
Ward Name :		**Ward Number:**	
Village name:		**Date of Interview**	**DD/MM/YYYY**
DEMOGRAPHIC INFORMATION			
	Gender of Respondent 1 = Male 2 = Female		
	Organisation ……		
	Designation …….		
	Highest educational qualification of the household head 1 = Never went to school, 2 = Primary School, 3 = Secondary School, 4 = Vocational Training, 5 = Tertiary Education		

B: EFFECTIVENESS OF CARE GROUPS IMPROVING KEY WATER AND SANITATION (WASH) BEHAVIOURS

B1	Have WASH practices improved in the past 2 years	Yes	No
B2	**If yes** What activities have contributed to the improvement …… …… ……		
B3	Have Care Groups helped improve WASH practices	Yes	No
B4	If Yes how have they improved WASH practices …… …… ……		
B5	Which key WASH Practices have improved? …… …… …….		

C: EFFECTIVENESS OF CARE GROUPS IMPROVING KEY CHILD HEALTH BEHAVIOURS

C1	Have Child health practices improved in the past 2 years	Yes	No
C2	**If yes** What activities have contributed to the improvement …… …… ……		
C3	Have Care Groups helped improve Child Health	Yes	No
C4	If Yes how have they improved Child Health …… …… ……		
C5	Which key Child health improvements have been realised? …… …… ……		

D: EFFECTIVENESS OF CARE GROUPS IN IMPROVING INFANT AND YOUNG CHILD FEEDING (IYCF) OUTCOMES IN COMMUNITIES

D1	Have IYCF practices improved in the past 2 years	Yes	No
D2	**If yes** What activities or interventions have contributed to the improvement? …… …… ……		
D3	Have Care Groups helped improve IYCF practices	Yes	No
D4	If Yes how have they improved IYCF practices …… …… ……		
D5	Which key IYCF Practices have improved …… …… ……..		

E. KEY STRATEGIES AND FACTORS THAT CONTRIBUTED TO WHAT WORKED OR DID NOT WORK

E1	In your option have Care Groups been successful	Yes	No
E2	If yes - What factors have contributed to success of the Care Groups …… …… ……		

E3	What did not work …… …… ……
E4	Any other comments …… ……

Appendix 6 Consent form

STUDY TITLE: THE EFFECT OF THE CARE GROUP MODEL ON THE NUTRITIONAL STATUS OF CHILDREN UNDER THE AGE OF 5 YEARS IN CHIREDZI DISTRICT.

My name is Edlane Mhariwa. I am a Public Health officer attached to Nutrition Action Zimbabwe. I am researching to determine the effect of the Care Group Model on the nutritional status of children under 5. I am kindly asking you to participate in this study by responding to my questionnaire.

Purpose of the study:

The purpose of the study is to identify the barriers and enhancers of adoption of appropriate Infant and young child feeding practices, to determine if Care Groups improve child health and IYCF outcomes in communities as well as to determine the knowledge levels of the mother/caregivers of under-five children on nutrition, infant and young child feeding.

This will enable MOHCC and NAZ to factor in lessons and provide a basis for modification and enhanced decision making on the delivery and design of the programme. It will further help the MOHCC nutrition department to gain insights and recommendations that will support the expansion of this approach to other districts in the country.

Procedures and duration

The eligible participants for this study are caregivers of children under five and Care Group implementers involved in the Care Group Model in Chiredzi rural. You have been randomly selected as a possible participant because you meet the stated selection criteria. If you decide to participate, you will be asked to undergo a face-to-face interview while completing this questionnaire. Anthropometric measurements i.e. height and MUAC will be measured for children under five. The interview will take about 30 minutes.

Risks and discomforts

We anticipate no harm/risk/discomfort to occur during the discussion. Privacy and confidentiality will be observed and protected. The interview will take place in private. If risks do appear, interviews will be foregone and rescheduled.

Benefits

There are no costs or direct benefits to you for participating in this study. You are free to ask for further clarification as need be.

Confidentiality

If you participate in the study, you will be assigned a participant identity to be used on the questionnaire as no personal details will appear on the questionnaire. Any information that is obtained in connection with this study that can be identified with you will remain confidential and will be disclosed only with your permission. All study records will be kept in secure, separate from any information that identifies you personally like this consent form. Your name will not be used in any reports or publications that may arise from this study. Under some circumstances, the University or Medical Research Council of Zimbabwe may need to review records for compliance audits only.

Voluntary participation

Participation in this study is voluntary. If you decide not to participate in this study, your decision will not affect your future relationship with MOHCC or NAZ. If you chose to participate, you are free to withdraw your consent and to discontinue participation without penalty at any time.

Questions

Before you sign this form, please ask any questions on any aspect of this study that is unclear to you.

Authorisation

If you have decided to participate in this study, please sign this form in the space provide below as an indication that you have read and understood the information provided above and have agreed to participate.

---------- ----------

Name of Research Participant (please print) Date

Signature of Research Participant or legally authorised representative

If you have any questions concerning this study or consent form beyond those answered by the researcher including questions about the research, your rights as a research participant, or if you feel that you have been treated unfairly and would like to talk to someone other than the researcher, please feel free to contact the Africa University Research Ethics Committee on telephone (020) 60075 or 60026 extension 1156 email aurec@africau.edu

Name of Researcher: EDLANE MHARIWA

Appendix 7 Consent form - Shona

CHINANGWA CHETSVAKURUDZO: THE EFFECT OF THE CARE GROUP MODEL ON THE NUTRITIONAL STATUS OF CHILDREN UNDER THE AGE OF 5 YEARS IN CHIREDZI RURAL.

Makadii? Zita rangu ndinonzi Edlane Mhariwa,uye ndiri Public Health officer ndichidzidzira ndiripaNutrition Action Zimbabwe. Ndirikuita tsvakurudzo yokuona kuti chirongwa chemapoka anamai emaCare Group akabatsira here pahutano hwevana varipasi pemakore mashanu. Ndinokukumbirai kuti mutore chikamu mutsvakiridzo ino nekupindura mibvunzo yangu.

Chinangwa chedzidzo:

Chinangwa chechidzidzo ichi ndechekuona zvipingamupinyi uye zvinosimudzira kutorwa kwemaitiro akakodzera ekudyisa vacheche uye nevadiki, kuona kana mapoka evanochengeta achivandudza hutano hwevana nezvibereko zvemapirwo echikafu nemachengeteri evacheche nevadiki munharaunda pamwe ne kuona huwandu hweruzivo rwaamai/vachengeti vevana vari pasi pemakore mashanu pamsoro pezvekudya kunovaka muviri wevacheche nevana vadiki.

Izvi zvinogonesa MOHCC neNAZ kuti vatarise muzvidzidzo uye nekupa hwaro hwekugadzirisa uye nekusimudzira kuita sarudzo ye dhizaini yechirongwa. Zvichabatsira zvakare bazi reMOHCC rinoona nezvekudya kuti riwane ruzivo nezvisungo zvinotsigira kuwedzera kwenzira iyi kune mamwe matunhu munyika.

Maitiro uye nguva

Vanokodzera kupinda muongororo iyi vachengeti vevana vari pasi pemakore mashanu nevatevedzeri veboka revanochengeta vanopinda muchirongwa cheboka reCare Group mudunhu reChiredzi. Imi masarudzwa zvisina tsarukano semunhu anogona kuva mutsvakurudzo ino nekuti munozadzisa zvinodiwa pavanhu vakasarudzwa. Kana mukabvuma kutora chikamu, muchakumbirwa kubvunzurudzwa tiripamwechete ndichizadzikisa gwaro remibvunzo iri. Zviyero zveanthropometric zvinoreva urefu uye MUAC zvichayerwa vana vari pasi pemakore mashanu. Hurukuro ino ichatora anenge maminitsi makumi matatu.

Njodzi uye kusagadzikana

Isu tinotarisira kuti hapana kukuvadzwa / njodzi / kusagadzikana kuchaitika panguva yekukurukurirana. Magwaro uye zvose zvichabva patsvakurudzo iyi zvichachengetedzwa pasina umwe ungazviona kana kushandisa. Hurukuro ichaitika pachivande. Kana njodzi dzikaonekwa, kubvunzurudza kuchafanoregerwa, kugorongwazve nerimwe zuva.

Benefits

Hapana mari kana mabhenefiti akananga kwauri kutora chikamu muchidzidzo ichi. Wakasununguka kukumbira kumwe kujekeswa sezvinodiwa.

Kuvanzika

Kana ukapinda muchidzidzo ichi, uchapihwa nhamba ichashandiswa pagwaro remibvunzo sezvo pasina humbowo hwezita huchabuda pagwaro remibvunzo. Ruzivo rwupi zvarwo ruchawanikwa maererano nechidzidzo chino rwunogona kuzivikanwa kwauri rucharamba rwakavandika uye ruchaburitswa pachena chete nemvumo yako. Marekodhi ese ezvidzidzo achachengetwa akachengetedzeka, akaparadzana kubva kune chero ruzivo rwunokuzivisa iwe sewe senge fomu remvumo iri. Zita rako harizoshandiswa mune chero mishumo kana zvinyorwa zvingangobuda muchidzidzo chino. Mune mamwe mamiriro ezvinhu, University kana Medical Research Council of Zimbabwe ingangofanira kuongorora marekodhi kuti iongororwe chete.

Kuzvipira kuita chimwe chinhu

Sarudzo yako yekupinda muchidzidzo ichi nekuzvidira, kana ukasarudza kusapinda muchidzidzo ichi, haikanganisi hukama hwako neMOHCC kana NAZ. Kana ukasarudza

kutora chikamu, wakasununguka kubvisa mvumo yako uye kurega kutora chikamu pasina mutongo chero nguva.

Mibvunzo

Musati masaina fomu iri, munokwanisa kubvunza mibvunzo ine chekuita nechidzidzo chino yamusina kujeka nayo.

Mvumo

Kana mafunga kutora chikamu muchidzidzo ichi, ndokumbira musaine fomu iri munzvimbo yakapihwa pazasi sechiratidzo chekuti maverenga nekunzwisisa ruzivo rwapihwa pamusoro uye mabvuma kutora chikamu.

---------- ----------

Zita remunhu arikutora mvumo Date

Signature yemunhu akutora mvumo

Kana uine chero mibvunzo maererano nechidzidzo ichi kana fomu remvumo kupfuura iyo yakapindurwa nemuongorori kusanganisira mibvunzo pamusoro petsvakurudzo, kodzero dzako semutsvakiridzo, kana imi muchinzwa kuti hamuna kubatwa zvakanaka uye muchida kutaura nemumwe munhu asiri muongorori, inzwai makasununguka kutaura neve Africa University Research Ethics Committee parunhare (020) 60075 or 60026 extension 1156 chero email aurec@africau.edu

Zita remunhu arikuita tsvakurudzo: EDLANE MHARIWA

Appendix 10 Letter of permission to conduct study

The District Medical Officer

Chiredzi General Hospital

Chiredzi

25 November 2021

Edlane Mhariwa

Africa University

Mutare

RE: PERMISSION TO CONDUCT RESEARCH: EDLANE MHARIWA

The above matter refers.

Reference is made to your request seeking permission to conduct research on the effect of the care group model on the nutritional status of children under five in Chiredzi Rural.

In view of the above permission is hereby granted.

Please note that you should share your final research results with the District Health Executive.

Dr. Brian Tendai Dhlandhlara

District Medical Officer – Chiredzi District

MIN. OF HEALTH & CHILD CARE
CHIREDZI DISTRICT
DISTRICT MEDICAL OFFICER
25 NOV 2021
P.O. BOX 142, CHIREDZI
ZIMBABWE TEL: 0231-2421