IMPACT OF SCHOOL FEEDING PROGRAMME ON CHILDREN'S ANTHROPOMETRY AND LEARNING OUTCOME IN CHIKWAWA DISTRICT-MALAWI

BY

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A Dissertation submitted to the University of Zambia in partial fulfillment of the requirements for the award of the degree of Master of Education in Early Childhood Development, Care and Education.

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DECLARATION

I, **Kondwani Chavula,** do hereby declare that this is my own work which has never been previously submitted for degree at this university or any other universities. However, all the work of other persons has been properly acknowledged

Signature (Candidate) …… Date ……

CERTIFICATE OF APPROVAL

This thesis by Kondwani Chavula is approved as a fulfilment of the requirements for the award of the Master Degree of Education in Early Childhood Development of the University of Zambia.

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ABSTRACT

In order to improve school enrolment in Malawi, the government is implementing a School Feeding Programme (SFP) in public schools in Chikwawa, one of the worst hit Tropical Cyclone Freddy and Elnino towns in Malawi where thousands of people died and millions were displaced without food to eat. Despite well implemented School Feeding Programme, there remains a need to comprehensively assess the impact of the SFP on the anthropometry and learning outcome. Therefore, the study aimed at assessing the effects of the School Feeding Programme on school children's nutritional status and learning outcomes. A Cross-sectional Quasi-experimental research design where one group of children who are beneficiaries of school meals in schools implementing SFP and another group of children in non-SFP was studied in Chikwawa District, Malawi. Two hundred and eight thousand (208) school learners who had been in the programme for 6 months or more were administered with child assessments using Zambian Child Assessment Tool (ZamCAT). Data variables were coded and entered on Statistical Package for Social Sciences (SPSS version 20), WHO anthro and STATA version 17. Data was analysed to generate descriptive statistics. Inferential statistics were also analysed using t-test and linear regression to determine significant differences and relationship between SFP and non-SFP schools. The results revealed significant relationships between anthropometry and learning outcome. At alpha 0.05, a strong positive relationship was found between MUAC and letter naming scores (R=0.046). The study also found that relationship existed between height for age and letter naming scores (R=0.037). Therefore, policies on SFP in early education and or primary education should be promoted to ensure that children attain normal nutrition status and develop optimally and holistically as they pursue their education. Future research should also be done on a large scale longitudinally to further evaluate the effect of SFP on school trajectories and the modification effect of socio-economic status.

Keywords: *Cognitive skills, Education, Malawi, Nutrition, School Feeding*

DEDICATION

This work is dedicated to my parents, late Mr. Austin Chavula and Mrs. Agness Chavula; your advice, instructions and motivation continues guiding me throughout my life, To my My wife Olive Chavula; you cooperatively encouraged and supported me throughout the studies, I am what I am today because of your support. Lastly, to my beloved children Xi Sangwani and Salma; Thanks for enduring my absence the study period.

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ABBREVIATIONS

CBCC	Community Based Child Care Centres
CK	Chikwawa
CSB	Corn Soy Blend
HH	Household Head
ECE	Early Childhood Education
MICS	Multiple Indicator Cluster Survey
MOH	Ministry of Health
MW	Malawi
MUAC	Mid Upper Arm Circumference
NSO	National Statistics Office
SFP	School Feeding Programme
SPSS	Statistical Package for Social Scientist
UNICEF	United Nations Children Fund
WHO	World Health Organization
WFP	World Food Programme
ZamCAT	Zambia Child Assessment Tool

CHAPTER ONE: INTRODUCTION

1.0 Overview

Anthropometry in nutrition refers to non-invasive measurements of the human body size, proportion and distribution of fats. It is used to determine nutrition status of an individual through measurements of height, weight and body circumferences. It assesses adequacy of individual nutrition status in clinical settings, schools where school feeding programmes are implemented and in sports to assess if there is any improvement or not (National Multi-Sectoral Nutrition Policy, 2018). In anthropometry, z-score charts are used to find stunting (height for age), wasting (weight for height) including underweight (weight for age) (Tosi, 2020).

Adequate nutrition is critical for physical and intellectual development of an individual and is a major determinant of one's intellectual performance, academic and professional achievement and overall work performance at a later stage (National Multi-Sectoral Nutrition Policy, 2018). When children are exposed to adequate nutrition, their brain development is enhanced, resulting into increased intelligent quotient levels. Children who have been exposed to adequate nutrition also have higher chances of attaining higher education and be productive at work (WHO, 2022). The body needs different nutrients (macro and micro) for normal functioning, growth and development. Each nutrient is important and should be taken in adequate quantities to ensure normal body functions and growth. When any of the nutrients is lacking, the body develops malnutrition. The resilience to fight infections dwindles and children have less energy to move about and play resulting in little brain stimulation and development hence poor school performance (Fadilah & Faizah, 2022).

Globally, malnutrition contributes to about half of all deaths of children under five years old in third world countries (Djoumessi, 2022). Aside from contributing significantly to child mortality, it also causes maternal deaths, decreases resistance to infectious diseases and prolongs episodes of illnesses. It impedes growth and cognitive development, threatens resilience in times of emergencies, and negatively impacts countries human capital and economic growth of countries (Millward, 2017). In Malawi, under-nutrition and illiteracy trends have reduced as a result of the enabling environment. The progress registered in the prevention, treatment, care and support for malnutrition in the country has seen a slight reduction in nutrition status marked by a reduction of stunting rate and wasting from 37% in 2015/16 to 35.5% in 2020 and 3% in 2015/16 to 2.6% in 2020 respectively (Malawi Multiple Cluster Indicator Survey, 2020). This is in tandem with the current improving education

outcomes in the country. Currently, 59% of 3-4 years children are developmentally on track in at least three of the four domains ((physical (89%), socio-emotional (78%), language domains (74%) and numeracy-literacy rate (17%)) (Micronutrient Indicator Cluster Survey, 2020). However, with the culminating malnutrition rates, it is envisaged that numeracy-literacy levels will continue to dwindle in the country. Children will hardly attain good health, neither will they be physically nor cognitively developmentally on track leading to poor health, education and quality of the population for sustainable socio-economic development as depicted by Malawi Growth and Development Strategy III goals (NSO and ICF Macro, 2020).

1.1 School Feeding Programme

School Feeding Programme (SFP) is an intervention commonly used by World Food Programme in Malawi which offers school children free meals to eradicate hunger, enhance enrolment, and reduce absenteeism and overall create demand for education Berejena *etal.*,. Besides that, it also improves childrens anthropometry hence improved child nutrition status and developmental domains (language, cognitive, physical and social and emotional) (Gartner, 2022). However, most schools in developing countries do not have canteens or cafeterias for school children to access food. To make matters worse, the majority of school aged children walk long distances to school without breakfast or lunch hence they fail to concentrate on their lessons leading to poor learning outcome (Olutola and Aguh, 2023). Globally, 66 million school age children attend school hungry and 23 million are in Africa alone (UNICEF, 2021).

Malawi is implementing the School Feeding Programme (SFP) in 329 Community Based Child Care Centres (CBCCs) in Chikwawa District with support from Malawi Red Cross Society (MRCS), Scotland mission, Marys Meal and World Food Programme (WFP). The aim of SFP is to improve school enrolment and retention. The program in Malawi started in 2006 with support from WFP in Chikwawa District. The district has pupil enrolment of 27,786 (Boys-13,337; Girls- 14,449) of which 4,750 children are benefiting from the School Feeding Programme (Chikwawa –District Education Information and Management Systems, 2023).

Studies on School Feeding Programme (SFP) have been done both in developed and developing countries across the world, but little has been gathered to highlight the impact of the programme on the nutrition status correlating with the learning outcomes in children. To make matters worse, since inception of the programme, no study has been done in the district to evaluate the Impact of School Feeding Programme on the nutrition status and consequently

learning outcome in children. Therefore, this study seeks to assess nutrition status and children learning outcome in schools participating in SFP and schools not participating in the SFP.

1.2 Statement of the Problem and justification

The promotion of School Feeding Programme has increasingly become a strategy adopted by International Organizations and Governments to address food insecurity (improved nutrition and health) and illiteracy (improved education outcome) which is aligned to Sustainable Development Goals (**No poverty, Zero hunger, Good health and well-being** and **Quality education**) (Chaves etal., 2023). Pienaar, (2021); Amusa, Bengesai and Khan (2022) conducted anthropometric measurements in early childhood SFP centres to examine the association between child stunting and academic achievement in South Africa. The results found that being short for age (stuntedness) in early childhood had 29% reduction in the odds of grade completion. Amuzu, (2023) study in Ghana on SFP showed that there is causal relationship between school meals and the learner's academic performance. The anthropometric measurements of the learners also showed quite a tremendeous improvement in weight for height, height for age and MUAC measurements. The study further found out that the presence of Ghana School Feeding Programme in basic schools had a positive effect on pupils‟ academic performance. The examination assessment of school going children before and after during the SFP period had shown a tremendous improvement in the results of learners. Similarly, Danquah *et al*. (2019) study on the influence of SFP on nutrition status of school children in Ghana revealed that there was no statistically significant differences in the nutritional status of participants in the SFP and the non-SFP schools. The negative study results were due to undiversified and nutritious.

Malawi is implementing School Feeding Programme in order to improve school enrolment in schools in Chikwawa, one of the Cyclone Freddy worst hit towns. Despite well implemented school feeding programme, there remains a need to comprehensively assess the impact of the nutrition intervention on children anthropometry. Malawi Deputy Minister of Education, Honorable Madalitso Kambauwa Wilima remarks during the meeting in Lilongwe, Malawi, confirmed the gap. Speaking during the education meeting in Lilongwe on 30th April, 2023, Wilima cited that currently, most children are failing badly on numeracy skills which probably might be due to poor nutrition resulting in poor brain development hence calling for better and sustainable ways of improving education systems. If this trend continues Malawi will have high levels of illiteracies with increased economic crisis. There will also be increased disease burden due to poor nutrition requiring more resources to manage the hospitals.

Therefore, the study seeks to assess the impact of school feeding programme on children nutrition status.

1.3 Purpose of the study

The purpose of this study was to assess the impact of the School Feeding Programme on children's anthropometry and Learning outcome.

1.4 Research Objectives

1.4.1 Main Objectives

To assess the impact of School Feeding Programme on Children's anthropometry and Learning outcomes in Schools implementing School Feeding Programme in Chikwawa District in Malawi.

1.4.2 Specific Objectives

1. To assess the impact of SFP on anthropometry of children in SFP and non-SFP Schools in Chikwawa District in Malawi
2. To assess the impact of SFP on learners outcome in SFP and non-SFP schools in Chikwawa District in Malawi
3. To establish the relationship between Children anthropometry and learning out come in SFP and non-SFP schools

1.5 Research Questions

1. What is the impact of SFP on anthropometry of children in SFP & non-SFP schools?
2. What is the impact of SFP on learners outcome in Children's Learning Outcome in SFP & non-SFP schools?
3. Is there any relationship between Children's anthropometry and Learning Outcome?

1.6 Hypothesis

H_1: Children in SFP schools have better anthropometry and Learning Outcome compared to children in non-SFP schools

1.7 Significance of the study

This paper provided an opportunity to assess the impact of the SFP on childrens anthropometry and learning outcome. This will help the government and stakeholders to realize the crucial role, the SFP play on reducing health and education costs in children since it is more effective and less costly than attempting to address the consequences of early adversity later. This study may also help to generate more evidence for further research on the subject. With enough

evidence, the results of this paper may help in providing strategic measures to improve and scale up the feeding programme to benefit a larger target population of school-aged children, preschoolers, and their households in Malawi. The findings may also help to determine the possibility of using school feeding, if well managed and sustained, as a tool for improving nutrition and education indicators in Malawi.

1.8 Limitation

There may be confounders such as age, education level of parents, and occupation of household head among others that would affect the study results. However, during the analysis, any extraneous variables that wanted to affect the study was controlled.

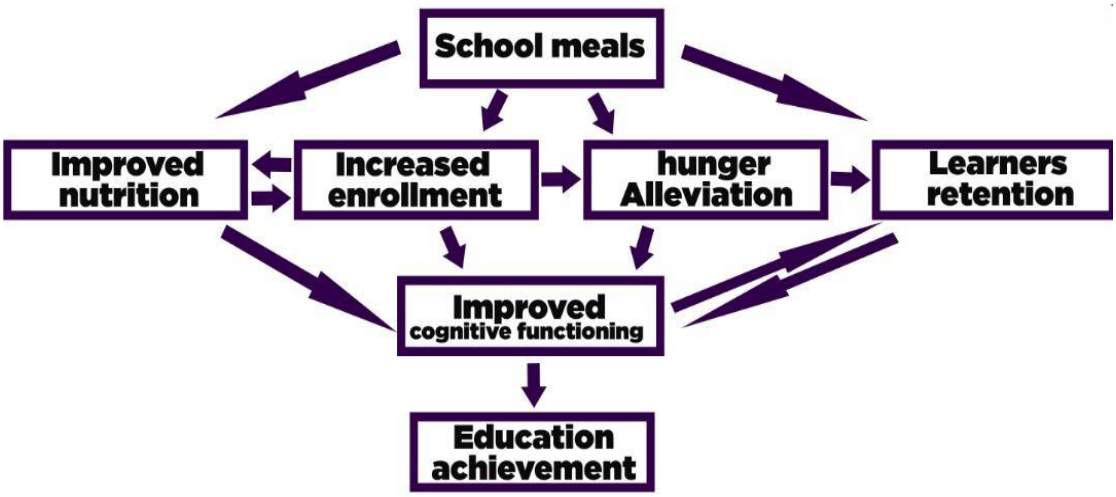
1.9 Delimitations

The study was limited to Chikwawa-District Council which is one of the districts offering SFP programme in ECE centres

1.10 Theoretical frame work

Maslow's Hierarchy of Needs is a motivational theory comprising a five tier pyramid of human needs. As needs are met, individual graduate from the most basic physiological needs to self-actualization. Food is a basic physiological need, and if this need is met through the school feeding programme, it is envisaged that school enrolment, retention and education achievement will improve significantly (Mehta, 2021). Linkages must exist between school meals and education achievement. School meals as a basic physiological need has to be met in order to attain higher education. According to Bekidusa, (2020), when learners feed at school, they get retained and this in return improves school enrolment, school attendance, school drop-outs reduction and absenteeisms hence increased attention leading to better nutrition status and education achievement. This would achieve Sustainable Development Goal 4, which targets quality equitable lifelong learning for all learners (UNICEF, 2019).

1.11 Conceptual frame work



In SFP, school meals causes increased learners enrolment. In addition, they also alleviates hunger leading to both learners retention in school and improved nutrition status hence improved cognitive functioning and overall education achievement.

1.12 Operational definitions

Nutrition is a science of taking in and use of food and other nourishing material by the body.

Anthropometry is the science of measuring human body size, shape and functional capabilities to determine the nutrition status

Cognitive functioning is brain based skills needed in acquisition of knowledge, manipulation of information and reasoning.

Malnutrition is cellular imbalance between the supply of nutrients and energy and the body's demand for growth, maintenance and specific functions.

Undernuutrition refers to deficiency of nutrients in the body

School Feeding is a safety net programme that involves the provision of food to school children.

Learners retention is the extent to which school going pupils remain in school and be able to complete school because of school meals.

Hunger a feeling of discomfort or weakness caused by lack of food, coupled with the desire to eat.

Wet-feeding is when meals are preapared and provided to learners right at school

Take home rations refers to providing food rations to school children to be prepared at home

Education achievement is the education status of a pupil in respect to attainment of knowledge and skills in comparison with others

Mid-Upper Arm Circumference (MUAC) is a colour coded tape for assessing malnutrition.

Nutrition status refers to the evaluation of an individuals health through diet, body weight and biochemical data.

Stunting refers to height for age that is more than 2 standard deviations below the WHO Growth standards median.

Wasting is defined as children with weight for height z score <-2SD and or Mid Upper Arm Circumference <125mm.

CHAPTER TWO: LITERATURE REVIEW

This chapter reviewed the impact of SFP on childrens anthropometry and learning outcomes and relationship between anthropometry and learning outcomes. Among others, it has also highlighted the historical review of SFP in Malawi and world at large including the origin of SFP, trends and its categories.

2.0 An over view of School Feeding Programme

SFP is the provision of meals in schools to learners with the sole purpose of alleviating hunger and retaining them in schools. Providing food to learners for consumption at school is beneficial for learning because it relieves immediate short-term hunger and has led to the improvement of many childrens education outcomes (Amuzu, 2023). Children who are not hungry are more attentive and have higher cognitive abilities. Therefore it is imperative that ration should be served early in school for maximum benefit. Thus, timing of the meal is important for combating hunger and improving cognitive functioning benefits (Gibson-Moore *etal.*, 2023).

2.1 Origin of School Feeding Programme

Historically, SFP originated from United Kingdom (UK) and United States of America (USA) in around 1930s. The problem then was that many children in low socio-economic families often dropped out of school as they could not afford to learn on an empty stomach in class. This affected their progress of the education system forcing the authorities to introduce milk subsidy in school going children in 1934 to help lessen the situation at hand and retain children in school (Kwena, 2020). Ten years down the line, both UK and USA started providing free milk to school going children with an aim of retaining them while also eradicating malnutrition and hunger. Similarly, Africa had a similar situation as most schools especially in developing countries do not have canteens or cafeterias for children to access food and this had a great impact on both childrens anthropometry and learning outcomes (Kwena, 2020).

2.2 Historical Overview of School Feeding Programme in Malawi

SFP in Malawi was introduced in 1999 first piloted by World Food Programme (WFP) and Action Aid. WFP provided most of the support for the School Feeding Programme activities in both numbers of children reached and geographical coverage. Initially, there were few schools enrolled on the programme, however, subsequently a scale up was made to more districts across the country.

Specifically, school meals program in Chikwawa District started in the year 2006 with six schools with support from WFP where learners were given rice and beans as take home ration. A year later, the program expanded to thirteen more schools with a new program known as wet feeding but in centralized model approach where it involved distribution of in-kind food ration to reduce short term hunger and improve attention span in class. In this feeding model, learners were receiving 60 grams of already prepared Corn Soy Blend (CSB) porridge. Today, More than twenty Early Childhood Centres are implementing the programme with support from two more partners and Malawi Red Cross Society (Chikwawa Education Management Information Systems, 2023).

2.3 Categories of School Feeding Programme

SFP occurs in a number of platforms, depending on context and timing. Broadly speaking though, the two major goals of SFP are education and food security (Barnabas *et al*, 2024). The educational goals include increased attendance and enrolment (particularly for girls) and improved concentration during teaching, aided by the food provided. Where as the goals of food security include the reduction of short-term hunger and the improvement of the nutritional status of school children, thereby reducing levels of malnutrition.

Bundy, (2021) had also described SFP in five different types namely; SFP as an emergency intervention strategy to combat food shortages during shocks such as droughts, tropical cyclones or wars. Secondly, the one that deals with developmental intervention to aid recovery and improve livelihoods of vulnerable groups in the community and there is also a programme aimed at improving child cognitive development linked to micro-nutrient supplementation of iodine and iron. Last but one, there is SFP that addresses short and long term food security and finally, SFP as nutrition intervention. Nevertheless, all these types exist in three forms as follows;

2.3.1 Wet feeding

Wet feeding is when meals are preapared at the institution and provided to school learners. In SFP, the programe uses highly nutritious Corn Soy Blend super-cereal (CSB++) flour which is procured to prepare meal porridge for children at school. Children are provided with daily breakfast meal porridge before class and consumption is well monitored. Sometimes, they are also complemented with other interventions such as micro-nutrient supplementation, fortified biscuits or de-worming programmes (Ronoh *etal,* 2024).

2.3.2 Take home ration

Children are given CSB++ flour packets to prepare meals at home. They are given instruction on how to prepare porridge. However, monitoring as to whether the ration is consumed by the beneficiary is a challenge as some parents use the ration as a replacement for feeding at home while in reality it is meant to complement the school child's diet in addition to home feeding. Nevertheless, it must be ensured that the substitution does not take place for it to be successful (Ronoh *etal,* 2024).

2.3.3 Home-Grown School Meals

Home-Grown School Feeding Programme (HGSFP) is a kind of school feeding that provides diversified meals to school children at break-fast before class begin, either in the mid-morning or at lunch in order to retain children in school and reduce school drop-outs. In HGSFP, foods are sourced from local small scale farmers with an aim of linking school feeding to local agricultural production. On one hand, this increases small-scale farmers access to the school feeding market thereby enhancing improved production practices among local farmers.

2.4 Impact of School Feeding Programme on childrens anthropometry

Many outcomes have reportedly improved with SFP including school performance and nutrition variables across the world (WHO, 2020). Nutrition variables ranging from improved dietary intake and anthropometric measurements have impressively changed with school feeding programme with the later having a greater impact on the overall health of school children. History has also indicated that even before the invention of school meals, children were offered a meal in form of a snack with fortified high energy biscuits which are a compact source of nutrients produced off-site that is easy to pack, store and transport. They were also commonly used in emergency situations and however research has shown that these also had a great impact on improving childrens anthropometry (Kwena, 2020).

Studies have shown that schools participating in the SFP have impressive outcomes on nutrition status and overall health of learners (Locke *etal.*, 2024). The researchers have compared the anthropometry of learners who were in schools that are implementing school meals and compared them with the schools that were not implementing school feeding and the results apart from improving pupil retention rate and increased class performance, have shown tremendeous improvement in weight for height and height for age (Amuzu, 2023). Other reported impact included reduced childrens susceptability to infection leading to reduced morbidity rate. This has led to reduced expenditure on the hospial resources that the

governement and development partners are putting on provision of hospital care. Furthermore, school childrens who access school meals, have developmental milestones are on track leading to improved overall health wellbeing.

Hussein *etal,* (2023) in their comparative study done in North East Ethiopia has also revealed that School Feeding Programme has more benefits than just retaining children in school as the currrent SFP objectives entails. The study have found that school feeding improves nutrition status, reduces drop-outs and also improves learners performance among others and that is why a strong recommendation on SFP to be used in all the schools in North East Ethiopia. Similarly, Bekidusa, (2020), concur with Hussein *etal,* (2023) that SFP leads to learners retention however their exposure to better diet has led to better nutrition status. On the other hand, SFP for instance, the Home Grown School Feeding Programme has boosted local farmers production in the food supply chain to ensure that food commodities are readily available for provision school meals at school (Chaves *etal*, 2023).

2.5 Impact of School Feeding Programme on Children Learning Outcome

SFP has siginificant impact on the learners education outcome. Besides eradicating poverty and malnutrition, studies have shown that SFP has led to improved learning outcomes. Studies have shown that most children who are served with school meals, their health improves tremendously. Their height increases and they tend to gain weight because of the high dense nutrients obtained from the meals. Their overall health also improves due to nutrients . Barnabas *etal.*, (2024), in their study found that there is a strong relationship between SFP and education outcomes. The study showed that the underprivileged who come from the low socio-economic profile fail to meet the education needs than those from a well to do background. It increases access to adequate food and they are able to concentrate in school. It is believed that the SFP provides a reasonable accommodation by ensuring that every child has access to food regardless of socio-economic status and this put every child at an opportunity to optimally develop in all the four developmental domains namely; language, physical socio-emotional and cognitive development.

Besides improving anthropometry and overall health of school going children, SFP has also shown increased cognition capacity for learners. Amuzu (2023), in Ghana also found that SFP had significant impact on the learner's academic performance.

The examination assessment of school going children before and after during the SFP period had shown a tremendous improvement in the learners outcome. This study also concurs with

Aotedu, (2020) study in Nigeria who found that SFP increased the enrolment and improved the performance of elementary school pupils in the state. Furthermore, the majority of schools had overcrowding as more children were enrolling because of the meals. Children who have been served school meals, their milestones are improved and they develop good cognitive functioning. This improves overall class performance reducing chances of repeating classes hence reducing the education costs as parents do not spend a lot of money on buying food for their children when they are going to school (Orunbon and Adeleke, 2024). Furthermore, SFP acts as incentives to children in schools not only to retain them in school but also to concentrate in class lessons thereby enabling them to grasp the content.

In addition, the majority of school children walk long distances to school without breakfast or lunch. Some children decide to carry their own food when going to school however, the majority of them do not manage and usually have problems concentrating on lessons as they learn while they are hungry. However, after seeing that the approach was working in UK and USA, African countries also emulated the approach. They first started with giving high energy biscuits to children before class at break-fast or at lunch. Their aim was to alleviate hunger and give energy to the children to kindle more concentration on lessons and perform well in class (Kwena, 2020). Furthermore, school meals also to reduce the risks of under-nutrition in school going children as it is associated with delayed school entry, early school termination, poor school performance and reduced work capacity (Hunter *etal.*, 2017).

Gibson-Moore *etal.*, (2023), also looked into factors beyond achieving education outcome in SFP. The findings of the study concluded that good health is far more economical than under-nutrition as the latter risks children to infection. Children become frequently sick requiring hospital admission putting more strain on the already depleted medical resources and long term costs to the government and the society at large. They also argued that under-nutrition deters societal integration and potential full personal development (Bundy *et al,* 2021). In another study, Ayalew, *etal* (2020) compared the learning outcomes in children with normal nutrition status and children with under nutrition. In their study comparing learning outcomes found that children with normal nutrition status had better school attendance than those with under-nutrition. This showed that better nutrition status is crucial to yield better learning outcomes however someone to achieve them, they need school meals.

In contexts of emergency, economic shock, vulnerability and protracted crisis such as tropical cyclones, school feeding programme has also shown to be the most reliable cushion for hunger

and under-nutrition. Children who are hungry or undernourished are less able to learn regardless of the setting. In addition, it has acted as social safety nets for the vulnerables in the community (Orunbon and Adeleke, 2024). According to Kamnyungu (2019), SFP in Early Childhood Education centres has a potential to provide better anthropometry which when coupled with proper stimulation, can lead to better development and organization of the brain hence good school performance. Therfore, with evidence based data, government agencies and development partners should be encourged to pump more resources in the operation of SFP.

2.6 Relationship between anthropometry and Children Learning Outcome

Historically, SFP has been the most popular platform for addressing hunger and retaining children in school. Apart from the provision of meals to eradicate hunger and retain children in school, SFP has also been ear marked for provision of de-worming tablets to eradicate helminthiasis which depletes body nutrients causing malnutrition leading to low cognitive skills (Hayford, 2021). Studies on cognitive skills positive impact evidence has shown that many school going children in developing countries hardly access diversified food necessary for the provision of macro-nutrients to afford them with adequate learning conditions. Hence, showing poor cognitive skills as a result of failure to maintain alertness, attention and concentration needed for classroom performance (Sharif *etal.*,: Amuzu, 2023). In his study, he however pointed out that SFP is suitable for learners attendance as a motivation for learning but academic performance is a combination factor.

Furthermore, Wall *etal*, (2022) evaluated the impact of SFP on children in United States of America and found that children who attended school feeding programme had lean muscle mass (thin body but strong and healthy) and they also had better reversal learning. There was also a remarkable interaction between anthropometry and cognitive skills of learners. Similarly, Gooderham, (2024) also showed that nutrition status is associated with meta-cognition. Despite, development of cognitive processes is governed by age and nutrition status, children with normal nutrition or improved nutrition status performs well in class than children who are undernourished. This is because undernourishment is linked to both structural and functional pathology of the brain (Walvis and Ball, 2020).

Tete *et al.* (2020), in their study argued that apart from SFP alleviating hunger, the programme also improves nutrition status through providing energy enhancing diet and kilo-calories. Not only did they found that it brings energy gain, but also it enhances education outcomes and equity among primary school going children. Similarly, Leshabana (2022) conducted a study

in South Africa at university of Free state and concluded height for age (stunting), weight for age (underweight), weight for height (wasting) and micro-nutrient deficiency (iodine deficiency) had drastically affected the academic performance of elementary school children. The study confirmed that there was a strong association between academic performance and malnutrition. Likewise, Beckmann *et al*, (2021) in a study conducted in South Africa, established that there is a positive and a strong relationship between under-nutrition and academic performance.

In addition, under-nutrition is also associated with delayed school entry, low completion rates, poor school performance and reduced work capacity (Amoadu *etal.*, 2024). The study further found that in institutions where schools use size/height as a marker for school readiness, many children who were short for their age (stunting) had delayed starting school as most of them were regarded small for school despite their age.

2.7 Summary

In a nutshell, SFP has increasingly become a strategy adopted by International Organizations and Governments to address food insecurity and improve learner's outcomes, hence it is widely implemented across the world. Despite the somewhat mixed research results, the present study demonstrates promising SFP positive impact on the nutrition status and learners outcome of school-aged children. However, most of the reviewed literature which had negative impact shows that studies were conducted on older children which its impact might be jeopardized by age as their brain had already lost the neuroplasticity. According to a series of assembled evidence by Black *et al* (2021), Britto *et al*. (2019) and Amuzu (2023) which shows that the foundations of the brain and mental development occur in the first few years of life failure which after five years, the brain rarely responds to any intervention that addresses the lost milestones. Children below five years of age have increased neuro-growth and increased synaptogenesis.

With the adequate and conducive nutrition factors, the neurons in the brain easily respond to the environment and make up for the lost milestones. Underlining the word "adequate and conducive nutrition factors", Lukanga & Nyanda (2023) in their study evaluating developmental impact of SFP on children in community based early child centres in urban Zambia, revealed a high performance among centre students on receptive language and pencil related fine motor skills. Longitudinal follow up showed a delayed school readiness as 27 % of non-attendees were not yet enrolled in primary school as compared to 11% of attendees of

centres that had all the necessities. Similarly, the SFP achieves limited impacts on anthropometric indicators such as wasting, stunting, under-weight as it comes late in the child physical development. Nutrition deficits that occurred after the first 1000 days have negligible potential for catch up growth hence providing school meals to older school age have little potential to reverse the damage of early nutrition deficits. Bigger impacts could have been achieved if school meals interventions targeted ECE centres where children are younger and their brain is still neuroplastic other than primary or secondary schools (Lukanga and Nyanda, 2023).

CHAPTER THREE: METHODOLOGY

3.0 Overview

A methodology is a strategy or a plan of action which underlines assumptions and decides the kind of methods to be used in a study (Grix *etal.,* 2024). It explains the research design, study location, target population, sampling techniques, sample size, reliability and validity of the data collection instrument including ethical considerations.

3.1 Research Approach

This study adopted quantitative research methods to establish the statistical significance on the impact of School Feeding Programme on nutrition status and learning outcomes. The researcher did this through administering a semistructured questionaire and conducting MUAC, Height and Weight measurements. The valuables were entered on SPSS, stata version 17 and WHO anthro to generate statisitical descriptive analyses to assess the impact of School Feeding Programme on childrens anthropometry and learning outcomes.

3.2 Research design

3.2.1 Quantitative

The study used Cross-sectional Quasi-experimental research design where one group of children who are beneficiaries of school meals in schools implementing School Feeding Programme and another group of children in non-School Feeding Programme was studied. The researcher collected data on children anthropometry and learning outcomes by administering Zambia Child Assessment Tool (ZamCAT) which has learning outcome assessment and nutrition assessment components. The quantitative approach was used to draw statistical perspectives about School Feeding Programme through descriptive and inferential statistical analysis because it emphasizes on the production of precise generalized statistical findings (Staller, 2021)

3.3 Study Period

The study was conducted during the lean period from 27th January, 2024 to 25th February, 2024. The lean period (time of the year when households do not have inadequate or surplus food) was chosen as means of controlling other extraneous factors such as occupation, education level, age and others which might impact the variabilities between subjects and within subjects.

3.4 Study Site

The study was conducted in Chikwawa district in selected Traditional Authorities (TA) where the SFP is implemented. The district was chosen because it is one of the few districts implementing School Feeding Programme and Malawi being one of the countries in Sub-Saharan Africa, has experienced increased frequency, intensity and magnitude of extreme weather events. Since 1980 more than 50 disasters associated with hydrological events including storms, floods, landslides and droughts have been reported year after year caused by Tropical Cyclone ANA, Gombe, Idai and Freddy in 2015, 2019, 2022 and 2023 respectively recently, (Malawi Vulnerability Assessment Committee Survey Report, 2023) hence providing School Feeding meals amidst the shocks helps to control some variabilities in the social economic statuses.

3.5 Pilot Study

The researcher conducted a pre-testing in two Community Based Child Care Centres in Chikwawa District, Malawi to test the degree of consistency of the child assessment tools and the administration of a structured questionnaires. A total of 19 interviews were conducted at Mpokonyola and Chimkole CBCCs in Traditional Authority Katunga in Chikwawa District. The study findings helped to polish the flow of questions, the feasibility of the structured questionaire and also to polish up the study administration approach such as skills on how to take anthropometric measurements (height, weight and MUAC). On the other hand, it also helped to avoid biasness and ensure compatibility of the instruments. However, the study did not use the findings of the pilot study to write this report as the pre-testing was solely meant for checking the suitability and perfection of the data collecting tools.

3.6 Study population

The study comprised pupils/learners aged 4-6, Early Childhood Education instructors (CBCC caregivers) and learners parents. Children with known health problems and those above six years and below 4 years were excluded from the study including those previously attending schools participating in the SFP.

3.7 Sample size

Sampling in mixed methods research refers to the procedures for selecting participants in both quantitative and qualitative research and to the sampling strategies employed within each of the designs (Creswell, 2014). Therefore, this research had quantitative sample size with a random sampling proceeding on quantitative strand. The sample size was derived quantitatively as follows

3.7.1 Quantitative sample size

A sample size of 217 determined by finite population correction factor formula was targeted however 208 participants comprising of 4-6 years old pupils in six ECE schools were enrolled for both participating and non-participating schools. This was because some respondents did not consent to participate in the study, others were absent during the time the study was conducted

The sample size has been determined by finite population correction factor formula (Qian, 2020).

$$n = \frac{z^2 x\ p(q)}{d^2}$$

Where n is the sample size, z is a standard deviation, p is the prevalence of stunting, d is the degree of accuracy and q is 1.0-p (Ryan, 2013). With the current district ECE numeracy-literacy prevalence rate of 17% (Micronutrient Cluster Indicator Survey, 2020), which is the highest among all the indicators, the sample calculation was based on the prevalence rate with confidence level of 95%.

Therefore, sample size $\frac{1.96^2 \text{ X } (0.17)\ (0.83)}{0.05^2} = 217$

3.8 Sampling techniques

3.8.1 Quantitative sampling methodology

Pupils aged 4-6 were selected using a multi-stage stratified sampling method. Considering the list of schools as a population frame. Six ECE schools were selected by stratified sampling method and each three represented schools participating in SFP or non-SFP in their zone. School going children in selected schools were incorporated in the study by using simple random sampling technique after obtaining a sampling frame from the class attendance registers. Out of 217 sample size, 208 learners were available for the study and participated in the study.

3.8.2 Sampling strategy

A multi-stage sampling strategy was employed to select the Zones whereas the CBCCs were selected using simple random sampling.

Stage I: Selection of the Zones

The initial phase involved the identification of School Zones using national gazetted catalogue with a particular focus on School Feeding and non School Feeding Programme.

Stage II: Selection of Traditional Authorities

Random sampling method was employed to determine specific three Traditional Authorities within the selected zones. This was particularly important in guaranteeing that the investigation included Schools that had directly running of School Feeding Programme.

Stage III: Selection of CBCCs

From the three Traditional Authorities that were chosen, six CBCCs (1 SFP CBCC and 1 non-SFP CBCC was selected from each Traditional Authority making a total of two CBCCs per Traditional Authority) were selected using a straightforward random sampling procedure. This method minimizes selection bias and ensures that all eligible CBCCs have an equal opportunity to participate in the study.

Stage IV: Participant Selection

In each school, school children were randomly selected from the school register

3.8.4 Research instruments

The research instrument is defined as a tool used by the researchers to collect, measure, and analyse data related to the study (Gay et al., 2012; Cohen et al., 2018). In this study, the researcher used ZamCAT. ZamCAT is Zambia Child Assessment tool (ZamCAT) which tests a wide range of domain areas -langauge, motor, attention, executive functions, non verbal functions and physical growth. It is used to assess learning outcomes using the object based reasoning assessments and anthropometry. It is also sensitive to the local culture and context, an instrument that is comparable with other international instruments (Matafwali & Serpell, 2014). This study targetted only five tests which were relevant with the topic namely; Tactile pattern completion, Pencil tapping, Peabody picture Vocabulary test, Expressive language, Letter naming and anthropometric measurements.

Pencil tapping is the child assessment that use to assess childs attention and memory. In the pencil tapping task, both the assessor and the child have a pencil and the child is instructed that when the assessor taps her pencil one/two times, the child is to tap his/her pencil two/one time (s). To display memory and attention skills, the child does according to the instructions given. Tactile pattern completion involves exploring patterns and sequence, challenging individuals

to recognise and complete logical progressions. This is crucial for problem solving, critical thinking and understandng complex ideas. Peabody picture vocabulary test is a quick outstanding vocabulary test that measures the listening and understanding of single word vocabulary (Serpell, 2023). Where as letter naming tests the ability of the child to recognise and identify letters by name, shape and sound. Expressive language tests measures the ability to communicate when the assessor read the the stimulus a loud and the child is asked to comprensively answer a question or finish a sentence. This also tests memory and attention including communication. ZamCAT also assesses nutrition status and it uses anthropometry.

Anthropometry refers to measurements of height, weight and circumferences. It is used to ascetain height for age (stunting, weight for height (wasting) and weight for age (underweight). It also assesses body size, proportion and distribution of fats (Tosi, 2020). Anthropometric measurements are used to assess individual nutrition status in clinical settings, schools where school feeding programmes are implemented and in sports to assess if there is any improvement or not (National Multi-Sectoral Nutrition Policy, 2018). However, all tools were conducted by well versed research assistants.

3.9 Data collection procedures

(a) Learning outcomes assessments

The researcher collected data on learning outcomes in both schools implementing School Feeding Programme and non-School Feeding Programme using Zambia Child Assessment Tool (ZamCAT). ZamCAT is modified assessment of the non-verbal reasoning designed contextually appropriate for children in rural Africa. It is an Object Based Pattern Reasoning Assessment (OPRA) which uses local materials such as beads, stones, tooth pick to assess learning outcomes. It also contains anthropometric measurements components. Specifically, for his study, the researcher dwelt much on components such as PEABODY picture vocabulary test, tactile pattern completion, pencil tapping, expressive language and letter naming which measures non-verbal cognition, receptive and expressive language, information processing and executive functioning. Where as for anthropometry, ZamCAT also assessed anthropometric measurements such as weight, height and MUAC for school going children.

(b) Anthropometric measurements

Data was collected using the anthropometric measurements such as Weight, Height and Mid Upper Arm Circumference (MUAC) to ascertain childhood malnutrition (wasting, stunting and

under-weight levels) in school going children both in School Feeding Programme and non-School Feeding Programme schools.

(c) Height measurement

Height was measured to the nearest 0.1 cm using height board by letting the child stand without shoes on a clean height board with the head held against the fixed end of the board compressing the hair and child eyes kept straight up while keeping the back touching the height board. The legs held with the researchers hand while slightly applying pressure on the legs to straighten the knee.

(i) Procedures for measuring Height

For children taller than 87 cm or 2 years old and above but less than 5 years, height was measured with the child standing.

The children stood upright against the middle of the measuring board with head, shoulders, buttocks, knees and heels held against the board by the assistant and they were looking straight ahead (neither up nor down). The moveable headboard was pressed firmly against the head compressing the hair and the height was measured after checking that the headboard level (the reading should be the same on both sides of the measuring board).

(d) Weight measurement

Weight of the child was taken using paediatric electronic scale. The scale was first checked against the standard weight and then set at zero and the child was put on the scale with minimal clothes and weight recorded to the nearest 0.I kg.

(I) Procedures for weighing a child using digital electronic scale

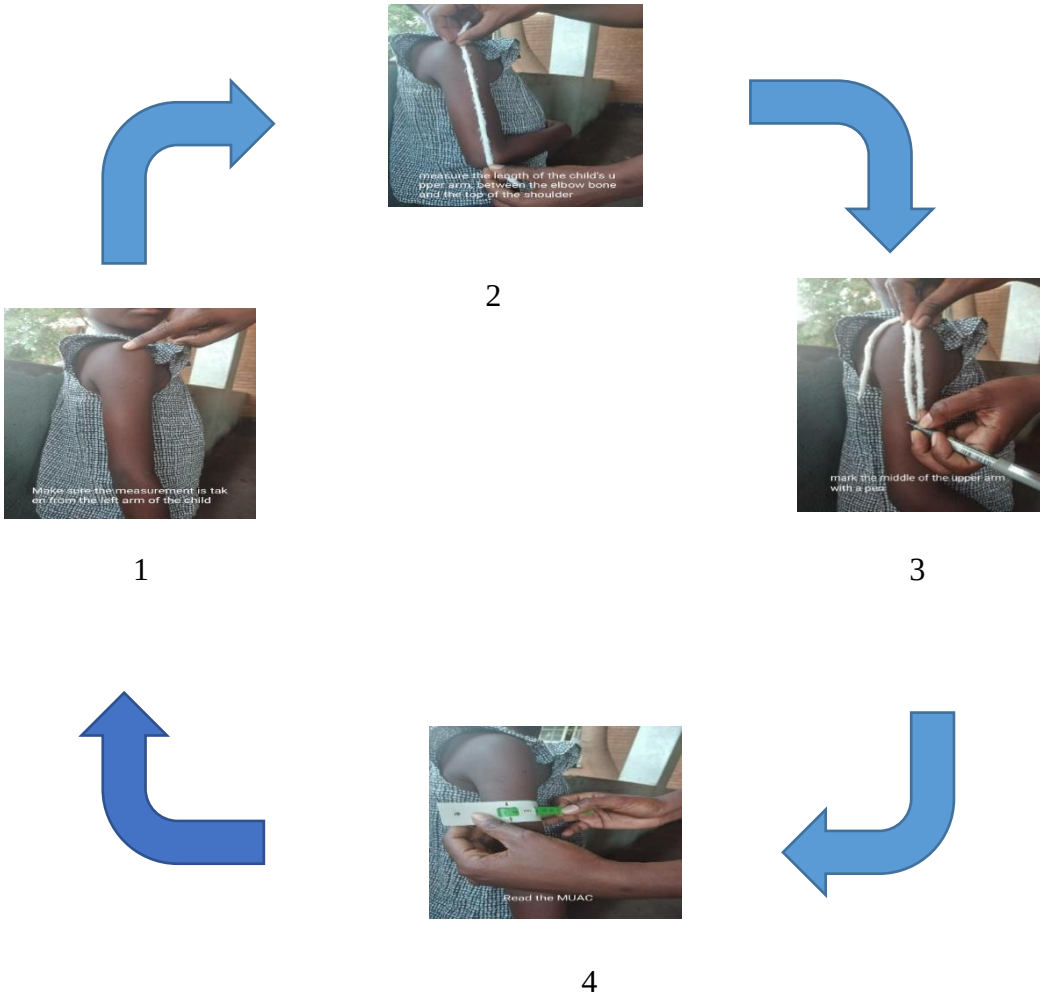
Firstly, the researcher gained the consent (assertion) from the caregiver and explained the procedures to the child. The researcher made sure that the scale is placed on a flat, hard, even surface. The scale was then turned on, zeroed to 0.0 and the researcher asked the child to remove the shoes and gently step on the scale. When the child's weight appeared on the display, the researcher recorded it.

(e) Mid Upper Arm Circumference (MUAC) measurement

MUAC is Mid Upper Arm Circumference. It is a very sensitive assessment used for early detection of acute malnutrition. It is commonly used in so many countries including Sub-Saharan region such Niger, Ethiopia, Mali, Nigeria Kenya and Malawi. The tool has proved to

be very effective in detecting both acute and chronic wasting. However, it is very simple and reliable to use (Shragai *etal*., 2022).

Figure 1: Procedures for taking MUAC



Source: 2022 Malawi Family MUAC guidelines

As per figure 1, Step 1 is for identification of prominent bone process, the acromion process and olecranon. This is followed by measuring the arm length (step 2) to determine the mid point (step 3) where the MUAC tape is placed for measurement (step 4). To ensure precision during data collection, the researcher ensured that the child is not wearing any clothing on his or her left arm and stood straight and sideways to the measurer while bending the child's left arm at 90 degrees to the body. The researcher then located the acromial process on the right shoulder by palpating firmly with the pads of the index and middle finger. While placing and holding the string on the acromial process with left thumb and extending the string down the mid-line of the back of the arm, past the tip of the olecranon process at the elbow.

To identify the mid-point which is between the tip of the shoulder and the elbow, the researcher used the string to measure the length of the upper arm by folding the string in half from the shoulder bone. The researcher further marked the mid-point of the arm with a pen and asked the child to relax the arm so it hangs by his or her side. Otherwise, using both hands, the researcher placed the MUAC tape window on the mid-point. While kept the left hand steady, wrapped the MUAC tape around the outside of the arm with the right hand. The researcher fed the MUAC tape through the hole in the tape while keeping the right hand planted on the arm and pulled the tape until it fits securely around the arm while keeping the right hand steady on the child's arm. The researcher then read and recorded the measurement at the window of the MUAC tape to the nearest 0.1 centimetre (cm).

3.10 Data analysis

Descriptive statistics was used to summarize data which included mean, median and mode for both children in schools implementing School Feeding Programme and those not implementing School Feeding Programme. Because of the nature of data, the researcher analysed data to show data variability using different analysis methods SPSS, WHO anthro and stata. SPSS was used for t-test to generate inferential statistics to determine mean differences for children learning outcome and childrens anthropometric measurements between the children in School Feeding Programme and non-School Feeding Programme schools and compare how demographic variables may affect childrens anthropometry and the learning outcomes for research question number one and two. While regression analysis was applied to answer research question number three and all data was presented in graphs, tables and percentages. WHO anthro statistical package was used to develop z-scores where as stata was used to analyse and produce graphical visualization of data.

(a) Data analysis strategy

This being sequential explanatory research method and both data sets being analysed separately starting with quantitative then qualitative, the researcher used qualitative findings to expand or elaborate quantitative findings. Key themes in each data set was checked for complementarity. Triangulation protocol technique was also used to integrate the findings of quantitative through cross reference with the patterns emerging from the qualitative data (Creswell & Clark, 2014). Data was then presented using graphs and tables to visually represent descriptive statistics for easy understanding and engaging.

3.11 Validity and Reliability of data

Validity refers to the extent to which a research instrument measure what it is supposed to be measured, while reliability is defined as the degree of consistency of the research instrument in measuring whatever it is measuring (Ary, Jacob & Sorensen, 2010). This study used ZamCAT as a tool for data collection. It is one of the standardised tools for data collection having been tested several times in Zambia. However, the tool was again tested on weekly basis for 3 weeks prior to the actual data collection. The consistency on the results with reliabiity of 0.8 was found. Furthermore, reliability was also achieved through conducting a pre-testing of the questionnaire developed with all effect of necessary corrections observed during the pre-testing. Data validity was also assured through data triangulation.

3.12 Ethical considerations

Ethical approval was obtained from the University of Zambia, Directorate of Research and Graduate Studies. Permission to conduct the study was sought from the District Council Research Committee and District Social Welfare Officer (DWSO) at Chikwawa District Council in Malawi. Furthermore, the head masters of schools were informed and consent obtained from parents of the participating learners including verbal assert from the participating learners. Confidentiality of information and anonymity of respondents was done by using research codes instead of names of respondents. However, learners whose parents declined the consent were replaced see ..apppendices.

3.13 Summary of methodology

The study used a quantitative research study approach to answer the three research questions; What is the impact of SFP on anthropometry of children in SFP & non-SFP schools?, What is the impact of SFP on learners outcome in Children's Learning Outcome in SFP & non-SFP schools? And Is there any relationship between Children’s anthropometry and Learning Outcome?. Data was collected through a structured questionaire with 208 learners aged 4-6 years to assess the impact of SFP on childrens anthropometry and learning outcomes by administering Zambia Child Assessment Tool (ZamCAT) which has learning outcome assessment and nutrition assessment components. The quantitative approach was used to draw statistical perspectives about School Feeding Programme through descriptive and regression analysis to identify relationship between anthropometry and learning outcomes. The dependant variables were anthropometry and learning outcomes while the dependent variable was school feeding and all procedures to collect data were followed including seeking approval from the research committees both from the university and the district where data was collected.

CHAPTER FOUR: PRESENTATION OF FINDINGS

4.0 Overview

This chapter presents findings of the study. The study sought to examine the impact of School Feeding Programme on children anthropometry and learning outcomes in Chikwawa District, Malawi. The result of the study are based on the analysis of data collected from 208 children aged 4-6 years. The findings of the study are organized according to the research questions as presented below:

1. What is the impact of SFP on anthropometry of children in SFP & non-SFP schools?
2. What is the impact of SFP on learners outcome in Children's Learning Outcome in SFP & non-SFP schools?
3. Is there any relationship between Children's anthropometry and Learning Outcome?

4.1 Objective 1: To assess the impact of SFP on Children's Anthropometry in Schools implementing SFP and non SFP.

Objective one (1) aimed at examining the impact of SFP on the children anthropometry in SFP and non SFP school. To better understand the study context, data on child information and anthropometric measurements was analysed comparing the SFP and non SFP schools.

4.1.1 Anthropometric measurements of children

Figure 2 Overall distribution of children nutrition status

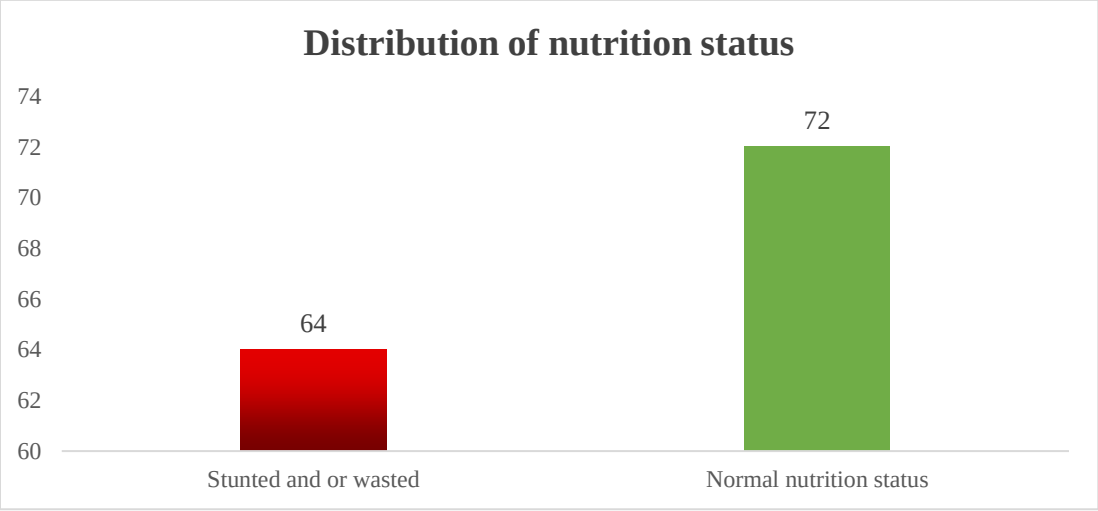


Figure 2 is a comparison between children who are healthy and those who are malnourished (stunted and or wasted). Out of 208 children who participated in the study, 126 children met the World Health Organization standards for analysis hence the assessment was based on 126 children in the data-set. The remaining 82 children were above 60 months and according to

WHO anthro these children did not meet the analysis criteria hence the exclusion. Of the 126 children, approximately 57% (n = 72) of the children are classified as healthy, however about 43% (n = 54) are classified as short for age and or small for height (stunted and/or wasted). These scores are indicating poor nutrition status below the estimated WHO growth standards. The descriptive tests further analysed School Feeding Programs on children's nutritional status through Height-for-Age (HAZ) and Weight-for-Height (WHZ) z-scores using WHO anthro plus. These scores were used according to WHO growth standards to assess stunting and wasting.

Figure 3: Height-for-age

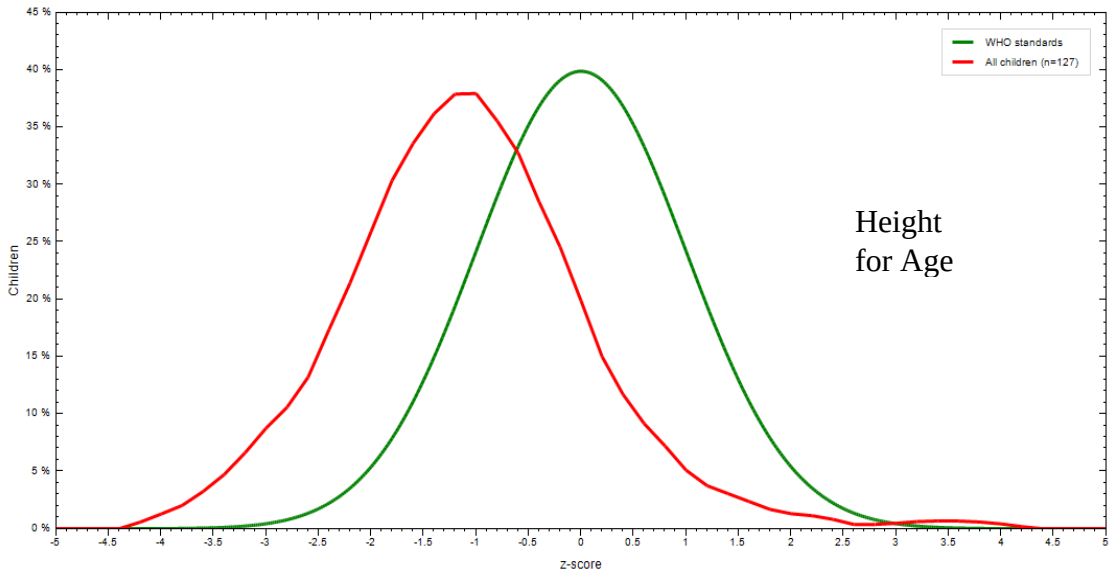


Figure 3, is the height-for-age graph comparing 126 children (left shif curve) to WHO standards (normal distributed curve). The curve with significant leftward shift shows that the children enrolled in the study were generally shorter for their age than global normal z-scores of below -2, the sample data indicates stunting. The wider spread of the red curve suggests more variability in height among these children, with some cases of severe stunting (z-scores below -3).

Figure 4: Weight for Height

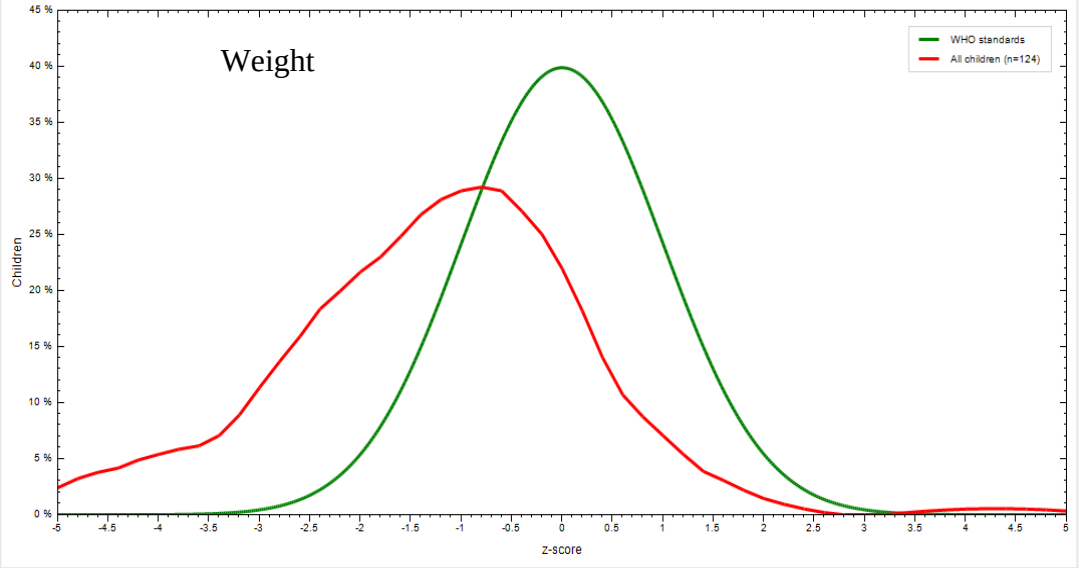


Figure 4 compares the weight-for-height distribution of 208 children (with left shift) to WHO standards (normal distributed curve). The children's distribution is shifted left, indicating they are wasted. Their peak is around -1 z-scores, while WHO's is at 0, with more variability in the studied group. Many fall below -2 z-scores, and few exceed the WHO median. This suggests a high prevalence of wasting among the children in both SFP and non-SFP schools, potentially due to nutritional or health issues.

Table 1: Anthropometric measurement of the children

Characteristics		SFP	Non-SFP	P-value
		n(%):mean (SD)	n(%):mean(SD)	
Nutrition indicator	Weight	15.1±2.4	14.6±2.3	0.168
Nutrition Indicator	Height	102.9±6.7	102.8±5.8	0.9160
Nutrition Indicator	MUAC	15.0±1.3	15.2±1.0	0.279
Nutrition Indicator	HAZ	1.03±1.18	1.22±1.41	0.428
Nutrition Indicator	WHZ	0.99±1.62	1.56±1.58	0.05
Sex of household head	Female	27 (22.1)	18 (20.9)	
	Male	95 (77.9)	68 (79.1)	0.836
Education level of household head	None	14 (11.4)	13 (15.1)	
	Primary	75 (61.5)	46 (53.5)	0.660
	Secondary	32 (26.2)	26 (30.2)	
	Tertiary	1 (0.82)	1 (1.2)	
	Employed full	0.00 (0)	2 (2.3)	

Employment status of household head	Employed part time	14 (11.5)	8 (9.3)	0.414
	Others	4 (3.3)	5 (5.8)	
	Subsistence farmer	97 (79.5)	67 (77.9)	
	Unemployed	7 (5.7)	4 (4.7)	
Who plays with child	Father	7 (5.7)	19 (22.1)	
	Mother	16 (13.1)	17 (19.8)	
	Siblings	99 (81.2)	50 (58.1)	0.000
Stimulation playing material	No	28 (23.0)	24 (27.9)	0.416
	Yes	94 (77.1)	62 (72.1)	
Household with numeracy literacy material	No	100 (82.0)	68 (79.1)	0.602
	Yes	22 (18.0)	18 (20.9)	

The anthropometric measurements of the children, as presented in Table 1, were compared between feeding and non-feeding schools using an independent T-test. Overall, 58.6 % of the respondents were from schools implementing the supplementing feeding programme and majority were females (53.4%). The average age of the children in SFP (58.1±7.6) and in Non-SFP (57.8±6.9). The mean Weight (15.1±2.4) and Height (102.9±6.7) was recorded higher in feeding schools than non-feeding schools however there was no significant differences $P>0.05$. Of note, Weight for Height z-score scored better in feeding schools (-0.99±1.62) than non-feeding schools (-1.56±1.58) with Weight for Height z-score statistical significance ($P<0.05$). However, there was very slight differences in MUAC measurement between schools implementing feeding programme (15.0±1.3) and those not implementing feeding programmes (15.2±1.0) and there was no significance difference between the two types of schools ($P>0.05$).

The significant association was noted between SFP and children playing with siblings (81.2%) compared to 58.1% in non-SFP schools ($P=0.000$). Children need other siblings to play with for them to get stimulated in school for development. Onyango etal, (2023) study on the effect of family members on child development showed that there was a large effect size for language stimulation (ES = 0.15) and overall gross motor development.

Table 2: The association between childrens socioeconomic status and anthropometry

Variables		Height for age	Weight for height
		Odds±Std Err	Odds±Std Err
School feeding programme	Ref=No	1	1
	Yes	0.56±0.324**	0.54±0.21
Education level of household	Ref= none	1	1
	primary	3.16±3.50	1.25±0.92
	secondary	0.68±0.43*	1.12±0.91
Occupation of household head	Ref= unemployed	1	1
	Subsistence farmer	0.717±0.86	0.38±0.34
	Employed part-time	1.184±1.60	0.38±0.40
	others	4.814±8.8	1.14±1.90
Age of child	Months	1.01±0.056	0.96±0.04
	Constant	0.082	11.3

Key *=0.1,**=0.05, ***=0.01 0.1 means it is significant at 90% confidence interval, 0.05 means it is significant at 95% confidence interavl and 0.01 means it is significant at 99% confidence interval

In table 2, the results reveal that children from schools with feeding programs have a 44% lower risk of being stunted compared to those from schools without feeding programs, significant at the 0.05 alpha level. Furthermore, secondary school education level was associated with a 30% lower odds of shorter height for age (stunting) compared to unemployment but was significant at 0.1 alpha level. However, no significant statistical association was found between subsistence farming and the risk of stunting, relative to unemployment. Additionally, the age of the child and education level of household were not significantly associated with the risk of stunting.

4.2 Objective 2: To assess the impact of School Feeding Program on Learning outcomes in Schools implementing SFP and non SFP.

This study had two categories of schools; schools offering school meals and those that did not offer school meals to school children. The study used Zambian Child Assessment Tool (ZamCAT) which comprised child learning outcomes and Nutrition Status Assessments. The

assessment included components such as letter naming, pencil tapping, expressive language, tactile pattern completion and Pea-body vocabulary test. The tools were administered to both categories of children in order to assess the impact of SFP on learning outcome. The table 3 demonstrates the effects of SFP on total pencil tapping score, overall pea body picture vocabulary test and expressive language scores.

Table 3 Total pencil tapping, Pea body picture Vocabulary Test and Expressive Language scores

Variables		Total Pencil tapping score	Overall PBPVT	Expressive language
		Coef. ±Std.Err.		
SFP	Ref=No	0	0	0
	Yes	1.04±0.65**	5.3±1.1***	0.93±2.64
Education level of HH head	Ref=None	0	0	
	preschool	5.34±8.55	10.2±5.3	0.40±4.92
	primary	2.10±1.83	-5.8±4.8	11.7±4.1***
	secondary	3.5±1.97*	6.3±3.2	14.8±4.45***
	tertiary	3.20±2.26*	10.5±6.3	-4.95±13.8
Occupation of HH head	Ref= unemployed	0	0	0
	Subsistence farmer	4.26±2.6	4.5±6.8	1.33±5.80
	Employed part time	.72±3.09	12.4±8.1	26±6.83
	Employed full time	6.78±6.52	18.0±8.0	23.0±14.46
	Others	1.06±3.82	-.5±10.0	-9.93±8.45
	Constant	2.12±2.99	44.3±7.8**	26.3±13.3**

Key *=0.1,**=0.05, ***=0.01

As presented in the table 3, Pea-body Picture Vocabulary is a test used to assess a child developmental process especially information processing. In this study, the learners in schools with Feeding Programs and those without School Feeding Programme were assessed. The results show that on average, Children from schools with feeding programs scored 5.3 points higher on Peabody Picture Vocabulary Test than those from schools without feeding programs (P=0.008). Moreover, Household Head education level significantly influenced overall Pea-

body Picture Vocabulary Test scores. Children with Household Heads having secondary and tertiary education scored 6.3 and 10.5 points higher, respectively, compared to those with Household Heads having no education (P=0.0224 and P=0.0055, respectively). In contrast, children with Household Heads having preschool education scored 10 points lower than those with household heads having no education (P=0.054). However, no significant relationship was found between household head occupation and overall Pea-body total scores (P>0.05).

Expressive language assessment is the child assessment for finding out the language development domain of a child. It is one of the crucial domain in child development and it is associated with cognitive capacities in children which is as a result of good nutrition development. The result in table shows that parents who had primary education as their highest level had 11.7 more score on total expressive language compared to children from parents with no education with significant level ($p<0.05$) . Similarly, children from Household Head whose education level was secondary school had 14.8 more score on expressive arts compared to children from parents no education with significant level ($p<0.05$). Interestingly, tertiary education of household had no statistical significant effect on total expressive language when compared with parents with no education. No significant association was found between occupation of the household head with children total score on expressive language.

The pencil tapping for children 4-6 years who were enrolled in the study. Pencil tapping is the child assessment that assesses attention and memory of a child. The results in Table 5 indicate that children from schools with feeding programs scored 1.04 points higher on the total pencil tapping score compared to those from schools without feeding programs, and this difference was statistically significant (P=0.0382). Additionally, at an alpha level of 0.1, children from households with secondary and tertiary education scored 2.10 and 3.5 points higher, respectively, on the total pencil tapping score compared to those with household heads having no education. However, no significant effect was observed for children with parents having primary or preschool education compared to those with parents having no education (P>0.1). Moreover, no significant relationship was found between household head occupation and children's performance on the total pencil tapping score.

Table 4 Letters Naming and Tactile Pattern Completion scores

Variables		Letter Naming	Tactile Pattern Completion
		Odds±Std Err	Odds±Std Err
School feeding programme	Ref=No	1	1
	Yes	0.41±0.26	0.82±0.26
Education level of household	Ref= none	1	1
	primary	0.44±0.31	1.87±0.99
	secondary	0.10±0.12**	1.37±0.78
Occupation of household head	Ref= unemployed	1	1
	Subsistence farmer	0.45±0.52	0.63±0.42
	Employed part-time	1.65±2.12	1.06±0.83
	others	0.56±058	1.64±2.60
Age of child	months	1.03±0.05	1.04±0.02
	Constant		0.05±0.078*

Key *=0.1,**=0.05

Table 4 presents the effect of school feeding on letter naming within two minutes and tactile pattern completion patterns. The analysis revealed that school feeding, occupation of the household head, and the child's age had no statistically significant impact on either Letter Naming or Tactile Completion patterns. However, the education level of the household head shown a significant association. Children from households with secondary education qualification were 90% less likely to have poor cognitive function resulting in poor learning outcomes in letter naming and tactile pattern completion tasks than those from households without formal education. Conversely, the education level of household heads did not significantly influence cognitive ability in letter naming patterns and tactile pattern completion tasks.

4.3 Objective 3: To establish whether there is a relationship between Childrens Anthropometry and Learning Out come in SFP and non-SFP schools

Learning outcomes and non- verbal cognitive abilities were assessed to establish their relationship with children's anthropometry using the sub-tests from the ZamCAT. Specifically, measures of learning outcomes included: receptive language abilities as assessed by the Pea-body Picture Vocabulary test; expressive language; and alphabet knowledge. Whereas cognitive abilities were assessed using tactile pattern reasoning and pencil tapping test.

Table 5: Relationship between children's Anthropometry (MUAC, HAZ and WHZ) and learning outcomes in SFP and non SFP schools

	HAZ	Coef.	p-value
School feeding	Base: Without school feeding	0	.
	School with SFP	.166±0.24	.494
Education of household head	base none	0	.
	primary	.185±0.42	.664
	secondary	.004±0.46	.993
	tertiary	.165±1.4	.906
Overall pear body total score		.001±0.005	.856
Letter naming		.032±0.02	.046
Total pencil tapping		.019±0.02	.202
Expressive language		.008±0.01	.237
Constant		1.095±0.52	.037

	MUAC	Coef.	p-value
School feeding	Base: Without school feeding	0	.
	School with SFP	.004±0.15	.981
Education of household head	: base none	0	.
	primary	.004±0.27	.989
	secondary	.211±0.29	.465
	tertiary	.569±0.88	.52
Overall pear body total score		0	.979
Letter naming		-.021±0.01	.037
Total pencil tapping		-.005±0.01	.625
Expressive language		.003±0.01	.509
Constant		.787±0.33	.018

	WHZ	Coef.	p-value
School feeding	Base: Without school feeding	0	.
	School with SFP	.482±0.30	.114
Education of household head	: base none	0	.
	primary	.17±0.53	.747
	secondary	.52±0.57	.364
	tertiary	.106±1.73	.951
Overall pear body total score		.006±0.007	.355
Letter naming		.004±0.019	.837
Total pencil tapping		.014±0.019	.461
Expressive language		.008±0.009	.345
Constant		-1.633	012

The Line Regression analysis results in table 5, reveal a significant relationship between anthropometric measurements and learning outcome. At an alpha level of 0.05, a significant relationship was found between anthropometry (Mid-Upper Arm Circumference and learning outcomes as follows; - At an alpha level of 0.05, a strong relationship was found between Letter naming scores and Mid Upper Arm Circumference. Similarly, a strong relationship was also found between Height for age and Letter naming scores total pencil tapping scores and Height-for-

Age z-scores. However, the study results revealed no relationship between Weight-for-height with any of the learning scores tested.

4.6 Summary of findings

The study findings, show that there is an impact of SFP on children's anthropometry and learning outcome. The findings show that there is prevalence of stunting and wasting in reference to WHO growth standards in both SFP and non-SFP schools. However, the level of stunting and wasting was more pronounced in non-SFP schools than SFP schools with Weight for Height-Z-score and Height-for-age Z-score readings recording higher in non-feeding schools than feeding schools. In addition, it has also shown that learners in schools with feeding programs are associated with a 44% lower risk of being stunted compared to those from schools without feeding programs. So was part-time employment which had a 30% lower odds of stunting compared to unemployment. Learning outcomes such as Pea-body Picture Vocabulary test and pencil tapping scored better in feeding schools than non-feeding schools unlike letter naming and tactile pattern completion and expressive language.

The linear regression findings further indicates a remarkable relationship between anthropometry and learning outcomes. The results show a strong relationship between Letter naming scores and Mid Upper Arm Circumference. Similarly, a strong relationship was also found between Height for age and Letter naming scores total. So was pencil tapping scores and Height-for-Age z-scores. Overall, there is an impact of SFP on children anthropometry and learning outcomes. Therefore, the hypothesis "Children in SFP schools have better anthropometry and Learning Outcome compared to children in non-SFP schools" has been accepted

CHAPTER FIVE: DISCUSSION OF FINDINGS

5.0 Overview

The chapter discusses the findings of the study in relation to other studies findings. The purpose of the study was to assess the effects of School Feeding Programme on Children's anthropometry and learning outcomes in schools implementing School Feeding Programme in Chikwawa District in Malawi. Specifically, (i) to assess the impact of SFP on Nutrition Status in Schools implementing SFP and those without (ii) to assess the impact of SFP on learners outcome in Schools implementing School Feeding Programme and those without, (iii) to establish whether there is a relationship between in Childrens anthropometric measurements and Learning Out come in SFP and non-SFP schools. Below provides a discussion bench mark for the objectives;

5.1 Objective 1: To assess the impact of SFP on Children's anthropometry in SFP schools and non-SFP schools.

In regards to the first objective, the study findings suggest that School Feeding Programme had an impact on the children's anthropometry as seen in the overall nutrition status of learners benefiting from SFP meals. The study findings demonstrated a diverse difference in anthropometric measurements outcomes of children between schools implementing School Feeding Programme and those without School Feeding Programme.

5.1.1 anthropometric measurements

Overall, children in SFP registered better anthropometric measurements. Weight for Height z-score improved in SFP schools than non-feeding schools with Weight for Height z-score statistical significance. This is in tandem with what Locke *etal*., (2024) in their review in Neitherlands found. The findings show that SFP meals have improved the anthropometry and overall nutrition status in learners. The results were used as a bench mark for advocating SFP in the public schools to enable scale up of SFP in the country.

Furthermore, The results also indicates that there is a significant association between school feeding and children playing with siblings in feeding schools compared to non-feeding schools. According to Mweru, (2017) study, children tend to play with other siblings in homes and it is usually common during feeding. Often when this happens, it brings about brain stimulation improving overall cognitive functioning. Playing is very important in initiating neuroconnectivity in the brain. Siblings in the family need to engage the children in a play everytime as this helps to stimulate their brain leading to improved developmental milestones. Similarly, Onyango *etal,* (2023) found a largest effect size for language stimulation (ES = 0.15)

and overall maternal stimulation was most strongly associated with gross motor development. This entails that children need friends to play with for them to get stimulated. It could be a father, neighbours, siblings or mothers as Onyango and his friends had rightly found in their study. According to WHO growth standards (Height-for-Age and Weight-for-Height z-scores results found that, 43% of the children enrolled had poor nutriton status below the WHO growth standards. Further analysis shows that WHZ is shifted to the left, indicating wasting. Their peak is around -1 z-scores, while WHO's is at 0, with more variability in the studied group. Many fall below -2 z-scores, and few exceed the WHO median. This suggests a high prevalence of wasting among the children enrolled. HAZ is also shifted leftward showing that the children enrolled in the study were generally shorter for their age than global normal z-scores of below -2, the sample data indicates stunting. The short stature may be due to chronic malnutrition as these children literally do not have diversified food to eat hence might have drastic effects on the growth of children due to lack of essential nutrients needed for the body growth (Quamme, 2022). Yaya *etal.*, (2022) study findings on short stature among children in Sub-Saharan region concurs with this study, the study found that more than one-third of children in Sub-Saharan African countries were reportedly stunted.

The leading countries include Burundi (55.9%), Madagascar (50.1%), Niger (43.9%) and the Democratic Republic of the Congo (42.7%). The percentage of stuntedness was higher among males than females and among rural children than their urban counterparts in Sub-Saharan countries. The prevalence of chronic malnutrition is widespread affecting one third of the under five children due to the increased prevalence of micro-nutrient deficiencies specifically the long-term deficiency of iron and iodine which is usually irreversible when the child reaches two years (Sawadogo *etal*., 2022). Nevertheles, the wasting rate was more pronounced in schools without School Feeding Programme than School Feeding schools meaning there was an impact observed from the school meals. This is in tandem with studies done in Ethiopia by Demilew & Nigussie, (2020) where the magnitude of stunting and thinness in school fed students was found to be lower, but over-nutrition is higher than non-school fed. In addition, the study also found that the MUAC measurements were normal in both schools implementing school meals and those not implementing school meals. MUAC measurement is precise but sometimes insensitive.

According to Lambebo *etal*., (2023), it is used as a proxy for assessing acute malnutrition and it is usually verified with Weight for Height Z scores. The findings of this study show that SFP has the great potential to improve the nutrition status among the targeted beneficiaries. Results

of regression analysis has also indicated that there is a significance interaction between nutrition status and education outcomes ($p<0.05$). Studies done by Mideksa *et al* (2024) found that school feeding programs in Ethiopia showed mixed findings on nutritional status and academic performance. Besides that, poor-quality food provisions and financial or funding constraints affect school feeding programs. Similarly, Abebe, and Ashenafi (2022) in their study done in Nigeria in the city of Kano revealed that there is a causal relationship between school feeding programme, anthropometry and education outcomes. The results showed that children who benefited from school feeding programme performed better in class and they had improved anthropometry and overall nutrition status as compared to the children in non school feeding programmes.

5.2 Objective 2: To assess the impact of SFP on Learning outcomes

To realise this objective, the study assessed the impact of school feeding on learning outcomes through comparing two categories of schools; schools offering school meals and those that did not offer school meals to school children. The study used Zambian Child Assessment Tool (ZamCAT) which comprised child learning outcomes. The tools were administered to both categories of children in order to assess the impact of School Feeding Programme on learning outcome. Selected components of ZamCAT such as Pea-body Picture Vocabulary Test, Naming letters, Pencil tapping, Tactile Completion task and Expressive languages were used. However, when the learners were attested with pea-body picture vocabulary learning assessments, schools with feeding programs showed a 5.3 points higher than those from schools without feeding programs ($P=0.008$). Similarly, the expressive language assessments in learners also showed that School feeding had negligible effect on expressive language total score with children from parents with primary and secondary education having the highest scoring of 11.7 and 14.8 score respectively compared to children from parents with no education ($p<0.05$). Learners also performed better in pencil tapping however with a weak association.

According to Onyango *etal*., (2023), development of the domains in expressive language is associated with cognitive capacities in children which is due to good development coupled with good nutrition status and consistent class attendance. Interestingly, household head higher education level (tertiary) had no association with the learning outcomes. Neither was the occupation of the household head. Much as higher parental education is associated with better school achievements through parenting practices (Tamayo *et al*, 2022), research has shown that higher parent education may unlikely effect on the child development because of inadequate

care towards the child. Educated parents are most of the times and tend to work for more hours and they likely leave their children unfed and unstimulated and unsupervised than their less-educated parents (Davis-Kean, Tighe & Waters, 2021).

Overall, the study findings leans towards School Feeding Programs scoring negligibly better than those in schools without School Feeding Programme with a weak association in pencil tapping, expressive language scores and Pea-body Picture Vocabulary Test Scores. This indicates that School Feeding Program is associated with better learning scores and overall improved learners performance than schools without feeding programmes. This also correlates with the prospective cohort study findings by Mohammed *etal*.,(2023) on effect of school feeding program on academic performance of primary school learners in Ethiopia where learners class performance improved drastically on School Feeding Programme.

Similarly, Mostert, (2021), found that School Feeding Programme has an impact on learning outcome. The results shows that the SFP has a significant effect, improving wellness, school attendance, and academic achievement because the meals improves concentration in class as such learners are able to grasp lessons leading to better performance. This also concurs with the quasi experimental study done by Metwally *etal*.,(2020) in which they found that Children who took the meal had better scores on visual memory, auditory vigilance tests than those that did not (9.71 ± 2.80 vs. 7.45 ± 3.25; 25.02 ± 3.36 vs. 10.82 ± 8.92, respectively ($P<0.001$). The study concluded that School Feeding Programme is a strong predictor of education outcomes in school children. Ayele *et al.* (2022) study in Ethiopia concurs with Belachew etal (2023) and Metwalley et al (2020). The study concluded that malnutrition in the form of stunting, underweight, and micro-nutrient deficiency (iodine deficiency) affects the academic performance of elementary school children. The study confirmed that there was a strong association between academic performance and malnutrition. Kamnyung, (2019), a study conducted in Tanzania also found that school feeding is a catalyst for improving students' attendance and academic performance. The study recommended that school feeding program should be enhanced in schools and to be established in schools which do not have such program to ensure learners enrolment, attendance and eventually good academic performance.

Contrary to the positive findings on effect of nutrition status on learning outcomes, a few scores of the child learning assessments did not do well. For instance, Letter Naming and Tactile Pattern Completion task scores, had showed no improvement despite the exposure to school meals and good nutrition status of learners and they had also no any significant association

between them. However, both SFP and non SFP schools had high “Incorrect” responses on the Letter naming and Tactile Pattern Completion task assessments. This is because the class room behaviours are complex and are affected by so many factors including the disasters such as tropical cyclones such as Cyclone Freddy which had also disturbed classes big time in the district. The quality of school itself can also affect learning outcomes. Other factors include education level of teachers as most instructors in these early learning are untrained volunteers in the communities.

While some children in these early childhood centres are handled by trained ECD caregivers, most of the children are being managed by untrained caregivers since only 17,101 caregivers out of 35,361 had received formal training by 2021 (Malawi Government, 2021). in addition, there are no incentives for them and they are not paid. In a review of other studies on learning outcomes, Beisly, *etal*., (2022), reported that despite school meals and better nutrition status of learners is more important in improving learning outcomes. However, it may be at a certain threshold level, otherwise education of teachers and socio-economic status (SES) of learners become critically important in achieving learning outcomes. The poor the SES of the child, the more ability to grasps concepts in class because executive function and learning behaviour are significantly correlated with children's literacy outcomes. Learning behaviour moderates the association between family SES and child learning outcomes. Teachers may support learning behaviour by teaching active listening and frustration management techniques, thus motivating children to actively participate in learning. This also serves to buffer the negative impacts of family SES on children's academic outcomes.

The school meals would most likely facilitate learning and improve learners concentration in class, even for the undernourished learners. However, in the non-SFP schools, it is uncertain whether good nutrition status would have led to an improved learning outcomes without the availability or access to meals (Aino, 2020).The findings suggest that, if we desire maximum benefits from school feeding programs, we should link them with educational improvements where necessary. There is currently a reasonable amount of evidence that children’s cognitive functions are enhanced if they eat breakfast, especially if they are undernourished. However, we cannot be certain that this will lead to better attainment levels.

5.3 Objective 3:To establish whether there is a relationship between Children anthropometry and Learning Out come in SFP and non-SFP schools

Learning outcomes and non- verbal cognitive abilities were assessed using the sub-tests from the ZamCAT. Specifically, measures of learning outcomes included: receptive language

abilities as assessed by the Pea-body Picture Vocabulary test; expressive language; alphabet knowledge, tactile pattern reasoning and pencil tapping test. The findings of the study which aimed at establishing the relationship between school children anthropometry and the learning outcomes was run using the Linear regression analysis. The results, reveal a significant relationships between anthropometry and learning outcomes. As the results read, at an alpha level of 0.05, a significant positive relationship was found between anthropometry and learning outcomes as follows;- At an alpha level of 0.05, a strong relationship was found between Letter naming scores and Mid Upper Arm Circumference (R=0.037).

Similarly, a strong relationship was also observed between Height for age and Letter naming scores (R=0.046). However, the study results revealed no relationship between Weight for height with any of the learning scores tested. A study by Ayalew *etal.*,(2020) comparing nutrition status and education performance revealed an association between the two variables. The study found that low height-for-age children had 75% decreased odds of achieving high average semester score compared to normal height-for-age children. Furthermore, moderate low weight for age children have 68%, 64% and 66% decreased odds of achieving high Science, Mathematics, Amharic, and English course scores compared to normal weighted children, respectively. Similarly, Bassuoni *etal*., (2020) studied the association of under-nutrition (micro-nutrients deficiencies of zinc, iodine and iron) and cognitive functioning in preschool in Egypt. The study concluded that inadequate diet is associated with reduction in IQ and overall poor cognitive functioning. This is because nutrients such as zinc, iodine and iron are cofactors for more than 200 enzymes that regulate different metabolic activities in the body, including protein and DNA synthesis. More importantly, Zinc is found in high concentrations in synaptic vesicles of hippocampal neurons, which are centrally involved in education and memorial status (Nyaradi *etal*., 2021).

Therefore, the Linear regression analysis findings demonstrate that Height-for-age (stunting) and MUAC could serve as strong predictors of learning outcomes progress in preschool children. This study findings also concurs with what Gansaonre *etal*., (2022) found on stunting and academic achievements in developing countries. The results concluded that children with low height for age (stunted) were more likely to repeat a grade than non-stunted [OR = 1.59 (95% CI, 1.18–2.14)].

5.4 Summary

This chapter determine this study findings as per research objectives. The first part of the discussion included the impact of SFP on nutrition status and learning outcomes of children and the correlation of nutrition status and learning outcomes. The research has established that SFP has an impact on nutrition status and overall academic outcome. In regards to the first objective, the study findings suggest that School Feeding Programme had an impact on the children nutrition status. The study findings demonstrated a diverse difference in nutrition and health outcomes of children between schools implementing School Feeding Programme and those without School Feeding Programme. Schools with School Feeding Programme had indicated improved nutrition and health well-being with reduced stunting and wasting than schools without School Feeding Programme.

Secondly, the study also showed the impact of SFP on learning outcomes of children using the child learning assessments tools. Out of the five learning assessments, three had demonstrated that children who are on SFP have the ability to perform well and attain their education outcomes. Consequently, the research has also established that there is an interaction between nutrition status and learning outcome. Children who were on SFP and had normal nutrition status through anthropometric measurements showed better cognitive abilities hence good learning outcome. Among others most children were retained in school because of the SFP. Overall, the findings aligns to study theoretical framework as schools with School Feeding Programme had indicated improved nutrition and health well-being of learners with reduced stunting and wasting than schools without School Feeding Programme. The learners in SFP had also performed better in the learning assessments than those without SFP. According to Maslow's Hierarchy of needs, food is a motivational need and as these needs are met in school feeding, individual graduate from one state to another. The presence of school meals in schools with SFP have led to learners attaining improved nutrition status and better learning outcomes hence the reseracher accept the hypotheses that "children in SFP schools have better anthropometry and Learning Outcome compared to children in non-SFP schools".

CHAPTER SIX: CONCLUSION AND RECOMMENDATIONS

6.0 Conclusion

Evidence has shown that SFP improves anthropometric measurements with opportunities for better nutrition and health wellbeing contributing to better child development outcomes hence better learning outcomes. The basic principles of building a better education performance is through ensuring adequate nutrition for children in preschool among others. It is more effective and less costly than addressing the consequences of early adversity later. The balanced approach to children nutrition through SFP should be taken into consideration for preparation of children's success in school and later in workplace and community. The study findings showed that there is currently a reasonable amount of evidence that children's learning outcomes could be enhanced by nutrition. The study points to what could be the potential impact of School Feeding Programme on anthropometry and overall nutrition status and learning outcome in Malawi. The comparison of SFP schools and non SFP schools would grant more confidence to generalize the findings however more research in Malawian setting or a longitudinal study on the same participants should be conducted to back up the findings. On the other hand, the results are based on entry level early childhood education (CBCC) learners and we do not know whether the benefits would be the same with older children. Furthermore, WHO Anthro Plus 2007 might have some limitations as it automatically excludes participants with an older age especially females were excluded due to the fact that their weight increases in spite of nutritional status hence other statistical packages should be recruited in the next study.

Nevertheless, based on the findings, the School Feeding Programme in Community Based Child Care Centres has a great potential to improve nutrition status and learning outcomes hence the need to consider scaling up the interventions to other schools which are not implementing the programmes. It is double sworded as it improves both nutrition and health of children and also their academic performance.

6.1 Recommendation

The findings of the study indicates that school feeding enhances learning outcomes and anthropometry. Therefore;-

1. The SFP should be considered in all early learning platforms and it should be scaled up in all schools in Malawi.

2. SFP should also be established in schools which do not have such program to ensure learners enrolment, attendance and eventually good academic performance.
3. A wide range of policies, including those directed toward School Feeding Programme in early education and or primary education should be promoted to ensure that children attain good nutrition status and develop optimally and holistically as they pursue there education.
4. Future research should be done on a large scale longitudinally to further evaluate the effect of School Feeding Programme on school trajectories and the modification effect of socio-economic status.
5. Furthermore, elements of hygiene and sanitation should also be studied as malnutrition are caused in two folds; diseases and indequate food intake.

   However, there is need for the government to put more resources in it to ensure effective running of the programme and also to ensure that children access meals in schools.

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APPENDICES

APPENDIX I: Parent Interview Guide

INTRODUCTION AND INFORMED CONSENT

CONSENT

My name is **Kondwani Chavula** a Med-ECD student at University of Zambia and am doing a research to assess the effects of the school feeding programme on anthropometry of children therefore, I wish to request you to assist in answering this questionnaire to get the correct and reliable information. The information that will be obtained will be treated with total confidentiality and will only be used for study purposes.

Are you willing to participate? Yes☐ No ☐

Name_____Sign_____Phone number_____Date_____

School Location	
Village	
GVH	
Traditional Authority	
Name of the school	_____

SOCIO-DEMOGRAPHIC INFORMATION

Circle the appropriate answer

Biographic Information	
Name of the child	
Age of the child	_____ (years)
Gender	Male……...1 Female……..….2
Class level	Three years (baby class) .....1 Four years (Nursery).....2 Five years (Reception.....3 Others (specify).....4
Religious Denomination	Roman Catholic ……1 CCAP…….2 Seventh Day……3 Islam……...4 Others (specify)……...5
. When did he/she start school?	Date _____
. For how long has he/she been in school?	Less than one year……1 One year ……..….2 More than 1 year……...3 I don't Know…….....4

. What is the gender of the HH head?	Male……..…...1 Female……..…...2
. How old is the HH head?	15-22 years……1 23-30 years…….2 31-40 years…….3 41-50 years…….4 51-60 years…….....5 60 above..……...6
. What is the parental status of the child?	All parents alive……..1 Single parent.....2

	Double orphan.....3 Other (specify)……4
. What is the highest level of school [NAME's] father attended?	None.....1 Pre-school.....2 Primary.....3 Secondary.....4 Tertiary.....5
. What is the highest level of school [NAME's] mother attended?	None.....1 Pre-school……...2 Primary.....3 Secondary.....4 Tertiary.....5
. What is the current employment status of [NAME's] mother?	Employed full time.....1 Employed part time…….....2 Unemployed…….....3 Subsistence farmer…….4 Retired…….....5 Others specify……6
. What is the current employment status of [NAME's]father?	Employed full time.....1 Employed part time…….....2 Unemployed…….....3 Subsistence farmer…….4 Retired…….....5 Others specify…….6
. Please select your annual HH income range	Less than K49,000.00…….1 K50,000.00-K99,000.00…….2 K100,000.00-K199,000.00….3 K200,000.00-K299,000.00….4 K300,000.00 and more……5 Others specify……..6
. Do you own or rent your residence?	Own a house……1 Rent a house……2 Others specify……..3
. Type of the house	Temporary……...1

	Semi temporary……...2 Permanent……3 Others specify……..4
. How many people including children you live with?	_____
. When [NAME] goes to pre-school, is the language s/he speaks at home the one use as the language of instruction?	Yes.....1 No.....2
Play and stimulation	
. Does your house have a designated space at home for play, reading or any learning activities?	Yes ……1 No……2
. Who plays with the child?	Father.....1 Mother.....2 Old (10 years) sibling…….3
. Does [Name] play with homemade toys?	Yes.....1 No.....2
. Does [Name] play with bought toys?	Yes.....1 No.....2
. Does [NAME] play with the following	Homemade toys such as dolls, cars, or other toys made at home.....1 Toys from a shop or manufactured toys....2 Household utensils such as bowls or pots spoons, cups …….3 or objects found outside such as sticks, rocks, animal shells or leaves.....4
. Does your household have the following	Electricity.....1 Radio.....2 Television.....3 A watch…….....4 Refrigerator.....5 Heating/cooling.....6 Tap water.....7 Gas stove.....8

	A Landline.....9 Mobile telephone.....10 Bicycle.....11 A motorcycle or scooter.....12 A car or truck.....14 An animal-drawn cart.....15 A boat.....16 Cattle……..17 Goats…….18 Specify others……19 **NB: Multiple answers are allowed**
. Is [NAME] exposed, use or operate some of these household items mentioned in 21?	Yes.....1 No.....2 Don't know.....3
. If yes, List down the items	_____
. Did an adult person engage with [NAME] in some activities in the past 3 days?	Yes…….....1 No.....2
. Did the father or mother engage with [Name] in at least 1 activity in the past 3 days?	Yes.....1 No.....2
Literacy and Numeracy materials	
. Does [NAME] like school?	Yes……...1 No.....2
. If yes, why does [NAME] like school?	School meals……1 Playing with friends…….2 Both playing and school meals ……...3 Others specify…….….4 **Multiple answers are allowed**
. Do you have children's books or picture books for [NAME] at home?	Yes……...1 No.....2
. Do you have letter/phonics/number chart at home?	Yes……...1 No……..……..2 others specify……..3

. How many books does [NAME] have?	Less than 3……...1 3 and more..……...2
. Does [NAME] read these books?	Yes……...1 No.....2
. Does anyone teach [NAME] to read or write:	Yes.....1 No.....2
. If yes, how many times	Never…….…1 Daily…….....2 Once a week…….....3 Several times a week…….2 Other specify……....4
. How has SFP helped your child	…….
Health history of the child	
. Is (NAME) often tired compared to other children of his/her age?	Yes.....1 No.....2
. Has (NAME) received all the vaccinations?	Yes.....1 No.....2
. Is (NAME) often sick compared to other children of his/her age?	Yes.....1 No.....2
. Has [NAME] ever had chronic illness?	Yes.....1 No.....2 Don't know.....3
. For how long had [NAME] ever had that illness?	Less than a week…….1 1-2 weeks …..……2 More than 2 weeks to month……...3 Above 1 month…….……...4 Others (specify)…...……5
. Have you lost any child from any disease?	Yes……..1 No….2

Food and Nutrition	
. What type of food groups do you feed your family?	None.....1 Staples.....2 Legumes.....3 Animal foods.....4 Vegetables…….....5 Fruits…….....6 Oils……7 Others (specify).....8 **NB: Multiple answers are allowed**
. How often do you feed your family per day?	Once a day…….....1 Twice a day……2 Thrice a day……3 4 times a day…….....4 More than four times….....5 I don't know…….....6 Others (specify)……..7
. Have you ever been given feed supplements for any of your children?	Yes…….1 No…….....2 Others (Specify)…….....3
. If Yes, what was it?	Likuni phala.....1 RUTF (Chiponde).....2 Milk.....3 All of the above…….....4 Others (Specify)……5
. Why was the supplements given?	Never.....1 The child was sick……...2 Routine .....3 Campaign…….....4 Others (specify)……...5

. How would you prevent malnutrition?	Feeding children adequate food ……...1 Going to under-five clinics ……...2 Getting advice …….3 Avoiding Msempho or moto……4 Others (Specify)……...5

APPENDIX II: Interview guide for ece-teacher

CONSENT

My name is **Kondwani Chavula** a Masters of Education in Early Childhood Development Care and Education (ECDCE) student at University of Zambia and am doing a research to assess the effects of the school feeding programme on anthropometry of children therefore, I wish to request you to assist in answering this questionnaire to get the correct and reliable information. The information that will be obtained will be treated with total confidentiality and will only be used for study purposes.

Are you willing to participate? Yes☐ No ☐

Name_____Sign_____Phone number_____Date_____

School Location	
Village	
GVH	
Traditional Authority	
Name of the school	_____

School feeding program information

Name of the responded	_____
Age of the responded	15-22 years…….1 23-30 years…….2 31-40 years…….3 41-50 years…….4 51-60 years…….....5 60 above..……..…..6
Gender	Male ……..1 Female……2

What is the highest education level?	None.....1 Primary Certificate.....2 JCE Certificate.....3 MSCE Certificate.....4 Professional Certificate…...5 Diploma …….6 Bachelor's Degree.....7 Master's Degree.....8 PhD.....9 Others (specify).....10
Do you have a school feeding programme at this school?	Yes……..…1 No……...2 Others (Specify)……..…3
What Organization is providing SFP at this school	Marys Meal.....1 Red Cross……...2 WFP…….....3 Not Implementing SFP…..4 N/A…….5 Others (specify).....6
When did the SFP begin?	_____
What type of SFP is available at this school?	None.....1 Wet feeding.....2 Take home ration.....3 Home Grown Meals…….....4 All above……5 Others (specify)…….....6
If it is take home ration, What is the package of the meal?	One kilogram……....1 One and half kilograms……2 Three kilograms……....3 More than three kilograms…...4
. If yes, Which meals are served	Breakfast……....1 Lunch (Mid-day meal…….2 Evening meal…….…3 Others (Specify)……..4

. Do school meals reach all children in the targeted range in this school?	Yes …….....….1 No…….……..2 I don't Know…….....3 Others (Specify)…….4
. If No, what percentage do they reach children?	75-99%……..….1 50-74.9%…….……...2 25-49.9%…….……...3 0-24.9%……..……..….4 I don't know….....5
. What is your role in SFP?	Preparing the meals.....1 Supervising SFP.....2 Distribution of meals to pupils...3 Purchasing food commodities…4 Others (specify)……..…5
. Where do you source your ingredients?	None.....1 Local farmers……...2 Prepackage.....3 All of the above.....4 Others (Specify).....5
. How do they know the quality of ingredients?	None……..……1 Hired Nutrition expert inspect before preparation……..2 Trained SHN teacher inspects....3 Others (Specify)…….4
. Who prepares the meal?	Comes in prepackaged……....1 Hired cooks.....2 School committee.....3 Parents…….....4 Others (Specify)……..5
. How is the meal prepared?	None …….....1 Brought already prepared…….2 Prepared at school……3 Others (Specify)……...4

. If its prepared at school, does the school have menu?	None……1 Recommended menu is available.3 Others (Specify)……4
. Does the menu integrate at least the four food groups?	No…….....1 Yes……2 I don't know…….....3 Others Specify……..4
. How many children does the school have?	_____ Male……1 Female……2
. How many children are on SFP Now?	_____
. How many children did the school have before SFP?	_____
. How many children dropped out this year?	Male…….....1 Female…….....2
. Do the school have children absent from class?	Yes……. ……1 No……....2 I don't Know……....3 Others specify……..4
. How long do children absent from class?	None……1 Less than three days……....2 A week……....3 More than a week……....4 A month……..…5 Nb: Cross check with daily reg. if available

APPENDIX III: Child instrument

Child verbal assert
Greetings and verbal assert Hello, my name is Kondwani Chavula I am a student with University of Zambia We are here to assess children nutrition status and cognition functioning to help them grow health, participate well in school and achieve their education outcomes. I will assess your learning outcome and take Mid Upper Arm Circumference measurement, Height, and Weight using standard procedures for the tests. The activities are not painful and they will take a little time Are you willing to participate in the measurement? Yes ☐ No ☐ Do you have any questions pertaining to what I have explained? Yes ☐ No ☐

Child Family Name	Child first name	
Parent Family Name	Parent first name	
Child Birth Date	Location/Village	
District	Province	
Sex Male ☐ Female	Dat☐	
Primary Language spoken by child at home	Chichewa ☐ English ☐Others	
Assessor	Start time:	End time:

PEABODY PICTURE VOCABULARY TEST

Practice: I want you to see the pictures here [Turn to practice item **A**]. Have you seen all pictures on this page? [Pointing to each of the four pictures]. When I mention the picture, I would like you point out the picture with your finger. If the subject is correct, say "**OK**" [Turn to practice item **B**] and ask them to point another one. If the subject again makes a correct response, turn to practice item **C** and say "**OK**" point out another. If the subject chooses the wrong illustration at any point, before going to the next item, point out the correct response while praising them "you did well"

Test: Now, I would like to show you other pictures and whenever I mention it, you should be pointing the picture. You will not know what this means but all what I want is you to point out the right picture for that name.

Begin test item below;

NB: Fill in the child responses using the appropriate mark provided in the key column

SET 1

Item	Word	Key	Childs Response	Error	Don't know
PPV1	Broken	2		E	
PPV2	Yawning	2		E	
PPV3	Tortoise	1		E	
PPV4	Dressing	1		E	
PPV5	Picking	4		E	
PPV6	Pair	3		E	
PPV7	Pulling	1		E	
PPV8	Pouring	4		E	
PPV9	Empty	4		E	
PPV10	Liquid	4		E	
PPV11	Washing	4		E	
PPV12	Terrified	1		E	
PPV13	Sharing	2		E	
PPV14	Bucket	1		E	
PPV15	Tugging	2		E	

SET 2

Item	Word	Key	Childs Response	Error	Don't know
PPV16	Full	2		E	
PPV17	Caterpillar	3		E	
PPV18	Arguing	1		E	
PPV19	Branch	2		E	
PPV20	Chain	2		E	
PPV21	Goat	4		E	
PPV22	Fighting	1		E	
PPV23	Root	2		E	
PPV23	Coming	3		E	
PPV24	Hoeing	2		E	

PPV25	Printing	4		E	
PPV26	Time	3		E	
PPV27	Reading	4		E	
PPV28	Leaking	3		E	
PPV29	Injection	4		E	

LETTER NAMING TASK

Materials: Sheet with scrambled letters, **FMS** sheet with letters and numbers for practice

Practice: Hold up the FMS letter/number sheet and ask the child to name the numbers by pointing and saying the number names out loud. If the cannot do so, teach them how by pointing to the "**1**". Practice as needed with the numbers on the sheet until the child is comfortably understands how to point and name.

Then move on to the scrambled letter sheet

Now I would like you to mention names of the letters. You have a little time however mention according to your capacity

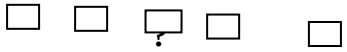
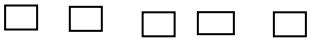
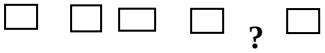
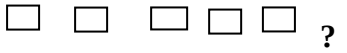
LN1	How many letters did the child name correctly in two minutes	#

TACTILE PATTERN COMPLETION TASK

Materials: 3 small stones, 6 beads of one colour and 1 of another colour, 4 beans, 4 tooth picks, 4 metal bottle caps of one colour and 4 of another colour, NEPSY blocks, 11 tiles with red /green square patterns, 11 tiles with blue diamond/square pattern, tactile grid pattern sheet

Now: I will put these items in **[LAY OUT PATTERN]** and I will ask you to complete the pattern **[POINT PUT TO THE PATTERN THEN SHOW CHILD OPTIONS]**

TP1	**Pattern:** bead, bead, bead, bead____bead (all beads same colour **?** **Responses:** 1 bead of the same colour, 1 bead of different colour, stone, bean **Correct:** bead of same colou	**Incorrect** ☐ **Correct** ☐
TP2	**Pattern:** bean, bead, bean, bead____bead ☐ ☐ ☐ ☐ **?** ☐	**Incorrect** ☐ **Correct** ☐

	Responses: bean, bead of the same colour, bead of different colour, stone **Correct:** bean	
TP3	**Pattern:** stone, bean____bean, stone, bean  **Responses:** bean, beads of two colours, stone **Correct:** stone	**Incorrect** ☐ **Correct** ☐
TP4	**Pattern:** bead, tooth pick, bead___bead, tooth pick (beads of same colour **?**  **Responses:** bead of the same colour, tooth pick, stone, bean **Correct:** tooth pick	**Incorrect** ☐ **Correct** ☐
TP5	**Pattern:** tooth pick, bean, tooth pick___tooth pick, bean **Responses:** bead, tooth pick, stone, bean **Correct:** bean	**Incorrect** ☐ **Correct** ☐
TP6	**Pattern:** bottle cap color A, ___ bottle cap colour A, bottle cap colour B, bottle cap color A, bottle cap colour B **?** **Responses:** bean, block, bottle cap A, bottle cap B, stone, bead **Correct:** bottle cap B	**Incorrect** ☐ **Correct** ☐
TP7	**Pattern:** block, bead of one color, block, bead of one colour___bead of one colour  **Responses:** bean, block, bottle cap colour A, bottle cap B, stone, bead **Correct:** block	**Incorrect** ☐ **Correct** ☐
TP8	**Pattern:** block, bean, stone, block, bean_____  **Responses:** bottle cup, tooth pick, beads of two colours, block, stone **Correct:** stone	**Incorrect** ☐ **Correct** ☐

TP9	**Pattern:** big red square (1) big red square +smaller green square, (2) big red square+smaller green square+smallest red square (3), big red square (4), big red square+smaller green square (5) __ **Responses:** big red square +smallest red square, (A) big red square+smaller green square+smallest red square (B), big red square+smaller green square (C) big red square+smaller green square +smallest red square+smallest green square(D), big red square+smaller green square+big red square (E) big red square **Correct:** big red square+smaller green square+smallest red square (B)	**Incorrect** ☐ **Correct** ☐
TP10	**Pattern:** blue vertical diamond (6) ___blue square (7) blue vertical diamond (8) outline horizontal diamond (9) blue square (10) ☐ ☐ ☐ ☐ ☐ **Responses:** blue horizontal diamond (G) outline horizontal diamond (H) outline vertical diamond (I) outline square (J) blue square (K) blue vertical diamond (L) **Correct:** outline horizontal diamond (H) NB: The pattern items are numbered 6-10. Remember to leave a space for the missing tile___and the response items are lettered G-L	**Incorrect** ☐ **Correct** ☐

ATTENTION
Pencil tapping with delay and shading

Materials: Two pencils (one for assessor, one for the pupil), sheets of papers for shading, timer
Assessors instructions

1. Provide feedback during the practice, after that do not offer feedback
2. Count slowly or use a timer. Record a total number of minutes and seconds to administer
3. Record child's responses
4. Do not score (0=incorrect, 1=correct) until after you have dismissed the child
5. Random taps should be noted

6.

Practice: Have the child sit next to you for the practice

Practice **A**. Tap one time →child should tap two times

Practice **B**. Tap two times →child should tap one times

Practice **C**. Tap three times →child should not tap

Feedback for practice A

If correct: Praise them for the job well done

If incorrect: tell them that they have tried but they have not done accordingly. Therefore, when I tap twice, you should be tapping once and when I tap once then you should tap twice. Thrice means you should not tap. Let's try again

Feedback for practice B and C,

If correct: Say **OK**

If incorrect: **Demonstrate by taking the hand of the child and tap his or her pencil the correct number of times**

NB: Practice two times before starting. Do not practice more than six times

Once you feel that the child has successfully learnt the rules say, now we are going to do this exercise several times. When I tap once, you should do twice and the vice versa. When I tap more than two times, you should not tap.

Item	Wait	Asses taps	Child taps	Score(0-1)		Item	Wait	Asses taps	Child taps	Score (0-1)	
AT1	10	2		☐ 0	☐ 1	AT6	30	3		☐ 0	☐ 1
AT2	30	1		☐ 0	☐ 1	AT7	10	1		☐ 0	☐ 1
AT3	20	3		☐ 0	☐ 1	AT8	30	2		☐ 0	☐ 1

AT4	30	2		☐ 0	☐ 1	AT9	20	3		☐ 0	☐ 1
AT5	20	1		☐ 0	☐ 1	AT10	10	1		☐ 0	☐ 1

				Score(0-1)						Score (0-1)	
AT11	20	3		☐ 0	☐ 1	AT16	30	2		☐ 0	☐ 1
AT12	30	1		☐ 0	☐ 1	AT17	20	1		☐ 0	☐ 1
AT13	10	2		☐ 0	☐ 1	AT18	10	3		☐ 0	☐ 1
AT14	20	2		☐ 0	☐ 1	AT19	30	1		☐ 0	☐ 1
AT15	30	1		☐ 0	☐ 1	AT20	20	2		☐ 0	☐ 1

Start time	**End time**	**Total minutes and seconds**

Random taps (check a box if the child inserts random taps during the wait time)

AT21 ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ **Random Taps** _____

EXPRESSIVE LANGUAGE

Ask the child the following questions, then score the child according to the guidelines below
Say to the child; we are almost finishing; just give me a little time.

1. **Tell me what had impressed among all the things discussed?**
2. **Whom are you staying with?**

0. Child was non-responsive
1. 1 child mumbled a few words that were incomplete and difficult to understand
2. Child said a short sentence in response to each question with grammatical mistakes
3. Child spoke several sentences or more in response to each question but with grammatical mistakes and occasional hard to understand
4. Child responded clearly and in several sentences with few mistakes
5. Child responded in multiple sentences to each question, speaking clearly and in grammatical correct sentences

EL1	Overall assessment	Score

SECTION D: Anthropometric measurement

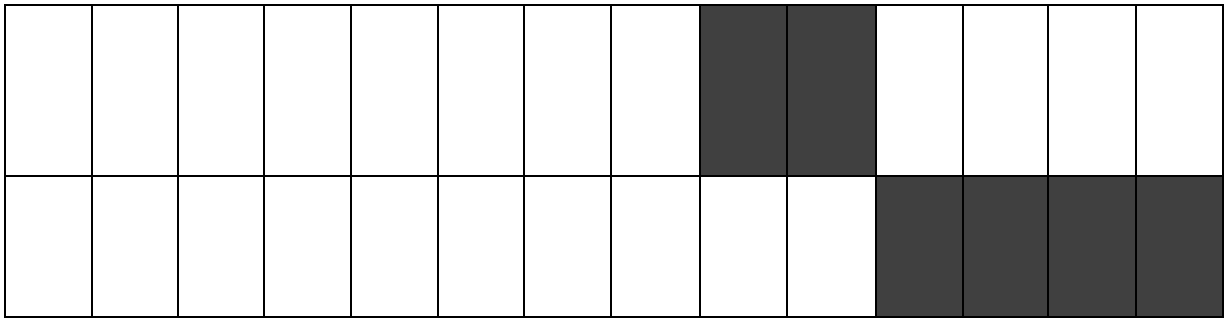
Materials: Scale, height board, Measuring tape (MUAC tape)

Child Measurement		
AN1	Weight of the child without shoes	_____kg
AN2	Height of the child without shoes *Stand a child against a wall and use a clip board to make a right angle between the wall and the top of the child head. Ask the child to hold on the clip board steady and measure from the ground to where the clip board meets the wall*	_____cm
AN3	Mid Upper Arm Circumference (MUAC) Where is the MUAC taken?	Right arm ……1

	Ask the child to stand and let their arm hang down straight with the hand relaxed. Measure the circumference of the child's arm midway between the shoulder and the elbow	Left arm…….2 _____cm

APPENDIX IV: Implementation workplan

		2023 Quarter 4			2024 Quarter 1			2024 Quarter 2			2024 Quarter 3		
Aug	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**



APPENDIX V: Budget and justification

ACTIVITY	DESCRIPTION	QTY	PERIOD	COST	TOTAL
Ethical Clearance	Meal allowance - 1 Researcher 1 x days	1	2	600	12,000.00
Stationery	pages printing x 345x1	200	1	200	800,000.00
Questionnaire translation	Language translation fee	1	3	5,000	35,000.00
Questionnaire pre-testing	Meal allowance for 5 RA and 1 Driver	6	1	1,000	6,000.00
	Fuel 1 Vehicle	20	1	920	8,400
Training of Research Assistants on Questionnaire admin & ODK software	Meal allowance - 5 RA plus a driver x 2 day	6	2	5,000	40,000.00
	Refreshments	6	2	,000	4,000.00
	Hall hire	1	2	0,000	10,000.00
	Stationery 5 questionnaires 20 pages each	5	1	0x200	0,000.00
	Communication	1	1	,600	1,600.00
Actual data collection in Malawi	Meal allowance - 5 RA plus a driver x 10 day	6	10	000	60,000.00
	Fuel per Litre	20	10	920	84,000.00
	Communication	1	1	,000	1,000.00
Data analysis	Lunch - 1 Data analyzer x 7 day	1	7	,000	2,000.00
Report printing and binding	copies	5	1	20x200	20,000.00
Dissemination	Publication	1	1	100,000	100,000.00
Contingency		1	1	100,000	100,000.00
	42,857.15 ZAMBIAN KWACHA	GRAND TOTAL MK			3,000,000.00

APPENDIX VI: Participants' consent form

The University of Zambia, School of Education Department of EPSSE

Dear Sir/Madam,

REF: REQUEST FOR CONSENT AS A RESEARCH PARTICIPANT

I am Kondwani Chavula, a student at The University of Zambia pursuing Master of Education in Early Childhood Care and Development Education. I am requesting you to take part in my research as a participant. The research is about; **"Impact of School Feeding Programme on Anthropometry of Children in Chikwawa District in Malawi".** Your participation is going to help me with reliable and correct information regarding the matter mentioned above. Be assured that the information you will share with me remains confidential and only for academic purposes. Your consent to this request will go a long way.

Yours Faithfully,

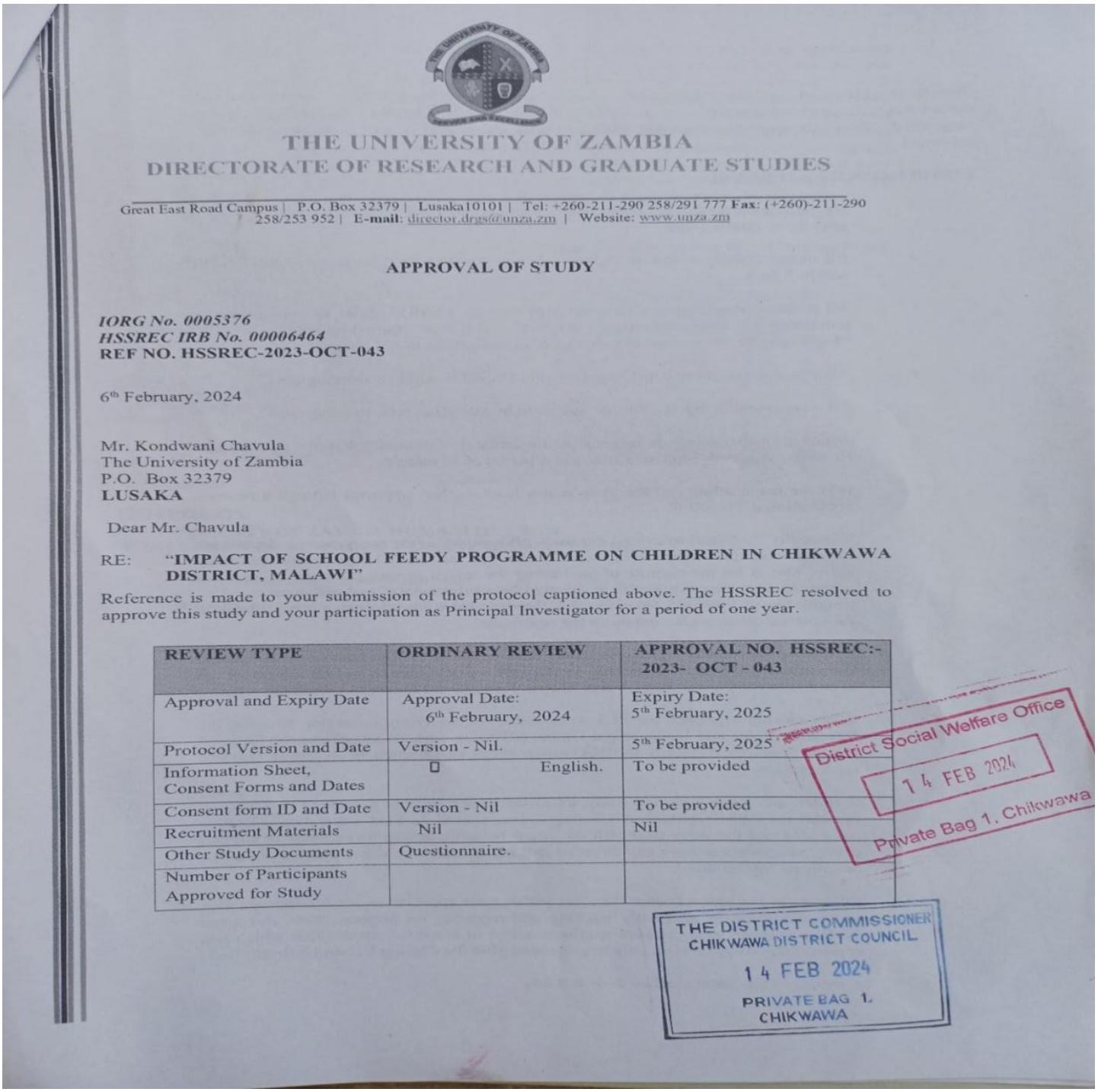
…… (Sign) Kondwani Chavula – Researcher

Consent by participant

Having read or heard the information concerning this research, I hereby consent by virtue of office/position/parent to be one of the participants. In this regard, I reserve the right not to answer particular questions if necessary.

Name: …… Sign: …….....……Date: ….....

APPENDIX VII: Ethical Clearance Approval



THE UNIVERSITY OF ZAMBIA
DIRECTORATE OF RESEARCH AND GRADUATE STUDIES

Great East Road Campus | P.O. Box 32379 | Lusaka10101 | Tel: +260-211-290 258/291 777 Fax: (+260)-211-290 258/253 952 | E-mail: director.drgs@unza.zm | Website: www.unza.zm

APPROVAL OF STUDY

IORG No. 0005376
HSSREC IRB No. 00006464
REF NO. HSSREC-2023-OCT-043

6th February, 2024

Mr. Kondwani Chavula
The University of Zambia
P.O. Box 32379
LUSAKA

Dear Mr. Chavula

RE: **"IMPACT OF SCHOOL FEEDY PROGRAMME ON CHILDREN IN CHIKWAWA DISTRICT, MALAWI"**

Reference is made to your submission of the protocol captioned above. The HSSREC resolved to approve this study and your participation as Principal Investigator for a period of one year.

REVIEW TYPE	ORDINARY REVIEW	APPROVAL NO. HSSREC:-2023- OCT - 043
Approval and Expiry Date	Approval Date: 6th February, 2024	Expiry Date: 5th February, 2025
Protocol Version and Date	Version - Nil.	5th February, 2025
Information Sheet, Consent Forms and Dates	☐ English.	To be provided
Consent form ID and Date	Version - Nil	To be provided
Recruitment Materials	Nil	Nil
Other Study Documents	Questionnaire.	
Number of Participants Approved for Study		

District Social Welfare Office
14 FEB 2024
Private Bag 1, Chikwawa

THE DISTRICT COMMISSIONER
CHIKWAWA DISTRICT COUNCIL
14 FEB 2024
PRIVATE BAG 1,
CHIKWAWA

- All protocol modifications must be approved by HSSREC by way of an application for an amendment prior to implementation unless they are intended to reduce risk (but must still be reported for approval). Modifications will include any change of investigator/s or site address or methodology and methods. Many modifications entail minimal risk adjustments to a protocol and/or consent form and can be made on an Expedited basis (via the IRB Chair). Some examples are: format changes, correcting spelling errors, adding key personnel, minor changes to questionnaires, recruiting and changes, and so forth. Other, more substantive changes, especially those that may alter the risk-benefit ratio, may require Full Board review. In all cases, except where noted above regarding subject safety, any changes to any protocol document or procedure must first be approved by HSSREC before they can be implemented.

Should you have any questions regarding anything indicated in this letter, please do not hesitate to get in touch with us at the above indicated address.

On behalf of HSSREC, we would like to wish you all the success as you carry out your study.

Yours faithfully,

District Social Welfare Office
14 FEB 2024
Private Bag 1, Chikwawa

Dr. J. I. Ziwa

DR. J. I. Ziwa

CHAIRPERSON
THE UNIVERSITY OF ZAMBIA HUMANITIES AND SOCIAL SCIENCES RESEARCH ETHICS COMMITTEE - IRB

cc: Director, Directorate of Research and Graduate Studies
Assistant Director (Research), Directorate of Research and Graduate Studies
Assistant Registrar (Research), Directorate of Research and Graduate Studies

University of Zambia
P.0.BOX 10101
Lusaka
Zambia
12th February 2024
Cell: +260951588935

The District Commissioner
Chikwawa District Council
P/Bag 3
Chikwawa
CC: District Social Welfare Officer
: Director of Education

Dear Sir

RE: AUTHORIZATION FOR COLLECTION OF DATA FOR RESEARCH AS FULFILMENT MASTERS DEGREE

I am Kondwani Chavula, student at University of Zambia pursuing postgraduate studies in MED-ECD following the award of scholarship by World Bank under Investing in Early Years Project for Growth and Productivity (IEYP).

My writing is to request for authorization to collect data in Community Based Care Centres that are implementing School Feeding Programme in Chikwawa District. My research topic "**IMPACT OF SCHOOL FEEDING PROGRAMME ON ANTHROPOMETRY OF CHILDREN IN CHIKWAWA DISTRICT**".

The council is implementing School Feeding Programme in primary schools and Community Based Child Care Centres in Chikwawa District with an aim of retaining children in schools and reducing school drop outs. However, research done in other countries has shown that apart from school retention, School Feeding Programme has also shown to have an impact on nutrition status of children. This has a profound impact on the cognitive functioning hence improved education outcome.

Therefore, I would like to seek your authorization to conduct the study in your district to assess the impact of the programme on the nutrition status and learning outcome. This will not only help in policy development but also it will save as a baseline data for the programme in Chikwawa District.

Your consideration in this matter will be highly appreciated

Yours Faithfully

Kondwani Chavula

Approved
DC 14/2/2024

THE DISTRICT COMMISSIONER
CHIKWAWA DISTRICT COUNCIL
14 FEB 2024
PRIVATE BAG 1,
CHIKWAWA

District Social Welfare Office
14 FEB 2024
Private Bag 1, Chikwawa

Phone :(+265) 0 999342402/081804552
Fax mail :(265) 01 420 214
Email: kambanardin@yahoo.co.uk

Communication should be addressed to:
District Commissioner,
Chikwawa District Council,
Private Bag 1,
Chikwawa.
Malawi
12 February 2024

TO WHOM IT MAY CONCERN

Dear Sir,

REF: AUTHORISATION LETTER FOR MR. KONDWANI CHAVULA

I am writing to authorise Kondwani Chavula to collect data in schools in Chikwawa District for the study he is conducting **entitled IMPACT OF SCHOOL FEEDING PROGRAMME ON ANTHROPOMETRY OF CHILDREN IN CHIKWAWA DISTRICT IN MALAWI.**

Mr. Chavula is a MED-ECD currently studying at the University of Zambia. He would like to conduct a study to assess the impact of school feeding programme on anthropometry and learning outcome.

His research has potential to not only improve the School Feeding Programme in Chikwawa District through provision of baseline data for the programme but also informing policies on school feeding programme.

I therefore recommend Mr. Chavula for any support needed for him to conduct his study.

If you need further information, please contact me at kambanardin@yahoo.co.uk.

Yours sincerely,

THE DISTRICT COMMISSIONER
CHIKWAWA DISTRICT COUNCIL
14 FEB 2024
PRIVATE BAG 1,
CHIKWAWA

District Social Welfare Office
14 FEB 2024
Private Bag 1, Chikwawa

Nardin JB Kamba
DISTRICT COMMISSIONER