

**(COMPLETED RESEARCH)**

**THE DETERMINANTS OF MALNUTRITION IN CHILDREN BELOW FIVE YEARS AT  
SESHEGO DISTRICT HOSPITAL, CAPRICORN DISTRICT, LIMPOPO PROVINCE,  
SOUTH AFRICA**

**By**

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**DECLARATION**

I hereby declare that this dissertation is submitted by me to the University of Limpopo, for the degree of Master in Public Health and it has not previously been submitted for a degree at this or any other institution. It is my work in design and in execution, and that all the material contained herein has been duly acknowledged.

Signature.....

Date:.....

## **DEDICATIONS**

This dissertation is dedicated to my daughter Seage Omogau Mmako. I want her to keep in mind that it is never too late to progress academically. I want her to look up to me when she will be walking her academic journey.

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## **ABSTRACT**

### **Background**

Malnutrition is one of the big problems of public health in developing countries. It is still a persistent public health issue particularly among the poorest and vulnerable groups. Malnutrition of children below the age of 5 put more burden on health systems of most countries. It accounts for high morbidity and mortality in children below the age of five years. The nutritional status of children below five years can also be used to measure the outcome for children's health. It is therefore important to provide good nutrition to children as an important factor of general well-being.

### **Methods**

The study was quantitative and retrospective in nature. The prevalence of malnutrition and the factors that contribute to malnutrition was quantified. The researcher has no control over the exposure. Population was the existing records of children below five years admitted at Seshego district hospital with malnutrition between January 2017 and December 2021. The study was probable, simple random sampling method was used whereby files was selected randomly from the patient filing register. The data collecting tool was developed and it was divided into three sections: the immediate factor questions, intermediate factor questions and distal factor questions. Descriptive statistical analysis was undertaken using the STATA statistical software version 6A for Windows (STATA Corporation, College Station, Texas) in order to identify frequencies and percentages of answers to the research questions. The statistical significance of the relationships between the selected variables was determined using the t-test. The level of significance was set at 0.05.

### **Findings**

The results showed that most of the children were in the age group 1year-1year 11 months at 46.5%. The prevalence showed that SAM was high at 59.5% and MAM was low at 40,9%. The prevalence of MAM and SAM stratified by the age of the child showed that children below 1 year, 41.9% of them have MAM and 41,1% have SAM. The severity of malnutrition decreased with the increase of the age of the child. The current study showed that statistically there is no significance among the variables in terms of the determinants. The P-values are above 0.05.

**Conclusion**

The study had showed high rate of MAM and SAM. This will urge the public health sector to put the interventions in place to prevent malnutrition from primary stage. In the future a further study with primary data should be done to examine the determinants of malnutrition among children below 5 years.

**Key words:** Malnutrition, prevalence, determinants, children

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## **DEFINITION OF CONCEPTS**

**Children:** Children refers to humans 18 years or younger unless national law defines a person to be an adult at an earlier age (UNICEF, 1990). In these current study children refers to a human beings below the age of five years.

**Determinants:** Determinants are causes and other factors that influence the occurrence of disease and other health related events (Kreiss, 2016). In this study, determinants refers to all factors that contribute to malnutrition in children below five years.

**Malnutrition:** Malnutrition in all its forms includes under-nutrition (wasting, stunting and underweight), inadequate vitamins or minerals, overweight, obesity, and resulting diet-related non-communicable diseases (WHO, 2013). In this study malnutrition, mean under-nutrition (wasting, stunting and underweight).

## **ABBREVIATIONS**

BMI	Body Mass Index
CP	Cerebral palsy
HIV	Human Immunodeficiency Virus
INP	Integrated Nutrition Programme
SAHR	South African Health Review
SDG	Sustainable development goals
SPSS	Statistical Package for Social Sciences
TB	Tuberculosis
TREC	Turfloop Research and Ethics Committee
UNICEF	United Nations Children's Fund
WHA	World Health Assembly
WHO	World Health Organization

## CHAPTER 1: GENERAL ORIENTATION OF THE STUDY

### 1.1. Introduction

In this study malnutrition as under-nutrition was looked into, whereby stunting is proportion of children with height for-age below  $-2$  standard deviations (SD), underweight is proportion of children with weight-for-age below  $-2$  SD and wasting is proportion of children with weight for-height below  $-2$  SD. Under-nutrition can present with severe acute malnutrition (SAM) or moderate acute malnutrition (MAM). SAM is defined by two distinct clinical entities: 1. Severe wasting (weight for height below-3 SD) in children aged 0 to 59 months, 2. Nutritional oedema (Williams & Berkley, 2016). MAM is defined as a weight-for-age between -3 and -2 z-scores below the median of the WHO child growth standards. It can be due to a low weight-for height (wasting) or a low height-for-age (stunting) or to a combination of both (WHO, 2013).

The determinants of malnutrition were complex and interrelated (Adeyonu, Obisesan & Balogun, 2022). They were either immediate determinants, intermediate or distal determinants (Boah, Azupogo, Amporfro & Abada, 2019).

Malnutrition showed to be one of the problems of public health in developing countries. It accounted for high morbidity and mortality in children below the age of five years. It is therefore important to provide good nutrition to children as an important factor of general well-being. The nutritional status of children below five years can also be used to measure the outcome for children's health (Yirga, Mwambi, Ayele & Melesse, 2019). The WHO African Region report on Nutrition showed that the current nutritional status of countries in relation to the six primary outcomes achievable by 2025, malnutrition was still a persistent public health issue particularly among the poorest and vulnerable groups (Day, Gray & Ndlovu, 2018). According to WHO statistics, it showed that 49 million children under five years are wasted, 17 million are severely wasted and 149 million are stunted. Around 45% of deaths among children below 5 years are due to under nutrition. These deaths mostly occur in low and middle-income countries (WHO, 2018). Out of 47 countries in the WHO African Region, 25 either have high ( $> 30\%$ ) or very high ( $> 40\%$ ) rates of stunting (Day et al., 2018). In 2016, Sub-Saharan Africa reported an increase of stunting of children

below five years at 33%. 16% of the children were underweight and 8% were wasted (Nankinga, Kwagala &Walakira, 2019).

South Africa also had a burden of Malnutrition of children below five years, whereby prevalence of stunting is at 27% that is more than the target average of 25% for developing countries, however South Africa's prevalence of wasting is at 2,5% which is less than the target 8,9% (UNAIDS, 2019). Immediate initiation of breastfeeding, exclusive breastfeeding for the first six months, adequate complementary feeding from six months, continued breastfeeding and meals at early child development centres were interventions to improve nutrition in children below the age of five years as put in the South African child gauge (May, Witten & Lake, 2020).

The South African social protection system on poverty relieve had improved dramatically since 1994 (Devereux & Waidler, 2017). Nearly half of households in poverty-stricken provinces received one social grant provided by the government. The biggest part of the grants was child support grant, which is about two in every three children under the age of eighteen. Regardless of a report given in a research done it was shown that in the last 20 years food insecurity had gone down but the challenge of chronic malnutrition among children below five years was still high. South Africa was at number 70 out of 132 in the 2016 global nutrition report (Devereux & Waidler, 2017).

Limpopo province as one of the nine provinces in South Africa provided child support grant. Child support grant was the country's biggest program of poverty alleviation in children and Limpopo province was the third in the provision of child grant. It covered 14% of all the children receiving the grant in the country (May et al, 2020). In one study in Limpopo province 60% of mothers started breastfeeding in the first hour of birth, 83% continued with breastfeeding during the two years of life and 75% reported the importance of starting complementary feeding at six months (Motadi, Malise & Mushaphi, 2019). Beyond all the interventions of alleviating malnutrition, Limpopo province was at the third place with hospital admissions and death of children with severe malnutrition in South Africa (Modjadji & Mashishi, 2020).

WHO and UNICEF reports clearly that those children who survive malnutrition, most present with impaired ability to resist most illnesses (Jude, Chukwunedum & Egbuna, 2019). In one study it was shown that malnutrition in children contribute to high mortality and morbidity (Awasthia , Vermaa , Sanghvib & Frongilloc, 2019). Malnutrition of children below five years is a health burden that will lead to immediate health problems like child mortality, child morbidity or disability. The long term health problem like shorter adult height, lower attained schooling, reduced economic productivity and lower offspring birth weight can also be a challenge (Ortiz , Van Camp , Wijaya , Donoso , & Huybregts , 2014).

## **1.2. Research problem**

South African government had put many interventions (social grant, social food packages and nutritional supplementation) in place to eradicate malnutrition in children aged between 0 to 18 years (Devereux & Waidler, 2017). Although the target population of this study, those under 5 years, were adequately covered by various social grants in place, it had been observed that some of the children admitted at Seshego hospital had reported malnutrition. It confirmed further by a study conducted in parts of the Limpopo province where it was reported that some of the children were underweight while others had stunting due to malnutrition (Kekana, Mabapa & Mbhenyane, 2020).

Unfortunately, despite government interventions, the researcher had observed that Seshego hospital still admit children below five years with malnutrition. In the assessment of the researcher, in a period of a month, the hospital might admit 2 to 7 children with moderate acute malnutrition to severe acute malnutrition (underweight, stunting and wasting). In some instances, these children could present with clinical manifestations of malnutrition such as hypoglycaemia, hypothermia, diarrhoea and vomiting. Most importantly, some of these malnourished children presented with delayed milestones that might lead to high rate of morbidity and mortality. Although it was anticipated that, due to government' social programmes as indicated above, the quality of children under social care grant would improve relatively, thus eliminating cases of unwarranted malnutrition, it was not clear what caused malnutrition in children below five years. Therefore,

the researcher will seek to determine the determinants of malnutrition among children below five years who sought health care at Seshego Hospital in Limpopo Province.

### **1.3. Preliminary literature review**

A good literature review should be substantive, thorough and sophisticated in order to produce a substantive, thorough and sophisticated research. “Good” research is good because it advances our collective understanding. A good researcher should understand the literature in the field of study (David, Boote & Penny, 2005). The researcher described the relevant available literature of malnutrition among children below five years. The prevalence and the determinants of malnutrition among children below five years was presented.

### **1.4. Purpose of the study**

The aim of this study was to investigate the determinants of malnutrition in children below five years admitted at Seshego district hospital from January 2017 to December 2021.

### **1.5. Objectives**

- To determine the prevalence of malnutrition in children below five years admitted at Seshego district hospital from January 2017 to December 2021.
- To determine the determinants of malnutrition in children below five years admitted at Seshego district hospital from January 2017 to December 2021.

### **1.6. Aim of the study**

To investigate the prevalence of malnutrition and its determinants in children below five years at Seshego district hospital.

### **1.7. Research methodology**

This study was quantitative and retrospective in nature. Quantitative research deals with quantifying and analysing variables in order to get result (Apuke, 2017). In this study, the prevalence of malnutrition and the factors that contributed to malnutrition was quantified. The pre-existing files of the subjects was used. This



study was retrospective study. Retrospective research design is a study that uses existing data that have been recorded for reasons other than research (Hess & Faarc, 2013). In this study, the existing files of children below 5 years with malnutrition was used. The relationship between the causes (factors) and the outcome (malnutrition among children) was investigated. The study was conducted at Seshego District hospital in the Polokwane Municipality in the Capricorn District of the Limpopo Province, South Africa. Seshego district hospital is one of the eight hospitals in the district. It is situated in Polokwane West part of the Capricorn District Municipality. Polokwane West has urban area, semi-urban area, rural area and informal settlement area. Seshego district hospital is a 180 beds capacity institution. The hospital is divided into five wards. One of the wards is a paediatric ward with 30 beds capacity. The hospital serves eleven (11) clinics and all these clinics offer child health services. This study area was chosen because Seshego district hospital serves large part of Polokwane municipality. It also makes a good study area for this study, because urban areas, semi-urban, rural area and informal settlement areas surround it.

### **1.8. Significance of the study**

Identifying the determinants of malnutrition in children below five years will assist the health professionals with information to be emphasized when advising mothers on prevention of malnutrition in children below five years. The mothers will use the information to prevent malnutrition from children. The information gathered during this study will help the health care professionals during the campaigns on child health particularly child nutrition. The study will help the health care workers, the health department and policy makers to work towards the achievement of the Sustainable Development Goal (SDG) 3, which is to reduce the mortality of children below five years.

### **1.9. CONCLUSION**

The extent and the challenges of malnutrition among children below five years was clearly covered globally, nationally and locally. The purpose, the objectives and the aims of the study was documented. The significance of the study was highlighted clearly.

## **CHAPTER 2: LITERATURE REVIEW**

The following chapter describes the relevant available literature of malnutrition among children below five years. The definition of malnutrition, prevalence and the determinants of malnutrition among children below five years was presented. The literature was searched from 2015 to 2022. The literature review was informed by literature retrieved from search engines such as Google scholar and Pub-med.

### **2.1. The global prevalence of malnutrition**

Malnutrition affected most of the children globally (Tariku, Bikis, Woldie, Wassie & Worku, 2017). Global nutrition report of 2020 showed a significant burden of global malnutrition among children below five years (Global Nutrition Report, 2020). In 2016, 52 million of children below five years were reported to be wasted and 17 million were severely wasted globally. This had put the prevalence of wasted children at 7.7 percent and 2.5 percent were stunted (Arhin, 2019). Malnutrition has shown to be one of the top killers in low and middle income countries with prevalence ranging from 0.1% in Guatemala and Peru to 9.9% in Timor-Leste (Fagbamigbe et al., 2020). This was also supported by the fact that nearly half of all death of children in the low and middle-income countries are due to malnutrition (Nankinga et al., 2019).

### **2.2. Malnutrition in Africa**

Africa and Asia were shown to contribute to the highest percentage of malnutrition globally. They contribute to about a third of all malnutrition cases globally (Akombi, Agho, Merom, Hall & Renzaho, 2017). The rate of stunting and wasting was reported to be above the global estimates in Africa, 39% of children were wasted and 27% was stunted (Boah *et al.*, 2019) Malnutrition has been on the rise in Nigeria, wasting and under-nutrition was at 18% and 29% respectively. Stunting has shown to reduce from 42% to 37% in 2013 (Akombi *et al.*, 2017). Rwanda is no different to other African countries, it recorded 36,7% of stunted children and 14% of severely malnourished children in the 2014/2015 demographic survey (Nishimwe, 2019). A study done in Nigeria found that of the 162 million children under five years who were stunted, in a study in 36% reside in Africa and 56% reside in Asia (Kalu, & Etim, 2019). It was highlighted by Acquah, Darteh, Amu & Adjei, (2019) that if Ghana government does not emphasize the interventions to

fight under-nutrition, it might not meet the SDG target to eradicate under-nutrition by 2030.

### **2.3. Malnutrition in South Africa**

South Africa as one of the developing countries contribute to the highest global burden of wasted children below five years (Tariku *et al.*, 2017). This was also shown by the fact that the Sub-Saharan African countries including South Africa are still having childhood malnutrition as a major challenge (Modjadji & Madiba, 2019). The prevalence of stunting for South African children was very high (>40%) between the ages of 18 and 27 months and generally increased between the ages of 8 and 23 months. The SAHR of 2018 showed stunting of children below 5 years at 27% and 22% at country level and in Limpopo Province respectively (Day *et al.*, 2018). Stunting was also found to be very prevalent in a study that was done in South Africa in the study setting consisting of urban, peri-urban and informal settlement areas (Madiba, Chelule & Mokgatle, 2019). One study done at Sekhukhune District in Limpopo province also showed that about 39% of children below 5 years were stunted, which is a health concern (Phooko-Rabodiba, Tambe, Nesamvuni & Mbhenyane, 2019).

### **2.4. The determinants of malnutrition**

The factors associated with malnutrition are found to be complex (Akombi *et al.*, 2017). The factors of malnutrition can be either direct which are inadequate dietary intake and presence of a disease or indirect which are age of the mother or place of resident. These factors are based on the nature of the relationship. These factors can further be divided into immediate factors, intermediate factors or distal factors. The immediate factors are those factors at the level of the child, intermediate factors are environmental and maternal factors and distal factors are socioeconomic and cultural factors (Boah *et al.*, 2019).

#### ***2.4.1 Immediate factors***

The immediate factors related to malnutrition are dietary diversity and breastfeeding; birth-weight and birth order number; and presence of illness. The

scientific based information suggests on several studies that insufficient quality and quantity of complementary feeding have adverse impact on child's growth and development (Cordelia, Subapriya & Pa, 2019 and Kekana et al., 2020). Given the path to malnutrition of children below five years, there is a need for community awareness and information giving on malnutrition. Secondly there should be awareness on optimal breastfeeding and good complementary Feeding (Awasthi *et al.*, 2019). The cultivated farm size was shown to be the key determinant of malnutrition in children below the age of five years in rural areas in Southwest Nigeria (Adeyonu *et al.*, 2022).

The birth weight and birth number of a child was identified as determinants of both wasting and stunting in children below five years (Boah *et al.*, 2019). A child who is number three or more in birth order is likely to be malnourished (Kumar *et al.*, 2019). Prevalence of diarrhoea was found to be related to acute malnutrition, which will lead to chronic growth faltering if not treated (Ortiz *et al.*, 2014). Children who suffers from illness or have fever two weeks before the study take place can have weight faltering (Akombi *et al.*, 2017).

#### **2.4.2. Intermediate factors**

The intermediate factors related to malnutrition are mother's age; mother's nutritional status; mother's autonomy and household size; and access to health services (Nankinga *et al.*, 2019 and Kumar *et al.*, 2019). Mothers with good nutritional status are less likely to have malnourished children (Ortiz *et al.*, 2014; kombi *et al.*, 2017 and Kumar *et al.*, 2019). High woman's autonomy is associated with low odds of malnourished children. These women had the power to give their children proper diet (Tariku *et al.*, 2017; Boah *et al.*, 2019 and Nankinga *et al.*, 2019). The families who have more children have high chances of having malnourished children. It was also shown that children born to woman with multiple birth can have negative health outcomes ( Frempong & Annim, 2017; Kumar *et al.*, 2019 and Boah *et al.*, 2019). Place of delivery has been shown to be associated with malnutrition (Ortiz *et al.*, 2014; Akombi *et al.*, 2017 and Nankinga *et al.*, 2019). Children born at home were more vulnerable

to wasting and underweight as compared to 38.6% of children born at a health facility, this was shown by 61.4 and 38.6 alternatively (Akombi *et al.*, 2017).

### 2.4.3. Distal factors

The distal factors related to malnutrition are socio-economic status; family literacy level and educational level of the mother; and demographic area of the children. The odds of malnutrition was shown to be high with poverty (Ortiz *et al.*, 2014; Nankinga *et al.*, 2019 and Boah *et al.*, 2019). The communities with low employment rate in low and middle income rate countries have shown high prevalence of malnutrition among children below five years (Fagbamigbe *et al.*, 2020). In India it was concluded that poor socio economic status is a responsible factor for malnutrition (Qureshi, Kazi, Memon & Khan, 2019). Improving the mother's work status will improve her economic status that will consequently improve the basic needs of their children including their nutritional status (Yirga *et al.*, 2019). In South Africa, the poor purchasing power and the low income in the family was clearly documented that are determinants of childhood malnutrition (Phooko-Rabodiba *et al.*, 2019).

The malnutrition among children below five years decreased in the communities with high illiteracy rate in the low and middle income countries (Akombi *et al.*, 2017; Boah *et al.*, 2019 and Nankinga *et al.*, 2019). In India the odds of malnutrition increased significantly if the mother had lower level of education (Ambadekar & Zodpey, 2017). Poor maternal knowledge has been shown to form path to malnutrition among children below two years in North India (Awasthi *et al.*, 2019). Three different studies done in South Africa support the fact that if mothers have poor knowledge or low education can ultimately lead to increased rate of malnutrition among children. Educating mothers to improve the acceptability of health interventions are shown to improve the nutritional status of children, the nutritional knowledge of caregivers is required to know the type and quality of food to be given to children and the accessibility of nutritional health knowledge to the caregiver (Madiba, Chelule & Mokgatle, 2019; Phooko-Rabodiba *et al.*, 2019 and Modjadji & Madiba, 2019). A study done in Ghana forecasting variation in the risk of malnutrition among children

below five years, recommended that improving maternal education in addressing childhood malnutrition can be given a greater consideration (Aheto, Taylor & Keegan, 2017).

Children resided in rural area are more likely to be undernourished when compared to children residing in the urban areas (Akombi *et al.*, 2017; Tariku *et al.*, 2017; Kumar *et al.*, 2019; Nankinga *et al.*, 2019 and Boah *et al.*, 2019). Evidence from the backward district of India clearly stated that the children who are particularly from the rural areas are more vulnerable to malnutrition because they receive food with low nutritional value. It was also shown that the demographic factors influence the nutritional status of the vulnerable children, particularly those below five years (De & Chattopadhyay, 2019).

## **2.5. Public health intervention**

The public health interventions to prevent and control malnutrition includes amongst others the Infant and young and young child feeding; feeding practices; and social family support. The association of feeding practises and malnutrition among children below five years have been clearly documented (Ambadekar & Zodpey, 2017). Optimal breastfeeding is an important source of nutrients and it can save more than 820 000 children under the age of five yearly (WHO, 2018). WHO and UNICEF recommends the following for a child to have optimal breastfeeding:

- Early initiation of breastfeeding within one hour of birth,
- Exclusive breastfeeding for the first six months of life and introduction of nutritionally-adequate and safe complementary foods at six months together with continued breastfeeding up to two years of age or beyond (WHO, 2018).
- At the age of six months, the child needs more energy and nutrients, which exceeds the supply from breast milk.
- Complementary foods should be given to meet the children's needs. If the foods are not started or are given inappropriately the child's nutritional status may falter ( WHO, 2018).

South African government has put in place integrated nutrition programme (INP) strategy to prevent and manage malnutrition (Enstrom & Pettersson, 2016). INP focus on the following areas: maternal nutrition, infant and young child feeding, youth and adolescent nutrition, disease specific nutrition support, community based nutrition, nutritional treatment and counselling, micronutrient malnutrition control, nutrition promotion, education and advocacy (Enstrom & Pettersson, 2016).

## **2.6. Conclusion**

It was clearly documented that malnutrition of children below five years was still a public health challenge. The scientific data showed that there were factors that influenced the nutritional status of children below five years. Therefore, it was important that the current study took place in order to identify the prevalence and factors that contributed towards malnutrition in the study setting.

## **CHAPTER 3: RESEARCH METHODOLOGY**

### **3.1. Introduction**

The current chapter explains the steps that the researcher took in selecting the study population, the study sample and the method used. It also includes the type of systems the researcher used when analyzing the data collected. An emphasis was placed on ethical considerations, significance of the study and study limitations.

### **3.2. Study design**

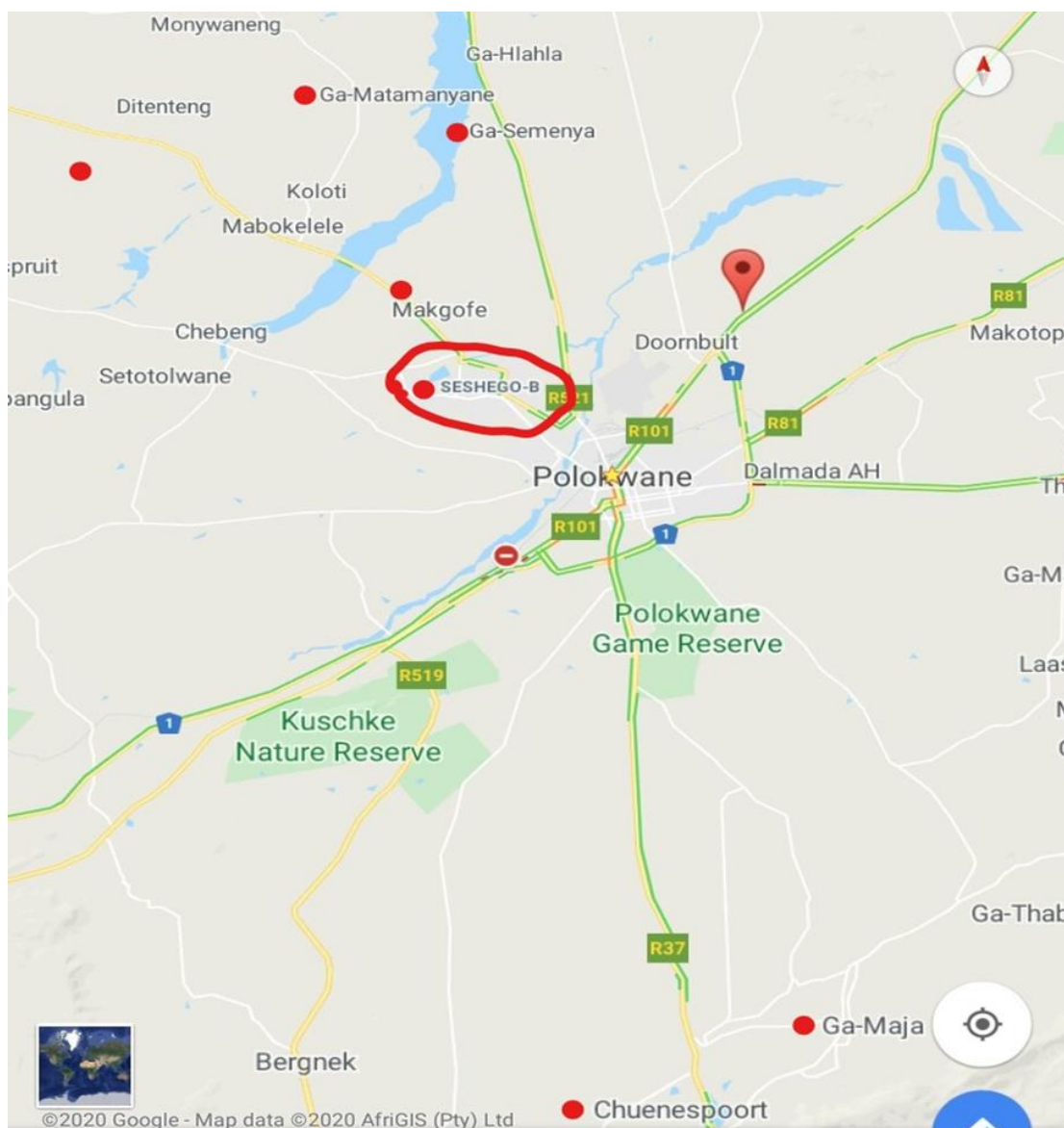
This study was quantitative and retrospective in nature. Quantitative research deals with quantifying and analysing variables in order to get result (Apuke, 2017). In this study, the prevalence of malnutrition and the factors that contribute to malnutrition was quantified. The pre-existing files of the subjects was used. This study was retrospective study. Retrospective research design is a study that uses existing data that have been recorded for reasons other than research (Hess & Faarc, 2013). In this study, the existing files of children below 5 years with malnutrition was used. The relationship between the causes (factors) and the outcome (malnutrition among children) was investigated.

### **3.3. Study setting**

The study was conducted at Seshego District hospital in the Polokwane Municipality in the Capricorn District of the Limpopo Province, South Africa. Seshego district hospital is one of the eight hospitals in the district. It is situated in Polokwane West part of the Capricorn District Municipality. Polokwane West has urban area, semi-urban area, rural area and informal settlement area. Seshego district hospital is a 180 beds capacity institution. The hospital is divided into five wards. One of the wards is a paediatric ward with 30 beds capacity. The hospital serves eleven (11) clinics and all these clinics offer child health services. This study area was chosen because Seshego district hospital serves large part of Polokwane municipality. It also makes a good study area for this study, because urban areas,



semi-urban, rural area and informal settlement areas surround it. The map of Seshego hospital catchment area was attached below:



**Figure 1:** Map of Polokwane municipality showing Seshego Hospital and the catchment areas.

### 3.4. Study population

A population refers to any collection of specified groups of human beings or of non-human entities such as objects, educational institutions, time units, and geographical areas, prices of wheat or salaries drawn by individuals (Wani, 2017). Population was the records of children below five years admitted at Seshego

district hospital between January 2017 and December 2021. The hospital admits 1000 to 1500 children below 5 years in a year.

### **3.5. Sampling strategy**

Sampling strategy is a process of taking a subset from chosen sampling frame or entire population (Taherdoost, 2017). In this study, the secondary data was used. Records of children admitted at Seshego hospital Paediatric ward between January 2017 and December 2021 was used. The files were retrieved using the paediatric ward admission register book. The statistics register at dietetics section was also used, as the section also deals with children admitted with malnutrition, this was used to determine determinants of malnutrition. All the files of children below five years admitted at Seshego district hospital with malnutrition was used to determine the prevalence of malnutrition. Not all children with malnutrition are referred to dietetics service. Therefore, both statistics registers were used. The files were retrieved from filling room with permission from the hospital accounting officer.

#### *3.5.1. Inclusion criteria*

All patients record of children below five years admitted with malnutrition at Seshego Hospital from January 2017 to December 2021 was included in the study.

#### *3.5.2. Exclusion criteria*

All patients' records of children admitted at Seshego Hospital from January 2017 to December 2021 with incomplete information such as diagnosis, demographic and socio-economic status and children with congenital abnormalities.

### **3.6. Sampling method**

Simple random sampling is a sampling method that is done in a systematic way to ensure as far as possible complete objectivity in the selection of the sample (Hunter, 2003). The sample has to be selected to be representative of the target population and in enough numbers to provide valid answers. In this study, it was a

probability, simple random sampling method whereby files were selected randomly from the patient filing register. The included participating files of the patients from the filing register book was attached to a code. Files were supposed to be selected randomly with equal chance of participating, however due to the fact that the population size was small and other files were without documents all the files found were used for data collection.

### 3.7. Sample size

It is difficult that researcher can be able to collect data from all cases to answer the research questions. Therefore, it is important to select sample. Researchers have neither time nor the resources to analysis the entire population so they apply sampling technique to reduce the number of cases. The subset with manageable number of cases is the sample size (Taherdoost, 2017).

The Cochran formula:  $n = \frac{z^2 p (1-p)}{e^2}$  is the formula that was used for calculating the sample size of the study. The Cochran formula was used because the sample size is for categorical data (Taherdoost, 2017).

N is the required sample size

P is the percentage occurrence of a state or condition and in this study, the current South African percentage of malnutrition of children less than 5 years with malnutrition is 31.3 % (this include 5.9% underweight, 2.5% wasting and 22.9% of stunting) (Day et al., 2018).

E is the percentage maximum error required which is 5%

Z is the value corresponding to the level of confidence required which is 1.96 (Taherdoost, 2017).

$$n = \frac{z^2 p (1-p)}{e^2}$$

$$= \frac{1.96 * 0.626 (1 - 0.313)}{(0.05)^2}$$

$$= 339$$

10% will be added to compensate for nonresponse, which bring the total sample to 373. This sample size was used to determine the determinants of malnutrition in children below five years. The prevalence of malnutrition in children below five years

was determined using the number of all children below five years admitted at Seshego district hospital. In this study 314 files were found for the study period from 2017 to 2021. Only 218 were used to collect data. The other files were not used due to the fact that they were without complete notes.

### **3.8. Pilot study**

A pilot study is conducted on a smaller scale than the main or full-scale study. It is important for improvement of the quality and efficiency of the main study. It is conducted in order to assess the safety of interventions and recruitment potentials. The pilot study increases the researchers' experience with the study methods for the study in hand (In, 2017). In this current study the researcher did the pilot study with the patient file of children admitted with malnutrition at Seshego district hospital for a period of three months. The files of patients admitted from January 2021 to March 2021 was used to pilot the data tool. The results found was used to adjust the data tool accordingly before the start of actual study.

### **3.9. Data collection**

Data collection is an important part of any research study. It plays a significant role in obtaining accurate results for any research study. To get accurate results is highly dependent on collecting the appropriate data from reliable source (Salian and Harisekaran, 2015). Secondary data were used where data was collected from medical records of the children below five years who were admitted with malnutrition at Seshego district hospital. A data collecting tool was used to collect the data. The data collecting tool was developed by the researcher, guided by the UNICEF framework of malnutrition. It was divided into three sections: the immediate factor questions, intermediate factor questions and distal factor questions. The supervisor validated the data tool. The pilot study was also done as part of the validation of the data tool. The questions were short and close ended. The researcher with the help of the assistant (dietetics head of section at Seshego hospital) filled in the data collecting tool.

### **3.10. Data analysis**

Data Analysis is in short, a method of putting facts and figures to solve the research problem. The data obtained from a study may be in numerical or Quantitative form. If they are not in numerical form, a Qualitative analysis based on the experience of the participants can be carried out (Ashirwadam, 2014). Data was analysed guided by the aim and objectives of the study. An excel software was used to organize the data. Descriptive statistical analysis was undertaken using the STATA statistical software version 6A for Windows (STATA Corporation, College Station, Texas) in order to identify frequencies and percentages of answers to the research questions. The statistical significance of the relationships between the selected variables was determined using the t-test. The level of significance was set at 0.05. All the children below 5 years admitted with malnutrition were eligible for inclusion in the current study as this was a retrospective review of patient files. Results was summarised using the descriptive statistics that included the tabulated results in percentage frequencies and charts. In order to investigate the determinants of malnutrition in children below five years admitted at Seshego district hospital logistic regressions was used in which the framework of multiplicative model with the more obvious effect measure of odds ratio. The associated confidence interval was carried out using binary logistic regression analysis using a dependent variable (1 = yes, 0 = no) while other factors were independent variables.

### **3.11. Reliability**

Reliability is the consistency of a measure, meaning a particular data collection tool should produce the same outcome if used under the same conditions (Heale & Twycross, 2015). The researcher used the same checklist with all the files. The researcher together with the assistant reviewed the filled data tools to make sure that the tool is consistent with every file assessed.

### **3.12. Validity**

Validity is the extent to which a concept is accurately measured in a research study (Heale & Twycross, 2015). Heale and Twycross (2015) describes validity by three types. In this study, content validity was addressed. Content validity, which covers the content with respect to the variables. This study, the researcher allowed the

supervisor and the co supervisor to critic the questionnaire and gave advice accordingly. The health professionals who are expects in the child health and nutrition services (the head of dietetics section at Seshego hospital) was given the checklist to assess the content.

### **3.13. Bias**

Bias is defined as any tendency, which prevents unprejudiced consideration of a question, and bias can happen when a systemic error is introduced in a research (Toro, 2005). The researcher can introduce the bias in sampling or testing by selecting or encouraging certain answers over other (Toro, 2005). The researcher bias in this study was avoided by not letting the researcher to influence the people who were helping with filling in the data tool. The selection bias was minimised by selecting all the patients records that met the inclusion criteria in the set period of the study. The checklist was standard for all the participating files.

### **3.14. ETHICAL CONSIDERATIONS**

#### *3.14.1. Ethical approval and permission*

The research proposal was submitted to the department and school for review and finally to Turfloop Research and Ethics Committee (TREC) for formal approval. A letter, research proposal together with ethical clearance was submitted to Provincial Department of health Limpopo to request permission to undertake the study. A request was also be submitted to District Department of Health and Seshego hospital. The approval was given to the researcher (annexure 3 and 4).

#### *3.14.2. Confidentiality and privacy*

Confidentiality is an ethical requirement in any medical research. The participants' information is likely to be handled by many people who are involved in the research. It is important to ensure confidentiality of the participants' records. Codes can be used to identify records (Hunter, 2003). In this study, the data collecting tools was kept in a locked cupboard at the work place of the researcher. The researcher did not share the information with other people except those who were part of the study.

### 3.14.3. Anonymity

Anonymity is when the identities of participants is kept a secret (Saunders, Kitzinger & Kitzinger, 2015). In this study, the codes were used to identify the data collecting tools of participating files to ensure anonymity of the owners of the files. There was no connection or link of the owners of files and data collecting tools.

### 3.14.4. *Informed consent*

Informed consent is a process in which the participating subjects understands the research and risks involved. Informed consent is a voluntary agreement to participate in research. (University of Southern California, 2003). In this study, the secondary data was used. Therefore, participants were not required to sign the informed consent. The approval by the Provincial Department of Health, the district executive manager and the chief executive officer of Seshego hospital gave the researcher permission to continue and use the medical records of those children below five years admitted at Seshego district hospital. The permission served as the consent in this study.

### 3.14.5. *Harm*

In research, harm refers to negative physical, psychological, social, legal and economical outcomes (Coleman, Menikoff, Goldner & Dubler, 2003). In this study, there was no harm, as there was no physical contact between the researcher and the participants. The researcher was only gathering information from the medical records of the qualifying participants.

## 3.15. **CONCLUSION**

This chapter elaborated on the methodology used in the current study which is about the prevalence and determinants of malnutrition among children below five years admitted at Seshego Hospital. The information about the methods used as well as the justification for using them was presented.

## **CHAPTER 4: RESULTS**

### **4.1. Introduction**

This chapter describes the management, analysis, discussion of data and interpretation of the research findings. The data management, analysis and interpretation were guided by the research hypothesis of the study. The data was analysed to determine the prevalence and determinants of malnourished children below 5 years admitted at Seshego hospital of Limpopo province. Data was collected from the hospital patients' files admitted at paediatric ward and 218 patients' files were retrieved and reviewed.

### **4.2. Data management and analysis**

The data collection process was finalized and the completed database was securely stored. The information was captured and then exported to Microsoft Excel spreadsheet for cleaning. The data is saved on a compact disc for confidentiality and privacy reasons. Descriptive statistical analysis was undertaken using the STATA statistical software version 6A for Windows (STATA Corporation, College Station, Texas) in order to identify frequencies and percentages of answers to the research questions. The statistical significance of the relationships between the selected variables was determined using the t-test. The level of significance was set at 0.05. All the children below 5 years admitted with malnutrition were eligible for inclusion in the current study as this was a retrospective review of patient files. The accuracy of the records which were retrieved from the database was assessed and it was found that majority of the records did not have the educational status (83.9%), age of the mother/caregiver (80.7%) and family income (72.9%).

### **4.3. Research results**

#### *4.3.1. Demographics of study population*

Figure 4.1 below shows the demographics of age categories of malnourished children. The results show that most of the children were in the age group 1year-1year 11 months at 46.5%, followed by children below 1 year; children between 2



years and 2 years 11 months and lastly children greater or equal to 3years at 41.4%, 8.4% and 3.7% respectively.

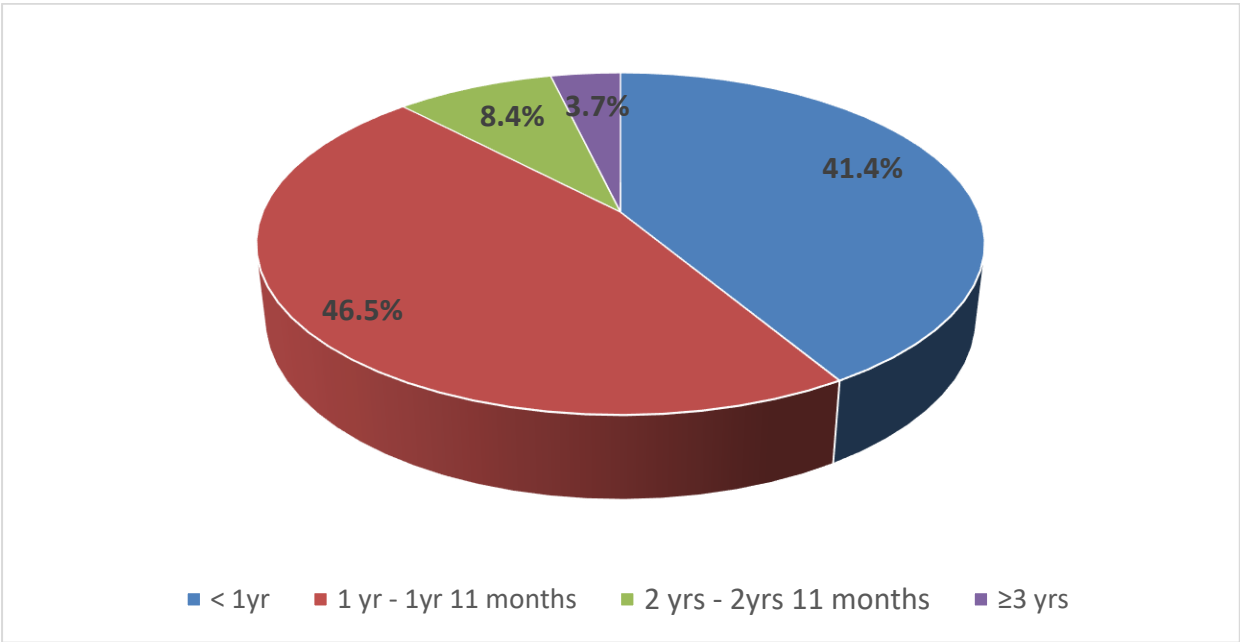


Figure 4.1: Age categories of study population in years

Table 4.1 presents the demographics of malnourished children stratified by age groups. The results show that most of the children between 1 year and 1year 11 months receives grant at 48.0% followed by children aged less than 1year; 2 years to 2years 11 months and greater or equal 3 years at 42.7%; 7.9% and 2.4% respectively. Those that were without records of grant are at 43.5% for children below 1 year, 34.8% for children aged 1year-1year 11 months, 13.0% for children aged greater or equal to 3 years and lastly 8.7% for children aged 2 years to 2 years 11 months. Most of the children received child support grant at 47.5% for children aged between 1year and 1year 11 months followed by children aged below 1 year, 2 years to 2 years 11 months and children with 3 years or more at 43%; 7.0% and 2.5% respectively.

In the study population there was only 1 child who was receiving disability grant and those without information on the type of grant were 42.9% for children less than 1 year, 28.6% for 1 year to 1 year 11 months, 28.6%; for children greater or equal to 3years and 0% for 2 to 2years 11 months. Most of the children were taken care by

their mothers at 92.1% in age group below 1 year followed by age group 1 year to 1 year 11 months; 2 years to 2 years 11 months and 3 years or more at 83.2%; 76.5% and 57.1% respectively. Those who were taken care by the caregiver were 42.9% in age group 3 years and above followed by 2 years to 2 years 11 months; 1 year to 1 year 11 months and below 1 year at 23.5%; 14.7% and 6.6% respectively. The study shows that there was a significant ( $P < 0.001$ ) between the age of the malnourished children and the type of the grant.

Table 4.1: Demographics of study participants stratified by age groups

	Age group in years				<i>P-value</i>
	< 1 year	1 yr - 1yr 11 months	2 yrs - 2yrs 11 months	≥3 yrs	
	n (%)	n (%)	n (%)	n (%)	
<b>Grant</b>					
No	9 (32.1)	15 (53.6)	3 (10.7)	1 (3.6)	0.240
Yes	70 (42.7)	77 (48.0)	13 (7.9)	4 (2.4)	
Not recorded	10 (43.5)	8 (34.8)	2 (8.7)	3 (13.0)	
<b>Type of grant</b>					
Child support	68 (43.0)	75 (47.5)	11 (7.0)	4 (2.5)	<0.001
Foster care	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	
Disability	0 (0.0)	0 (0.0)	1 (100)	0 (0.0)	
Not recorded	3 (42.9)	2 (28.6)	0 (0.0)	2 (28.6)	
<b>Child caring</b>					
Mother	70 (92.1)	79 (83.2)	13 (76.5)	4 (57.1)	0.105
Caregiver	5 (6.6)	14 (14.7)	4 n(23.5)	3 (42.9)	
Not recorded	1 (1.3)	2 (2.1)	0 (0.0)	0 (0.0)	

Table 4.2 presents demographics of the mother/caregiver. The results show that 71.4% were unemployed followed by those who were employed, pensioners and those whom their employment status was not recorded at 19.8%; 8.9% and 7.8% respectively. The mothers/caregivers receiving income from grant were the majority at 49.8%, followed by those that get support from family members, those that receive source of income from both grant and family support and those whom their source of

income was not recorded and lastly those who get maintenance at 23%; 14.1%; 12.2% and 0.9% respectively.

The files without records on number of children in the families were at 43.5. Those with number of children in the family between 3 and 5 were at 35.4% followed by those with less than 3 children; then more than 5 children in the family at 15.8% and 5.3% respectively. The category of number of family members revealed that majority of families had between 5 and 10 family members at 48.1% followed by 3 to 5 family members; more than 10 family members and less than 3 family members at 22.4%; 10.8% and 0.9% respectively while 17.8% were not having records on number of family members in the family.

Table 4.2: Demographics of the mother/ caregiver

Variables	N	%
<b>Employment status</b>		
Unemployed	155	71.4
Employed	43	19.8
Pensioner	2	8.9
Not recorded	17	7.8
<b>Source of income</b>		
Maintenance	2	0.9
Grant	106	49.8
Support from family	49	23.0
Grant and support from family	30	14.1
Not recorded	26	12.2
<b>Number of children</b>		
<3	33	15.8
3 – 5	74	35.4
>5	11	5.3
Not recorded	91	43.5
<b>Number of family members</b>		
<3	2	0.9
3 – 5	48	22.4
5 – 10	103	48.1
>10	23	10.8
Not recorded	38	17.8

#### 4.3.2. Nutritional Knowledge/practice of the mother in relation to the feeding of the child.

Figure 4.2 below shows that most of the mothers had poor nutritional knowledge or practice in relation to the feeding of the child at 95.9%.

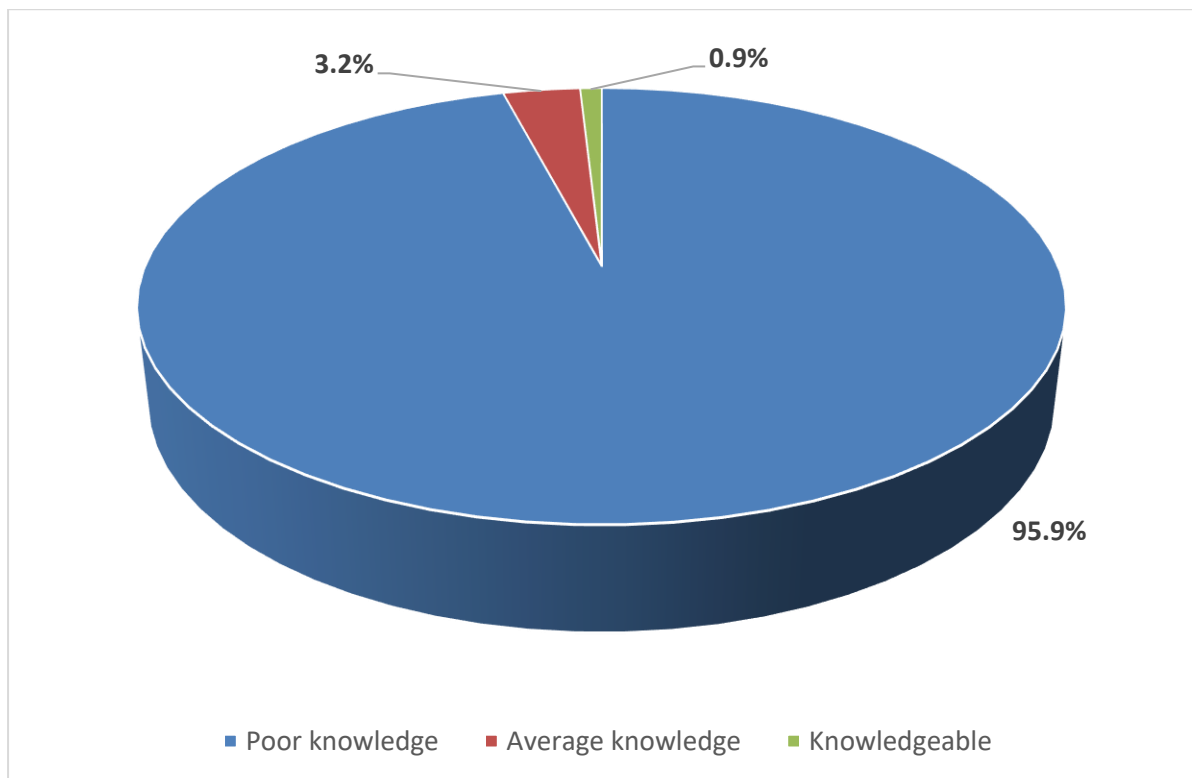


Figure 4.2: Nutritional Knowledge/practice of the mother in relation to the feeding of the child

Nutritional knowledge/practice of the mother in relation to the feeding of the child stratified by socio-economic factors is presented in Table 3 below. The study revealed that majority of the mothers/caregivers who were unemployed had poor feeding knowledge at 96.1% followed by those with average knowledge and those who are knowledgeable at 3.2% and 0.7% respectively. The surprising revelation is with mother/caregivers who were unemployed as they also contributed a high percentage of poor knowledge at 95.4%. Those who receive grant as source of income 97.2% had poor knowledge while approximately 1.9% had average knowledge and 0.9% were knowledgeable. Those who received support from family, 89.8% had poor

knowledge while 8.2% had average knowledge and 2,0% were knowledgeable. Approximately 96.7% of those who received both grant and support from family members had poor knowledge while 3.3% had average knowledge and no one was recorded to be knowledgeable in this category. The employment status stratified by nutritional knowledge is statistically significant ( $P = 0.014$ ) and source of income is not statistically significant ( $P= 0.587$ ).

Table 3: Nutritional knowledge/practice of the mother in relation to the feeding of the child stratified by socio-economic factors

	Poor Feeding knowledge	Average feeding knowledge	Knowledgeable	<i>P-value for trend</i>
<b>Employment</b>				
Unemployed	149 (96.1)	5 (3.2)	1 (0.7)	0.014
Employed	41 (95.4)	1 (2.3)	1 (2.3)	
Pensioner	1 (50.0)	1 (50.0)	0 (0.0)	
Not recorded	17 (100)	0 (0.0)	0 (0.0)	
<b>Source of income</b>				
Maintenance	2 (100)	0 (0.0)	0 (0.0)	0.587
Grant	103 (97.2)	2 (1.9)	1 (0.9)	
Support from family	44 (89.8)	4 (8.2)	1 (2.0)	
Both grant and Support from family	29 (96.7)	1 (3.3)	0 (0.0)	
Not recorded	26 (100)	0 (0.0)	0 (0.0)	

#### 4.3.3. Prevalence of SAM and MAM

The Figure 4.3 below shows the prevalence of SAM and MAM, where SAM is high at 59.5% and MAM is low at 40,9%.

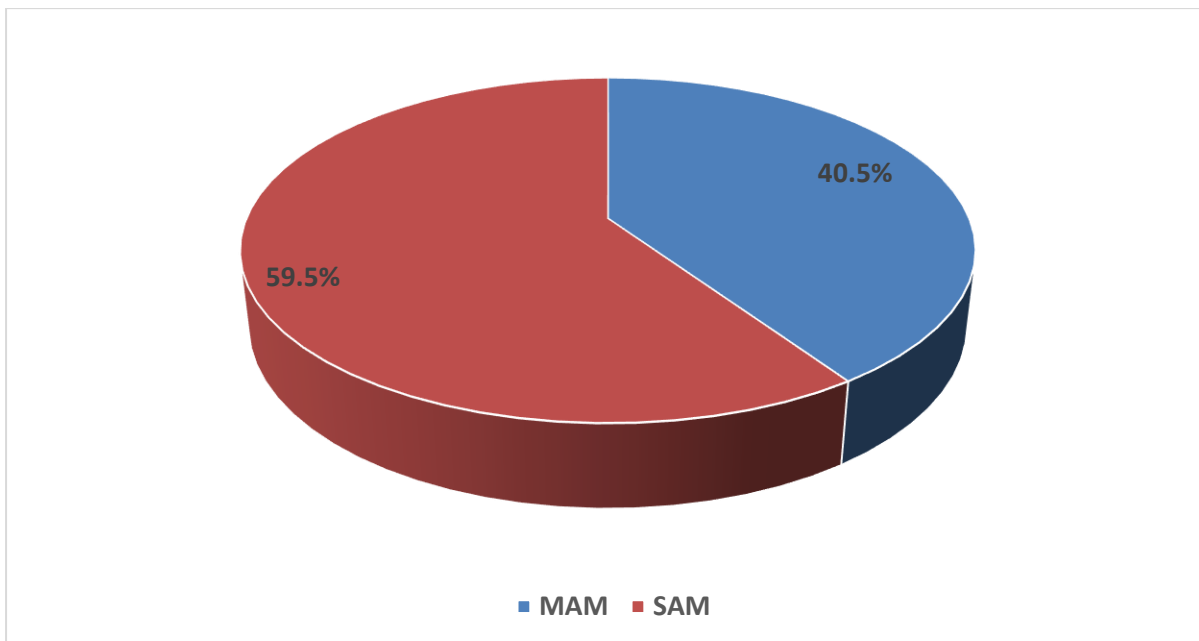


Figure 4.3: Prevalence of MAM and SAM

The Figure 4.4 below shows the prevalence of MAM and SAM stratified by the age of the child. It shows that children below 1 year 41.9% of them have MAM and 41,1% have SAM, 1 year-1year 11 months 45.4% have MAM and 47,3% have SAM, those of age range 2 years-2 years 11 months 8.1% have MAM and 8.5% have SAM and those  $\geq 3$  years are at 4.7% MAM and 3.1% SAM.

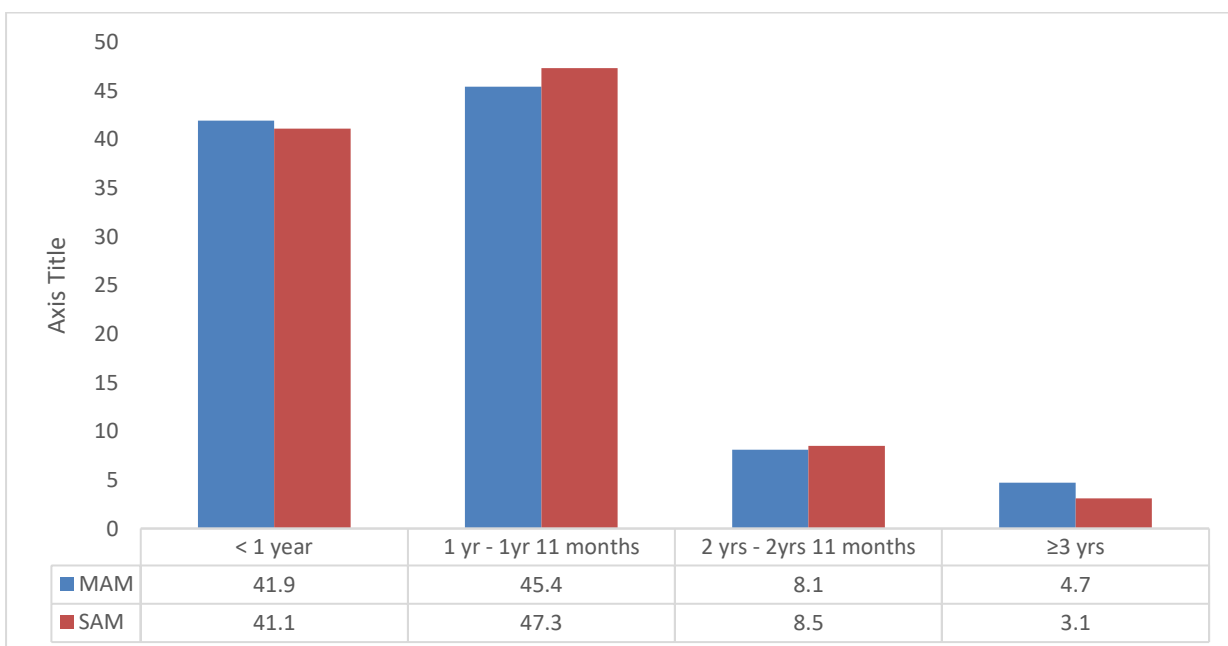


Figure 4.4: Prevalence of MAM and SAM stratified by age of the child

#### 4.3.4. Determinants of MAM and SAM

The table 4.4 below reflect the determinants of MAM and SAM. Children greater or equal to 3 years have 1.5 greater chance of having MAM than children below 1 year. All the age ranges are not statistically significant as determinants of both MAM and SAM. The p-values are greater than 0.05. The study showed that the children who receive grant are have 1 chance to have or not have MAM or SAM as compared to those who don't receive grant. But statistically the children who receive grant are not significant (p-value= 0.994). Children who receive disability grant have 1.1 chance to have SAM compared to those who receive child support grant. The children who are cared for by the caregivers have 1.1 chance to have SAM as compared to those who are cared for by their mothers.

The children of unemployed mothers or caregivers have 1.1 chance of having MAM as compared to those of employed mothers or caregivers. Statistically the employment status is not significant (p-value=0.708). This study further shows that the children who are from families who financially depend on family members or those who depend on both grant and family support are having 1.8 chance of having SAM as compared to those who receive maintenance as source of income. Children who are 3 to 5 in their families are having 1.2 chance of having MAM as compared to those who are less than 3 at home. Statistically the 3 to 5 number of children in the family is not significant p-value= 0.735. The family members who are 5 to 10 have 1.9 chance of having children with SAM as compared to those who are less than 3.

Table 4.4 Determinants of MAM and SAM

Age group in years	MAM		SAM	
	OR (95%CI)	p-value	OR (95%CI)	P-value
< 1	Ref		Ref	
1 – 1 year 11 months	0.9(0.5-1.7)	0.839	1.1(0.6-1.9)	0.839
2 – 2 years 11 months	0.9(0.3-2.6)	0.902	1.1(0.4-.01)	0.902
≥ 3 years	1.5(0.3-6.3)	0.601	0.7(0.2-2.9)	0.601

<b>Grant</b>				
No	Ref		Ref	
Yes	1.0(0.6-1.8)	0.994	1.0(0.6-1.7)	0.994
<b>Grant type</b>				
Child support	Ref			
Disability	0.9(0.5-1.5)	0.0689	1.1(0.7-1.9)	0.689
<b>Child caring</b>				
Mother	Ref			
Caregiver	0.8(0.4-2.0)	0.757	1.1(0.5-2.7)	0.757
<b>Mother employment status</b>				
Employed	Ref			
Unemployed	1.1(0.6-2.3)	0.708	0.9(0.4-1.7)	0.708
Pensioner			-	
<b>Source of income</b>				
Maintenance	Ref			
Grant	0.6(0.2-1.4)	0.223	1.7(0.7-4.0)	0.223
Support from family	0.5(0.2-1.4)	0.213	1.8(0.7-4.8)	0.302
Both grant and support from family	0.6(0.2-1.7)	0.302	1.8(0.6-5.1)	0.302
<b>Number of children</b>				
< 3	Ref			
3 – 5	1.2(0.5-2.6)	0.735	0.9(0.4-1.9)	0.735
>5	0.1(0.0-1.2)	0.071	7.4(0.8-4.4)	0.071
<b>Number of family members</b>				
<3	Ref			
3 – 5	0.8(0.1-14.3)	0.908	1.2(0.7-20.)	0.908
5 – 10	0.5(0.0-8.8)	0.664	1.9(0.1-0.6)	0.664
> 10	0.8(0.0-13.9)	0.859	1.3(0.7-3.4)	0.859

#### 4.4. CONCLUSION

In this chapter, the results of the study were presented and interpreted. The percentages of the prevalence and determinants of malnutrition were presented in tables and charts.



## **CHAPTER 5: DISCUSSION, CONCLUSION AND RECOMMENDATIONS**

### **5.1. Introduction**

The findings of the current study were presented and interpreted in the previous chapter. In the current chapter, the results are discussed and compared to the relevant literature to address the study objectives which are:

- To determine the prevalence of malnutrition in children below five years admitted at Seshego district hospital from January 2017 to December 2021.
- To determine the determinants of malnutrition in children below five years admitted at Seshego district hospital from January 2017 to December 2021.

This chapter will be divided into sub-sections to cover the following:

- Introduction
- Demographic of malnourished children
- Demographic of mother or caregiver
- Nutritional Knowledge/practice of the mother in relation to the feeding of the child
- Prevalence of SAM and MAM
- Determinants of SAM and MAM
- Study limitations,
- Conclusion and recommendation.

### **5.2. Demographics of malnourished children.**

The demographics of age categories of malnourished children in the current study showed that most of the children were in the age group 1year to 1year 11 months at 46.5%. The current study is similar to several studies where children below the age of 2 years are likely to develop malnutrition (Chaudhary & Agrawal, 2019). A study done in the Uganda also reflected that malnutrition is still a problem and its severity increase in children below the age of two (Mawa & Lawoko, 2018). The current study shows that most of the malnourished children receive government grant. This fact is supported by (Devereux & Waidler, 2017) when it was stated that the South African social protection system on poverty relieve has improved dramatically since 1994 nearly half of households in poverty-stricken provinces receives one social grant provided by the government. The biggest part of the

grants is child support grant. It is further reported that regardless of improvement in food security in the last 20 years, the challenge of chronic malnutrition among children below five years is still high (Devereux & Waidler, 2017).

### **5.3. Demographics of the mother or caregiver.**

The study revealed that most of the mothers were unemployed at 71.4% and 49.8% was depending on social grant. A study done in India reported poor socio economic status as a responsible factor for malnutrition (Qureshi, Kazi, Memon & Khan, 2019). The prevalence of malnutrition among children below 5 years was also high in the communities with low employment rate in low and middle income rate countries (Fagbamigbe et al., 2020). The number of family members was the highest at 48.1% when it was compared by ranges of less than 3, 3 to 5, 5 to 10 and greater than 10. The intermediate factors related to malnutrition include household size (Nankinga et al., 2019) and (Kumar *et al.*, 2019). Families who have more children have high chances of having malnourished children (Kumar *et al.*, 2019, (Boah *et al.*, 2019).

### **5.4. Nutritional knowledge/practice of the mother in relation to the feeding of the child stratified by socio-economic factors.**

The study revealed that majority of the mother/caregivers who were unemployed had poor knowledge at 96.1%. The employment status stratified by nutritional knowledge is statistically significant (P-value=0.014). This is supported by a study done in North India where poor maternal knowledge has been shown to form path to malnutrition among children below two years (Awasthi *et al.*, 2019). It was also reported that if mothers have poor knowledge or low education it can ultimately lead to increased rate of malnutrition among children (Madiba, Chelule & Mokgatle, 2019, Phooko-Rabodiba et al., 2019 and Modjadji & Madiba, 2019).

### **5.5. Prevalence of MAM and SAM**

The current study showed prevalence of SAM at 59.5% and MAM at 40.5%. The current findings are in contrary with other studies, whereby the percentage of SAM is showed to be low as compared to the percentage of MAM. A study done in Ghana showed that the percentage of MAM and SAM was at 78% and 43% respectively

(Frempong & Annim, 2017). Akombi *et al.*, 2017 in a study done in Nigeria found the prevalence to be at 41% for MAM and 27% for SAM. Another study done in the rural area of Limpopo province South Africa also found MAM to be 11.1% and SAM 3.9% (Phooko-Rabodiba *et al.*, 2019). The results of this current study might be different with the percentages of malnutrition because the study was done in clinical setting as compared to other studies as they were done in community setting.

The current study shows that the chances of children being malnourished diminish with the increase in the child's age. Children below 2 years are at 43.7% MAM and 43.3% SAM. The children above 2 years are 6.4% MAM and 5.8% SAM. The other study showed that the children showed predominant MAM below 2 years and less predominant MAM above 2 years of age. They were at 10.2% and 4.2% respectively (Frempong & Annim, 2017). There is another study which does not agree with the current findings, it states that the children above 2 years were mostly affected by MAM (Akombi *et al.*, 2017)

## **5.6. Determinants of MAM and SAM**

The current study showed that statistically there is no significance among the variables. The P-values are above 0.05.

### *5.6.1. Age of the child*

The children 1 year to 2 years 11 months have less odds of having MAM as compared to children below 1 year. The analysis disagrees with the study done in India whereby it was found that children between the ages of 1 year and 3 years have high chance of developing MAM. The same study agrees with the current findings of more odds of developing SAM in children greater or equal to 3 years (Chaudhary, & Agrawal, 2019).

### *5.6.2. Grant and grant type*

The current study revealed that the children who receive grant can either have or not have MAM or SAM when compared to the children who do not receive grant. It was shown that most of the families of the malnourished children receive grant (Phooko-Rabodiba *et al.*, 2019). The children who receives

disability grant have less odds to develop MAM and have greater odds to develop SAM.

#### *5.6.3. Child caring*

The children who are cared for by the caregivers have greater chance of having SAM as compared to those who are cared for by their mothers. This does not agree with a study done in Sekhukhune district in Limpopo province which showed that most of the malnourished children are cared for by their mothers at 73.9% those who were cared for by their grandmothers were only 22.2% (Phooko-Rabodiba *et al.*, 2019)

#### *5.6.4. Employment status*

This study showed high chances of children with unemployed mothers developing MAM as compared to those with employed mothers. The findings also showed that children with unemployed mothers have less chances of developing SAM. This disagrees with a study done in Ethiopia, it showed that children of unemployed mothers may have SAM (Tariku *et al.*, 2017)

#### *5.6.5. Source of income*

The current findings further show that the children who are from families who financially depend on grant, family support or those who depend on both grant and family support are having greater chances of having SAM as compared to those who receive maintenance as source of income. This does not agree to a study done in the rural and urban Ecuadorian highlands where it was shown that children from low socio-economic families have high odds of developing MAM (Ortiz *et al.*, 2014).

#### *5.6.6. Number of children in the family*

Children who are 3 to 5 in their families are having more chance of having MAM as compared to those who are less than 3 at home. The children who are more than 5 at home have less chances of having both MAM or SAM. The current results study disagrees with the study done in Ghana where it was showed that children who are from families of 4 children have greater odds of having SAM and those who are 5 have greater odds of having MAM (Boah *et al.*, 2019).

(Nankinga *et al.*, 2019) also agrees that the number of children in the household may affect and influence the quality and amount of food that has to be shared among the children.

#### *5.6.7. Number of family members*

The family members who are 5 to 10 in the family have greater odds of having children with SAM as compared to those who are less than 3 members in the family. The study done in Limpopo showed that most of the families of malnourished children were between 6 and 10 in numbers (Phooko-Rabodiba *et al.*, 2019)

### **5.7. Study limitations**

The study was done with secondary data, and there are several limitations that come with secondary data. Firstly, there was complications of retrieving the files from the filing room. Some files were incomplete with missing notes. The files that were assed were not complete, poor quality of the notes. The files were missing the important notes like other underlying medical complications. Therefore, it is very important to assess the findings of the study carefully.

### **5.8. Conclusion and recommendations**

The current study showed that statistically there is no significance among the variables. The P-values are above 0.05. The study was only able to reveal the associations among the variables. The study has showed high rate of MAM and SAM. This will urge the public health sector to put the interventions in place to prevent malnutrition from primary stage. In the future a further study with primary data should be done to examine the determinants of malnutrition among children below 5 years.

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ANNEXURE: 1. Data tool

INSTRUCTION FOR COMPLETING THE CHECKLIST

Date of data collection	
Name of the researcher	
File number	
<ol style="list-style-type: none"><li>1. The questions will be answered by putting a cross next to the write answer.</li><li>2. The researcher will be the one to complete the checklist.</li><li>3. All questions should be filled completely.</li><li>4. If a mistake is done, the researcher will put a signature next to the correction.</li></ol>	

1. DEMOGRAPHIC QUESTIONS		X	Researcher's block	
1. Age of the child	<1yr		0	
	1yr-1 11/12		1	
	2yrs-2 11/12		2	
	≥3yrs		3	
2. Does the child receive grant?	Yes		1	
	No		0	
	Not recorded		2	
3. If yes, type of grant	Child support		0	
	Foster care		1	
	Disability		2	
	Not recorded		3	
4. The person taking care of the child	Mother		0	
	Caregiver		1	
	Not recorded		2	
5. Age of the mother/caregiver	<18yrs		0	
	18-39yrs		1	
	40-59yrs		2	
	>60yrs		3	
	Not recorded		4	
6. Employment status of mother/caregiver	Employed		0	
	Unemployed		1	

	pensioner		2	
	Not recorded		3	
7. Source of income	Maintenance		0	
	Grant		1	
	Support from family members		2	
	Both grant and support from family members		3	
	Not recorded		4	
10. Number of children in the family	<3		0	
	3-5		1	
	>5		2	
	Not recorded		3	
12. Number of family members	<3		0	
	3-5		1	
	5-10		2	
	>10		3	
	Not recorded		4	

## 2. HEALTH NUTRITIONAL KNOWLEDGE/PRACTICE OF THE MOTHER

13. Which feed was given for the first 6 months?	Breastmilk		0	
	Formula		1	
	Cow's milk		2	
	Mix feeding		3	
	Not recorded		4	
14. If mix what was given	Breastmilk and water		0	

	Breastmilk and formula/cows' milk		1	
	Formula and other fluids		2	
	Breastmilk and other fluids		3	
	Breastmilk and food		4	
	Not recorded		5	
15. When was complementary feeding started	0-3 months		0	
	4-6 months		1	
	After 6 months		2	
	Not recorded		3	
16. Which food was introduced first during complementary feeding?	Soft porridge with breast milk		0	
	Soft porridge with formula		1	
	Soft porridge only		2	
	Purity		3	
	Not recorded		4	
17. Which relish is used for the child	Vegetables		0	
	Gravy powder soup		1	
	Protein (fish, meat, legumes etc.)		2	
	No relish		3	
	Not recorded		4	
18. Is the child still breastfeeding?	Yes		1	
	No		0	
	Not recorded		2	
19. If NO above. What is the child drinking in place of breastmilk?	Formula		0	

	Rooibos tea	1	
	Water	2	
	Juice	3	
	Not recorded	4	

**ANNEXURE: 3 Letter to Provincial Department of Health**

133 Lengau Street  
Southern Gateway  
Polokwane  
0699  
18 October 2021

HEAD OF THE DEPARTMENT  
PROVINCIAL DEPARTMENT OF HEALTH  
PRIVATE BAG X9302  
POLOKWANE  
0700

APPLICATION FOR PERMISSION TO CONDUCT A STUDY AT SESHEGO HOSPITAL

TITLE OF THE STUDY: Determinants of malnutrition in children below five years at Seshego District Hospital, Capricorn District, Limpopo Province, South Africa.

RESEACHER: Mmako L.N

SUPERVISOR: Dr Maimela E

I am currently a registered student at the University of Limpopo (Turfloop campus), studying master's degree in Public Health. As part of the degree fulfilment, I am required to conduct a research study. In order to achieve this I would like to request permission to conduct the study at Seshego Hospital.

Attached get the whole proposal for the research study. Any new amendment that will be done during the study will be communicated accordingly.

Thanking you in advance

MMAKO L.N

18 October 2021

Signature: \_\_\_\_\_

Email: [ndweks1978@gmail.com](mailto:ndweks1978@gmail.com)

Contact number 0732087910

**ANNEXURE: 4 Letter District Department of Health**

133 Lengau Street  
Southern Gateway  
Polokwane  
0699  
18 October 2021

DISTRICT EXECUTIVE MANAGER  
CAPRICORN DISTRICT OF HEALTH  
34 HANS VAN RENSBURG STREET  
POLOKWANE  
0700

APPLICATION FOR PERMISSION TO CONDUCT A STUDY AT SESHEGO HOSPITAL

TITLE OF THE STUDY: Determinants of malnutrition in children below five years at Seshego District Hospital, Capricorn District, Limpopo Province, South Africa.

RESEACHER: Mmako L.N  
SUPERVISOR: Dr Maimela E

I am currently a registered student at the University of Limpopo (Turfloop campus), studying master's degree in Public Health. As part of the degree fulfilment, I am required to conduct a research study. In order to achieve this I would like to request permission to conduct the study at Seshego Hospital.

Attached get the whole proposal for the research study. Any new amendment that will be done during the study will be communicated accordingly.

Thanking you in advance

MMAKO L.N

18 October 2021

Signature: \_\_\_\_\_

Email: [ndweks1978@gmail.com](mailto:ndweks1978@gmail.com)

Contact number 0732087910



**ANNEXURE: 5 Letter to Seshego Hospital**

133 Lengau Street  
Southern Gateway  
Polokwane  
0699  
18 October 2021

CHIEF EXECUTIVE OFFICER  
SESHEGO HOSPITAL  
PRIVATE BAG X4016  
SESHEGO  
0742

APPLICATION FOR PERMISSION TO CONDUCT A STUDY AT SESHEGO HOSPITAL

TITLE OF THE STUDY: Determinants of malnutrition in children below five years at Seshego District Hospital, Capricorn District, Limpopo Province, South Africa.

RESEACHER: Mmako L.N  
SUPERVISOR: Dr Maimela E

I am currently a registered student at the University of Limpopo, studying master's degree in Public Health. As part of the degree fulfilment, I am required to conduct a research study. In order to achieve this I would like to request permission to conduct the study at your institution.

Attached find the proposal for the research study. Any new amendment that will be done during the study will be communicated accordingly.

Thanking you in advance

MMAKO L.N

18 October 2021

Signature: \_\_\_\_\_

Email: [ndweks1978@gmail.com](mailto:ndweks1978@gmail.com)

Contact number 0732087910

## ANNEXURE: 6 Ethical clearance from University of Limpopo



**University of Limpopo**  
Department of Research Administration and Development  
Private Bag X1106, Sovenga, 0727, South Africa  
Tel: (015) 268 3935, Fax: (015) 268 2306, Email: anastasia.ngobe@ul.ac.za

### TURFLOOP RESEARCH ETHICS COMMITTEE

#### ETHICS CLEARANCE CERTIFICATE

**MEETING:** 22 August 2022  
**PROJECT NUMBER:** TREC/378/2022: PG  
**PROJECT:**

**Title:** The Determinants of Malnutrition in Children below Five Years at Seshego District Hospital, Capricorn District, Limpopo Province, South Africa.  
**Researcher:** LN Mmako  
**Supervisor:** Prof E Malmela  
**Co-Supervisor/s:** Mr MS Makwela  
**School:** Health Care Sciences  
**Degree:** Master of Public Health

**PROF D MAPOSA**  
CHAIRPERSON: TURFLOOP RESEARCH ETHICS COMMITTEE


The Turfloop Research Ethics Committee (TREC) is registered with the National Health Research Ethics Council, Registration Number: REC-0310111-031

**Note:**

- i) This Ethics Clearance Certificate will be valid for one (1) year, as from the abovementioned date. Application for annual renewal (or annual review) need to be received by TREC one month before lapse of this period.
- ii) Should any departure be contemplated from the research procedure as approved, the researcher(s) must re-submit the protocol to the committee, together with the Application for Amendment form.
- iii) PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES.

*Finding solutions for Africa*

## ANNEXURE: 7 Gatekeeping approval from Limpopo Department of Health

**LIMPOPO**  
PROVINCIAL GOVERNMENT  
REPUBLIC OF SOUTH AFRICA

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**Department of Health**

Ref : LP\_2022-09-018  
Enquires : Ms P F Mahlokwane  
Tel : 015-293 6028  
Email : Phisohe.Mahlokwane@dhsd.limpopo.gov.za

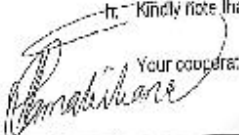
Lettie Ndweleng Mmakoa

**PERMISSION TO CONDUCT RESEARCH IN DEPARTMENTAL FACILITIES**

Your Study Topic as indicated below:

**THE DETERMINANTS OF MALNUTRITION IN CHILDREN BELOW FIVE YEARS AT SESHEGO DISTRICT HOSPITAL, CAPRICORN DISTRICT, LIMPOPO PROVINCE, SOUTH AFRICA**

1. Permission to conduct research study as per your research proposal is hereby Granted.
2. Kindly note the following:
  - a. Present this letter of permission to the Office District Executive Manager a week before the study is conducted.
  - b. This permission is **ONLY** for Seshego Hospital
  - c. In the course of your study, there should be no action that disrupts the routine services, or incur any cost on the Department.
  - d. After completion of study, it is mandatory that the findings should be submitted to the Department to serve as a resource.
  - e. The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.
  - f. **The approval is only valid for a 1-year period.**
  - g. If the proposal has been amended, a new approval should be sought from the Department of Health
  - h. Kindly note that, the Department can withdraw the approval at any time.

 Your cooperation will be highly appreciated

pp Head of Department 24/ 01/2022  
Date

---

Private Bag X9302 Polokwane  
Fidel Castro Ruz House, 18 College Street, Polokwane 0700. Tel: 015 293 6000/12. Fax: 015 293 6211.  
Website: <http://www.limpopo.gov.za>

*The heartland of Southern Africa – Development is about people!*

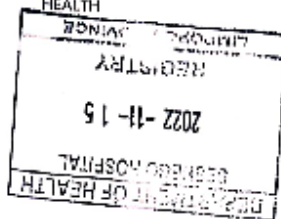
**ANNEXURE: 8 Gatekeeping approval from Capricorn District**

04/11/2022



**LIMPOPO**  
PROVINCIAL GOVERNMENT  
REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF  
HEALTH



REF : S.50/1/2  
ENQ : Makgohla KA  
TEL : 015 290/9096

FROM : DISTRICT EXECUTIVE MANAGER

TO : LETTIE NDWELENG MMAKO

SUBJECT : PERMISSION TO CONDUCT RESEARCH ON THE DETERMINANTS OF MALNUTRITION IN CHILDREN BELOW FIVE YEARS AT SESHEGO DISTRICT HOSPITAL, CAPRICORN DISTRICT, LIMPOPO PROVINCE, SOUTH AFRICA

The above matter refers:-

1. Permission to conduct the above study at Capricorn District Health Institutions/facilities is hereby granted
2. Kindly be informed that :
  - In the course of your study there should be no action that disrupts the services.
  - After completion of the Situational Analysis, it is mandatory that the findings should be submitted to the Department to serve as a resource.
  - The researcher should be prepared to assist in the interpretation and implementation of the study recommendation where possible.
  - Kindly note that the Department can withdraw the approval at any time.
3. Your cooperation will be highly appreciated.

  
DISTRICT EXECUTIVE MANAGER

04/11/2022  
DATE

Private Bag X8530, Polokwane  
Capricorn District Office, 34 Hans Van Rensburg Street, Polokwane 0700. Tel: 015-290 9000. Fax: 015 293 6211.  
Website: <http://www.limpopo.gov.za>

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