

**FACTORS AFFECTING NUTRITIONAL STATUS AMONG
CHILDREN UNDER FIVE YEARS OLD: A
CORELATIONAL STUDY**



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March 2022

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UNDER FIVE YEARS OLD: A CORELATIONAL STUDY**

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Bachelor of Science in Midwifery

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March 2022

APPROVAL SHEET

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The Researchers

DEDICATION

This study is dedicated to our beloved parents, children and partner in life who have been our source of inspirations guide and give us strength, when we thought of giving up, who continually provide their moral, emotional, spiritual and financial support.

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Jeramie,

Michelle,

Kissa Belle

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ABSTRACT

This correlational study examined factors associated with malnutrition among children under five years of age in one of the municipalities of Lanao del Norte, during the COVID-19 pandemic. Primary data were collected using a structured, closed-ended questionnaire administered to mothers or primary caregivers of 22 children aged 0–50 months. Home visits were conducted to obtain socio-demographic information, household food security indicators, infant and young child feeding practices, health care access, and pandemic-related livelihood changes. Anthropometric measurements (weight and length/height) were taken following standard procedures and converted to z-scores for weight-for-age (WFA), height-for-age (HFA), and weight-for-length/height (WFL/H) using World Health Organization reference standards to classify nutritional status. Descriptive statistics summarized sample characteristics and prevalence of underweight, stunting, and wasting. Bivariate correlational analyses explored relationships between nutritional outcomes and potential determinants such as caregiver education, household income loss, dietary diversity, illness episodes, and access to health services during the pandemic. Findings aim to identify key correlates of malnutrition in this community context and to inform targeted public health and nutrition interventions responsive to pandemic-related vulnerabilities. Despite the limited sample size, the study provides community-level insights into how social and health service disruptions during COVID-19 may have influenced child nutritional status, highlighting priorities for surveillance, program planning, and further research with larger samples.

Keywords: *malnutrition, under-five children, anthropometry, covid-19 pandemic, child nutrition determinants*

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Chapter 1

INTRODUCTION

Rationale of the Study

Nutritional status of children is one of the major predictors of child survival. However, malnutrition is a major public health problem in most of the developing countries and occurs prominently among under-five children affecting morbidity and mortality and causing 45% of all deaths among children aged 0-59 months (FAO, IFAD, UNICEF, WFP, WHO, 2019). Studies indicated that poor child nutrition hinders children's physical and mental development and perpetuates intergenerational malnutrition that cross into adulthood.

Malnutrition is a risk threatening vulnerable people due to multiple factors related to poverty and food security in the country in addition to the spread of diseases and several social factors that negatively affect the nutritional status of society (Headey et al., 2020; Popkin et al., 2020). On the other hand, malnutrition is one of the major problems significantly affecting almost all continents, especially the developing ones within which Asia and Africa are the ones which are worst hit (Singh et al., 2019). Despite increased attention at the global and national level, nutritional deficiencies remain a devastating catastrophic multifaceted problem affecting infants, young children, adolescent, and women.

Chronic undernutrition under five years of age hinders the mental and physical growth of children. Stunting and wasting in children under five years of age are the best indicators for chronic and acute undernutrition respectively and is a strong prognosticator

of both morbidity and mortality in this age group (Singh et al., 2019). The underlying causes of these catastrophic multifaceted problems include household food insecurity, inadequate care and feeding practices and unhealthy household environment and inadequate health services, while the immediate causes are insufficient dietary intake and diseases.

The current crises of COVID-19 may deepen the problem of malnutrition in the Philippines. The Philippines has the highest cumulative COVID-19 cases and deaths in the Western-Pacific. It remains a continuing public health crisis with over 2.4 million confirmed cases and 27 thousand deaths as of 2021. Evidence shows that the COVID-19 pandemic has led to declining use of essential healthcare and deteriorating population health-status and well-being. It has been assessed that the magnitude and duration of changes in hospital admissions for 12 high-burden diseases and the utilization of five common procedures by lockdown stringency, hospital level, and equity in patient access (Uy et al., 2022).

The effects of malnutrition on human health and survival have been the subject of extensive research for several decades. Although many questions remain concerning the precise mechanism and magnitude of effect, there has now been considerable evidence there has been now considerable evidence to suggest that malnutrition has effects on physical growth, chronic development, reproduction, physical work capacity, and cognitive impairments in children if they do not receive ample nutrition during the first few years of their life (Save the children, 2012; Pelletier and Frongillo, 2013; Casapia, 2017; Singh et al., 2019). Nutritional status of children is an integral component of the overall

health of the individual. In the case of children, nutritional status can affect growth, development, and immunity to disease. UNICEF reported that 55% of deaths of children below 5 years of age are due to malnutrition. Dreze and Sen (1989) stated that child malnutrition and infant mortality kill people slowly in long run than famine (Singh et al., 2019).

The consequences of malnutrition on the growth of children under five years old differ depending on socioeconomic class. Children from low-income families were more likely to be underweight and have insufficient micronutrient intakes, such as thiamin and vitamin C. Collective action in the public sector is essential from a young age to decrease nutritional and health inequities (Kim, Shin, & Shim, 2015). However, research on the links between nutritional consumption, growth development, and obesity in children under five-year old based on socioeconomic class is currently limited.

During this health crisis, it is addressed the challenges and options for guaranteeing food availability for child nutrition. There is no single, best answer to a public health disaster. Government and non-government partners work together to organize and scale up child nutrition services in the community by enhancing the public distribution system and delivering food packages to beneficiaries of child nutrition programs at their homes wherever possible (Upadhyay, Patra, & Khan, 2020). There are avoidable discrepancies in health status, most of which are caused by living and working conditions, and inequalities cause significant variances in people's quality of life. As a result, the WHO (World Health Organization) commission on social determinants of health has proposed numerous concepts to reduce the health gap within this generation, one of which is to improve

everyday living conditions from an early age, as early childhood experiences establish the foundations for later life health (Kim, Shin, & Shim, 2015).

The Department of Health (2020) stated that, high prevalence of stunting, underweight and wasting among young and children in this occupational group poses immediate and serious nutrition intervention techniques such as health and nutrition education, health care, sanitation and hygiene, and physical activity. A national policy on the health, nutrition and welfare of households and their children is highly suggested. It's important to have immediate and serious nutrition intervention strategies in place for children because of the high prevalence of stunting, underweight, and wasting among children. A national policy on the health, nutrition and welfare of households and their children is highly suggested.

In 2019, 47.0 million children under the age of five were wasted, with 14.3 million of them being severely abused. There is also a new facet of malnutrition that is gaining traction: childhood obesity and overweightness. The number of overweight children has risen by 8 million since 2000, to 38.3 million in the United States alone (WHO, 2019). Malnutrition is the main cause of death and diseases in the world and undernutrition is responsible for about 45% of all deaths of under five children. These deaths mainly occur in low- and middle-income countries where child obesity is increasing at the same time. Globally, about 47 million (6.9%) under five children are acutely malnourished (wasted) and 14.3 million of them are severely wasted. Approximately, 144 million (21.3%) are stunted, while 38.3 million (5.6%) are overweight or obese (WHO Malnutrition, 2020, FAO. IFAD. UNICEF. WFP. WHO, 2021).

The pandemic has had an influence on people from all walks of life, including the availability of food and nutrition-related services, which can affect children's nutritional health. In Sapad, Lanao del Norte, there were 181 children under five-year old who were underweight in the year 2020, while in the year 2019, there were 160. In terms of wasted weight for length/height there were 55 in 2019 and 58 in 2020. Moreover, the overweight was recorded as 33 in 2019 yet 53 in 2020. Lastly for obese children under five-year old serious nutrition intervention techniques such as health and nutrition education, health care, sanitation and hygiene, and physical activity. A national policy on the health, nutrition and welfare of households and their children is highly suggested. It's important to have immediate and serious nutrition intervention strategies in place for children because of the high prevalence of stunting, underweight, and wasting among children. A national policy on the health, nutrition and welfare of households and their children is highly suggested.

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There will were 45 in 2019 and 51 in 2020. Based on the Top 10 nutritionally depressed barangays in 2021, the barangay who ranked as top one (1) having underweight, stunting, and overweight under-five children are from barangay Poblacion. Most children are stunting from Poblacion having 78 in number. Then the top 2 are from Barangay Mala Salug having under-five children with underweight and wasting while stunting children are from Barangay Baning and some are from barangay Gamal. Barangay Gamal is the top 3 in underweight and stunting children while barangay Mapurog is also top 3 on wasting children and overweight+obese are from barangay Lower Sapad.

Malnutrition alters the immune system in a variety of ways, decreasing the immunological response and increasing vulnerability to viruses like SARS-CoV-2 (de Araújo Morais, et.al., 2021). In this instance, the research aims to determine the factors affecting nutritional status among under-five children in Sapad, Lanao del Norte during Covid-19 Pandemic. During the pandemic, the status of life has been different in Sapad, Lanao del Norte.

With this, it is necessary to determine the food security experiences, cultural practices, and health service utilization of the mothers do to supplement the good nutritional status of their children under five-year old and to determine the nutritional status among under-five children in terms of their BMI (Body Mass Index) and their undernourished status if the under-five child is underweight, overweight, stunting, and/ or wasting. Young children are more prone to poor nutrition and health conditions than adults. Poor nutrition among children of this age could not only contribute to increased likelihood of contracting serious illnesses but may also have a permanent effect on their health and development.

Theoretical Framework

Good nutrition during the 1,000-day period between the start of a woman's pregnancy and her child's second birthday is critical to the future health, wellbeing and success of her child. The right nutrition during this window can have a profound impact on a child's ability to grow, learn and rise out of poverty. (Singh, 2019).

When children start their lives malnourished, the negative effects are largely irreversible. Pregnancy and infancy are the most important periods for brain development. Mothers and babies need good nutrition to lay the foundation for the child's future cognitive, motor, and social skills, school success and productivity. Children with restricted brain development in early life are at risk for later neurological problems, poor school achievement, early school dropout, low skilled employment, and poor care of their own children, thus contributing to the intergenerational transmission of poverty (Singh et al., 2019).

Another paper highlights during first three months after birth, there was no increase in underweight and stunting rates, while progressive increase in underweight and stunting rates between 3-23 months of age and low BMI for age and wasting rates were highest at birth were reported (Ramachandran and Gopalan, 2011) (Singh et al., 2019). Another paper shows the comparison of the relative risk for infections in undernourished children showed that the relative risk morbidity due to infections was higher and more consistently seen in children with low BMI (Body Mass Index) and wasting as compared to stunting or underweight.

A child can underweight 'because she/he is stunted, wasted or both. Weight is a sensitive indicator of short-term (i.e., acute) under nutrition. Whereas deficit

in height (stunted) is difficult to correct, a deficit in weight (underweight) can be recouped if nutrition and health improve later in childhood. Since the inception of life, nutrition has dictated the growth and survival of our species. Almost all the body processes, from meager to vital, have a strong dependence on diet. Nutritional status serves as an outlook on the past, present, and future of one's health (Tanaka, 2017).

It is a quality of life emphasizing physical, mental, and social well-being. In other words, nutrition, both in terms of amount and kind, serves to act as the cornerstone of optimum health and the cutting edge for disease prevention (Krehl, 1983) (Tanaka, 2017). The ancient theory of nutrition dates to the time of Aristotle and Galen. They considered nutrition as a vital part of health, disease, performance, and healing. According to the Greek, Roman, and Chinese classical literature, the diet should consist largely of cereal grains, legumes, fruits, honey, fish, and milk. Foods like meat, wine, and confectionary should be consumed in moderation (Chen and Xu, 1996; Kleisiaris et al., 2014; Skiadas and Lascaratos, 2001).

The modern theory of nutrition has taken one step ahead. Starting with a series of discoveries of vitamins and minerals between 1910 and 1930, nutritional science has evolved alongside modern food production methods. Although serious malnourishment problems still exist in parts of the world such as Africa and Southeast Asia, food distribution improved following WWII in many countries (Semba, 2012; Muller & Krawinkel, 2005) (Tanaka, 2017). Prior to the 1940s, nutrition-related diseases resulted primarily from undernourishment i.e., lack of variety, inadequate calories, or a combination of both. Increasingly, nutrition and lifestyle related conditions such as obesity, heart disease, diabetes, and metabolic syndrome have become prevalent in many modern cities and countries. Now, foods are not just considered a source of energy for survival, instead it is an experience for instant pleasure and gratification.

On a global level, nutrition research influences public health policy and food production. The emerging nutrition research substantiates the economic sustainability and benefits of traditional dietary practices. Over the past few decades, there has been a significant advancement in the field of nutrition science. Further studies are needed for more evidence based dietary guidelines and recommendations. Better understanding of the science of nutrition would not only benefit individual health status, but also has the potential for preventing disease and fostering well-being for future generations (Tanaka, 2017).

Conceptual Framework

Children's health and development are concerns that require constant attention from a variety of stakeholders, including the government and families. The study of Khairunnas, Husna, & Marniati (2020) examined the significant relationship between the factors affecting the nutritional status in terms of food security, culture and health services utilization and the under-five children's nutritional status. As a result, growth retardation, causing children under five-year old to be lazy to do activities related to energy production, disruption of the toddler's immune system, making them susceptible to infectious diseases, inhibited optimal brain growth, and changes in behavior exhibited by children under five-year old such as not calm, easy crying, and its ongoing impact is apathetic behavior are all consequences of malnutrition status in infancy.

Figure A below presents the schematic diagram of the study. To evaluate the prevalence of malnutrition in Sapad, Lanao del Norte. The study aims to determine the factors affecting the nutritional status of children under 5-year-old during Covid-19 Pandemic. Food security, cultural practices, and health services utilization are the determinants of nutritional status of children aged 0 to 5 years old.

Food security is to measure the ability to access nutritious foods and enough and dietary needs, active and healthy. People have access to adequate caregiving practices and to a safe and clean environment that allows the children to stay healthy and utilize the foods they eat effectively. Children must have enough of the right foods, and this includes breast milk for up to two years of age, along with appropriate quantity and quality of complementary foods starting at six months of age because breast milk can no longer fulfill all the infant's nutrient needs after that age. In addition, young children also need caregivers who have the time, education, knowledge, physical and mental health, and nutritional well-being to care for them adequately. Adequate caregiving means that caregivers can attend to all their children's multiple needs, including adequate feeding, hygiene, health-seeking practices and supportive parenting. Finally, to be nutrition secure, young children must also be free of repeated (chronic) or acute infections, which interfere with absorption and utilization of food and nutrients for body functions.

It has been a culture anywhere in the Philippines to let mothers breastfeed their children at birth. It is crucial to ensure access to optimal nutrition for each mother and child for the first 1000 days of a child's life. The period of pregnancy and lactation and the first 2 years of life is a special nutritional challenge for those in need of nutrition or with inappropriate feeding practices (CAPO-CHICHI, 2016). Exclusive breastfeeding has a protective effect against obesity and certain noncommunicable diseases later in life. Most mothers said they treat their children at home using tablets or herbal tea and only go to the hospital when the condition worsens. They also said that they get or listen to the advice from the children's grandmothers on how to care for their children. They primarily give maize porridge to the child during sickness, and when he/she gets better, normal family food is given. Inadequate feeding and care practices often lead to a rapid decline in

nutritional status after birth, and more prominently after 3 to 4 months of age (when other foods beyond just breast milk are typically introduced) (Lokossou et al., 2021). It is believed that because protein helps the body to grow, if a woman consumes a lot of protein in her pregnancy, then the baby will grow too big leading to complications during labour (Kuzma, et al., 2023).

Health services utilization refers to how much care people use, the types of health care they use, and the timing of that care. Respiratory illness and diarrhea are the two most important causes of death in children under the age of 5 in the Philippines. The government has accorded high priority to reducing the number of deaths caused by these illnesses as it attempts to reform its healthcare system. To re-design health systems, policy makers need to have a good understanding not only of overall health services utilization, but also of the use of public and private sectors (Thind & Cruz, 2003).

The three-reference standard used in paper is as follows: Weight-for-age: A child of a given age (in months) and sex is said to be moderately under nourished when his/her weight in kgs falls below two standard deviations of the median in the reference population, and severely under nourished when his/her weight falls below three standard deviations of the median. Height-for-age: Similarly, moderate, and severe under nutrition can be ascertained for a child of given age and sex by comparing the recorded observation for height in centimeters with that of the median for the reference population.

Weight-for-height: If the recorded weight for a given height is less than two standard deviations of the median weight value of the reference population, the child is identified as moderately undernourished. The three indices defined above capture different aspects of under nutrition. Apart from the above, there are three measures to see the

nutritional status of the slum children. This paper uses two classification that is Gomez and waterloo classification to see different grades of malnutrition among children. Gomez classification gives classification of underweight, and waterloo gives classification of both stunted and wasted through following formula Gomez underweight=percent of reference weight for age = ((patient weight) / (weight of normal child of same age) * 100.

Waterloo Classification: Chronic malnutrition results in stunting. Malnutrition also affects the child's body proportions eventually resulting in body wastage percent weight for height = ((weight of patient) / (weight of a normal child of the same height)) * 100percent height for age = ((height of patient) / (height of a normal child of the same age)) * 100 (Singh et al., 2019).

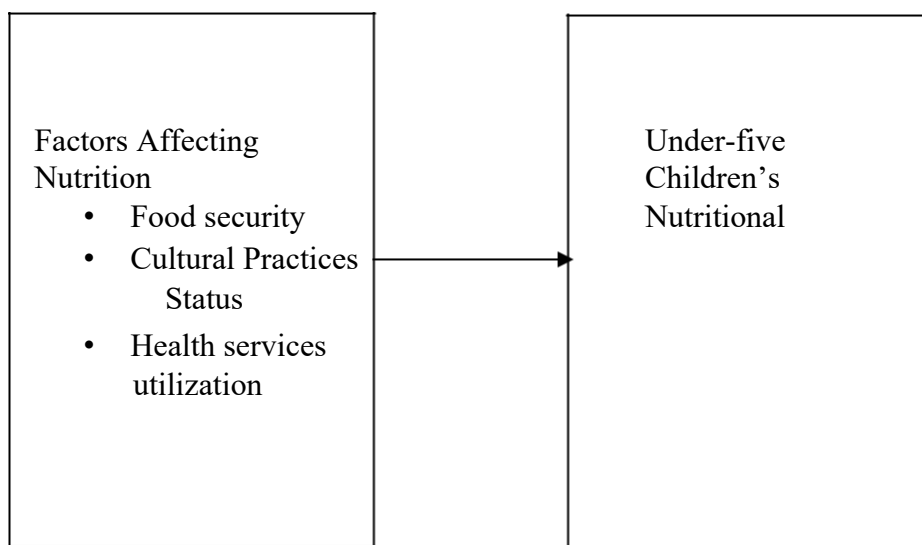


Figure 1. Schematic Presentation of the Study

Objectives of the Study

This study explored the factors affecting the nutritional status among toddler in Sapad, Lanao del Norte during Covid-19 Pandemic. Specifically, this study aimed to:

1. Determine the factors affecting the nutritional status among under-five children in terms of food security, cultural practices, and health services utilization.
2. Determine the nutritional status among children under five children.
3. Explore significant differences between the factors affecting nutritional status in terms of food security, culture and health services utilization and the under-five children's nutritional status.

Significance of the Study

The results and conclusion derived from this researcher endeavor were beneficial to the following groups of individuals or sectors of society:

Midwifery Students. Students may gain knowledge on the factors that affect nutritional status among children under five-years old during Covid-19 Pandemic. This study will help them to enhance their ideas, to show their capabilities to know and discover new things. Further, to explore, have an experience, sharing ideas to others.

Researchers. This study may benefit the researchers as they learned about the progress and latest trends about the topic. Moreover, to get to know and mingle with other researchers to come up with some benefits vice versa.

Future Researchers. This study may help them to give more concepts and ideas that shall broaden their knowledge. This will serve as one of their sources and guide when conducting a study. Community in Sapad, Lanao del Norte. They can determine the factors

affecting the nutritional status among children under five-year old in their area amidst pandemics. They can raise this to the local government unit for immediate solution.

Scope and Delimitation

This study focused on the factors affecting nutritional status among Children under five-year old in Sapad, Lanao del Norte during Covid-19 Pandemic. Furthermore, this determined how the status of the respondents during pandemic affects their nutritional status. The data collection was conducted with the 22 respondents from the residents of Sapad, Lanao del Norte. These respondents will be the parents who have a toddler whose ages 0-5 years old. A researcher-made questionnaire will be the main gathering instrument for collecting data to utilize the descriptive research method of the study. Survey questionnaire will be used to determine the status of the respondents and the factors affecting the nutritional status of the children under five-year old and the weight and height of their children under five years old.

Chapter 2

REVIEW OF RELATED LITERATURE

This chapter presents the different readings which are deemed important and related to the present study. The literature reviewed serves as links between the readers and the studies already done, talks about aspects that have been already established or concluded by other authors and give chances to appreciate the evidence that have already been collected by previous research, and projects the current research work in the proper perspective.

Status during Covid-19 Pandemic

Malnutrition is a major public health issue that causes child morbidity and is the cause of more than half of all child deaths globally, especially in low-income communities in developing nations. Inadequate dietary consumption and infectious illnesses are two key contributors to children's low nutritional condition. Because of their high protein and calorie needs, as well as their vulnerability to illnesses, young children are more vulnerable to malnutrition than adults (Galgamuwa, Iddawela, Dharmaratne, & Galgamuwa, 2017).

Children who are malnourished have slower physical and mental development, are more susceptible to diseases, and are more likely to die young. Malnutrition in children frequently has long-term consequences. It has a negative impact on their mature logic and work capacities. Anthropometric measurements are a cost-effective and reliable way to assess an individual's or a society's health and nutrition status. It is vital to evaluate the correlations between individual variables and health-related factors in a child population to define the actual priorities of child health within a community (Islam, Islam, Bharati, Aik & Hossain, 2016).

Childcare

Childcare is one of the key underlying causes of childhood malnutrition. Childcare is manifested in the way a child is fed, nurtured, socialized and guided. It is practiced by women who carry out some of the care activities such as breastfeeding and feeding of young children; psychosocial stimulation of children and support for their development; complementary food preparation, feeding and storage practices; hygiene practices and care for a child during illness and adoption of health seeking practices (Engle et al., 1999) (Oludo, et al., 2019).

Childhood malnutrition is most prevalent in developing countries. It is the leading responsible cause of underweight. Underweight was defined as the standardized weight of age ratio less than 2. In Africa and Southeast Asia, the prevalence of chronic malnutrition and underweight was about 39.9% and 26.6%, respectively. Globally, an estimated 101 million (16%) children under five years of age were underweight in 2011 and a 36% decrease from the estimated 159 million in 1990 (52%) (WHO and UNICE report 2016 on nutritional status). Data from the previous four Ethiopian Demographic and Health Surveys (2000, 2005, 2011, and 2016) showed that the prevalence of underweight decreased over the past 16 years (41, 33, 29, and 24%, respectively), but it is still too large, and we need to know the important factors affecting this status (EDHS report) [2, 3] (Fenta et al., 2020).

Food Security Status

Food security is to measure the ability to access nutritious foods and enough and dietary needs, active and healthy. Food security status and usage of toilet facility emerged as major predictors of childhood stunting and underweight, thus underpinning the importance of addressing poverty and providing sanitation facilities to rural households. The low BMI status of mothers also emerged as a major predictor of childhood stunting

and underweight which shows that both maternal and child under-nutrition are interrelated (Sinha et al., 2018).

Nutritional practices

Nutrition-related knowledge, attitudes, and practices (KAP) of both parents are important determinants of nutritional status and are probable contributors to malnutrition (Fathea, Salama, & Dalia, 2014). In delivering health and nutrition services, schools are appropriate platforms to reach many because parents spend time in school for parent–teacher meetings and receiving of children's school card. In the Philippines, usually, the mothers are responsible for meal preparation at home. The lack of correct KAP about nutrition among mothers may put the nutritional status of family members, especially the children at risk (Angeles et al., 2019).

A common nutrition intervention that aims to address gaps in KAP is nutrition education. Nutrition education is a set of learning experiences designed to facilitate voluntary adoption of eating and other nutrition-related behaviour conducive to health and well-being that includes those on a limited budget (Contento, Manning, & Shannon, 1992). In the Philippines, this type of nutrition intervention has been widely used due to the high-rate efficiency, which led to the implementation of various nutritional education programmes, one of which is the Nutrition and Health Kiddie Class that aims to educate children (4–6 years) about the importance of food and nutrition (NFP, 2015). In the study of Angeles-Agdeppa, Saises, and Capanzana (2012) that modelled the scaling-up of the

rice fortification programmed in the Philippines, significant increases in the percentages on parent's knowledge about iron were observed from baseline to endpoint: knowing what is iron (30.2% to 97.5%, $P \leq 0.001$), identifying good food sources of iron (28.3% to 95.0%, $P \leq 0.001$), and what iron-fortified rice (IFR) is and can do (5.6% to 81.9%, $P \leq 0.001$). A significant increase in the practice of buying IFR was also observed from baseline to endpoint (2.4% to 51.4%, $P = 0.041$) (Angeles et al., 2019).

Nutritional status of children ages 0–5

Poverty is a strong determinant of undernutrition among young children, it may not be true for schoolchildren. A previous study suggests that poverty is predictive factor to the poor nutrition among young children but not to the nutritional outcomes among schoolchildren (Bhattacharya et al., 2004). On the other hand, factors such as household food insecurity, low maternal education and poor health are stronger predictor for the undernutrition of schoolchildren (Wolde et al.,) Under-nutrition results from different causes – immediate, underlying, and basic. Immediate causes include inadequate intake of diet and repeated illnesses, whereas underlying causes include inadequate care of mothers, lack of access to health facilities, poverty, and food insecurity (Chatterjee, 2016) (Sinha et al., 2018). Stunting, wasting, and being underweight are the important nutritional status indicators for children. While stunting is caused by long-term insufficient nutrient intake and repeated infections, wasting is a result of acute food shortage and illness. Effects of stunting are delayed motor development and impaired cognitive development and are largely irreversible. Wasting, on the other hand, is a strong predictor of mortality and requires urgent response. Underweight combines information about linear growth obstruction and weight for length/height (WHO, 2019).

Malnutrition in children is the result of complex interaction of numerous and multifaceted factors. UNICEF's conceptual framework for the causes of malnutrition was considered. The prevalence of malnutrition among Filipino children ages 0–60 months (0–5.0 years old) by occupational group in the Philippines research results showed that stunting was the most prevalent malnutrition among children of this age group in the country, followed by underweight. The prevalence of stunting and underweight in this age group are considered high based on the 1995 WHO cut-off for public health significance (WHO).

The percentage of children with a low height-for-age (stunting) reflects the cumulative effects of undernutrition and infections since birth, and even before birth. This measure can therefore be interpreted as an indication of poor environmental conditions or long-term restriction of a child's growth potential. The percentage of children who have low weight-for-age (underweight) can reflect wasting. (i.e. low weight-for-height), indicating acute weight loss or stunting, or both. Thus, underweight is a composite indicator that may be difficult to interpret. Stunting, wasting and overweight in children aged under 5 years are included as primary outcome indicators in the core set of indicators for the *Global nutrition monitoring framework* to monitor progress towards reaching Global Nutrition (Capanzana et al., 2018).

Cultural Practices

Research into the feeding experience is critical, especially in the years before children start school. Young children rely on their caregivers to make decisions about the types of foods and beverages offered, when they are offered, the number and size of portions served, and whether the eating experience is pleasurable. Early-life dietary

practices and food choices have been demonstrated to influence consumption behaviors. Improved caregiver choices will be required to improve the nutrition of toddler's children. However, there is surprisingly little study on caregivers' decision-making processes when deciding what, and how much, food and drink to provide to very young children, as well as caregiver attitudes and opinions about the feeding experience.

Parents' attempts to standardize the recurrent scenario of meals and snacks using a classification system that can be cultural, social, or personal may give rise to norms and routines. Snacking, for example, was viewed negatively, but the Swiss cultural practice of feeding children at 10 a.m. and 4 p.m. was not viewed as snacking per se. Snacking was reported by participants as consisting of salty or sweet foods. This suggests that the researcher's and participant's conceptions of snacking may differ, or that cultural differences exist. This necessitates more investigation because it may have an impact on how Hereditary coproporphyria (HCP) advice is offered as well as the collecting of food intake data (Jacquier, Gatrell, & Bingley, (2016).

Children Under five-years old' Nutritional Status and Present Diseases

An anthropometry, biochemical, clinical, dietary, and environmental approach is commonly used in a licensed dietitian's nutritional assessment. Although anthropometry provides for the measurement of body size, composition, weight, and proportions, biochemical assessment entails the measurement of nutritional markers and organ function indicators in biological specimens (blood, urine, feces, hair, nails, and tissue samples). Through observation, palpation, percussion, and auscultation, the nutrition-focused clinical (also known as physical) exam analyzes the patient for signs and symptoms consistent with malnutrition or specific nutrient deficiencies (Ranjan & Nasser, 2015).

Although aggregated results showed significant variation, access to sanitation services is protective. The quality of evidence ranged from very low to very high across the health outcomes. Because most of the research was observational, estimates for various outcomes were usually derived from a small number of intervention studies and RCTs. Few studies evaluating progress up the sanitation ladder were available, restricting our ability to draw conclusions regarding the efficacy of various levels of sanitation services. There is far too few research on sanitation use to derive any useful conclusions. Subgroup analysis indicated some indication of influence among specific subpopulations, in particular age ranges, which adds to our knowledge of STH, trachoma, and diarrheal disease biology and transmission (Freeman, et.al., 2017).

Children under five-year old' Nutritional Status and Food Allergy

At the ages of 12, 21, and 28 months, 18 patients who avoided milk and 28 patients who avoided milk and wheat were assessed. The markers of nutritional status, nutrient intake or height for age, and weight for height were comparable between the two groups during the follow-up, even though the means for anthropometric measures in both groups were below the average for age. When the diet is sufficiently supplemented, the breadth of a food elimination diet has little effect on the growth or nutritional status of food-allergic children. When eliminating one or more foods that are staples of the diet, food-allergic youngsters require close physician and dietitian monitoring (Berry, et.al., 2015).

Chapter 3

METHODOLOGY

This part of the study presents the research methodology that composes the design, setting, respondents, instrument, data gathering procedure, data analysis and ethical consideration.

Research Design

This study is quantitative research using descriptive-correlational design. Descriptive survey research used surveys to gather data about varying subjects. This study aimed to know the extent to which different conditions can be obtained among these subjects. In this type of quantitative study, the researchers anchored this design to determine the factors affecting nutritional status among children under five years old.

Research Setting

This study focused on the factors affecting nutritional status among children under five-year old in Sapad, Lanao del Norte during Covid-19 Pandemic. Sapad, officially the Municipality of Sapad, is a 5th class municipality in the province of Lanao del Norte, Philippines. According to the 2020 census, it has a population of 22,974 people. Sapad was created by virtue of Republic Act No. 5745 where it is separated from the Municipality of Kapatagan, Province of Lanao del Norte, and constituted into a district and independent municipality, to be known as the Municipality of Sapad, same province. The seat of government of the new municipality shall be in the present site of the barrio Sapad.

The municipality of Sapad has a total land area of 140.03 km² (54.07 sq mi). It has 17 barangays with 4,354 households. The native languages used by the residents are

Maranao, Cebuano, Binukid, and Tagalog. In the year 2018, the municipality has 25.10% compared to 2015 statistics, the poverty incidence was 64.68% poverty incidence based on "PSA Releases the 2018 Municipal and City Level Poverty Estimates". Philippine Statistics Authority on December 15, 2021. Retrieved on 22nd day of January 2022.

Respondents of the Study

The respondents of this study were 12 mothers with one or more under-five children chosen from the identified barangays of Sapad, Lanao del Norte. They were selected through random sampling technique to identify the estimated sampling size to have appropriate respondents of the study by using the Slovin's formula. They will be the respondents of this study and will be asked consent first before a survey questionnaire will be distributed to determine the factors affecting nutritional status among children under five-year old and to identify the children's Nutritional status whether the child is stunting, wasting, underweight, or overweight. Slovin's formula is used to calculate the sample size (n) given the population size.

(N) and a margin of error (e). It is computed as $n = N / (1 + Ne^2)$.

Research Instruments

This study will use a modified questionnaire from the National Nutrition Council's (NNC) rapid Nutritional Assessment Survey form of 2020 to determine the factors affecting the Nutritional Status among Children under five-year old during Covid-19 Pandemic. It has 3 indicators namely: food security, cultural practices, and health services utilization. Each indicator is composed of 8 statements indicating why it is considered as a factor affecting nutritional status among children under five years old.

In interpreting the factors affecting nutritional status among children under five-year old, the following scale was used:

Responses	Continuum	Interpretation
4 Strongly Agree	3.26 – 4.00	Very High (VH)
3 Agree	2.51 – 3.25	High (H)
2 Disagree	1.76 – 2.50	Low (L)
1 Strongly Disagree	1.00 – 1.75	Very Low (VL)

Different cut-offs for overweight and obesity in Asians based on available data which suggests that Asians have a higher percentage of body fat than White people of same age, sex, and BMI. Identified potential action points: Underweight BMI less than 18.5; Normal: BMI 18.52-24.9; Overweight-BMI 25.0-29.9; Obesity - BMI>30.0. The standard formula to calculate BMI is $\text{weight} \div (\text{height} \times \text{height}) \times 703$. To calculate this with imperial (pounds and inches) measurements: Measure the child's weight in pounds. Measure the child's height in inches. Calculate the BMI by dividing the weight by the height squared and multiplying that total by 703.

To determine the undernourished under-five children, the indicator below was used to measure nutritional imbalance resulting in undernutrition (stunting, wasting, overweight, or underweight) that is based from the WHO (2019) guidelines.

Indicator	Cut off values	Terms of Status
	< -3.00 WAZ	Severe underweight
Underweight WAZ	-3.00 to -2.01 WAZ	Moderate underweight
	-2.00 to -1.01 WAZ	Mild underweight

	± 1.00 WAZ	Normal
	< -3.00 HAZ	Severe stunting
	-3.00 to -2.01 HAZ	Moderate stunting
Stunting HAZ	-2.00 to -1.01 HAZ	Mild stunting
	± 1.00 HAZ	Normal

Labels	Wasting WHZ%	Stunting HAZ%	Overweight WAZ%
Low	$2.5 < 5$	$2.5 < 5$	$2.5 < 5$
Medium	$5 < 10$	$5 < 10$	$5 < 10$
High	$10 < 15$	$10 < 15$	$10 < 15$
Very High	> 15	> 30	> 15

Data Gathering Procedure

Before the physical distribution of the research instrument, the researchers secured permission from the Dean of the College Nursing, Midwifery, and Radiologic Technology of Misamis University, Ozamiz City, to conduct the study. Upon the approval of the letter request, the researchers identified the respondents, explained about the intention and coverage of the study, and asked if they were interested in participating. The researchers personally distributed the questionnaires to the target respondents and gave them ample time to answer the questions. The answered questionnaires were collected immediately. Collection of data covered two to three weeks. After all, instruments will be retrieved, the responses were tallied using MS Excel for statistical treatment and analyses.

Data Analysis

To derived comprehensive, valid, and reliable results, the following statistical methods and techniques was utilized with the aid of statistical software Minitab:

Mean and Standard Deviation. This was used to describe the factors affecting the nutritional status of children under five years old.

Frequency and Percentage distribution. Used to determine the percentage for data on the age, gender, weight, and height of the under-five children.

ANOVA (Analysis of Variance). This tool was used to test differences among more than two populations.

Ethical Consideration

The following ethical issues were observed during the conduct of the study: (1) a request letter was made addressed to the Dean of the College of Nursing, Midwifery and Radiologic Technology in Misamis University (2) a written informed consent was obtained from the respondents after providing them with information on the purpose of the study and their rights of participation, (3) anonymity and confidentiality was ensured by using survey questionnaire that does not require respondents to divulge their identity, (4) respondents were encouraged to contact the researcher for any queries and concerns, and (5) all information will be destroyed upon completion of the study.

Chapter 4

RESULTS AND DISCUSSION

This part of the study presents the results and discussion based on the existing literature. Results are presented in table 1 to 3.

Factors Affecting Nutritional Status of Under-five Children

Table 1 presents the factors affecting the nutritional status of the under-five children. These factors were measured based on the respondents' food security, cultural practices, and health services utilization. As gleaned in the table food security got the lowest mean score of 2.31 and is interpreted as "low." This means that the respondents worried about what to prepare for their meals, they were reluctant on the adequacy of nutrients from their food. Moreover, low food security was reflected in their ability to maintain a regular diet at home. It can be noted that the respondents' inability to maintain the nutritive value of food that is recommended for their child's age obtained the lowest score of 1.67 and interpreted as very low. This finding could be associated to increase of poverty incidence of 25.10% from 2015 to 64.68% in 2021, according to the Philippine statistics authority that was released last December 15, 2021.

Similarly, factors related to cultural practices and health services utilization got a mean score of 2.79 interpreted as high. The finding implies that the respondents' nutritional practices during pregnancy and breastfeeding were influenced by their traditional practices. The respondents adhered to the folk practices such as not being alone during nighttime as it is harmful for the fetus. Moreover, they believed that adhering to pleasant such as drinking lots of lot of fruit juices for cleansing during pregnancy also influenced the children's nutritional status.

Overall, the factors affecting the nutritional status of under-five were highly practiced by the respondents. Several studies were conducted that align with the findings of this study. The study of Burman et al. (2022) highlighted that food insecurity (FI) remains a predictor of chronic undernutrition (wasting and stunting) highlighting the need for multisectoral strategies and policies to combat FI and multiple forms of malnutrition which will lay the foundation for sustainable and inclusive growth. Similarly, the study of Chege et al. (2015) found that culture influenced dietary practices among children under five years. It recommended initiation of programs to create awareness on how the beliefs negatively affect dietary practices with a view for a change. Moreover, the finding is also congruent with study of Sun et al. (2019) that underscored the reasonable utilization of health services can reduce the poor result of nutrition and growth of infants in poor rural areas where ethnic minorities gather.

Table 1
Factors Affecting Nutritional Status of Under-five Children

Statements	Weighted mean	QI
Food security		
1. I have no worries about food.	2.08	L
2. We eat healthy and nutritious foods.	2.58	L
3. I made sure that food for my family is safe to eat.	2.75	H
4. I always check the processed/canned goods that it is BFAD approved and no therapeutic claims.	1.75	VL
5. We maintain a regular healthy diet at home.	2.33	L
6. I made sure that processed/canned goods are not expired yet.	2.75	H
	1.67	VL
7. We always follow the nutritive value as recommended.	2.58	H
8. Eating fresh fruits and vegetables is safer than processed foods.		
<i>Mean</i>	2.31	L
Cultural practices		
1. During my pregnancy, I do not go alone at night because it is dangerous.	3.08	H
2. I drink lots of water and fruit juices during pregnancy.	2.08	L
3. I avoid twin fruits like bananas to prevent twin pregnancies.	3.75	VH
4. I cleanse my breasts with warm water before breastfeeding.	2.75	H
5. I am not allowed to drink soft drinks because it is harmful for my pregnancy.		
6. I sleep early at night to gain strength.	1.58	VL
7. I am not allowed to sleep or take a nap during the daytime because I might gain so much weight.	3.08	H
	2.25	L
8. I expose my baby to the sunlight after taking him/her a bath.	3.75	VH
<i>Mean</i>	2.79	H
Health services utilization		
1. My child is fully immunized.		VH
2. My child has routine check-ups.	3.42	H
3. I attended ante-natal care.	2.58	L
4. I had maternal supplements for childbirth.	2.33	L
5. I had to intake vitamins and had a regular check-up during pregnancy.	2.42	
	2.17	
6. My child undergone new-born screening.	4.00	L
7. My children regularly see a doctor.	3.50	VH
8. I visited the health center for prenatal care.	1.92	VH
		L
<i>Mean</i>	2.79	H
Weighted mean	2.63	H

Nutritional Status of Under-five Children

Table 2 reflects the nutritional status of under-five children in rural households. Children's nutritional status was measured through their anthropometric measurement. Nutritional status indicators stunting, wasting, overweight and underweight are used to measure children nutritional imbalance; such imbalance results in either undernutrition or

overweight/obese. As shown in the table, most of the under-five children in this study were underweight. Although a few percentages of the under-five children were categorized as normal weight for height and obesity category. The finding implies that with the high number of under-five children categorized as underweight, the government might place strategic responses to reduce child under nutrition. These responses include strengthening access to community-based nutrition services that support the early detection and treatment of undernourished children and emergency food distribution, including fortified foods with vitamins and minerals, to vulnerable households, particularly those with children under 5 years.

Moreover, Govender et al. (2021) explicate that malnutrition is a health condition resulting from eating food that contains either insufficient or too many calories, carbohydrates, vitamins, proteins, or minerals. It is a state of under- or overnutrition, evidenced by a deficiency or an excess of essential nutrients. Good nutrition is the basic need for children to thrive, grow, learn, play, and participate.

Table 2. Nutritional Status of Under-five Children

Nutritional Status Indicators	Frequency			Percentage
	Male	Female	Total	
Total- Weight for Age	12	10	22	100.0%
WFA - Normal	3	0	3	13.6%
WFA - OW	0	2	2	9.1%
WFA - UW	8	8	16	72.7%
WFA - SUW	1	0	0	4.5%
Total- Height for Age	12	10	22	100.0%
HFA - Normal	7	8	15	68.2%
HFA - St	1	1	2	9.1%
HFA - SSSt	4	1	5	22.7%
Total- Weight for Length/Height	12	10	22	100.0%
WFL/H - Normal	3	4	7	31.8%
WFL/H - OW	1	2	3	13.6%
WFL/H - Ob	1	0	1	4.5%
WFL/H - MW	3	1	4	18.2%
WFL/H - SW	4	3	7	31.8%

Significant Relationship between Factors Affecting Nutrition and Nutritional Status of Under-five Children

This part of the study showed the significant relationship between the factors affecting nutrition and the nutritional status of children under five.

The table shows test an f-value = 0.27, and p-value: 0.849 leading to the decision of not rejecting null hypothesis. The relationship between food security and nutritional status is not statistically significant. In other words, there is insufficient evidence to suggest that food security has a significant impact on nutritional status. Similarly, for cultural practices computed f-value is 0.00, and p-value: 0.972 with the decision of not rejecting null hypothesis means that the relationship between cultural practices and nutritional status is not statistically significant. Cultural practices do not appear to have a significant impact on nutritional status. On the contrary, for health services utilization computed f-value is 4.12 and a p-value: 0.043 lead to the decision of rejecting the null hypothesis. The finding implies that food security and cultural practices, health services utilization does show a statistically significant relationship with nutritional status. The p-value (0.043) is less than the conventional significance level of 0.05, indicating that the null hypothesis can be rejected. Therefore, there is evidence to suggest that health services utilization does have a significant impact on nutritional status in this analysis.

Overall, based on this analysis, while food security and cultural practices do not seem to significantly influence nutritional status, health services utilization does appear to have a significant association with nutritional status. This implies that improving health services utilization may lead to better nutritional outcomes.

Moreover, the findings underscored that among the constructs on factors affecting nutrition, health services utilization significantly influenced the nutritional status of under-five children. This implies that the respondents' utilization of health services such as

immunization ensuring that their children were protected against contracting preventable diseases. Moreover, regularly obtaining prenatal services was a means of availing prenatal vitamins and supplements necessary for healthy pregnancy. Furthermore, diagnostic services such as newborn screening also influenced the nutritional status of under-five children.

The study of Umallawala et al. (2022) is congruent with the findings of this study which underscored that the utilization of health facilities was restricted primarily because of the beliefs that “treatments are not required,” lack of knowledge about the treatment for malnutrition, and unavailability of services in the district. Most of the family avoided visiting government health facilities during child illness as they preferred private service providers. Low uptake of health and nutrition services has been documented in various studies in India and other developing countries. However, the study of Pradhan et al. (2023) contradicted the findings of this study which highlighted that despite health services utilization, a sizable proportion of under-five children suffer from undernutrition. The undernutrition prevalence varied considerably by socioeconomic and demographic characteristics.

Table 3. Significant Relationship Between the Factors Affecting Nutrition and the Nutritional Status of Under-five Children

Variables	Test Statistics		Remarks
	f-value	p-value	
<u>Factors and nutritional status</u>			
Food security	0.27	0.849	Do Not Reject Null Hypothesis
Cultural practices	0.00	0.972	Do Not Reject Null Hypothesis
Health services utilization	4.12	0.043*	Reject Null Hypothesis

Chapter 5

SUMMARY, FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Summary

This study explored the factors affecting the nutritional status among under-five children in Sapad, Lanao del Norte during Covid-19 Pandemic. Specifically, this study aimed to 1) determine the factors affecting the nutritional status among under-five children in terms of food security, cultural practices, and health services utilization; 2) determine the nutritional status among under-five children; 3) explore significant relationship between the factors affecting nutritional status in terms of food security, culture and health services utilization and the under-five children's nutritional status. This study used a descriptive-correlational design using complete enumeration survey. Twelve mothers of the identified malnourished children were the respondents of the study. The study was conducted in Sapad Lanao del Norte.

Findings

The following are the findings of the study:

1. The factors affecting the nutritional status of under-five children were on average high which implies that the respondents' cultural practices and health services utilization were highly observed by the respondents. However, the respondents claimed to low food security as a factor affecting the nutritional status of the under-five children.
2. Most of the under-five children belonged to the underweight category, with a few counts of children categorized as normal and under obesity category.

3. Respondents' health services utilization influenced the nutritional status of their children under five children. Other constructs such as food security and cultural practices relating to nutrition did not affect the children's nutritional status.

Conclusions

Based on the study's findings, the following are the conclusions:

1. The respondents food security situation, cultural practices relating to nutrition and their utilization of health services as factors affecting children's nutritional status were averagely high.
2. Most of the under-five children belonged to the underweight category.
3. Respondents' health services utilization influenced the nutritional status of their children under five.

Recommendation

Based on the findings and conclusions of the study, the following are the recommendations:

1. The government may strengthen the existing health and social welfare programs and related activities that will ensure and improve food security, especially paying attention to households with identified malnourished under-five children.
2. The Department of Health and its implementors such as midwives and nurses, continually and religiously implement and monitor the nutrition programs particularly among the under-five children as they are considered vulnerable to unpleasant health outcomes. Moreover, counseling and promotion programs may be reinforced to revitalize community nutrition education in areas such as gestation, exclusive breast-feeding and complementary feeding.

3. The Local Government Unit may work closely with the DOH to ensure proper implementation of nutrition programs, especially addressing the immediate needs of the identified malnourished children. They may heighten their health campaigns and improve health services as they essentially affect the nutritional status of individuals if promptly utilized.

4. Future research may explore more on specific health services utilized by the mothers and their utilization barriers and enablers including larger sample size.

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Appendix A: SURVEY QUESTIONNAIRE

FACTORS AFFECTING NUTRITIONAL STATUS OF UNDER FIVE CHILDREN IN SAPAD LANA DEL NORTE DURING COVID-19 PANDEMIC

Part 1- Factors Affecting Nutritional Status of Under Five Children

(Modified and Adopted from Rapid Nutritional Assessment Survey of 2020)

Directions: Please put a check (✓) on the extent of the status of respondents during Covid-19 pandemic that is appropriate to your answer.

Legend: 4 – Strongly Agree
3 – Agree
2 – Disagree
1 – Strongly Disagree

1.1 Food Security	4	3	2	1
1. I have no worries about food.				
2. We eat healthy and nutritious foods.				
3. I made sure that foods for my family is safe to eat.				
4. I always check the processed/canned goods that it is BFAD approved and no therapeutic claims.				
5. We maintain regular healthy diet at home.				
6. I made sure that processed/canned goods are not expired yet.				
7. We always follow the nutritive value as recommended.				
8. Eating fresh fruits and vegetables is safer than processed foods.				

1.2 Cultural Practices		4	3	2	1
1. During my pregnancy, I do not go alone at night because it is dangerous.					
2. I drink lots of water and fruit juices during pregnancy.					
3. I avoid twin fruits like bananas to prevent twin pregnancies.					
4. I cleanse my breast with warm water before breastfeeding.					
5. I am not allowed to drink soft-drinks because it is harmful for my pregnancy.					
6. I sleep early at night to gain strength.					
7. I am not allowed to sleep or take a nap at daytime because I might gain so much weight.					
8. I expose my baby to the sunlight after taking him/her a bathe.					

1.3 Health Service Utilization	4	3	2	1
1. My child is fully immunized.				
2. My child has routine check-ups.				
3. I attended ante-natal care.				
4. I had maternal supplements for child-birth.				
5. I had intake vitamins and had a regular check-up during pregnancy.				
6. My child undergone new-born screening.				

7. I visit the health center for pre-natal care.				
8. Free vitamins and food supplements are provided during pre and post-natal care at RHU.				

Part 2 - Nutritional Status of Under Five Children's Body Mass Index (BMI)

Child 1

Age: _____ months
years

Sex: _____ boy _____ girl

Height: _____
inches

Weight: _____ lbs

Child 2

Age: _____ months
years

Sex: _____ boy _____ girl

Height: _____
inches

Weight: _____ lbs

Child 3

Age: _____ months
years

Sex: _____ boy _____ girl

Height: _____
inches

Weight: _____ lbs

Part 3 –Undernourished under-five children (Stunting, wasting, overweight and underweight)

Child 1

Age: _____ months

Height: _____ inches

Weight: _____ lbs

Child 2

Age: _____ months

Height: _____ inches

Weight: _____ lbs

Child 3

Age: _____ months

Height: _____ inches

Weight: _____ lbs

Thank you for your time.