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A STUDY ON NUTRITIONAL KNOWLEDGE OF MOTHERS AND HEALTH STATUS OF CHILDREN IN HMAWBI TOWNSHIP

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EMDevS – 47 (16th BATCH)

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This is to certify that this thesis entitled "**A STUDY ON NUTRITIONAL KNOWLEDGE OF MOTHERS AND HEALTH STATUS OF CHILDREN IN HMAWBI TOWNSHIP"** towards the requirements for the Degree of Master of Development Studies has been accepted by the Board of Examiners.

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ABSTRACT

The improvement of nutrition in Myanmar supports the National Economic and Social Development Plan. This study examines the relationship between mother's nutritional knowledge and her children health status. Descriptive method is used in this study. A sample of 200 respondents from Hmawbi Township is selected by two stage random sampling approach. This study finds that many of the mothers who have higher nutritional knowledge level and their children have normal weight. Mothers with a higher level of nutritional knowledge feed their children more vegetables, fruit, soybeans, and less sugar than mothers with a lower level of nutritional knowledge. Mothers who are knowledgeable about nutrition avoid feeding their children foods that contain artificial ingredients. Children's eating habits are influenced by their mothers' nutrition knowledge in Hamby Township. To reduce the risk of malnutrition in this area, provision of proper health education, strengthening the public health care strategies and effective coordination mechanism should suggested and nurtured to the targeted population in order to meet the health needs.

ACKNOWLEDGEMENTS

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LIST OF ABBREVIATIONS

ACF	Action Contre la Faim
ASEAN	Association of Southeast Asian Nations
BMI	Body Mass Index
CPI	Consumer Price Index
CSO	Central Statistical Organization
DHS	Demographic and Health Survey
DOH	Department of Public Health
FAO	Food and Agricultural Organization
FCS	Food Consumption Score
FNS	Food and Nutrition Security
FSIN	Food Security Information Network
HAZ	Height for Age
HAZ	Height-for-age z-score
HDDS	Household Dietary Diversity Score
HEB	High Energy Biscuits
HHS	Household Hunger Scale
H-L	Hosmer and Lemeshow
IDA	Iron Deficiency Anemia
IDD	Iodine Deficiency Disorder
IDDS	Individual Dietary Diversity Score
INGOs	International Non-Governmental Organizations
IYCF	Infant and Young Child Feeding
JMP	Joint monitoring program (WHO & UNICEF)
KAP	Knowledge, Attitude, Practices
KAP	Knowledge, Attitudes and Practices
LIFT	Livelihoods and Food Security Trust Fund
MCCT	Maternal and Child Cash Transfer
MDHS	Myanmar Demographic Health Survey
MIMU	Myanmar Information Management Unit
MMK	Myanmar Kyat
MNPED	Ministry of National Planning and Economic Development

MOALI	Ministry of Agriculture, Livestock and Irrigation
MOE	Ministry of Education
MOHS	Ministry of Health and Sports
NNC	National Nutrition Centre
NPAFN	National Plan of Action for Food and Nutrition
OVC	Orphans and Vulnerable Children
PEM	Protein Energy Malnutrition
PLW	Pregnant and Lactating Women
PPP	Public Private Partnership
RHC	Rural Health Center
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
VFVL	Virgin, Fallow and Vacant Land Management Law
WASH	Water, Sanitation and Hygiene
WAZ	Weight for Age
WAZ	Weight-for-age z-score
WFA	Weight for Age
WHO	World Health Organization
WHZ	Weight for Height
YUE	Yangon University of Economics

CHAPTER I
INTRODUCTION

1.1   Rationale of the Study

It is critical to instill healthy eating habits in children. It aids in the prevention of malnutrition, growth retardation, and acute child nutrition issues, as well as chronic, long-term health problems such as cardiovascular disease, diabetes, cancer, obesity, and osteoporosis. Parents are typically the most responsible adults in the lives of their children. Parents have a significant influence on their children's eating habits and preferences. Mothers, in particular, are nutritional knowledge role models for their children. As a result, it is critical to ascertain the mother's eating habits in order to promote both the child's and mother's healthy nutrition. Mother's eating habits are influenced by a variety of factors, including socioeconomic status, educational attainment, age, employment status, and level of nutrition knowledge.

The improvement of nutrition in Myanmar contributes to the National Economic and Social Development Plan, which outlines a vision for the country to become a peaceful, modern, and developed nation. Malnutrition can be passed down from mothers to their children, perpetuating intergenerational cycles of poor health and poverty. Maternal and child malnutrition increases the incidence and severity of illness, which raises health-care costs and impedes overall socioeconomic development, with estimates indicating that child malnutrition can cost up to 11% of GDP. Nutrition is both an input and an outcome of national development, and it has been demonstrated that investments in evidence-based nutrition interventions will result in significant economic returns. Populations that are well-nourished are healthier, earn more money, and spend less money on health care.

Myanmar continues have a high prevalence of maternal and child undernutrition (declined from just over 40% in 1990 to 29.2% in 2016, there are still some 1.4 million children). Food contains nutrients substances which the body uses for growing and functioning. All of us need many different nutrients in order to say healthy, to have

energy and to grow. Food contains various nutrients in different amounts. (Multi Sectoral National Plan of Action on Nutrition, MS-NPAN, 2018-2019 – 2022-23).

Many studies were conducted in Myanmar to address those nutritional issues among children under the age of five. Similarly, a number of studies on the determinants of child nutrition status in developing countries were conducted. Risk factors for undernutrition among children aged 0 to 5 years were studied using multivariable logistic regression in 35 households using data from the Myanmar Demographic Health Survey (MDHS). However, because many studies focused on children under the age of five, there were few studies on their nutritional status. It is assumed that the mother's nutritional knowledge level can have an impact on their children's eating habits. As a result, the purpose of this research is to determine the effects of the mother's nutritional knowledge level on the children's nutritional attitudes and behaviors. As a result, the underlying factors that determined the nutritional status of children under the age of five from Hmawbi Township were investigated in this study.

1.2   Objectives of the Study

The objectives of the study are:

(i)   To explore the relationship between mothers' characteristics and nutritional knowledge in Hmawbi Township.

(ii)   To examine the relationship between nutritional knowledge of mothers and health status of children in Hmawbi Township.

1.3   Method of Study

In this study, descriptive method was used to describe the relationship between mother nutrition knowledge and child health status. Two-stage random sampling method with 200 random sample mothers were used to conduct data collection. The primary data was collected by using face to face interview to the mothers who having children age under five years in Hmawbi Township.

1.4   Scope and Limitations of the Study

The study focuses on Hmawbi Township, Yangon Region. The target group is mother who having children age under five years in Hmawbi Township. Survey period was from October to November in 2020. Accordingly, the scope of this study covered the child malnutrition status and the feeding practices of mothers at Hmawbi Township.

1.5   Organization of the Study

This study is organized into five chapters. Chapter one consists of introduction with rationale of the study, objectives of the study, scope and limitations of the study, method of study and organization of the study. Chapter two presents Literature review. Chapter three presents Food and Nutrition Security in Myanmar. Chapter four discusses survey data analysis. Finally, chapter five involves the conclusion with the findings and suggestions.

CHAPTER II
LITERATURE REVIEW

2.1   Nutrition Knowledge

Nutrition is both an input to and an outcome of national development, and it has been emphasized that investments are necessary. Food contains nutrients and substances that the body uses for growth and function. We require a variety of nutrients in order to be healthy, have energy, and grow. Food contains various nutrients in varying amounts.

Bodybuilding foods include: Proteins contribute to the structure of the body, including muscles and the immune system. Plants: beans, nuts and oilseeds, legumes, tofu, lentils; animals: fish, poultry, meat, eggs, seafood, milk.

Energy – giving foods: Carbohydrates and fates provide energy for the body to function, move and works as well as giving the warmth. E.g rice, noodles, bread, sweet potatoes, biscuits, taro and oil.

Protective foods: Vitamins and minerals help the body to function properly. Example; vitamins and minerals are found in vegetable and fruits. Colorful composition in the diet, support a health mean. Star-Food Groups: If we divide the body-building foods in plant and animal source protein, we talk about the four start food groups. These are vegetable and fruit, grain foods, milk and milk products, lean meat, fish eggs and legumes.

2.1.1   Nutritional Outcomes

A wide variety of factors that influence food availability, access, and utilization ultimately result in nutritional outcomes. This is best assessed through actual physical measurements of height and weight, as well as direct measurements of micronutrient levels in the body. The ultimate success metric for food and nutrition security policies and programs is improvement in these indicators.

Taking anthropometric measurements of children is widely recognized as an important indicator of the nutritional status of the population as a whole. Children are

one of the most vulnerable groups to malnutrition because they have little control over the amount and composition of their diet. Furthermore, poor childhood nutrition during the first 1,000 days after conception has been shown to significantly impair physical and cognitive development later in life. Stunting (low height for age), wasting (low weight for height), and underweight are the three anthropometric indicators used to assess childhood malnutrition (low weight for age). SDG 2.2 recognizes the importance of these indicators and has set targets for countries to reduce stunting by 40% (compared to a 2010 baseline) and wasting to less than 5% of the population by 2025. Data indicate that the nutritional status of children in Myanmar is improving, but it remains unacceptably low.

2.1.2 Stunting

Stunting is a form of linear growth retardation caused by chronic malnutrition. Stunting data from three surveys are shown in the graph below. This is done to provide a succinct view of pertinent data. Because of the differences in sampling methodologies, survey results are not directly comparable, and it is best to avoid drawing conclusions or trends from data from multiple surveys. The most recent data for child nutrition are from the Myanmar Demographic and Health Survey (MDHS) 2015-16, which was conducted by the Ministry of Health and Sports. According to the survey, 29.2 percent of children under the age of five are stunted, with 8.2 percent severely stunted. 82 MICS survey data provide some longitudinal insights, indicating a significant decrease in stunting from 47.6 percent in 1997 to 35.1 percent in 2009-10. Stunting was found to be 31.9 percent in 2013 according to the LIFT Survey.

2.1.3 Wasting

Wasting is a sign of acute malnutrition, which can be caused by short periods of low energy intake, high nutrient loss, or a combination of the two. According to the DHS 2015-16, 7% of children under the age of five are wasted, while 1.3 percent are severely wasted. 83 MICS longitudinal data points to little change, with wasting decreasing 0.1 percent from 1997 to 2009-10. According to DHS data, wasting is more prevalent in cities than in rural areas, with prevalence rates of 8.9 percent and 6.5 percent, respectively. Wasting can be an indicator of a poor health environment in which children experience brief periods of high nutrient loss due to disease. Hence,

higher wasting rates in urban areas may be indicative of a poor health environment brought about by growing urbanization as mentioned earlier.

2.1.4 Underweight

Underweight is frequently regarded as a composite measure of stunting and wasting and thus cannot be directly attributed to either acute or chronic malnutrition. According to DHS findings, 18.9 percent of children in Myanmar are underweight, with 3.7 percent severely underweight. 84 In MICS data, the prevalence of underweight children under the age of five fell from 25% in 1997 to 22.6 percent in 2009-10, while in IHCLA data, the same metric fell from 34.3 percent in 2005 to 32 percent in 2009-10.

2.1.5 Micronutrient

Although not as visible as stunting or wasting, micronutrient deficiencies are also a direct result of poor nutritional intake and can severely impair cognitive and physical development. The National Nutrition Centre (NNC) has identified five undernutrition issues in Myanmar. One is a macronutrient issue, protein energy malnutrition (PEM). The other four are related to micronutrient deficiencies.

A lack of iron Anemia (IDA) is defined as a low level of hemoglobin (or red blood cells) in the blood caused by blood loss, decreased hemoglobin production, or increased hemoglobin breakdown. Iron deficiency reduces hemoglobin production in the case of nutrition. Other factors that contribute to anemia include micronutrient deficiencies in vitamin B12, parasitic infections, and acquired or inherited disorders. Anemia caused by iron deficiency affects nearly one billion people 88 and was responsible for 183,000 deaths worldwide in 2013. While mild anemia may cause few or minor symptoms in many people, more severe cases of anemia can have a significant impact on an individual's quality of life as well as productive capacity.

It can also impair children's growth and cognitive development. The DHS took direct measurements of hemoglobin in blood and discovered that 57 percent of children aged 6 to 59 months were anemic. This was classified as 32 percent mildly anemic, 25 percent moderately anemic, and less than 1 percent severely anemic. The DHS also measured the hemoglobin of women aged 15 to 49 and discovered that 47 percent of the sample was anemic, with 38 percent mildly anemic, 8 percent moderately anemic, and less than 1 percent severely anemic. Anemia can also be caused by a poor health

environment and the parasitic infections that result. According to the NNC (2013), parasitic worms infected 30.8 percent of children under the age of five and 44.3 percent of pregnant women. It is unknown how much of iron deficiency anemia is caused by poor dietary intake or a poor health environment, but it is almost certainly caused by a combination of the two. Anemia rates for children were slightly higher in cities than in rural areas, at 60% and 57%, respectively. Similarly to the figures for child wasting, Yangon had higher rates of childhood anemia (67 percent) than the national average despite having a relatively low poverty rate. Given that the Yangon Region's population is largely urban, these findings point to the possibility that rapid urbanization has resulted in a poor health environment and has a significant negative impact on nutrition outcomes.

Vitamin B1 deficiency, also known as Beri Beri, is defined as insufficient levels of Vitamin B1 Thiamine for the body to grow and function properly. This micronutrient deficiency is more prevalent in countries that rely on white, polished rice as a staple grain, such as Myanmar. Thiamine is found in the husk of the rice grain, which is removed during processing. Infantile Beri Beri is a significant cause of infant mortality. Mothers who are deficient in thiamine are unable to pass this micronutrient on to their children through breast milk. According to the NNC's Under 5 infant mortality survey (2003), infantile Beri Beri is responsible for 7.12 percent of deaths among children aged 1 to 12 months in Myanmar. A 2013 NNC document also cites a 2009 NNC study, finding that 6.8% of pregnant women and 4.4% of lactating women suffer from Beri Beri (NNC, 2009).

Vitamin A deficiency (VAD) has typically been identified by corneal damage known as xerophthalmia or Bigot's Spots. The prevalence of Bitot's Spots among children under the age of five has decreased from 0.6 percent in 1991 to 0.03 percent in 2000. (NNC, 2013). According to UNSCN (2011), these spots have a prevalence of only 2% among people with VAD, making them a less than reliable indicator. As a result, serum retinol concentration is increasingly being used to diagnose Vitamin A deficiency. According to the UNSCN, as of 2007, 30.1 percent of children aged 6 to 59 months in Myanmar had low serum retinol levels (LEARN, 2016). This is consistent with the findings of a 2012 survey conducted jointly by the NNC and the Department of Medical Research (Lower Myanmar). Although the survey only covered 12 townships in Southern Myanmar and is therefore not nationally representative, 38% of children age 6 to 59 months in the sample had low serum retinol levels (NNC, 2013).

Iodine Deficiency Disorder (IDD) during pregnancy can cause severe brain damage to the fetus, as well as infant deaths, spontaneous abortions, and congenital abnormalities (LEARN, 2016). Goiter, the most visible symptom of IDD, decreased from 33% in 1994 to 2.2 percent in 2006. (NNC, 2006). 90 This decrease has been attributed to a significant increase in the proportion of households consuming iodized salt, from 18.5 percent in 1994 to 91.5 percent in 2011. (NNC, 2013). However, according to NNC (2013), only 68.8 percent of households were consuming enough iodized salt in 2011.

2.2   Nutrition Status of Mothers with Child

Birth weight is an important indicator of both the child's and the mother's nutritional status. Low birth weight is strongly associated with perinatal, neonatal, and postnatal morbidity and mortality, as well as chronic diseases in adulthood. Increasing birth weight contributes to a reduction in child growth stalling, resulting in less stunting and increased adult height. Furthermore, global evidence shows that birth weight can be rapidly improved, even in populations of short adult women (UNSCN, 2011). Low birth weight tends to converge with underweight prevalence over time, eventually reaching zero for both. Birth weight data, which was previously collected using health system data, are now typically collected as part of household surveys. The UN Standing Committee on Nutrition (UNSCN) has called for a revived focus on birth weight as an outcome of programs to improve child nutrition.

Increasing birth weight not only improves child health outcomes, but it also has additional benefits for mothers' health and has a positive impact on family well-being and overall development (UNSCN, 2011). Because many infants are not weighed at birth, and those who are weighed may represent a biased sample of all births (because they were more likely to be delivered in a health facility), reported birth weights in developing countries cannot be used to estimate the prevalence of low birth weight. As a result, the percentage of births weighing less than 2,500 grams is estimated using) the mother's assessment of the child's size at birth (i.e. very small, smaller than average, average, larger than average, very large) and the mother's recall of the child's weight or the weight as recorded on a health card if the child was weighed at birth (MNPED & MOH, 2011).

Minimum dietary diversity: The proportion of children aged 6 to 23 months who consumed food from four or more food groups within the previous 24 hours. Grain,

roots and tubers, legumes and nuts, dairy products (milk, yoghurt, or cheese), flesh foods (meat, fish, poultry, or liver/organ meats), eggs, vitamin A-rich fruits and vegetables, and other fruits and vegetables are the seven food groups used to calculate this indicator.

2.2.1 Malnutrition and Under-nutrition of Mothers with Child

Minimum dietary diversity: The proportion of children aged 6 to 23 months who received food from four or more food groups in the preceding 24 hours. Grain, roots and tubers, legumes and nuts, dairy products (milk, yoghurt, or cheese), flesh foods (meat, fish, poultry, or liver/organ meats), eggs, vitamin A-rich fruits and vegetables, and other fruits and vegetables are the seven dietary groups used to compute this indicator. Acute malnutrition, often known as wasting, is a sign of recent or ongoing malnutrition and is typically measured by weight-for-height, mid-upper arm circumference (MUAC), or the presence of edema. Children who are severely malnourished have a much higher risk of death than their well-nourished peers.

Shortfalls in food, care, health, inequality, and poverty are all examples of malnutrition. The right nutrition during the 1,000-day window helps to build a child's brain and fuel their growth, improve a child's school-readiness and educational achievements, reduce disparities in health, education, and earning potential, reduce a person's risk of developing chronic diseases such as diabetes and heart disease later in life, boost a country's GDP by up to 12%, and break the intergenerational cycle of poverty.

2.2.2 Causes of Under-nutrition

(a) Immediate causes of malnutrition in children

The direct causes of malnutrition in children are associated with nutritional intake, psychosocial care (stress, trauma), and disease-related variables. Inadequate food intake in early infants affects immunological function, which may lead to disease or cause disease to be more severe or prolonged, according to UNICEF (1992). Youngsters with low nutritional intakes are more sensitive to disease than children who are well-nourished. As a result, undernutrition may occur as a result of illnesses and dietary deficiencies interacting in a mutually reinforcing manner (Allen & Gillespie, 2001). As a result, poor food intake may not be the main cause of malnutrition, because

sickness may reduce bioavailability or increase requirements or nutrient losses, and can thus be an immediate cause of malnutrition.

(b) Underlying Causes of Malnutrition in Children

Most people suffer from malnutrition as a result of disease or an insufficient nutritional intake. These factors are exacerbated by barriers in the home and family, such as:

Inadequate food access: Families are unable to consume enough food that contains the necessary calories and nutrients. Other issues may include access to land and agricultural inputs, food marketing and distribution, income, and other considerations.

Inadequate maternity and child care practices: Families and communities did not devote enough time and resources to meeting the health, nutritional, emotional, and cognitive requirements of women and children. Feeding unwell children incorrectly; failing to use health care facilities; failing to provide adequate supplemental feeding; inadequate diets for children, including food taboos during weaning and feeding practices are all considered bad caring practices.

Poor water/sanitation and inadequate health services: Health services are unstandardized, non-existent, or inconvenient for service customers. Inadequate health services are characterized by low vaccine coverage, a lack of prenatal care, inadequate management of sick and malnourished children, and insufficient water and sanitation facilities.

Education: The education level of women, who are the primary caregivers for children, has an impact on the quality of care because more educated women are better able to process nutrition information, acquire skills, and display positive caring behaviors than less educated women, and this is reflected in the child's nutritional status. Furthermore, women with less education are more inclined to embrace the old status quo and are less open to changes for improved health and family practices, which may influence how they feed their children.

Information: Caregivers' nutritional understanding influences how they feed their children, which in turn influences the nutritional condition of the children. According to UNICEF (1992), a lack of nutritional education contributes to the majority of the multi-sectoral factors that contribute to the development of malnutrition, such as insufficient food intake and unsanitary dietary practices. Lack of awareness and

nutrition information regarding feeding volume, frequency, kind of food, and balanced diet contribute considerably to children under the age of five having poor nutritional status, even in families where adults meet their daily requirements (Levitt, Pelletier, & Pell, 2009). Filthy circumstances and practices at the household level include the lack of sanitary latrines, improper waste disposal, and unsanitary conduct in childcare and food preparation. It generates a hazardous environment with health concerns such as diarrhoeal infections, which can lead to poor nutritional status in young children (United Nations Environment Programme (UNEP)/UNICEF/ WHO, 2002).

(c) Basic Causes of Malnutrition in Children

The primary causes of hunger include a lack of resources and a lack of control over human and organizational resources, economic structure, political and ideological superstructure. Furthermore, primary causes of malnutrition include culture, religion, tradition, and belief, which influence how children are fed and cared for, affecting their nutritional condition (UNICEF, 1992). Furthermore, cultural and religious systems of civilizations frequently give greater resources and authority to men, resulting in women having less access to loans, improved technology, seed, and fertilizers due to women's restricted influence or power within the household and community. It results in unequal food distribution within the household (Ajani, 2008). Furthermore, religious and cultural traditions limit women's rights, while reproduction and home obligations limit their time and mobility, leading to inadequate care of themselves and their children, culminating in poor nutritional condition. Economic growth in a country, particularly equitable growth, when social services become affordable and accessible, and proper investment in human resources (including women's empowerment), is more likely to enhance the nutritional quality of the community, particularly that of young children (FAO, 2009).

2.2.3   Consequences of Under-nutrition

(1) High Child Mortality, Disease, and Disability

Newborns who are born too small for their gestational age are more likely to die than youngsters who are delivered at a healthy weight. If a child is severely stunted, he or she is four times more likely to die than a healthy child (Black et al. 2008). A severely wasted child is nine times more likely to die than a healthy child (Black et al. 2008).

Micronutrient deficiencies, such as vitamin A, zinc, and iron, damage the immune system, increasing the risk of sickness and mortality. Vitamin A insufficiency is a major cause of blindness. Iron deficiency anaemia in pregnant women raises the risk of maternal and perinatal mortality. Maternal malnutrition has an impact on foetal growth and the first two years of a child's life, contributing to children born small for gestational age, stunting, as well as obesity and noncommunicable illness later in life (Victora, et al. 2008).

Children who are malnourished at birth, in infancy, and early childhood, as well as those who gain weight quickly after the age of two, are at an increased risk of developing chronic diseases in adulthood, such as hypertension, cardiovascular disease, high blood glucose concentrations, and low birth weight.

(2) Weakened Brain Development and Nervous System

Stunting is connected with reduced cognitive and motor development, as well as poor academic ability and performance. Iron deficiency and iron deficiency anaemia affect cognitive development and can hinder children's school performance as well as adults' physical capacity for work. Adults with developmental disabilities have a limited earning capacity. Neural tube defects are caused by folic acid deficiency. Iodine shortage causes mental retardation, physical development retardation, or a combination of the two (cretinism). Iodine deficiency problems have an impact on a child's ability to learn, school performance, likelihood of staying in school, and speech and hearing skills.

(3) Socioeconomic Consequences of Under-nutrition
1) Increased or persistent poverty
2) High costs in treating illnesses relating with malnutrition
3) Costs of caring for sick family members, including time away from work or school
4) Limited care for family members who are not sick

2.2.4   Nutritional Status of Children

Stunting has been linked to poor cognitive and motor development, as well as poor academic ability and performance. Iron deficiency and anaemia hinder cognitive

development and can affect children's and adults' physical capacity for work. Adults with developmental problems have a reduced ability to earn a living. Neural tube malformations result from a lack of folic acid. Mental retardation, physical growth delay, or a mix of the two results from an iodine deficit (cretinism). Iodine deficiency problems have an impact on a child's ability to learn, academic performance, likelihood of remaining in school, and speech and hearing skills.

The NCHS/CDC/WHO international reference standard has been replaced as the benchmark for measuring children's nutritional status by the WHO Child Growth Standards (WHO, 2006). Natural variations in a well-nourished community cause 2.2 percent of children to be 2.0 to 2.99 SD below the mean, and 0.1 percent to be 3.0 or more SD below the mean. The level of malnutrition in a population should be determined by the extent to which the proportions of moderate and severe malnutrition surpass the percentages found in a well-fed population of youngsters. Children's and Women's Nutrition Children's height/length, weight, and age data were used to create three indices: height-for-age, weight-for-height, and weight-for-age. Each of these indices provides different information regarding growth and body composition for determining nutritional status. Stunting, or low height-for-age, is an indication of chronic undernutrition that demonstrates a failure to acquire appropriate nutrition over time.

Recurrent and chronic sickness can also have an impact on stunting. Wasting, also known as low weight-for-height, is a symptom of acute malnutrition and signifies a failure to get appropriate nourishment in the period preceding the survey. Wasting might occur as a result of insufficient food intake or a recent bout of illness that causes weight loss. Overweight (high weight-for-height), a measure of overnutrition, is the inverse of wasting. Weight-for-age is a combination of weight-for-height and height-for-age. As a result, it comprises both acute (wasting) and chronic (stunting) undernutrition and serves as a measure of total malnutrition.

Underweight or underweight-for-age Weight-for-age is a combination of height-for-age and weight-for-height. It takes into account both acute and chronic malnutrition. Underweight children have a weight-for-age Z-score that is less than minus two standard deviations (-2 SD) from the reference population's median. Children with a Z-score less than minus three standard deviations (-3 SD) from the median are termed very underweight. (FAO, 2007).

2.2.5 Eating Behaviors in Child

The mothers with a higher degree of nutritional awareness feed their children more vegetables, fruits, legumes, and less sugared drinks such as pop, juice, and fast foods than mothers with a lower level of nutritional knowledge. Furthermore, moms with greater nutritional knowledge levels avoid feeding their children items containing artificial ingredients and have a stronger belief in nutrition-health understanding. The level of nutrition awareness of mothers influences the dietary patterns of their children. It is critical to instill healthy eating habits in children from an early age. It aids in the prevention of malnutrition, growth retardation, and acute child nutrition problems, as well as chronic, long-term health issues such as cardiovascular disease, type 2 diabetes, cancer, obesity, and osteoporosis. Parents bear the majority of the responsibility in this regard (Nicklas, 1995; Nicklas & Hayes, 2008).

Parents have a significant influence on their children's eating habits and preferences. Mothers, in particular, are their children's eating behavior role models. As a result, it is critical to ascertain the mother's eating habits in order to promote both the child's and mother's healthy nutrition.

Mother's eating habits are influenced by a variety of characteristics, including socioeconomic status, educational attainment, age, employment status, and level of nutrition knowledge (McLeod, Campbell & Hesketh, 2011; Variyam, Blaylock, Lin, Ralston & Smallwood, 1999; Vereecken & Maes, 2010). It is considered that the mother's nutritional education level can have an impact on their children's eating habits. As a result, the purpose of this research is to assess the impacts of the mother's nutritional knowledge level on the children's nutritional attitudes and actions.

2.3 Sustainable Development Goals Regarding Health

The United Nations Sustainable Development Goals (SDGs) are targets for global development adopted in September 2015, set to be achieved by 2030. All countries of the world have agreed to work achieving these goals.

2.3.1 ASEAN SDG Indicators Baseline Dashboard

In Goals 3, ASEAN SDG Indicators baseline dashboard are as follow;
- Maternal mortality ratios was 235 maternal deaths per 100,000 live births in 2016.

- In 2018, 83.3% of births in the region were attended to by skilled health personnel.
- About 30 out of 1,000 children who were born alive died before reaching age 5 in 2016-2018.
- Neonatal mortality rate in ASEAN averaged about 15 neonatal deaths per 1,000 live births in 2018.
- The incidence rate of tuberculosis in the AMS was 236 cases per 100,000 population in 2018.

Table (2.1)   ASEAN SDG Indicators Summary 2016-2018 GOALS AND INDICATORS (2016 2017 2018)

Goal 3: Ensure healthy lives and well-being at all ages				
Goals	**Indicators**	**2016**	**2017**	**2018**
SDG 3.1.1	Maternal Mortality ratio (Number per 100,000 live births	234.6	233.9	234.6
SDG 3.1.2	Proportion of births attended by skilled health personnel (%)	83.1	83.1	83.3
SDG 3.2.1	Under-five mortality rate (Number per 1,000 live births)	30.6	30.5	30.4
SDG 3.2.2	Neonatal mortality rate (Number per 100,000 population)	14.7	14.7	14.7
SDG 3.3.2	Tuberculosis incidence (Number per 100,000 population)	206.7	215.7	236.2
SDG 3.3.3	Malaria incidence (Number per 1,000 population)	0.52	0.57	0.51
SDG 3.6.1	Death rate to road traffic injuries (Number per 100, 000 population	13.5	13.4	13.7

Source: ASEAN Sustainable Development Goals Indicators Baseline Report (2020)

Maternal mortality ratios were 235 maternal deaths per 100,000 live births in 2016. In 2018, 83.3% of births in the region were attended to by skilled health personnel. About 30 out of 1,000 children who were born alive died before reaching age 5 in 2016-2018.Neonatal mortality rate in ASEAN averaged about 15 neonatal deaths per 1,000 live births in 2018.The incidence rate of tuberculosis in the AMS was

236 cases per 100,000 population in 2018. Incidence of malaria was generally low in the region, at about 0.5 per 1,000 population during the period 2016-2018. Death rates due to road traffic injuries in the region stood at 13.7 deaths per 100,000 population. There were 37.6 adolescent births for every 1,000 females aged 15-19 years in ASEAN in 2016.In 2016, 25.4% of population 15 years old and over in ASEAN were users of tobacco.

2.4   Reviews on Previous Study

The impacts of mothers' nutritional knowledge on children's nutritional attitudes and behaviors were studied at the 5th World Conference on Educational Sciences - WCES 2013. In Ankara, Turkey, 302 voluntary moms of students (mean age 12.51.8 years, 132 boys and 170 girls) participated in this study. This study discovered that high nutritional knowledge level moms have higher percentiles for preparing at least 3 portions vegetables, 2 portions fruit, and salads in each meal for their children than low nutritional knowledge level mothers (p0.05). The higher the mothers' nutritional awareness level, the lower their children's food intake levels of total fat and cholesterol are, and the higher their consumption of dietary fiber is.

Kang and Kim (2018) used cross sectional data from the Myanmar Demographic Health Survey 2015–2016 to investigate risk factors for undernutrition among children aged 0–59 months in Myanmar. It revealed that the prevalence of stunting, wasting, and underweight was 29.0 percent, 7.3 percent, and 19.2 percent, respectively. Through multivariable logistic regression on 35 households, it was discovered that lower wealth quintiles, maternal nonagricultural occupation, and male child only predicted stunting. Only the age of the kid and the absence of vitamin A supplementation in the previous six months were risk factors for wasting. According to the study, socioeconomic and demographic characteristics, as well as low mother nutritional status and residing in certain geographical areas, all have an impact on children's undernutrition.

Kang, Aguayo, Campbell, Dzed, Joshi, Wid, et al. (2018) conducted a research of nutritional status and risk factors for stunting in preschool children using the 2015 National Nutrition Survey in Bhutan. It assessed the nutritional condition of 1,506 children (based on zscores of height for age [HAZ], weight for height [WHZ], and weight for age [WAZ]). Data were analyzed using multivariable linear/logistic regression to identify child, mother, and household risk variables for childhood

undernutrition and overweight. It was said that the prevalence of stunting, wasting, underweight, and overweight was 21.2 percent, 2.6 percent, 7.4 percent, and 2.6 percent, respectively. According to multivariate regression analysis, the risk of stunting increased considerably with age: 5.3 percent at 6 months (reference), 16.8 percent at 6–23 months (OR = 3.06, 95 percent CI [0.63, 14.8]), and 25.0 percent at 24–59 months (OR = 5.07, [1.16, 22.2]). It was established that, while stunting persists in one-fifth of Bhutanese children, additional nutrient deficient or non-nutritional variables limited linear growth for a significant proportion of children.

Mya-K-S, Kyaw-A-T, and Tun-T (2019) used secondary data analysis from the 2015–16 Myanmar Demographic and Health Survey to study the feeding behaviors and nutritional status of children aged 6-23 months in Myanmar. Multiple logistic regression analysis was used on data from 1,222 children aged 6–23 months. Breastfeeding reduced the likelihood of being stunted. It was also discovered that short height mothers, working mothers, perceived low birth weight and size, and male gender were statistically significant predictors of stunted in offspring. Iron-rich dietary consumption was linked to moderate anemia. This study emphasized the need for additional research to determine the impact of treatments such as iron supplementation and nutritional education programs feeding practice on linear development in order to prevent stunting and anemia among children in Myanmar.

Olusegun Fadare (2019) investigated mothers' nutrition-related knowledge and child nutrition outcomes: Nigerian empirical evidence A nutrition-related knowledge index was created utilizing information on food practices, disease treatment and prevention, child immunization, and family planning. Based on survey results, he discovered that mother's knowledge is independently and positively associated with HAZ and WHZ scores in early children. Higher levels of maternal education have a positive relationship with child HAZ and WHZ scores.

Su Su Nyein (2019) used a cross-section survey from Myanmar to investigate the factors of Nutritional Status in children aged three to five years in Waw Township. It examined the nutritional indices (weight-for-height (WHZ), height-for-age (HAZ), weight-for-age (WAZ), and MUAC-for-age) using WHO Anthro (version 3.2.2). Descriptive statistics were used to calculate socioeconomic indicators and the minimal dietary diversity score (DDS). According to the findings of this study, 289 (79.6 percent) of children are normal height, while 9 (2.5 percent) are severely stunted and 3 (0.8 percent) are above normal. As a dichotomous variable, it is divided into having

stunted and not having stunted. It was shown that 191 (52.5 percent) are not stunted, while 172 (47.4 percent) are. According to the findings of this study, 292 (80.4 percent) of children aged 3-5 years are not stunted, whereas 71 (19.6 percent) of children aged 3-5 years are stunted. According to the survey results, 209 (57.6 percent) of children aged 3-5 years are underweight, while 154 (42.4 percent) are not. As a nutritional indication of stunted among children aged 3-5 years, it is discovered that 289 (79.6 percent) of those children are normal, while the remaining children are moderately stunted, severely stunted, and above normal, respectively. Many research were focused on children under the age of five and under the age of two, according to previous study reviews. It was determined that the factors of nutritional status of children aged 3-5 years needed to be investigated in order to provide appropriate nutrition care to young children.

2.5   Measurement of Nutrition Knowledge of Mother

In this study present of nutrition knowledge of mother there were stunting and wasting. And wasting was coded as for 'not wasted' and coding implies wasted.

Independent variables were chosen based on the literature and their availability in our data. They were socio-demographic variables and environmental factors such as child's age, gender, mother's age, level of education, employment status, wealth status, domicile, marital status, region, family size, source of drinking water, and kind of toilet facility. Also considered are maternal factors such as the time interval between giving birth and conception, antenatal care visits, anemia status, nutritional status, and place of delivery. We also included child parameters such as birth weight, health state (fever, diarrhea, and cough), breast feeding status, nutritional diversity, and birth order. According to World Health Organization guidelines, maternal nutritional status was assessed as underweight (18.4), normal (18.5–24.9), overweight (25.0–29.9), or obese (30 kg/m2) using BMI (weight (kg)/height (m2).

Furthermore, maternal anemia was categorized as anemic if Hb was less than 11.0 g/dl. The minimum dietary diversity score (DDS) was calculated using a 24-hour dietary recall approach based on seven food types in the local environment. The reported food items were then categorised as grains/roots/tubers; legumes and nuts; dairy products; flesh foods (meats/fish/poultry); eggs; vitamin A-rich fruits and vegetables; and other fruits and vegetables. The children who consumed four or more food groups out of the seven food groups were then considered to have a sufficient

dietary variety score. Early commencement of breastfeeding, exclusive breastfeeding, and ever breastfeeding status of the kid were collected from the mother/caregivers, and the detailed technique can be found in the EDHS 2016 report.

2.5.1 Mother's Nutrition-related Knowledge Versus Mother's Education Variables

It is generated four interaction factors by connecting the four educational level dummy variables with the mother's knowledge index. Including interaction factors in the model improves understanding of the relationship between knowledge and education, as well as their relevance to outcomes. To put it another way, we want to see if the association of mother's knowledge with HAZ and WHZ varies depending on the level of education of the mother. For the nonparametric analysis of mother's knowledge versus mother's education on the distribution of HAZ and WHZ scores, we defined mothers with high knowledge as those with nutrition-related knowledge above the mean cut off in our sample, and mothers with low knowledge as those with nutrition-related knowledge below the mean cut off in our sample.

2.5.2 Child Health

Child and adolescent health status measures include the parent's report of the child's general health state (excellent, very good, good, fair, or poor) and whether the child had any functional limitations. The functional restriction questions inquired whether the kid was limited in play activities compared to children of a comparable age, as well as whether the child was limited in school activities (for children aged 5-17 years). We also used a consequences-based criterion to see if the child was identified as having a chronic illness. Included one measure of health care utilization, whether the child was hospitalized (this covers children hospitalized for a variety of reasons), because hospitalization may be related with particular time demands of parents.

CHAPTER III
FOOD AND NUTRITION SECURITY IN MYANMAR

3.1   Status of Nutrition in Myanmar

Despite substantial macroeconomic growth and poverty reduction over the last decade, Myanmar continues to have a high prevalence of maternal and child undernutrition. While stunting, or chronic undernutrition, has decreased from just over 40% in 1990 to 29.2% in 2016, there are still 1.4 million stunted children under the age of five (DHS 2015-16). At the same time, acute undernutrition, or wasting, is prevalent, affecting 7% of preschool children. Micronutrient deficiencies are also a matter for concern, as seen by the high prevalence of anemia among 57.8 percent of children aged 6-59 months and 46.5 percent of women of reproductive age, which is likely due in part to insufficient iron intake. Finally, the prevalence of low birth weight (LBW) is 8.1 percent, which is an important measure of both maternal and child nutrition because it is the direct effect of inadequate nutrition throughout pregnancy. Adolescent moms are more likely to have LBW kids, and over 50,000 teenage girls give birth in Myanmar each year. The four forms of maternal and child undernourishment (stunting, wasting, micronutrient deficiencies, and low birth weight) each have separate syndromes and, as such, necessitate various ways to alleviate the problem.

Table (3.1)   Myanmar Population and Housing Census

Group	Population Number	% of Total Population	Population in Millions
Total population	52917000		52.9
Total female	27466000	52%	27.5
Total male	25450000	48%	25.5
Women of reproductive age (15-49 years)	14515000	27%	14.5
Adolescent (10-19 years)	10044000	19%	10.0
Children <5 years	4938000	9%	4.9
Children <2 years	1077363	2%	1.1
Children <6 months	508871	1%	0.5

Source: Myanmar Population and Housing Census, (2014), (Volume 4-F).

3.1.1   The State of Food and Nutrition Security in Myanmar

This Strategic Review evaluated Myanmar's food and nutrition security along three dimensions: availability, access, and use. Food availability essentially asks, "Is there enough food to feed the population?" A national food balance is frequently used by countries to analyze food availability at the national level. This considers domestic food production as well as imports, exports, wastage/spoilage, and other pertinent factors that affect the total supply of available food in the country. It is also critical to examine local food supply, especially in areas with a high rural population living in remote places. Even if there is enough food to feed the entire population in absolute terms, one cannot assume that it is divided evenly.

Food access in the home must be evaluated. This is determined by socioeconomic conditions, which determine households' ability to generate their own food or earn enough money to buy food. Food availability is also influenced by food prices and their volatility over time in relation to household income. Food must be used appropriately in order for food and nutrition security to exist. This necessitates a biological approach that considers the body's biophysical requirements for nutrient intake and absorption. Dietary consumption, as well as disease prevalence, are immediate factors influencing food usage. These immediate factors are, in turn, influenced by underlying variables. Dietary intake mainly refers to the food that the body consumes. This is based on food security and a number of cultural and

socioeconomic issues at the home level, which influence care behaviors. Disease can impair the body's ability to absorb nutrition. This is primarily due to the health environment, hygiene care practices, and access to healthcare. Simply defined, food and nutrition security are accomplished and beneficial nutritional results can be predicted when food is available, accessible, and consumed effectively by all members of the population in a supportive health environment. Food security and nutrition issues should take into account the unique needs of men, women, boys, and girls as they encounter varied obstacles.

3.1.2   Current Nutrition Situation in Myanmar

Despite the country's excellent macroeconomic growth, the frequency of malnutrition among women and children remains high. Data on trends in maternal and child nutritional status are available from many Multiple Indicator Cluster Surveys (MICS) and Demographic Health Surveys (DHS) that were conducted between 1997 and 2016 and used various measures. The prevalence of stunting, wasting, underweight, low birth weight, and micronutrient deficiencies in Myanmar, as listed here, reflects the country's present nutritional state. Stunting, also known as low height-for-age, is an anthropometric measure of linear growth in children that is caused by long-term food insufficiency and recurring viral illnesses. Stunting has been linked to cognitive development deficiencies, poor academic achievement, and lower adult output. According to the most recent estimates from 2015-16, the nationwide prevalence of stunting is 29.2 percent, down from 40.8 percent in 2015.

Stunting often reflects poverty and a lack of general socioeconomic development. Stunting is more common in poor children (38.0 percent) than in wealthy youngsters (16.0 percent). It is also higher in children whose moms have little or no formal education (39.3 percent) than in those whose mothers have a secondary education or higher (16.9 percent). It is critical to recognize that, even in the richest quintile, nearly one out of every six children has suboptimal growth, limiting their overall development potential.

These findings support the notion that important factors of stunting, such as poor child feeding practices and inadequate sanitation, exist in households of all socioeconomic backgrounds. The prevalence of stunting in rural areas (31.6 percent) is higher than in urban areas (21.0 percent), and there are significant disparities by State/Region. According to the 2015-16 DHS, the highest rates of stunting are reported

in Chin State (41.0 percent), Kayah State (39.7 percent), and Rakhine State (37.5 percent). Shan State (242,597), Ayeyarwady area (227,343), and Mandalay region (139,828) are predicted to have the most stunted children (MICS, 2000, 2003, 2009).

Table (3.2)   **Prevalence of Stunting in Children Under 5 Years Old in Myanmar**

Year	Population Number Children < 5 years	% of Total Population	Population in Millions	% Stunting of Total Population Children < 5 years
2000*				40.8%
2003*	4938000	9%	4.9	40.6%
2009				35.1%
2016				29.2%

Source: MICS (2000, 2003, 2009); Myanmar DHS 2015-16

Acute malnutrition, also known as wasting, is a symptom of recent or ongoing malnutrition and is frequently the result of a short-term lack of food and a high morbidity burden, such as diarrhea or respiratory infection. It is determined by weight for height, mid-upper arm circumference (MUAC), or the existence of edema. According to the 2015-16 DHS, 7.0 percent of children under the age of five are classified as having acute malnutrition, a decrease of roughly one-third from the 10.7 percent seen in 2000. The prevalence of severe acute malnutrition (SAM) among under-five children is under 1%, although the problem of moderate acute malnutrition (MAM) is much larger. Although younger children are at a higher risk of wasting, there are no significant differences based on socioeconomic status, implying that problems leading to acute short-term nutritional insults are widespread in the country and occur even among families who should be able to afford adequate quality and quantity of food.

Table (3.3)   Prevalence of Wasting in Children in Myanmar

Year	Population Number Children <5 years	% of Total Population	Population in Millions	% Wasting of Total Population Children < 5 years
2000*				10.7%
2003*				10.7%
2009	4938000	9%	4.9	7.9%
2016				7.0%

Source: MICS (2000, 2003, 2009); Myanmar DHS 2015-16

Food and nutrition security in Myanmar has improved in recent years, according to nutrition outcomes data. The prevalence of stunting in children under the age of five has decreased, and efforts to address micronutrient deficiencies have made headway. Food and nutrition security is a concern for a large proportion of Myanmar's population. The current agricultural system does not generate adequate farm-based revenues to ensure food access for the majority of rural residents, who are smallholder farmers and landless laborers. Natural disasters and climate shocks are very common in Myanmar, and they can cause acute, localized food shortages as well as imperil affected households' income and food availability.

Food price inflation, as well as highly variable pricing for key items like rice, are major problems. They systematically impede food access for both rural and urban poor. Food purchase debt financing has been a typical coping method. According to a recent poll, food is the leading source of debt for 32% of rural households. While this prevents acute hunger, it prevents asset growth and traps many people in a debt cycle. As things stand, Myanmar will need to cover a lot of ground in order to improve food access and food system resilience and meet the SDGs.

3.2   Prevalence of Undernutrition Among Children in Myanmar

Despite recent advances, the prevalence of undernutrition among children in Myanmar remains high. Trends in child nutritional status from the Multiple Indicator Cluster Surveys (MICS) from 1997 to 2010. (with prevalence rates from 1997, 2000 and 2003 recalculated using the 2006 WHO Growth Standards). The 2009-2010 MICS was a nationally representative survey and is the most frequently acknowledged source for malnutrition prevalence estimates. However, there were methodological flaws with

the MICS that may have influenced national and regional estimates of undernutrition (MNPED & MOH, 2011).

According to the MICS 2009-10, 22.6 percent of children under the age of five are underweight, a decrease from around 30 percent in 2000. (MPED & MOH, 2011). Despite a decline of more than five percentage points since 2000, more than one-third of all children under the age of five in Myanmar are stunted. Undernutrition is caused by roughly 8% of wasting.

Table (3.4)   Undernutrition of Children Under Five Years in Myanmar

	Total Number of Children < 5 Years	**Estimated Number of Children with Undernutrition**	**% Undernutrition**
Wasting	4938000	345660	7%
Stunting	4938000	1441896	29%
Underweight	4938000	933282	19%

Source: MICS (2000, 2003, 2009); Myanmar DHS 2015-16

3.2.1   Stunting

Stunting, also known as low height-for-age, is an anthropometric measure of linear growth that suggests persistent restriction of a child's potential growth and is related with deficiencies in cognitive development, poor school performance, and reduced productivity in adulthood. According to MICS 2009-10, more than one-third of all children in Myanmar are stunted. Stunting is most common in children from 24 to 35 months. However, approximately 15% of children under the age of six months are already stunted (MNPED & MOH, 2011), showing poor growth and development beginning in utero. This evidence emphasizes the importance of strong maternal nutrition interventions in order to enhance child nutritional status in Myanmar. At the same time, initiatives to improve women's nutritional health, regardless of whether they are pregnant or nursing, should be prioritized.

Women's health and nutrition improvements will have a wide range of ramifications for families, communities, and the nation as a whole. Children from low-income families are particularly affected by stunting. According to MICS 2009-10 statistics, children under the age of five living in the poorest households are more than twice as likely (46.6 percent) as those living in the wealthiest households to be stunted

(20.7 percent). However, one in every five children in the wealthiest homes is stunted. These data imply that several significant predictors of stunting, such as poor child feeding practices, exist in households of all socioeconomic statuses. Furthermore, increasing income without resulting in changes in nutrition-related behaviors is unlikely to solve Myanmar's stunting problem. Stunting is more common in rural settings (38.4 percent) than in urban areas (27.2 percent), with significant regional variances. According to the MICS 2009-10, the highest rates of stunting are reported in Chin State (58.0 percent) and Rakhine State (49.9 percent).

Table (3.5)   Prevalence of Stunting by Child Age (MICS 2009-10)

Total Number of Children < 5 Years	Estimated Number of Children with Undernutrition	Description	Prevalence of stunting
4938000	1441896	highest among children 24-35 months of age	44%
4938000	1441896	children under-five years of age living in the poorest households	46.6%
4938000	1441896	children under-five years of age living in the wealthiest households	20.7%
4938000	1441896	The prevalence of stunting in rural areas	38.4%
4938000	1441896	The prevalence of stunting in urban areas	27.2%
4938000	1441896	The highest rates of stunting, according to the MICS 2009-10, are found in Chin State	58.0%
4938000	1441896	The highest rates of stunting, according to the MICS 2009-10, are found in Rakhine State.	49.9%

Source: UNDERNUTRITION IN MYANMAR, LEARN report, March (2016)

3.2.2 Wasting

Acute malnutrition, often known as wasting, is a sign of recent or ongoing malnutrition and is typically measured by weight-for-height, mid-upper arm circumference (MUAC), or the presence of edema. Children who are severely malnourished have a much higher risk of death than their well-nourished peers.

According to the MICS 2009-10, approximately 8% of Myanmar's children under the age of five are severely malnourished (low weight-for-height). The prevalence of wasting is highest among children aged 12 to 23 months, when children are often more reliant on supplemental foods for energy and when many children may be weaned. Children from low-income households are particularly affected by waste. The prevalence of wasting across children under five in the poorest wealth quintile was 9.9 percent, compared to 6.9 percent in the wealthiest households (MNPED & MOH, 2011). However, there is little variation in the prevalence of wasting across urban and rural areas (7.4 percent and 7.9 percent, respectively) (MNPED & MOH, 2011). According to the MICS 2009-10, there are significant regional disparities in the prevalence of acute malnutrition, with the highest rates recorded in Rakhine State (10.8 percent) and Magway Region (10.4 percent). (LIFT, 2013a) (UNDERNUTRITION IN MYANMAR, LEARN study, March 2016).

Table (3.6)   Prevalence of Wasting by Child Age (MICS 2009-10)

Total Number of Children <5 Years	Estimated Number of Children with Undernutrition	Description	Wasting
4938000	345660	highest among children 12 to 23 months of age	10%
4938000	345660	The prevalence of wasting among children under five in the poorest wealth quintile	9.9%
4938000	345660	The prevalence of wasting among children under five in the wealthiest households	6.9%
4938000	345660	The prevalence of wasting in urban	7.4%
4938000	345660	The prevalence of wasting in rural areas	7.9%
4938000	345660	The highest rates being found in Rakhine State	10.8%
4938000	345660	The highest rates being found in Magway Region.	10.4%

Source: UNDERNUTRITION IN MYANMAR, LEARN report, March 2016

3.2.3 Underweight

Weight-for-age is a composite statistic that helps detect children who are wasting or stunting. Weight-for-age is regarded the simplest anthropometric indication to measure, yet it can become more complicated or less precise in circumstances where mothers do not know their child's actual age. According to the MICS 2009- 10, approximately 23 percent of all children under the age of five are underweight in Myanmar, a decrease from nearly 30 percent in the previous MICS (2003). Weight-for-age statistics were also collected in the 2010 Integrated Household Living Conditions Survey (IHLCA). According to the IHLCA, the prevalence of underweight among children under the age of five was 32.0 percent in 2010, representing a non-statistically significant improvement from 34.3 percent in 2005. (MNPED, UNDP, SIDA & UNICEF, 2011).

Underweight follows the same trend as stunting and wasting in that children living in low-income households with less educated moms are more likely to be underweight. There are considerable regional disparities in the prevalence of underweight. Rakhine State has the highest rate of underweight at 37.4 percent, which is a result of the state's high rates of stunting and wasting (MNPED & MOH, 2011).

Table (3.7)   Prevalence of Under Weight by Child Age (MICS 2009-10)

Total Number of Children <5 Years	Estimated Number of Children with Undernutrition	Description	Wasting
4938000	933282	a non-statistically significant improvement from 34.3% in 2005	34.3%
4938000	933282	According to the MICS 2009- 10, nearly 23% of all children under five are underweight in Myanmar	23%
4938000	933282	improvement from nearly 30% according to the previous MICS (2003)	30%
4938000	933282	The highest rates being found in Rakhine State	37.4%,

Source: UNDERNUTRITION IN MYANMAR, LEARN report, March 2016

3.2.4 Low Birth Weight

Birth weight is an essential measure of both the child's and the mother's nutritional health. Low birth weight is strongly associated with perinatal, neonatal, and postnatal morbidity and mortality, as well as chronic disorders in adulthood. Increasing birth weight contributes to a reduction in infant growth stalling, resulting in less stunting and improved adult height. Furthermore, global research shows that birth weight may be swiftly improved, even in populations with short adult women (UNSCN, 2011). Low birth weight tends to converge with underweight prevalence over time, eventually reaching zero for both. Birth weight data, which was previously obtained using health system data, are now routinely collected as part of household surveys.

The United Nations Standing Committee on Nutrition (UNSCN) has recommended for a renewed emphasis on birth weight as a result of measures to enhance child nutrition. Increasing birth weight not only improves infant health outcomes, but it also offers additional benefits for mothers' health and has a beneficial impact on family well-being and overall development (UNSCN, 2011). Because many infants are not weighed at birth, and those who are weighed may represent a skewed sample of all births (because they were more likely to be delivered in a health facility), recorded birth weights in poor countries cannot be used to predict the prevalence of low birth weight. As a result, the percentage of births weighing less than 2,500 grams is estimated using 1) the mother's assessment of the child's size at birth (i.e. very small, smaller than average, average, larger than average, very large) and 2) the mother's recall of the child's weight or the weight as recorded on a health card if the child was weighed at birth (MNPED & MOH, 2011).

According to the MICS 2009-10, 8.6 percent of children born in the two years preceding the survey had low birth weight (less than 2,500 grams), a decrease from 15 percent in 2000. However, only 56.3 percent of children in the 2009-10 MICS were weighed at birth, with significant regional variations.

3.2.5 Micronutrient Deficiencies

Data on micronutrient deficiencies in Myanmar are limited and, in some cases, of dubious quality and origin. However, the Ministry of Health, with the assistance of UNICEF, is now conducting a nationwide Micronutrient Deficiency Survey, which is due to end in December 2015. The goal of this survey is to provide up-to-date evidence for the creation of effective nutrition policies and guidelines, including a complete

micronutrient deficit control approach. Data on chosen biomarkers of major micronutrient deficiencies, as well as food consumption and anthropometric measurements of children under the age of five, will be gathered. Some micronutrient deficiencies will have prevalence estimates that are representative at the state/regional level, while others will be representative at the national level. Table 1 summarizes the most recent data available on markers of micronutrient status within priority groups. The sections that follow will go through trends in the prevalence of important micronutrient deficiencies in greater depth. Anemia is a condition in which the amount of red blood cells (and thus their oxygen-carrying ability) is insufficient to meet the body's physiologic needs.

Although iron deficiency is thought to be the most common cause of anemia worldwide, other nutritional deficiencies (including folate, vitamin B12, and vitamin A), acute and chronic inflammation, parasitic infections, and inherited or acquired disorders that affect hemoglobin synthesis, red blood cell production, or red blood cell survival can all cause anemia (WHO, 2011). Anemia in early infants can increase vulnerability to disease, cause appetite loss, contribute to macronutrient malnutrition, and delay cognitive development. In Myanmar, anemia is a serious public health issue. According to NNC and UNICEF (2005), 64.6 percent of children under the age of five are anemic, with more than 80 percent of children from 6 to 23 months being anemic. A more recent WHO estimate of anemia prevalence among children under the age of five is substantially lower, at around 40% in 2011 (Stevens GA et al., 2013), which is the same figure stated by the World Bank.

Maternal mortality, spontaneous abortion, early birth, and poor birth weight can all be attributed to anemia. Anemia can be caused by a lack of micronutrients, helminth infections, or other diseases such as malaria. According to a 2005 survey by NNC and UNICEF (cited in MNPED & UNICEF, 2013), 45.2 percent of non-pregnant women aged 15 to 49 years are anemic. Anemic women make up 33.3 percent of the population, according to WHO estimates for 2011.

The variations in anemia estimates between NNC and WHO are due to different techniques and do not allow for trend analysis. According to the current data, the prevalence of anemia among women and children in Myanmar is unacceptably high and requires prompt attention. Current data on anemia prevalence obtained through regulated and transparent techniques are also badly needed. The presence of intestinal parasites aggravates iron insufficiency.

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According to the NNC and UNICEF (2005) survey, worm infestation is linked to anemia in all age groups. Infestation levels were particularly high in coastal areas: 92 percent of pregnant women and 70 percent of children were discovered to have one or more of three common worm kinds (Ascaris, Trichuris, and hookworm), compared to national estimates of 45 percent and 31 percent, respectively. (MNPED & UNICEF, 2013) (UNDERNUTRITION IN MYANMAR, LEARN report, March 2016).

Table (3.8) Most Recent Data on Indicators of Micronutrient Deficiencies in Myanmar

	Indicator	Prevalence rate (%)
Anemia	Anemia among children 6 to 23 months	>80.0[1]
	Anemia among children under 5	64.6[1]
	Anemia among non-pregnant women ages 15-49	45.2[1]
	Anemia among pregnant women	71.0[2]
	Anemia among adolescent girls	26.0[3]
Vitamin B1 / (Beriberi)	Vitamin B1 deficiency among pregnant women	6.8[4]
	Vitamin B1 deficiency among lactating mothers	4.4[4]
Vitamin A	Estimated prevalence of vitamin A deficiency (low serum retinol) among children 6 to 59 months	30.1[5]
	% of children (6-59 months) supplemented with vitamin A	55.9[6]
Iodine	% of households consuming adequate iodized salt	68.8[7]

Source: UNDERNUTRITION IN MYANMAR, LEARN report, March 2016

3.2.6 Vitamin A Deficiency

Vitamin A deficiency has well-recognized clinical indications, such as night blindness and corneal damage (eye signs are known as xerophthalmia or Bitot's Spots), with low prevalence rates of typically 2% or less, which are difficult to assess effectively through surveys (UNSCN, 2011). In 1991, the frequency of xerophthalmia in children under the age of five ranged between 0.6 and 1.2 percent (MOH, 2013). (UNSCN, 2011). Biannual administration with high potency vitamin A capsules reduced the prevalence of xerophthalmia to acceptable levels by 2000, with an estimated prevalence of 0.03 percent. (MNPED & UNICEF, 2013; NNC & Serum retinol concentration is increasingly being used to assess the severity and trends of vitamin A insufficiency. The phrase "sub-clinical" is no longer used, and low serum retinol is now referred to as vitamin A deficiency, which refers to a lack of vitamin A nutrition. Low serum retinol (20 g/dl, which is the same as 0.7 mol/l) is the word used here for clarity (UNSCN, 2011). According to UNSCN, the prevalence of low serum retinol among children aged 6 to 59 months in Myanmar in 2007 was at 30.1 percent. (UNSCN, 2011). In 2012, NNC collaborated with the Department of Medical Research (Lower Myanmar) to test vitamin A levels in 15 townships across the country. According to the UNSC N estimate, 38 percent of children aged six to 59 months have low serum retinol levels (Htin Lin et al., 2014). Vitamin A deficiency (even in the absence of xerophthalmia) is linked to a high prevalence of under-five mortality, diarrhea, measles, and acute respiratory infections (ARI). While widespread usage of vitamin A supplements has lowered the prevalence of xerophthalmia, the prevalence of low serum retinol has not been altered. However, vitamin A fortified meals have been shown to be helpful in boosting serum retinol and thereby lowering vitamin A deficiency.

Table (3.9)   Prevalence of Vitamin A Supplementation among Children 6-59 Months

State	2016
Kayin	43.7%
Shan	44.6%
Ayeyarwady	44.8%
Yangon	48.2%
Magway	51.3%
Tanintharyi	52.0%
Chin	53.9%
Bago	55.6%
Rakhine	56.0%
Mandalay	59.5%
Kachin	61.3%
Mon	70.3%
Sagaing	73.0%
Kayah	81.8%

Source: MICS (2000, 2003, 2009); Myanmar DHS 2015-16

3.3   Food Availability and Access in Myanmar

Food is abundantly available in Myanmar on a national scale. Myanmar is self-sufficient in food production and exports significant quantities of food overseas, particularly pulses (peas and beans) and fish and shrimp products, thanks to a huge agricultural workforce and abundant agricultural grounds. However, the agricultural system is both the solution and the cause of Myanmar's food security problems. While the agricultural system can generate more than enough food to support the people, it does not provide significant farm-based earnings to provide food availability for smallholder farmers and landless laborers, who make up the majority of the rural population.

Similarly, the lopsided pattern of agricultural production contributes to cyclical underemployment for the agricultural labor and highly unpredictable prices for staple goods like rice. Food price changes cyclically reduce food access for both rural and urban poor. Simply expressed, there are times of the year when they do not earn enough

money to buy food. Debt-financed food purchases are a popular coping method. While this prevents acute hunger, it stifles asset creation and traps many individuals in a cycle of debt and precarious food security. To improve rural food access and meet SDG 2.2, agricultural earnings and farm output for small-scale farmers and agricultural laborers must rise. While this review identified numerous factors influencing agricultural incomes, the greatest gains can be made by ensuring that smallholder farmers and landless agricultural laborers have secure ownership or usage rights to land as well as access to agricultural inputs such as quality seed, agrochemicals, and agricultural finance. The rural road network must also be expanded and upgraded to provide farmers with access to marketplaces where they may purchase agricultural supplies and sell their products.

This will encourage more intensive agriculture investments and the cultivation of cash crops. Farmers also require knowledge of new agricultural techniques and technologies that not only increase yields and diversify agricultural production, but also improve resiliency to climatic shocks, maintain ecosystems, and ultimately ensure the sustainability of food production systems, in accordance with SDG 2.3. To fulfill these objectives, the government can provide a comprehensive, responsive agricultural extension system. This system should advise farmers on what to grow and how to grow it based on the specific agro-ecological circumstances of a given area, agricultural inputs available, and current market prices for agricultural crops. The system must be governed by farmer desires, giving knowledge and technical skills that they find valuable and profitable.

Agricultural research and extension require major investment and should be prioritized in terms of financing and concentration within the Ministry of Agriculture, Livestock, and Irrigation. A conceptual shift is also required among agricultural researchers and extension workers in order to provide services based on farmer requests rather than central government policies. Further legal reforms are required to build a legal framework that protects the land rights and land usage rights of smallholder farmers and landless laborers, recognizes a multiplicity of ownership systems and agricultural methods, and expressly provides equal land rights for women. Government concessions of land to big scale agri-businesses should be approached with extreme caution until the legal system can sufficiently preserve all types of land tenure. If properly reformed, the legal system can also stimulate healthy and appropriate private sector investment in the agricultural sector, particularly in the manufacturing,

distribution, and testing of quality seed and agrochemicals, as well as agricultural extension (Strategic Review of Food and Nutrition Security in Myanmar, June 2018).

3.3.1 Food Intake in Myanmar

For the most part, food intake in Myanmar is controlled by customary dietary choices rather than nutritional considerations. While statistics on the care practices that govern food intake inside the home are scarce, it is obvious that they are based on strongly rooted cultural and gender norms, and anecdotal evidence and indications of malnutrition show that they do not promote nutrition security. Furthermore, figures show that a large portion of the population does not practice adequate infant and young child feeding (IYCF). Approximately half of infants are not exclusively breastfed for the first six months, and many are introduced to semi-solid meals too soon. This hinders the newborn from acquiring the nutrients required for full cognitive and physical growth. Food use in Myanmar is further impeded by a poor health environment and insufficient cleanliness and sanitation standards. Sanitation is a particularly pressing issue for the urban poor, many of whom live in filthy circumstances in fast increasing industrialized regions. Despite having a lower poverty rate, the detrimental effects of a bad health environment in urban regions are As evidenced by higher rates of childhood wasting and IDA in cities compared to rural locations. Within the general population, there are specific vulnerable populations that cannot be expected to achieve food and nutrition security without ongoing assistance from either government social safety nets or humanitarian help.

In terms of reach and support services, the national social protection system is extremely restricted. Vulnerable populations such as OVCs, PLHIVs, PLwDs, and the elderly frequently rely on development partners and grassroots welfare organizations for assistance when and when it is available. Myanmar also has a sizable IDP population that is heavily reliant on food aid due to a lack of access to productive assets and livelihood prospects.

3.4 Food Utilization in Myanmar

Food and nutrition security necessitates not only the availability and accessibility of nutritionally diverse foods, but also their appropriate utilization. Only then may beneficial nutritional consequences be anticipated. The UNICEF Conceptual Framework for Malnutrition deconstructs the immediate and underlying causes of

nutritional outcomes. It accomplishes this by taking a biological approach to nutrition, focusing on the body's physical nutrient requirements. The framework below is based on the causes outlined in the UNICEF framework and was used to examine food use in the context of this evaluation.

Table (3.10) Nutritional Outcomes

Food Utilization		
Dietary Intake	**Prevalence of Disease**	
Food Security	Care Practices	Health Environment	Access to Healthcare

Source: Strategic Review of Food and Nutrition Security in Myanmar, June 2018

Food utilization is determined by the amount of meal taken by the body as well as the body's ability to absorb nutrients from that food. As a result, this approach emphasizes inadequate food intake and disease as the two immediate drivers of positive nutritional outcomes. Food security, as previously noted, and household care practices, which are related to deeply ingrained socio-cultural and gender norms, are the underlying causes that influence dietary consumption. Care behaviors, together with the surrounding health environment and access to healthcare, are underlying determinants of disease.

According to FSPES data, 22.3 percent of Myanmar's rural population has an inadequate diet, with significant regional variation. 68 The high uplands, and especially the North West, have a much smaller proportion of the population that follows a healthy diet. Chin State North and South fare the worst, with only 9.5 percent and 15.3 percent of the population eating a healthy diet, respectively. Sagaing Region (North), Kachin State (North), and Shan State (North) fared poorly as well, with just less than half of the people in these areas receiving an inadequate diet. Lower consumption levels in hilly locations are caused by a number of interconnected factors, the most important of which is remoteness.

Breaking down FCS by food group reveals nutritional composition and the frequency with which different food groups are consumed. Chart 8 depicts the food groups consumed in the previous seven days by wealth quintile. Protein consumption and wealth show a positive relationship, with the poorest quintile consuming meat 3.3

days per week compared to the richest quintile at nearly 5. Vegetable and cereal consumption, on the other hand, remains pretty constant across all quintiles. Although food consumption scores for urban populations have not been collected, a recent survey of the urban poor in Yangon indicated that 37% of households interviewed eaten meat 1 to 2 times per week, with 10% eating no meat at all.

3.4.1 Child Health

Information on child health and survival can help policymakers assess the efficacy of current strategies, formulate appropriate interventions to prevent deaths from newborn and childhood illnesses, and improve the health of children in Myanmar.

3.4.2 Birth Weight

According to a study on causes of under-5 mortality in Myanmar conducted by the Ministry of Health and Sports (MoHS) in 2014, low birth weight is the primary cause of neonatal deaths. It is not just an indirect measure of maternal nutrition, but it is also a predictor of likely newborn death and malnutrition if the infant survives. Only 45 percent of live newborns in the five years preceding the survey had a recorded birth weight. Among newborns having a reported birth weight, 8% had a low birth weight (less than 2.5 kg). The data also includes a mother's estimate of her infant's size at birth. The information also contains a mother's estimate of her infant's birth weight. Although the mother's estimation of the child's size is subjective, it can be a good proxy for the child's weight. Only 2% of newborns are reported as very small, 11% as smaller than average, and 83% as medium or larger than average.

The percentage of newborns with low birth weights reduces with increasing mother's age at childbirth, from 10% for mothers under the age of 20 to 8% for mothers aged 20-34 and 6% for mothers aged 35-49. Babies born to mothers with little education are more likely to have a low birth weight than babies born to moms with a secondary education; nevertheless, drawing conclusions is problematic because birth weights are only available for 16 percent of births among women with no education. Despite the fact that very few women in Myanmar smoke, one-quarter of kids born to these women are reported to be either very little or smaller than average at birth, compared to only 13% of babies born to nonsmokers.

3.4.3 Vaccination of Children

Percentage of children aged 12 to 23 months who got specified immunizations at any time prior to the survey (as documented by a vaccination card or a mother's report). A child must have received at least one dose of BCG vaccine, which protects against tuberculosis, three doses of DPT/pentavalent vaccine, which protects against diphtheria, pertussis (whooping cough), tetanus, hepatitis B, and Haemophilus influenzae type b, three doses of polio vaccine, and the first dose of measles/measles rubella vaccine.

Immunization is the most cost-effective and efficient strategy to control and eliminate vaccine-preventable illnesses that contribute significantly to childhood morbidity and mortality. The Expanded Program of Immunization (EPI) was launched in Myanmar in 1978, comprising BCG and DPT vaccines for children and tetanus toxoid shots for mothers. The oral polio vaccine (OPV) and measles vaccination were introduced in 1987. The monovalent hepatitis B (HepB) vaccination was released in 2003. Since November 2012, DPT and hepatitis B vaccines have been coupled with Haemophilus influenzae type b vaccine to form the pentavalent vaccine. A second dose of measles vaccination was administered in stages beginning in 2008 and was made available nationwide in 2012. The combined measles and rubella (MR) vaccination was released in 2015 to replace the first dose of measles vaccine. All of these fundamental vaccinations are suggested to be administered to a child within his or her first year of life.

Because the pneumococcal conjugate vaccine (PCV) was released in 2016, it was not included in the MDHS questionnaire. The 2015-16 MDHS collected information on basic immunization coverage among all children born in the five years preceding the survey. The MDHS acquired information on vaccination coverage in two ways: immunization cards and mothers' verbal reports. For all infants born since January 2010, moms were requested to show the interviewer the vaccination cards on which the immunization dates were noted. If there was no card, or if the mother was unable to provide the card to the interviewer, the child's immunization information was relied on the mother's recall.

The mother was asked if her child had had BCG, polio, DPT/pentavalent, hepatitis B, or measles/measles rubella vaccines. If she said the child had polio, DPT/pentavalent, hepatitis B, or measles/measles rubella vaccines, she was asked how many doses the child had had. Because mothers' recall may be inaccurate, vaccination

coverage should be taken with caution. Only 45 percent of toddlers aged 12 to 23 months have access to vaccine cards. According to the survey data, 55 percent of children aged 12 to 23 months had all basic vaccines at some point prior to the poll. Only 8% of youngsters aged 12 to 23 months had received any immunizations.

According to the survey data, 55 percent of infants aged 12-23 months had received all basic immunizations at some point prior to the poll. 8% of children aged 12 to 23 months had not received any polio immunizations.

Indicates that the percentage of children aged 12-59 months at the time of the survey who had received all basic vaccinations by the age of 12 months increased from 46 percent among children aged 48-59 months to 56 percent among children aged 24-35 months and then decreased to 45 percent among those aged 12-23 months. The main explanation for the current fall is a dip in coverage for the measles vaccine during the transition period from the measles to the MR vaccine. However, the percentage of children who received no vaccinations decreased from 17% among those age 48-59 months to 10% among those age 12- 23 months.

3.4.4 Fever

In Myanmar, fever is the most prevalent sign of a child's illness. It can be caused by benign infections like the common cold or by more serious diseases including malaria, dengue hemorrhagic fever, and Japanese encephalitis.

Children who had a fever and sought guidance or treatment from a health facility or provider. Children under the age of 5 who had a fever in the two weeks preceding the survey were included in the sample. Sixteen percent of children under the age of five had a fever in the two weeks preceding the poll. Fifty-seven percent of these youngsters were taken to a health institution or provider for consultation or treatment, and 32 percent were given antibiotics. The prevalence of fever rises from 10% among toddlers under the age of six months to 22% among those aged six to eleven months. The percentage of children who had a fever in the two weeks preceding the survey was highest in Chin State (32%), and lowest in Sagaing Region (7 percent). The percentage of children with fever who are taken to a health facility or provider improves significantly with rising household wealth, from 47 percent of children living in the lowest quintile to 74 percent of children living in the top quintile.

3.4.5 Diarrheal Disease

Diarrhea is a frequent childhood ailment that, according to the previously cited MoHS study on causes of under-5 mortality (MoHS 2014a), is the fourth-leading cause of death among children under the age of five in Myanmar. To address this important source of morbidity and mortality in children, nationwide implementation of F-IMNCI, IMNCI, and CCM (as outlined in Section 10.3) is underway. The MoHS created national F-IMNCI, IMNCI, and CCM guidelines that are used by health care practitioners across the country (MoHS 2014b).

The prevalence of diarrhea is highest among children aged 12 to 23 months, followed by those aged 6 to 11 months. Chin State has the greatest rate of diarrhea (24%), followed by Kachin State (20 percent). There are minor changes in diarrhea prevalence based on household wealth. For example, the prevalence of diarrhea among children in the lowest and second-lowest wealth quintiles is 13% and 13%, respectively, compared to 7% among children in the highest wealth quintile. Treatment procedures for diarrhea are included in the F-IMNCI, IMNCI, and CCM recommendations. One treatment is oral rehydration therapy (ORT), which consists of administering low-osmolarity oral rehydration salt (ORS) tablets or a prescribed homemade solution. The national guidelines for the treatment of diarrhea in children under the age of five also include the use of zinc sulphate (ZnSO4) tablets (MoHS 2014b).

Children with diarrhea are given a fluid made from a special packet of oral rehydration salts (ORS) or government-recommended homemade fluids (RHF). Children under the age of 5 who had diarrhea in the two weeks preceding the study were sampled. As previously stated, 10% of children under the age of five had diarrhea in the two weeks preceding the poll. Fifty-four percent of these children were sent to a health institution or provider for advice or treatment, and 68 percent were given oral rehydration therapy (ORT) or more fluids. Patterns by Boys (74%) are more likely than girls (61%) to be given ORT or additional fluids as a treatment for diarrhea in children under the age of 5. The proportion of children with diarrhea who seek advice or treatment from a health facility or provider is higher in rural areas (55 percent) than in urban areas (49 percent). However, the proportion of children who receive ORT or increased fluids as a treatment for diarrhea is higher in urban (77%) than rural (66%) settings.

The proportion of children with diarrhea who seek advice or treatment from a health facility or provider is substantially greater among those whose moms have a secondary education (62 percent) than among those whose mothers have no education (36 percent) (DHS Myanmar 2015-2016).

CHAPTER IV
ANALYSIS OF SURVEY DATA

4.1   Survey Profile

Mawbi Township is located at Northern District in Yangon Region. Hmawbi Township is one of the Yangon Region. Yangon Region is composed of 4 Districts and 45 Townships. The location of the Hmawbi Township is between North Latitude 73 degree 36 minutes and East Longitude from 176 degree to 136 degree. The area is 183.78 square miles. The neighboring township at the east of Hlegu Township, west of Htantabin Township, north of Taikkyi Township and south of Mingaladon Township. The Hmawbi airport is at Indan (Inntan), 4 kilometres (2.5 mi) northeast of the town of Hmawbi. Hmawbi Township is home to the Myaung Dagar Industrial Zone, which is 1,016 acres (4.11 km^2) zone constructed in 2006-2008 and is intended to house all of Yangon's steel factories.

Hmawbi Township is organized with 4 wards, 39 village tracts and 195 villages. According to 2014 population census, 25928 people live in urban area and 218679 people live in rural area. The total population of Hmawbi Township is 244607, with 120931 males and 123676 females. Most of the people in township are cultivating and farming.

The religions are Buddhist, Christian, Islam and Hindu. The number of Buddhist is the largest and Christian is the second largest. The majority of the households in Hmawbi Township are living in bamboo houses and wooden houses. Agriculture is the main economic activity. Most of the crops grown in Hmawbi Township include rice, sunflower, cow-pea, beans. There are 14 high school, 7 middle school and 123 primary school. In addition, there are fifty-bedded hospitals, two sixteen-bedded hospitals and thirty rural healthcare centers.

4.2   Survey Design

Sample surveys are the most commonly used method for primary data collection. The household survey was conducted in Hmawbi Township to obtain the required information. The objectives of the survey are to assess mothers' nutritional knowledge and to investigate the health status of children in Hmawbi Township.

4.2.1   Questionnaire Design

The questionnaire was used to collect the required information. Data were collected by using interviewer administered questionnaire in Myanmar language visited house-to-house and conducted face-to-face interview with the help of four assistant interviewers.   The questionnaire basically consists of three main sections. The first section is the mother's characteristics in a household. It includes basic characteristics of age, marital status, education, occupation, family members, number of children in family, and average monthly income of household. The second section is the health status of children. It includes gender, age, height, weight and health conditions of children. The third section includes mother's nutritional knowledge five-point Likert scale. The questionnaire was prepared for asking the required information from a mother who has children age under five years in the household.

4.2.2   Sample Design

In this study, a two-stage random sampling design was used to carry out a household sample survey. There were 4 wards and 195 villages in the study area. In the first-stage sampling, a ward and five villages were randomly selected in Hmawbi Township. In the second-stage sampling, the households included in the sample ward and villages were proportionately selected and then a sample mother with age 18 years and above who had the children age under five was selected from each sample household. They have given verbal agreement to participate in this study.

In a household sample survey of Hmawbi Township, a ward and five villages were randomly selected from 4 wards and 195 villages. And then, the 200 mothers were randomly selected from 2036 mothers. The selected ward and villages with total number of mothers were described in Table (4.1).

Table (4.1)   List of Mothers in Selected Area in Hmawbi Township

No.	Selected Ward and Villages	Number of Mothers	Number of Selected Mothers
1	Ward (4)	751	74
2	La Pan Tan Su	324	32
3	Thar Yar Khone	97	9
4	Thae Khone	140	14
5	Yin Tike Pin	413	41
6	Inn Lyan	310	30
	Total	**2035**	**200**

Source: General Administration Department of Hmawbi Township, (2020).

4.3   Survey Data Analysis

4.3.1   Age of Mothers

In the study, the mothers are assigned into four age groups, which are categorized into below 30 year, 30-39 years, 40-49 years, and 50 years and above. Mothers who have children age under five years are decided to be eligible in the survey. Table (4.2) shows frequency distribution of mothers by age.

Table (4.2)   Frequency Distributor of Mothers by Age

Age	Number of Mothers	Percent
Below 30 years	66	33
30-39 years	93	46.5
40-49 year	28	14
50 years and above	13	6.5
Total	**200**	**100**

Source: Survey data (2020)

As shown in Table (4.2), the largest distribution of the mother's age group is 30-39, which contributes 46.5% of total mothers. The second largest age group of mothers is below 30 years (33%). The smallest distribution of the mother's age group is 50 years and above with 6.5% of total mothers.

4.3.2 Marital Status of Mothers

In this study, the marital status of mothers is grouped into four categories: married, divorced, widow and separated. Table (4.3) represents frequency distribution of mothers by marital status.

Table (4.3)   Frequency Distribution of Mothers by Marital Status

Age	Number of Mothers	Percent
Married	124	62
Divorced	33	16.5
Widow	25	12.5
Separated	18	9.0
Total	**200**	**100**

Source: Survey data (2020)

According to Table (4.3), about 124 out of 200 are currently married. This group contributes 62% to total sample mothers. There are about 33, 25 and 18 mothers who are divorced, widow and separated, respectively. These groups contribute 16.5%, 12.5% and 9% to total sample mothers.

4.3.3 Educational Background of Mothers

In the study, the education background of mothers is categorized into five groups: no education, primary school, middle school, high school and graduate and above. Table (4.4) provides frequency distribution of mothers by educational background.

Table (4.4)   Frequency Distribution of Mothers by Educational Background

Frequency Distribution of Mothers by Educational Background	Number of Mothers	Percent
No education	16	8.0
Primary school	21	10.5
Middle school	50	25.0
High school	37	18.5
Graduate and above	76	38.0
Total	**200**	**100**

Source: Survey data (2020)

According to Table (4.4), about 16 mothers (8%) are illiterate. The majority of the mothers, 38% are graduate followed by 25% with middle school level of education, 18.5% with middle school level of education and 10.5% with primary school level of education.

4.3.4 Occupational Status of Mothers

The occupational status of the mothers is considered as unemployed, in-house business and outside business. According to Table (4.5), 38.5% of mothers are unemployed, 24% of mothers are in-house business and 37.5% of mothers are outside business.

Table (4.5)   Occupational Status of Mothers

Occupational Status	Number of Mothers	Percent
Unemployed	77	38.5
In-house business	48	24.0
Outside business	75	37.5
Total	**200**	**100**

Source: Survey data (2020)

4.3.5 Number of Children

The mothers are asked about the number of children in their families. The number of children in household is classified as 1-3 children, 4-6 children and above 6 children. Table (4.6) represents frequency distribution of children in household.

Table (4.6)   Frequency Distribution of Number of Children

Number of Children	Number of Mothers	Percent
1-3 children	141	70.5
4-6 children	52	26
above 6 children	7	3.5
Total	**200**	**100**

Source: Survey data (2020)

According to the table (4.6), 70.5% of the mothers have 1-3 children in their family followed by 26% of mothers have 4-6 children and 3.5% of mothers have above 6 children.

4.3.5   Family Size

The mothers were asked about the number of members in their families. The family members are classified as 2-4 members, 5-7 members and above 7 members. Table (4.7) represents frequency distribution of the family size.

Table (4.7)   Frequency Distribution of the Family Size

Family Size	Number of Households	Percent
2-4 members	112	56
5-7 members	65	32.5
Above 7 members	23	11.5
Total	**200**	**100**

Source: Survey data (2020)

As shown in Table (4.7), majority of households have 2-4 family members. This group represents 56%. The households have 5-7 family members, which represents the second largest group (32.5%). Moreover, about 23 households have above 7 family members which represent the smallest group (11.5%).

4.3.7   Average Monthly Income

The average monthly income level is importance for the uplift of the socio-economic condition of household. Household survey is useful for measuring the economic and well-being of people. Household income is the sum of the income of all members in the household. The distribution of monthly average income of household is shown in table (4.8).

Table (4.8)   Frequency Distribution Average Monthly Income

Average Monthly Income	Number of Households	Percent
Under 100,000 MMK	57	28.5
100,000 – 500,000 MMK	71	35.5
500,001 – 1,000,000 MMK	43	21.5
Above 1,000,000 MMK	29	14.5
Total	**200**	**100**

Source: Survey data (2020)

Concerning average monthly income of households, the majority of households (35.5%) have earned between 100,000 and 500,000 kyats, followed by under 100,000 kyats (28.5%), between 500,001 and 1,000,000 kyats (21.5%) and above 1,000,000 kyats (14.5%).

4.4   Health Status of Children

4.4.1   Gender of Children

In the study, gender of children is assigned into two groups such as boys and girls. Table (4.9) shows frequency distribution of children by gender. According to the following result, there are about 100 boys and 100 girls in the study.

Table (4.9)   Frequency Distribution Children by Gender

Gender	Number of Children	Percent
Boys	100	50
Girls	100	50
Total	**200**	**100**

Source: Survey data (2020)

4.4.2   Age of Children

In the study, the children were assigned into five age groups such as below 1 year, 1 year (12-23 months), 2 years (24-35 months), 3 years (36-47 months) and 4-5 years (48-59 months). Table (4.10) shows frequency distribution of children by age.

Table (4.10)   Frequency Distribution of Children by Age

Age	Number of Children	Percent
Below 1 year	58	29.0
1 year (12-23 months)	31	15.5
2 years (24-35 months)	53	26.5
3 years (36-47 months)	28	14.0
4-5 years (48-59 months)	30	15.0
Total	**200**	**100**

Source: Survey data (2020)

Concerning Table (4.10), the largest distribution of children's age group is below 1 year, which contributes 29% of total children. The second largest age group of children is 2 years (24-35 months). This group contributes 26.5%. The third largest age

group of children is 1 year (12-23 months) (15.5%). The smallest distribution of children's age group is 3 years (36-47 months) with 14.5 % of children.

4.4.3 Health Conditions of Children

In the study, the mothers were asked about health conditions of their children during six months. The children suffer the following health conditions (symptoms) such as diarrhea, cough, shortness of breath, vomiting, headache, rashes and malnutrition (underweight) which show in Table (4.11).

Underweight or weight-for-age takes into account both acute and chronic undernutrition. Children whose weight-for-age Z-score is below minus two standard deviations from the mean of the reference population are classified as underweight. This study is calculated the Z-score of weight-for-age. Therefore, Z-score value is less than -2 standard deviations from the mean was classified as underweight and Z-score value is at least -2 standard deviations from the mean was classified as non-underweight.

Table (4.11)   Health Status of Children

No	Symptom	Number of Children	Percent
1	Diarrhea		
	Yes	127	63.5
	No	73	36.5
2	Cough		
	Yes	138	69
	No	62	31
3	Shortness of breath		
	Yes	21	10.5
	No	179	89.5
4	Vomiting		
	Yes	61	30.5
	No	139	69.5
5	Headache		
	Yes	36	18
	No	164	82
6	Rashes		
	Yes	42	21
	No	158	79
7	Underweight (weight-for-age)		
	Yes	50	25
	No	150	75
	Total	200	100

Source: Survey data (2020)

This study found that 127 (63.5%) of children suffer diarrhea while 73 (36.5%) of children do not suffer diarrhea. It can be seen that 138 (69%) of children suffer cough while 62(31%) do not suffer cough. Concerning shortness of breath, 21 (10.5%) of children experience the shortness of breath but 179 (89.5%) of children are not experienced. Regarding vomiting, 61 (31.5%) of children suffer vomiting while 139 (69.5%) do not suffer this health problem. It found that 36 (18%) of children have got headache but 164 (82%) of children have not got headache. It can be seen that 42 (21%) of children have experienced rashes but 158 (79%) of children have not experienced rashes. It found that 50 (25%) of children are malnourished (underweight) but 150 (75%) of children are nourished. Hence, this study found that the most of children suffer cough as well as diarrhea.

4.5 Nutritional Knowledge of Mothers

In this study, the nutritional knowledge of mothers includes seventeen statements and each statement is measured with five-point Likert scale (1: strongly disagree, 2: disagree, 3: neutral, 4: agree, and 5: strongly agree). Thus the mean value of all variables can be categorized into three nutritional knowledge level of Mothers such as low, moderate and high level. Mean value of less than 3 is categorized as low level Nutrition knowledge, mean value between 3 and 4 is categorized as moderate nutrition level of knowledge and mean value of above 4 is categorized as high nutrition level of knowledge.

Table (4.12) Descriptive Statistics of Mothers' Nutritional Knowledge

No	Description	Mean	Standard Deviation
1	Meat, fish, eggs, liver, *momo* etc. are highly nutritious food items.	4.50	1.07
2	Dairy products including rice pudding, green vegetables, fruits and dried fruits are nutritious food for children.	4.25	1.11
3	Peas and beans, potato, pumpkin sprouts and soups are nutritious food for children.	3.80	0.90
4	Rice, maize, potato, bread, wheat, lentil, millet etc. are highly nutritious food items.	3.85	0.92
5	Breast milk alone is sufficient in the first 6 months.	3.67	1.08
6	Breast milk is more beneficial than formula feeding.	3.72	1.10
7	Cereals, pulses, milk, fish, and green leafy vegetables are essential for the growth of children.	4.37	0.90
8	Breastfeeding should be done every half hour.	4.10	1.04
9	Supplementary feeding should be initiated at 6 months of age.	3.67	1.15
10	Imbalanced diet is the cause of malnutrition.	4.25	1.02
11	The less weight at children's age is a feature of undernutrition.	3.97	1.20
12	Every 3 months, height and weight must be checked for children aged 3–5 years.	3.92	1.34
13	Delayed physical growth and impaired cognitive development are the complications of malnutrition.	3.52	1.11
14	Adequate breastfeeding, nutritious food, and regular deworming will prevent malnutrition of children.	4.48	1.05
15	Immunization of children is the best way to protect the child against infectious diseases.	3.76	1.18
	Overall mean	**4.01**	**0.55**

Source: Survey data (2020)

Table (4.12) states the individual mean scores of the statements of mothers' nutritional knowledge in various oversights. It is found that the mean scores of statements 1, 2, 7, 8, 10 and 16 are 4.5, 4.25, 4.37, 4.25, 4.1 and 4.48. Hence, these statements are higher than 4 (agree level) and it indicates that the mothers' nutritional knowledge about these statements is high level of nutritional knowledge. It is found

that the mean scores of statements 3, 4, 5, 6, 9, 11, 12, 13, and 15 are between 3.5 and 4 and it shows that the mothers' nutritional knowledge about these statements is moderate level knowledge. In addition, the overall mean value of nutritional knowledge of mothers is 4.01. It shows that the overall mean of all statements are about 4. Therefore, it can be concluded nutritional knowledge of mothers in Hmawbi Township is high level knowledge.

The mothers who have higher level nutritional knowledge feed their children more with vegetable, fruit, legumes, and less sugared drinks such as pops, juice and fast foods than the mothers who have lower level of nutritional knowledge. Also, higher nutritional knowledge level mothers avoid giving the foods which contains artificial to their children and believe more the knowledge about nutrition-health. Mothers' nutrition knowledge level affects children's eating habits in Hmawbi Township.

4.6   Association between Nutritional Knowledge Level and Characteristics of Mothers

Cross-tabulation and chi-square test are done to determine the association between nutrition knowledge level and characteristics of mothers. Mothers' nutritional knowledge level is categorized into three groups: low level, moderate level and high level of knowledge. Characteristics of mothers are considered as age, marital status, education, and occupation. The results are shown in Table (4.13).

Table (4.13)   Results of Relationship between Nutritional Knowledge of Mothers and Characteristics of Mother

Characteristics of Mothers	Nutritional Knowledge of Mothers			Chi-square Value	P-value
	Low Level	Moderate Level	High Level		
Age					
Below 30 years	8	25	33		
30-39 years	10	25	58	5.89	0.435
40-49 years	5	10	13		
50 years and above	3	5	5		
Marital status					
Married	11	35	78		
Divorced	5	15	13	12.51*	0.052
Widow	5	9	11		
Separated	5	6	7		
Education level					
No education	4	5	7		
Primary school	4	9	8		
Middle school	13	19	18	14.27*	0.075
High school	8	9	20		
Graduate and above	5	26	45		
Occupation					
Unemployed	18	24	33		
In-house business	15	16	17	10.9**	0.028
Outside business	7	28	42		

***, **, * present statistically significant at 1%, 5% and 10% level.

Source: Survey data (2020)

The result shows that marital status of mothers is statistically related to nutritional knowledge of mothers at 10 % level. It can be seen that currently married mothers have more nutritional knowledge than widow, separated and divorced mothers. Education of mothers is statistically related to nutritional knowledge of mothers at 10% level. It can be seen that educated mothers have more nutritional knowledge than

uneducated mothers. Mothers' occupation is statistically related to nutritional knowledge of mothers at 5% level. It can be seen that employed mothers have more nutritional knowledge than unemployed mothers.

4.7 Association between Nutritional Knowledge Level of Mothers and Health Status of Children

Cross-tabulation and chi-square test are done to determine the association between nutrition knowledge level and health status of children. Mothers' nutritional knowledge level is categorized into three groups: low level, moderate level and high level of knowledge. Health status of children is considered as diarrhea, cough, shortness of breath, vomiting, headache, rashes, and malnutrition. The results are shown in Table (4.14).

Table (4.14)   Results of Relationship between Nutritional Knowledge of Mothers and Health Status of Children

Health Status of Children	Nutritional knowledge of mothers			Chi-square Value	P-value
	Low level	Moderate level	High Level		
Diarrhea				57.88***	0.000
Yes	54	50	23		
No	5	15	50		
Cough				59.24***	0.039
Yes	70	47	21		
No	2	21	39		
Shortness of breath				32.03***	0.000
Yes	10	7	4		
No	13	61	105		
Vomiting				50.68***	0.001
Yes	29	17	15		
No	8	51	80		
Headache				34.4***	0.000
Yes	14	12	10		
No	9	56	99		
Rashes				74.32***	0.000
Yes	20	15	7		
No	3	53	102		
Underweight (weight-for-age)				16.98***	0.000
Yes	25	15	10		
No	35	40	75		

***, **, * statistically significant at 1%, 5% and 10% level.

Source: Survey data (2020)

The result shows that nutritional knowledge of mothers is statistically related to diarrhea at 1 % level. It can be seen that mothers with high level of nutrition knowledge reduce children who suffer diarrhea. In addition, nutritional knowledge of mothers is statistically related to cough at 5 % level. It can be seen that mothers with high level of nutrition knowledge lessen children who suffer cough. The nutritional knowledge of mothers is statistically related to shortness of breath at 1 % level. It can be seen that mothers with high level of nutrition knowledge decrease children who suffer shortness of breath.

The nutritional knowledge of mothers is statistically related to vomiting at 1 % level. It can be seen that mothers with high level of nutrition knowledge decrease children who suffer vomiting. The nutritional knowledge of mothers is statistically related to headache at 1 % level. It can be seen that mothers with high level of nutrition knowledge decrease children who experience headache. The nutritional knowledge of mothers is statistically related to rashes at 1 % level. It can be seen that mothers with high level of nutrition knowledge decrease children who suffer rashes. The nutritional knowledge of mothers is statistically related to underweight of children at 1 % level. It can be seen that mothers with high level of nutrition knowledge decrease children who are underweight.

It is concluded that nutritional knowledge of mother play on important role of children's health conditions. The more the nutrition knowledge levels of mothers, the better the children's nutrition health conditions.

CHAPTER V
CONCLUSION

5.1   Findings

Myanmar has a high prevalence of maternal and child undernutrition in the recent year. The study is analyzed the relationship between nutritional knowledge and health status of children. In the study, 200 mothers who have children age under five year are considered. The characteristics of mothers includes age, marital status, education, occupation, family size, number of children and average monthly household income. The most mothers are age group with 30-39 years, currently married, graduate and employed (outside business). The most mother who have 1-3 children and average monthly their household income with 100000-500000 kyats.

Concerning gender of children, 100 boys and girls are participated in the study. Most children are age group below 1 year. Concerning health status of children, this study found that 63.5% of children suffer diarrhea while 36.5% of children do not suffer diarrhea. It can be seen that 69% of children suffer cough while 31% do not suffer cough. It can be said that 10.5% of children experience the shortness of breath but 89.5% of children are not experienced. Regarding vomiting, 30.5% of children suffer vomiting while 69.5% do not suffer this health problem. It found that 18% of children have got headache but 82% of children have not got headache. It can be seen that 21% of children have experienced rashes but 79% of children have not experienced rashes. It found that 25% of children are malnourished but 75% of children are nourished. Hence, this study found that the most of children suffer cough as well as diarrhea.

This study is analyzed the nutritional knowledge of mothers that includes fifteen statements and each statement is measured with five-point Likert scale. It states the individual mean scores of the statements of mothers' nutritional knowledge. It is found that the mean scores of statements 1, 2, 7, 8, 10 and 14 are higher than 4 (agree level), and it indicates that the mothers' nutritional knowledge about these statements is high level knowledge. It is found that the mean scores of statements 3, 4, 5, 6, 9, 11, 12, 13, and 15 are between 3.5 and 4, and it shows that the mothers' nutritional knowledge

about these statements is moderate level knowledge. In addition, the overall mean value of nutritional knowledge of mothers is 4.01. It shows that the overall mean of all statements are about 4, and it can be concluded nutritional knowledge of mothers is high level knowledge.

This study is analyzed the relationship between mothers' characteristics and nutritional knowledge by using Chi-square test. The result shows that marital status of mothers is statistically related to nutritional knowledge of mothers at 10% level. It can be seen that currently married mothers have more nutritional knowledge than widow, separated and divorced mothers. Education of mothers is statistically related to nutritional knowledge of mothers at 10% level. It can be seen that educated mothers have more nutritional knowledge than uneducated mothers. Mothers' occupation is statistically related to nutritional knowledge of mothers at 5% level. It can be seen that employed mothers have more nutritional knowledge than unemployed mothers.

This study is investigated the relationship between nutritional knowledge of mothers and health status of children by using Chi-square test. The result shows that nutritional knowledge of mothers is statistically related to diarrhea at 1 % level. It can be seen that mothers with high level of nutrition knowledge reduce children who suffer diarrhea. In addition, nutritional knowledge of mothers is statistically related to cough at 1% level. It can be seen that mothers with high level of nutrition knowledge lessen children who suffer cough. The nutritional knowledge of mothers is statistically related to shortness of breath at 1% level. It can be seen that mothers with high level of nutrition knowledge decrease children who suffer shortness of breath.

The nutritional knowledge of mothers is statistically related to vomiting at 1% level. It can be seen that mothers with high level of nutrition knowledge decrease children who suffer vomiting. The nutritional knowledge of mothers is statistically related to headache at 1% level. It can be seen that mothers with high level of nutrition knowledge decrease children who experience headache. The nutritional knowledge of mothers is statistically related to rashes at 1% level. It can be seen that mothers with high level of nutrition knowledge decrease children who suffer rashes. The nutritional knowledge of mothers is statistically related to malnutrition of children at 1% level. It can be seen that mothers with high level of nutrition knowledge decrease children who are malnourished.

5.2   Suggestions

Hmawbi Township is one of the Townships of Yangon Region. The Hmawbi airport is at Indan (Inntan), northeast of the town of Hmawbi. Hmawbi Township have Myaung Dagar Industrial Zone, which is intended to house all of Yangon's steel factories.

Implementing the health development of children, the major findings of the study have the following suggestions for government, local authorities, health staff and academic scholars in urban area as well as rural area.

An awareness need to be created among mothers regarding nutrition for children age under five. Health staffs need to organize regular short-term training programmes, workshops etc., with support of local authorities for the mothers about nutritional knowledge for children under five. Health Educational program should also give importance to equip the mothers with adequate skill to provide health education to the individuals, guide other family members in perceiving threat of malnutrition and other deficiency diseases because of lack of nutrition. Health staff and nurses can give nutritional knowledge and child care trainings to the rural mothers who have lack of knowledge regarding nutrition and help them to understand the importance and effects of nutrition for growth and development of child, it helps them to adjust with the reasons for why they should start giving proper nutrition. Local administrator can organize in service education programme for mothers to increase their knowledge regarding nutrition for children under five. A suitable environment for study could be maintained through provision of adequate education regarding nutrition and its effects on growth and development.

The government should increase the range of the paved rural health program by increasing living conditions of people for the next coming development strategy. In order to improve rural and urban health plans and appropriate health policies need to be in Hmawbi Township. Most of the people lived in rural areas and thus, to promote the benefits and health care of rural population are essential. Authorities need to prioritize rural connectivity and adopt appropriate policies and innovative technologies for its rural development. Therefore, more infrastructure investments are needed in health sector in Hmawbi Township.

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APPENDIX - I

Survey Questionnaire

A Study on Relationship between Nutritional Knowledge of Mothers and Health Status of Children

SECTION A: Mothers' Profile

1. Age

   ☐ below 30

   ☐ 30 – 39

   ☐ 40–49

   ☐ 50 and above

2. Marital status

   ☐ Married

   ☐ Divorced

   ☐ Widowed

   ☐ Separated

3. Level of Education of mother

   ☐ No education

   ☐ Primary

   ☐ Middle

   ☐ High School

   ☐ Graduate and above

4. Occupation

   ☐ Unemployed

   ☐ In house Business

   ☐ Outside Business

5. Average Monthly Income of Household

   ☐ Under 100,000 MMK

   ☐ 100,000 – 500,000 MMK

   ☐ 500,001 – 1,000,000 MMK

   ☐ Above 1,000,000 MMK

6. Number of children in Family
- ☐ 1 – 3 children
- ☐ 4 – 6 children
- ☐ Above 6 children

7. Number of household members (Family Size)
- ☐ 2 – 4
- ☐ 5 – 7
- ☐ Above 7

Section B. Child Characteristics (Anthropometric) and Health Status

1. Sex
- ☐ Male
- ☐ Female

2. Age ---------------------(years)

3. Height ----------------------(cm)

4. Weight -----------------------(kg)

5. Has your child been Sick in the last two weeks?
- ☐ Yes
- ☐ No

6. If yes, how many times?
- ☐ One time
- ☐ 2 – 3 times
- ☐ above 3 times

7. Did you seek healthcare assistance when child was sick?
- ☐ Yes
- ☐ No

8. If yes, where?
- ☐ Own medication
- ☐ Traditional healer
- ☐ Clinic/ Pharmacy

9. Did your child suffer as the following symptoms?

No	Symptom	Yes	No	If yes	
				How many times	How many days
1	Diarrhea				
2	Cough				
3	Malaria				
4	Shortness of breath				
5	Vomiting				
6	Headache				
7	Bloody stool				
8	Bloody urine				
9	Rashes				
10	Joint and body pains				

Section C: Awareness of Mothers' Nutritional Knowledge

No	Description	Strongly Agree	Agree	Normal	Disagree	Strongly Disagree
1	Meat, fish, eggs, liver, *momo* etc. are highly nutritious food items.					
2	Dairy products including rice pudding, green vegetables, fruits and dried fruits are nutritious food for children.					
3	Peas and beans, potato, pumpkin sprouts and soups are nutritious food for children.					
4	Rice, maize, potato, bread, wheat, lentil, millet etc. are highly nutritious food items.					
5	Breast milk alone is sufficient in the first 6 months.					

No	Description	Strongly Agree	Agree	Normal	Disagree	Strongly Disagree
6	Breast milk is more beneficial than formula feeding.					
7	Cereals, pulses, milk, fish, and green leafy vegetables are essential for the growth of children.					
8	Breastfeeding should be initiated within half an hour of delivery.					
9	Supplementary feeding should be initiated at 6 months of age.					
10	Imbalanced diet is the cause of malnutrition.					
11	Less weight for age is a clinical feature of undernutrition.					
12	Every 3 months, height and weight must be checked for children aged 3–5 years.					
13	Delayed physical growth and impaired cognitive development are the complications of malnutrition.					
14	Adequate breastfeeding, nutritious food, and regular deworming will prevent malnutrition in children.					
15	Immunization of children is the best way to protect the child against infectious diseases.					