NUTRITIONAL STATUS OF 6-59 MONTHS OLD CHILDREN OF NEWAR COMMUNITY IN MADHYAPUR THIMI MUNICIPALITY-14, BHAKTAPUR DISTRICT

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NUTRITIONAL STATUS OF 6-59 MONTHS OLD CHILDREN OF NEWAR COMMUNITY IN MADHYAPUR THIMI MUNICIPALITY-14, BHAKTAPUR DISTRICT

A dissertation submitted to the Department of Nutrition and Dietetics, Central Campus of Technology, Tribhuvan University, in partial fulfillment of the requirements for the degree of B.Sc. Nutrition and Dietetics

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Approval Letter

This *dissertation* entitled *Nutritional Status of 6-59 months old children of Newar community in Madhyapur Thimi Municipality-14, Bhaktapur District Nepal* presented by Ayush Adhikari has been accepted as the partial fulfillment of the requirement for B.Sc degree in Nutrition and Dietetics.

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Abstract

Nutritional status of children is one of the major predictors of child survival. However, malnutrition is a major public health problem in most of the developing countries and occurs prominently among under-five children. In context of Nepal, 29 % children are suffering from underweight, 41% from stunting and 11% are suffering from wasting. These children are at a substantially greater risk of severe acute malnutrition and death. The objective of the study was to assess the nutritional status of children under five years of age. A cross-sectional study was conducted in Newar community of Madhyapur Thimi Municipality. The study was carried out in 96 children of age between 6-59 months. Anthropometric measurements such as weight, height and MUAC of children were measured. A semi-structured questionnaire was used to collect information of socioeconomic status, infant and young child feeding, concepts on diseases and hygiene practices. WHO Anthro version 3.2.2 and SPSS version 20 were used to analyze data. Out of 96 children, the prevalence of stunting, wasting and underweight were 35.41 %, 1.04% and 9.37 % respectively where stunting is higher and other two are low compared to the national prevalence rate of Nepal according to NDHS 2011. In the study population, there is high prevalence of malnutrition, especially stunting among under-five. Taking into account weight, height, age and mid upper arm circumference (MUAC) measurements, there is need of intervention.

Keywords: Nutritional status, Malnutrition, Underweight, Stunting, Newar community

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List of Abbreviations

Abbreviation	Full form
NDHS	Nepal Demographic Health Survey
PEM	Protein Energy Malnutrition
IBM SPSS	International Business Machines Statistical Package for Social Sciences
MUAC	Mid Upper Arm Circumferences
NCHS	National Center for Health Statistics
WHO	World Health Organizations
UNICEF	United Nations International Children Emergency Fund
WAZ	Weight for Age Z-score
WHZ	Weight for Height Z-score
HAZ	Height for Age Z-score
ARIs	Acute respiratory infections
EBF	Exclusive breast feeding
PEM	Protein energy malnutrition

Part I

Introduction

1.1   General Introduction

Malnutrition or malnourishment is a condition that results from eating a diet in which nutrients are either not enough or are too much such that the diet causes health problems. It may involve calories, protein, carbohydrates, vitamins or minerals. Not enough nutrients are called under nutrition while too much is called over nutrition. Malnutrition is often used specifically to refer to under nutrition where there are not enough calories, protein or micronutrients. (Srilaxmi, 2002)

Adequate nutrition is the fundamental right of every human being. Poor nutrition is cited as the major factor in more than half of all child deaths in Nepal- a significantly higher proportion than those claimed by other infectious diseases. Malnutrition is not just a stark manifestation of poverty, it is also the non- income face of poverty and it helps perpetuate poverty (Report, 2012). Nutritional status is defined as the condition of the body resulting from the intake, absorption and utilization of food. It is determined by a complex interaction between internal/ constitutional factors like age, sex, nutrition, behavior, physical activities and diseases and external environmental factors like food, safety, cultural, social and economic circumstances (joshi,2011).The period from birth to age two is especially important for optimal physical, mental, and cognitive growth, health, and development. Unfortunately, this period is often marked by protein-energy and micronutrient deficiencies that interfere with optimal growth. Childhood illnesses such as diarrhea and acute respiratory infections (ARIs) are also common.

Nepal is one of the least developed nations in South- East Asia Region (SEAR), which was ranked 157 among 187 countries in the Human Development Index (UNDP, 2012).

According to 2011 census, the total population of Nepal is 26.6 million. More than 83% of population resides in rural area. The infant and under five mortality rates are 64.2 and 91 per 1000 respectively. The population growth rate in 2011 is 1.41% (NDHS, 2011). 41 % of children under five years of age are stunted, 11% are wasted, and 29 % are

underweight.46 % of children age 6-59 months are anemic, 27 % are mildly anemic, 18 % are moderately anemic, and less than 1 % are severely anemic.18 % of women are malnourished, that is, they fall below the body mass index (BMI) cutoff of 18.5. 14 % of women are overweight or obese. Women's nutritional status has improved only slightly over the years. 35 % of women age 15-49 are anemic, 29 % are mildly anemic, 6 % are moderately anemic, and less than 1 % severely anemic. (MoHP, 2012)

Good nutrition is a fundamental basic right. Nepal with its ratification in 1990 of the 'Convention on the rights of child, by UN General Assembly in 1980',committed itself to recognizing and implementing a wide range of civil and political rights for Nepalese children. The convention recognizes children's right to survival and to the highest attainable standard of health implies a healthy environment, nourishing food, quality health services and parental awareness (Save the Children, 2000). Strategies to improve Infant and Young Child Feeding (IYCF) are key components of the child survival and development programs of many nations, supported by UNICEF and WHO. The scientific rationale for this decision is clear, with steadily growing evidence underscoring the essential role breastfeeding and complementary feeding as major factors in child survival, growth and development.

The importance of breastfeeding as the preventive intervention with potentially the single largest impact on reducing child mortality has been highlighted. In addition, of the available nutrition interventions, improvement of complementary feeding have been shown to be most effective to improve child growth, and thereby, together with maternal nutrition interventions, to contribute in reducing stunting.

A number of recent programmatic reviews have highlighted factors for success and important lessons learned in large-scale programs. A total of 20 countries worldwide have recorded gains of more than 20 % age points in rates of exclusive breastfeeding of infants at 0-6 months of age in a period of approximately ten years. Factors for success, in general, are the large-scale implementation of comprehensive, multi-level programs to protect, promote, and support breastfeeding, with strong Government leadership and broad partnerships. Despite the achievements, there is still significant room for

improvement and acceleration in programming to improve infant and young child nutrition. This includes both increasing and sustaining good breastfeeding practices as well as interventions to improve complementary feeding. (UNICEF, 2011)

Background

Newar are the indigenous people of the Kathmandu valley and its surrounding areas in Nepal. According to Nepal's 2011 census, 1321933 Newars in the country are the nation's sixth largest ethnic group representing 5 % of the population.

Newar were formed by the relation between Tibetan tribe and Indian tribe coming in Nepal. (Dr. Rajesh Gautam, Castes of Nepal).According to language chronicle, the followers of King Nanyadev were later called Newar. (Dr. Rajesh Gautam, Castes of Nepal)

Newar follow both Hinduism and Buddhism. They are the most educated ethnic group of Nepal and their main occupation is business. There is lot of caste division inside newar community. Though being educated and living on the most developed part of Nepal, they have lots of superstitious belief and practices. They believe in ghost, demon and other mythical creature.

Table 1.1 Population Distribution of Newar community

Ecological Belt	Total Population
Mountain	63,694
Hill	10,50,110
Terai	2,08,129
Total	13,21,933

1.2 Statement of the problem

Malnutrition refers to a pathological state resulting from a relative or absolute deficiency or excess of one or more essential nutrients. It is a state of nutrition where the weight for age, height for age and weight for height indices are below -2 Z-score of the NCHS reference. (National Center for Health Statistics)

Malnutrition continues to be a major public health problem in developing countries. It is the most important risk factor for the burden of disease causing about 300, 000 deaths per year directly and indirectly responsible for more than half of all deaths in children. Health and physical consequences of prolonged states of malnourishment among children are: delay in their physical growth and motor development; lower intellectual quotient (IQ), greater behavioral problems and deficient social skills; susceptibility to contracting diseases.

Major types of nutritional problems in developing countries are under-nutrition and nutritional disorders which are resulting from inadequate food intake both quality and quantity, particularly of calories, proteins, vitamins and minerals; and parasitic infection and disease.

Malnutrition remains a serious obstacle to child survival, growth and development in Nepal. Prevalence of malnutrition among children below five children is high with 48.6% in the country (NDHS, 2011). Protein-energy malnutrition (PEM) and micronutrient deficiency are most common types of malnutrition. In Nepal, 11 percent of children are wasted and 3 percent are severely wasted. Children whose weight-for-age is below minus two standard deviations from the median of the reference population are considered underweight. The measure reflects the effects of both acute and chronic under nutrition. Nearly three in ten children (29%) are underweight and 8% are severely underweight (NDHS, 2011).Nepal suffers from extensive malnutrition, ranking in the top 10 countries with the highest prevalence of stunting (less than -2 SD scores) (UNICEF 2009).

The prevalence of malnutrition imposes significant costs on the Nepalese economy as well as society. The high mortality due to malnutrition leads to the loss of the economic potential of the child .It affects children in many ways, predisposing them to different infectious diseases, psychosocial underdevelopment and cognitive deficiencies.

Therefore, this study is designed to assess the prevalence of malnutrition and associated factors among children aged 6-59 months which can be used as a reference in priority setting and designing effective nutritional programs at Madhyapur Thimi Municipality.

1.3   Objectives

1.3.1   General Objectives

The general objective is to assess the nutritional status of children between 6– 59 months age and identify the factors that are associated with nutritional status.

1.3.2   Specific Objectives

The specific objective is to determine the nutritional status of 6-59 months children in the population, to identify the factors affecting malnutrition among children and to suggest corrective measures.

1.4   Significance of the study

The finding of this work will:

1. Provide information to the government as well as voluntary organizations to initiate steps to tackle the problem.

2. Encourage the people for the improvement of their existing nutritional status by improving dietary pattern of the children.

3. Encourage the government and the other concerned authorities such as NGOs and INGOs for the development of an adequate system of nutritional programs.

4. Provide data for concerned agencies.

5. Serve as a helpful guide to make a nutrition program for this area.

6. Reflect sanitary conditions, socio-economic variables, degree of malnutrition and condition of mothers and children to make the people aware of the real situation.

National estimates of the burden of malnutrition, including estimates for child malnutrition, provide vital information on preventable ill-health, and indicate the health gains possible from interventions to prevent the risk factor (malnutrition). The results also allow policy- makers to direct resources to the most vulnerable segments of the population, and thus make better use of resources. (Blakely, 2004)

1.5   Limitations of the study

1. Language used by the Newar community is different than that of national language so collected information might be slight different than the actual statement.

2. Many families who were illiterate and tribal might not provide the correct age of their children.

3. Clothing, weighing time (before or after meal) might have caused some errors.

4. Rough floor surface, struggling of the young children, personal error during taking reading might have caused some errors.

5. This study was conducted with limited resources due to which other important questions and many other important assessments were impossible to carry out.

Conceptual Framework

The literature repeatedly shows that malnutrition is caused by a combination of factors, such as low income, illiteracy, an unhealthy environment, unsatisfactory health services, inadequate food habits, low agricultural productivity, etc., and that all these factors affect each other differently according to the particular situation. (Beghin, 1988) For this thesis I have chosen UNICEF framework.
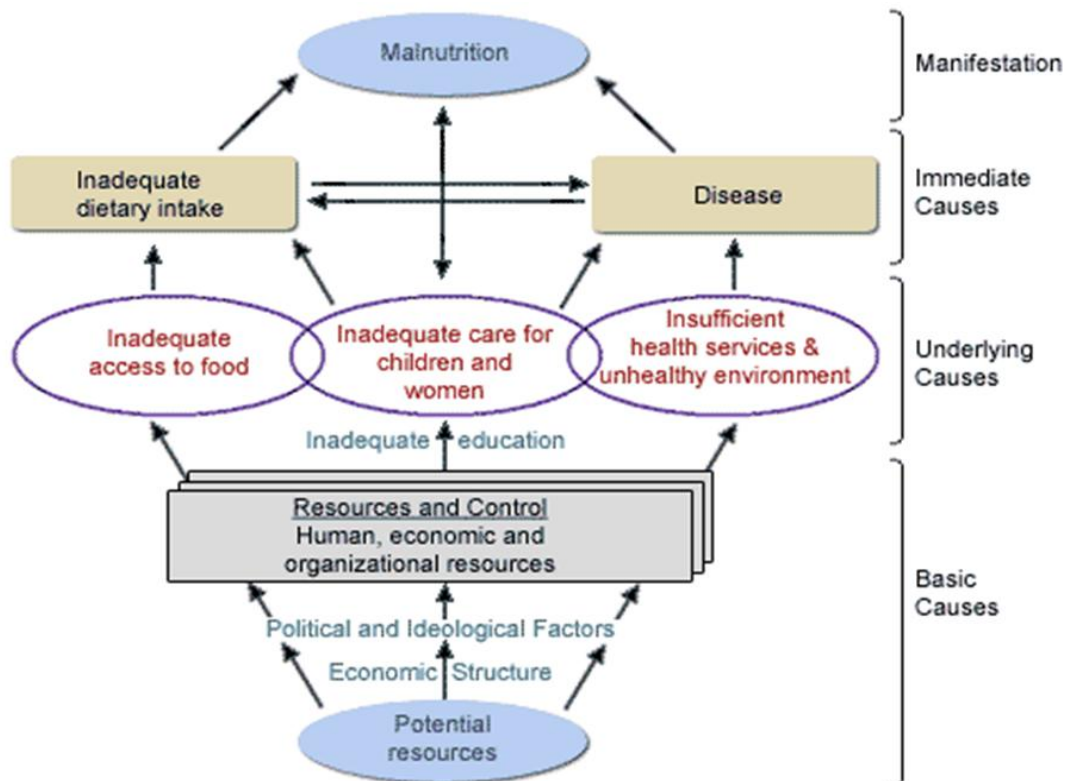
Figure 1: Conceptual framework for the causes of malnutrition by UNICEF

The above figure can be divided into following parts:

1. Immediate causes of under nutrition: The immediate cause of under nutrition is a result of a lack of dietary intake or disease. This can be caused by consuming too few nutrients and infection which can increase requirements and prevent the body from absorbing the consumed.

This part focuses on the infection under nutrition cycle. In practice, under nutrition and infection often occur at the same time because one can lead to another. This is illustrated in the cycle below:
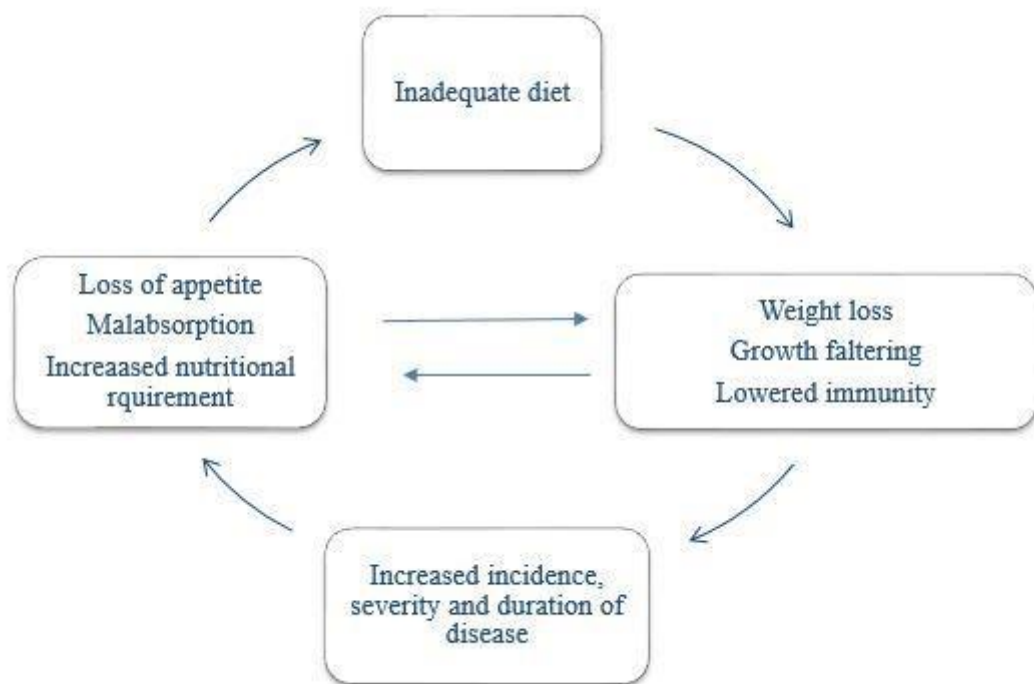
Figure 2: Poverty - Malnutrition Cycle

• The level of interaction depends on the infection and extent of under nutrition but in general, poor nutrition can result into reduced immunity to infection.

• This can increase livelihood of an individual getting an infection or increase its duration or severity.

• Infection can result in the loss of appetite, increased nutrients requirements and decreased absorption of nutrients consumed.

• This triggers further weight loss and reduced resistance to further infection.

The vicious cycle needs to be broken by treatment of infection and improved dietary intake.

2. Underlying causes of under nutrition: Whether or not an individual gets enough food to eat or whether s/he is at risk of infection is mainly the result of factors operating at the household and community level.

Within the UNICEF framework just described these are classified as underlying causes. These can be grouped into three broad categories:

- Household Food Insecurity

- Inadequate Care

- Unhealthy household environment and lack of health services (poor public health).

These often referred to as 'food', 'care' and 'health' factors.

Household food security is defined as sustainable access to safe food of sufficient quality and quantity to ensure adequate intake and healthy life for all members of the family. When members of household do not have access to sufficient quantity and quality of food they can be said food unsecured. Food must not only be in the market but people must be able to afford it. Additionally, for an active and healthy life, people need enough food as well as the right balance of fat, protein, carbohydrate and micronutrients.

Caring practices such as breastfeeding, appropriate complementary feeding, as well as hygiene and health seeking behaviors support good nutrition. These practices can be severely disrupted in an emergency which can lead to poor dietary intake and increased infection, both of which are underlying causes of under nutrition.

The third category of the underlying causes of under nutrition refers to those related to poor public health. This includes factors relating to the health environment, exposure to disease and access to basic health services. The health environment is affected by access to clean, safe water and sanitation, the presence of malarial breeding sites, the quality of shelter and consequent level of cold, stress, overcrowding. Extent to basic health services determines the extent to which infection and disease can be prevented or treated.

3. Basic Causes: The third levels of factors contributing to under nutrition identified by the conceptual framework are considered basic causes. These refer to what resources are available (human, structural, financial) and how they are used (political, legal and cultural factors). These can be thought of as the real reason behind the underlying causes.

Political, legal and cultural factors may defeat the best efforts of households to attain good nutrition. These include the degree to which the right of women and girls are protected by law and customs; the political and economic system that determines how income and assets are distributed; and the ideologies and policies that govern the social sectors. Overcoming entrenched poverty and under development requires resources and inputs. (UNICEF, 2015)

Part II

Literature Review

2.1 Nutrition

Nutrition is the study of food in relation to health and the process by which living organism used food for the maintenance of life, growth, normal functioning of the organs and tissues and productivity of energy or the study of various nutrients their functions food resources and their utilization by human body and their effect on human wellbeing (Katwal,1989). In other word, nutrition is the science that deals with absorption, digestion, and metabolism of a food in the body.

2.2 Malnutrition

Malnutrition has been defined in different ways some believe that it is a result of an imbalance in the intake of nutrient; whereas other say that it is the result of too little or even too much intake of certain nutrient. There are still other who say it is a clinical syndrome with typical symptoms and signs depending on the type of nutrient responsible for the disease. Nevertheless, both over nutrition and under nutrition are considered malnutrition.   Malnutrition has been defined as a pathological state resulting from a relative or absolute deficiency or excess of one or more of the essential nutrients in the diet (Jellife, 1966).Malnutrition, a widespread problem with devastating consequences, weakens immune systems and worsens, illnesses lower intellectual quotient. Malnutrition reduces the quality of life and financially drains families, communities, and countries. (Kandalaetal., 2001)

According to the World Health Organization (WHO, 1983), malnutrition has three commonly used comprehensive types named stunting, wasting and underweight measures by height for age, weight for height and weight for age indexes respectively. For girls, chronic under nutrition in early life, either before birth or during early childhood can later lead to their babies being born with low birth weight, which

can lead again to under nutrition as these babies grow older. Thus a vicious cycle of under nutrition repeats itself, generation after generation (UNICEF, 2009)

2.3 Types of Malnutrition

2.3.1 Protein Energy Malnutrition (PEM)

PEM is the most common form of malnutrition occurring among infants and young children. Mild PEM manifests itself mainly as poor physical growth, whereas individuals with severe PEM have high case of fatality in different countries of developing world (Muller and Krawinkel, 2005; Das et al., 2008; Ubesie and Ibeziakor, 2012)

WHO defines PEM as, "a range of pathological condition arising out of coincident lack of protein and energy in varying proportion, most frequently seen in infants and young children and usually associated with infection."

PEM is further classified under following names

- Kwashiorkor

The term kwashiorkor, means; "The disease which the child gets when the next baby is born" i.e., sickness of the disposal child". Kwashiorkor is characterized by following symptoms such as growth failure, edema, fatty liver, skin and hair changes, muscle wasting, diarrhea, moon face, apathy and peevishness, crazy pavement dermatitis etc. (Swaminathan, 2000). Children above 18 months are usually affected by kwashiorkor (Jelliffe, 1966).

- Marasmus

This is common form of PEM. It is a child version to starvation. It usually occurs in a second six months of life. The cause is the diet very low in calories and incidentally in protein and other essential nutrients. The symptoms include growth failure and low body weight, severely

wasting of muscle mass and of subcutaneous fat, shrunken eyeball, depressed cheeks, and ribs becomes prominent, dry and atrophic skin, etc.(Swaminathan, 2000).

Marasmic- kwashiorkor

When the incidence of PEM is high, a large number of cases shows some of the features of both marasmus and kwashiorkor (Swaminathan, 2000).

Similarly, the other types of the malnutrition problems most common in developing countries are

1. Vitamin A deficiency

2. Iron deficiency Anemia

3. Iodine deficiency disorder etc.

Forms of Malnutrition

1. Under nutrition: The pathological state results from the consumption of an inadequate quantity of food over an extended period of time.

2. Over nutrition: It is the pathological state resulting from the consumption of an excessive quantity of food and hence a calorie excess, over an extended period of time.

3. Specific deficiency: It is the pathological state resulting from a relative or absolute lack of an individual nutrient.

4. Imbalance: This pathological state results from a disproportionate consumption of essential nutrients with or without the absolute deficiency of any nutrient as determined by the requirements of a balance diet. (D.B. Jelliffe, 1966)

2.4   Methods of assessment of nutritional status

There are basically two methods of assessing the nutritional status. The methods is categorized as, direct and indirect methods.

- Direct method

This method deals with the individual and measures the objective criteria

- Indirect method

This method uses community indices that reflect community nutritional status.

2.4.1   Direct methods of nutritional survey

They are summarized as ABCD

2.4.1.1   Anthropometric methods

Nutritional anthropometry is concerned with the measurement of the variations of the physical dimensions and the gross composition of human body at different age levels and degrees of nutrition (Jelliffee D.B 1966). Nutritional Anthropometry has most commonly been conducted on preschool children, the age group in which PEM is usually most prevalent and most severe. The commonly used anthropometric measurements or indicators of nutritional status for children are briefly discussed below:

- Weight for height: weight and height of child is measured using standard Seca digital balance and stadiometer respectively and index is expressed in standard deviation units from the median of WHO child growth standards adopted in 2006. Children whose weight-for-height is below minus one standard deviations is considered mildly wasted similarly below minus 2 and 3 standard deviations are considered moderately and severely wasted respectively.

- Weight for age: Children whose weight-for-age is below minus two standard deviations from the median of the reference population are considered underweight. The measure reflects the effects of both acute and chronic under nutrition.

- Height for age: Children whose height-for-age is below minus two standard deviations from the median of the reference population are considered stunted or short for their age. Stunting is the outcome of failure to receive adequate nutrition over an extended period and is also affected by recurrent or chronic illness.

- Mid upper arm circumference: children whose mid upper arm circumference is below 12.5cm are considered malnourished. Hence it is significant during the diagnosis of protein energy malnutrition. Measurement should be taken by flexible, non-stretch tape made of fiber glass or steel.

- Edema: Accumulation of fluid in interstitial cells is called as edema it also reflects PEM.

- Head and chest circumference: Measurement of head circumference is important because it is closely related to brain size. It is often used with other measurements to detect pathological conditions too. (Gibson RS,1993)

2.4.1.2 Biochemical or laboratory methods

Biochemical test is used primarily to detect subclinical deficiency states or to confirm a clinical diagnosis. Some of its examples are hemoglobin estimation, serum protein, urine creatinine, serum retinol etc.

2.4.1.3 Clinical methods

We can also assess one's nutritional status by observing certain signs and symptoms which are associated with various nutrient deficiencies in various organs of body like skin, hair, mouth, tongue etc.

2.4.1.4   Dietary evaluation methods

Dietary assessment protocol is designed to assess nutrient intakes after implying questionnaire, records, and recall methods.

2.4.2   Indirect methods of nutritional survey

Vital statistics: - A variety of vital statistics such as maternal, infant and childhood mortality rates, prevalence rates have been considered as indirect indicators of nutritional status of community.

Ecological Information:-The nutritional status of an individual or community is affected by socioeconomic and ecological factors. Therefore these parameters are likely to serve useful indirect indicators. (RajaLakhsmi, 1987)

2.5   Nutritional Status

Nutritional status is defined as the condition of the body resulting from the intake, absorption and utilization of food. The nutritional status of the people of the developing countries is very poor. Malnutrition, under nutrition and various forms of nutritional deficiencies are wide spread and mostly prevalent in rural area of the developing countries (Neumanetal, 2004). Early childhood health and nutrition is a true reflection of countries' level of development.

These health indicators are directly linked through existing policies, plans and programs to countries' investment in early childhood and respect for children's rights (Molina, 2012).

The Nutritional status cannot be measured directly as various factor such as Poverty, poor feeding practices, lack of land, insufficient food production, Ignorance of parent on child care, food losses, Exploitation, diarrhea, potable water, high price of fertilizer, drought, measles, high number of children, credit too expensive, availability of Health care too facilities has been reported to contribute for malnutrition (Beghin et al., 1988). Both direct and indirect method can be helpful in the details assessment of nutritional condition particular community or groups.

2.5.1 Nutritional situation of children under five years of age.

The three components measured are low birth weight, malnutrition-induced stunting and underweight. These indicators reflect the reality of poverty and hunger that began during pregnancy. But malnutrition also deals with the excess which is named as overweight.

a) Low birth weight (for gestational age) - This indicator, which reflects the maternal situation (nutrition and morbidity), care during pregnancy (primary health care) and possible fetal diseases, is useful both in developing and developed countries.

b) Malnutrition evidenced by a weight deficit (insufficient weight for age and height, by gender) - This indicator is useful in developing countries because it reflects the child's holistic life conditions, not only in terms of nutrition and nourishment but also in terms of infections and environmental hygiene, and it predicts mortality and morbidity risks.

c) Malnutrition evidenced by stunting (short height for age, by gender) - This is an indicator for countries with higher levels of development, where low weight is a problem resolved or on the decline; it reflects the food situation in respect of meeting energy requirements and involves both macronutrients and micronutrients.

d) Malnutrition associated with excess (overweight for height, by gender) -this indicator is generally useful in countries emerging from underdevelopment in that underweight coexists with overweight for, owing to nutritional changes, both situations associated with poverty and poor diet are to be found within the population. This indicator should be added to others and also predicts the risk of diet-related non-communicable diseases. (Molina, 2012)

2.6 Nutritional status of Nepal

Various surveys conducted in Nepal shows that there is a decreasing trend of malnutrition in past few years. Although there has been a great reduction in malnutrition problems but still the data shows that the prevalence is much higher than that of developed countries. The Nepal Demographic Health Survey (NDHS, 2011) has provided the data on prevalence of malnutrition less than 5 years of child. The percentage of prevalence of malnutrition below 5 years of age is illustrated in Figure 3
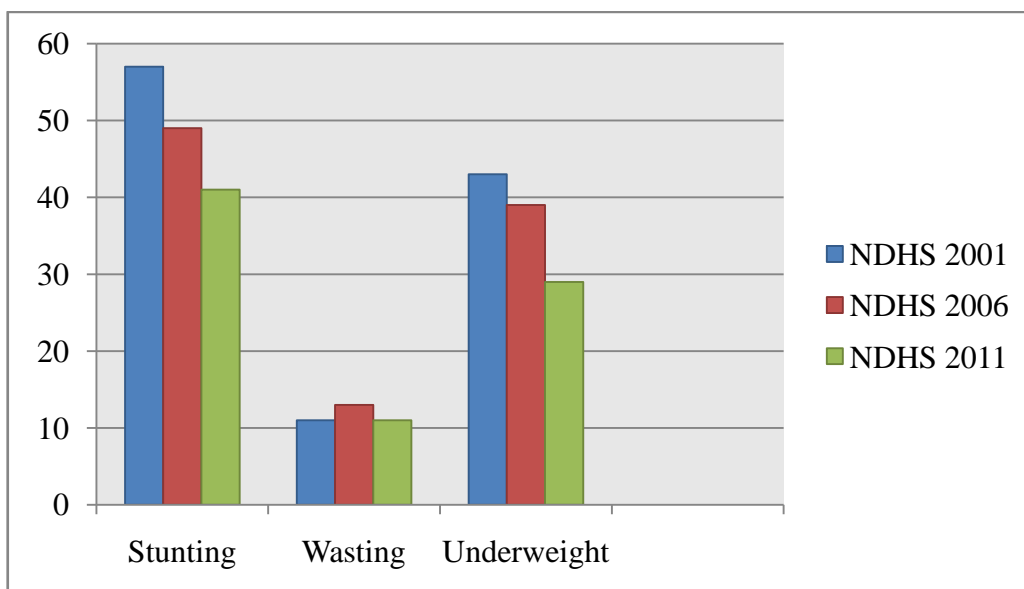
Figure 3: Prevalence of Malnutrition of under-five years aged children in Nepal

2.7   Breast Feeding and Complementary Feeding

Optimal infant and young child feeding entails the initiation of breastfeeding within one hour of birth; exclusive breastfeeding for the first six months of the child's life; and continued breastfeeding for two years or more, together with safe, age-appropriate feeding of solid, semi-solid and soft foods starting at 6 months of age. While infant feeding practices need to be strengthened overall, increasing the rates of early initiation of breastfeeding and of exclusive breastfeeding is critical to improving child survival and development. (UNICEF, 2009)

It has been postulated that 13% of the current under five mortality rate could be averted by promoting proper breastfeeding practices, which is seemingly the single most cost effective intervention to reduce child mortality in resource constrained settings such as in Nepal. The importance of EBF (Exclusive Breast Feeding) for optimal growth and development, irrespective of country of residence, is also reflected in the recent WHO growth standard for children. Introduction of foods other than breast milk before six months of life is not only undesirable, but could also be harmful. These foods not only displace nutritious mother's milk, but also serve as a vehicle for infectious pathogens that can lead to severe illness. Despite well-established guidelines for promotion of EBF, the adherence to EBF is quite low in many settings. Childhood malnutrition and growth faltering affects more than half of children under five in developing countries, and usually starts during infancy,

possibly due to improper breastfeeding and mixed feeding practices. The mean total duration of breastfeeding in Nepal, like most other low and middle income countries, is long and usually more than two years, but data on EBF up to six months of age as well as descriptions of mixed feeding practices are scarce. Information on breastfeeding practices and the factors influencing them is important for successful campaigns. (Ulak et.al., 2012)

2.7.1 Definition of Breastfeeding Categories

Breastfeeding can be categorized into three groups; exclusive, predominant and partial breastfeeding.

- Exclusive Breastfeeding: The infant had received only breast milk from his/her mother or a wet nurse, or expressed breast milk and no other liquids or solids with the exception of drops of syrup consisting of vitamins, mineral supplements or medicines.

- Predominant Breastfeeding: The infant's predominant source of nourishment had been breast milk. However, the infant may also have received water and water-based drinks like tea and local herbal drops.

- Partial Breastfeeding: When infant's feeding included non-breast milk foods such as animal/powdered/condensed milk and/or solid/ semi-solid food (i.e. cereals, vegetables, fruits, lentils or meat). (WHO, 2007)

2.8 The Z- Score or standard deviation classification system

There are three different systems by which a child or a group of children can be compared to the reference population: Z-scores (standard deviation scores), percentiles, and percent of median. For population-based assessment—including surveys and nutritional surveillance—the Z-score is widely recognized as the best system for analysis and presentation of anthropometric data because of its advantages compared to the other methods. At the individual level, however, although there is substantial recognition that Z-score is the most appropriate descriptor of malnutrition, health and nutrition centers (e.g. supplementary feeding programs in refugee camps) have been in practice reluctant to adopt its use for individual assessment.

In this database, weight-for-height, height-for-age and weight-for-age are interpreted by using the Z-score classification system. The Z-score system expresses the anthropometric value as a number of standard deviations or Z-scores below or above the reference mean or

median value. A fixed Z-score interval implies a fixed height or weight difference for children of a given age. For population-based uses, a major advantage is that a group of Z-scores can be subjected to summary statistics such as the mean and standard deviation.

The formula for calculating the Z-score is:

Z-score (or SD-score) = (observed value - median value of the reference population) / standard deviation value of reference population.

Interpreting the results in terms of Z-scores has several advantages as follows:

➤ The Z-score scale is linear and therefore a fixed interval of Z-scores has a fixed height difference in cm, or weight difference in kg, for all children of the same age. For example, on the height-for-age distribution for a 36-month-old boy, the distance from a Z-score of -2 to a Z-score of -1 is 3.8 cm. The same difference is found between a Z-score of 0 and a Z-score of +1 on the same distribution. In other words, Z-scores have the same statistical relation to the distribution of the reference around the mean at all ages, which makes results comparable across age groups and indicators.

➤ Z-scores are also sex-independent, thus permitting the evaluation of children's growth status by combining sex and age groups.

➤ These characteristics of Z-scores allow further computation of summary statistics such as means, standard deviations, and standard error to classify a population's growth status. (WHO, http://www.who.int/, 2015)

2.8.1 Cut-off points and summary statistics.

For population-based assessment, there are two ways of expressing child growth survey results using Z-scores. One is the commonly used cut-off-based prevalence; the other includes the summary statistics of the Z-scores: mean, standard deviation, standard error, and frequency distribution.

2.8.2 Prevalence based Reporting.

For consistency with clinical screening, prevalence-based data are commonly reported using a cut-off value, often <-2 and >+2 Z-scores. The rationale for this is the statistical definition of the central 95% of a distribution as the "normal" range, which is not necessarily based on the optimal point for predicting functional outcomes.

The WHO Global Database on Child Growth and Malnutrition uses a Z- score cut-off point of <-2 SD to classify low weight-for-age, low height-for-age and low weight-for-height as moderate under nutrition, <-3 SD to define severe under nutrition and <-1 SD to define mild under nutrition. The cut-off point of >+2 SD classifies high weight-for-height as overweight in children.

2.8.3   Summary statistics of the Z-scores

A major advantage of the Z-score system is that a group of Z-scores can be subjected to summary statistics such as the mean and standard deviation. The mean Z-score, though less commonly used, has the advantage of describing the nutritional status of the entire population directly without resorting to a subset of individuals below a set cut-off. A mean Z-score significantly lower than zero—the expected value for the reference distribution—usually means that the entire distribution has shifted downward, suggesting that most, if not all, individuals have been affected. Using the mean Z-score as an index of severity for health and nutrition problems results in increased awareness, if a condition is severe, an intervention is required for the entire community, not just those who are classified as "malnourished" by the cut-off criteria. (WHO, http://www.who.int/, 2015)

2.9   Literature review from previous studies

According to 2011 survey, 41% of children under five are stunted or too short for their age. This indicates chronic malnutrition. Stunting is more in rural areas (42%) than urban areas (27%). 11 % wasted and 29 % underweight. (NDHS, 2011)

According to a study in Bhaktapur, out of 477 children about 10 % were stunted (Low height for age). Of these 7.8 % were moderately stunted, while 2.1 % were severely stunted. About 5.5 % were underweight (low weight for age) whereas 4.6 % were moderately underweight and 0.8 % were severely underweight. Measurements of wasting (low weight for height) showed that 2.1 % of the children fell into this category. Almost 1 % were moderately wasted, while 1.3 % were severely wasted. (Maren Kvaalvag,2013)

According to study in Kavre and Dolakha districts, Out of 243 children,7% were wasted,39.9% were stunted and 18.9%were underweight. (Chataut J, Khanal K,2016)

In far western district Kanchanpur Nepal 21.8% of under five year children were severely stunted, 25% moderately stunted, 9.1% were moderately and 1.4% was severely wasted,

28% were moderately underweight and 9.7% were severely underweight .In a study done in under five children in Padampur VDC chitwan Nepal, the prevalence of stunting, wasting and underweight was found to be 22.7%, 37.3% and 25.7% respectively(Ruwali D, 2010).

Part III

Methodology

3.1 Research Design

Data collection was done. Standardized procedures for obtaining informed consent, conducting interviews and performing anthropometry were done. Field work was conducted in a standard ways under the direction and supervision of my guide teacher.

Data was collected within the community and with various respondents, as outlined below:

1) Household survey with the help of questionnaire: A set of questionnaires that have directly or indirectly influence in the nutrition status will be asked to the parents of the children who are to be studied. The questions asked to the respondent give the both qualitative and quantitative data. (Appendices 8.2)

2) Women's interview: The child mother was interviewed with the help of framed questionnaire about pregnancy history, pre- and post- natal care, recent morbidity, recent child mortality, receipt of health and nutrition services, decision making roles, child care and feeding practices, and knowledge and practices related to maternal and child health and nutrition.(Appendices 8.2)

3) Anthropometric measurements of 6-59 month age children: The following indices will be used
i.   Weight-for-age
ii. Height-for-age
iii. Weight-for-height
iv. Arm circumference

4) Edema check for protein energy malnutrition.(PEM)

5) 24 hour dietary recall: In this method, the respondent is asked to remember in detail the type and quantity of foods consumed during the previous 24 hours. This recall was done to know common types of foods they basically eat.

3.2   Measurement Methods
The methods used were:

3.2.1   Height Measurement
The height of an individual is made up of the sum of four components; Legs, pelvis, spine and skull. While, for detailed studies of body proportions, all of these measurements are required, in field nutritional anthropometry usually only the total height (or length) is measured. (Jelliffe, 1966)

Equipment and Technique: According to WHO guideline, children of 6-59 months age are measured using the vertical measuring scale. So all the children in this study was measured using vertical stadiometer provided by the college. The measuring scale was put on the flat surface where it was fixed and did not move according to child's movements. Then the child was guided to stand on the stadiometer without the shoes or slippers. The child was guided to stand parallel to the stadiometer with heels, buttocks, shoulders and back of head touching the board. Head was held comfortably erect with its line of sight vertically perpendicular to the surface of board. The hand was let hanging in natural manner.

Then the headpiece, made off wooden piece, was gently lowered, crushing the hair, and making contact with the top of the head. Any object like clips and bands on the hair was removed before the measurements and also the thick hair was taken into account. These processes was carried out and data were noted.

The measurement was taken nearest to 0.1 cm. The measurement was taken by triplicate measurement and the mode value was used for the analysis.

3.2.2   Weight Measurement
Weight is the anthropometric measurement most in use. Its potential value, especially for children, is appreciated not only by health personnel, by often by less educated parents, for whom it is useful as a source of health education.

In developing regions, the prevalence of protein-calorie malnutrition appears to be best indicated by weight deficiency in all age-groups and by growth failure in children. Weighing is the key anthropometric measurement.

Weight estimations can be made on isolated occasions, as in many surveys, or repeated at intervals under special conditions, as at child-welfare clinics, schools, parental clinics, or in longitudinal studies. These serial measurements give a better index of actual growth or growth failure. (Jelliffe, 1966)

Equipment and Technique: The type of the weighing scale used was spring balance machine. The child was subjected to the machine with the minimum number of cloths so that we could reach nearer to actual value. The child was guided to stand straight and erect and look straight forward not downward or upward. The measurement was noted as indicated by the machine.

Child's weight was measured to the nearest 100 g on a weighing scale. The machine was checked regularly for accuracy using standard weight (1 kg weight used in shop).

The measurement was taken by triplicate measurement and the mode was used for analysis.

3.2.3   Mid upper arm circumference

Measurements of the mid upper arm circumference appears to be most useful in practice. This region is easily accessible, even with a young child sitting in front of the examiner on his mother's lap. Also, in kwashiorkor the upper arm is not usually clinically edematous, while it has been shown that the mid upper arm is markedly wasted in his condition. (Jelliffe, 1966)

Equipment and technique: For the measurement of mid upper arm circumference we used non-stretchable and flexible fiber-glass tape. The measurement was taken at the mid-point of acromion process of the scapula and the olecranon process of the ulna. After the detection of the mid-point child was freed to hang his/her hand. Left hand was used for the right handed child and right hand for the left handed child for the measurement by placing firmly around the limb to avoid compression of the soft tissues. Measurement was done and data were noted.

The measurement is taken by triplicate measurement and the mode was used for analysis.

3.2.4 Edema Checkup

Usually first appears over the ankles and feet, it may extend to other areas of the extremities. It may involve the genitals, face and hands. It is commonly seen in kwashiorkor. (Jelliffe, 1966)

Technique: We applied firm pressure for three seconds with one digit on the lower portion of the median surface of the tibia. The sign was taken as positive if there was a visible and palpable pit that persists after the pressure is removed. And recorded only if present bilaterally.

3.3 Study Area

Madhyapur Thimi is located about 5KM from Kathmandu. According to Nepal's 2011 census, Madhyapur Thimi Municipality is divided into 17 wards with 83,036 total populations, 20,302 households and 5670 under five year children and there are 592 household in ward 14 having population of 3794 and 325 under five year children.

3.4 Study Population

All the children of 6-59 month age of Newar community living in Madhyapur Thimi Municipality ward no 14, Bhaktapur was chosen for the study. Children were used for the anthropometric measurements.

Mothers of the respected children were asked framed questionnaire about the breastfeeding, nutritional care, health care and the hygiene and sanitation related practices.Father/Mother or the head of the family were also asked questionnaire about the household members, occupation and education etc.

Some of the important information was collected verbally from the local leaders of the Newar community, teachers, old people from the community, and other expert people about the condition of the community before survey and the basic food, nutrition, hygiene and sanitation related behaviors.

3.5 Sample Size

The calculation of the sample size will be done by using the statistical formula,

$$n = \frac{t^2 . P.(1-P)}{m^2}$$

Where, n = required sample size

t= confidence interval at 95% (standard value of 1.96)

p=estimated prevalence of malnutrition.

m=margin of error at % 10 (standard value of 0.10)   (www.surveysystem.com)

Here, p is estimated prevalence assuming to be 50 % in the survey area.

The sample size will be obtained as below,

$n = \underline{t^2 . P. (1- P)} / m^2$

$= \{1.96^2 * 0.50 * (0.50)\}/0.10^2$

$= \{3.8416 * 0.50 * 0.50\}/0.01$

$= 0.9604/0.01$

$= 96$

3.6 Research Equipments

Instruments and equipments necessary for the conduction of the survey are:

a) Weighing Machine :- Weighing machine with the capacity of 100kg and having the least count of 0.1Kg.(1piece)

b) Height measuring scale (standiometer) :- 1 Piece

c) MUAC Tape :- For measuring mid-upper arm circumference.(1piece)

d) Questionnaire: - A well designed and pretested set of questionnaire to collect household information

3.7 Pre-testing

The equipments were tested before the actual survey by measuring the children of 6-59 months old. Since no fault was found on the equipment they were confirmed for the actual survey. The questionnaire was pretested among the mothers of Newar community to see if there was any ambiguous questions or not and also to see if all the questions and options present on the question was easily understandable by the community members or not. By taking the suggestions from the community people the questions were modified to achieve most practical format.

3.8 Validity and Reliability

3.8.1 Validity

Validity is a matter describing a phenomenon correctly. For example, anthropometry reflects a person's or population group's nutritional status in relation to an accepted standard. A valid indicator of food safety is food consumption.

To ascertain the degree to which the data collection instruments would measure what they purposed to measure, the instruments was validated by a group of professionals from Central Campus of Technology, Department of Nutrition and Dietetics. The aspects tested in the questionnaire were also drawn from the available literature in nutrition about the preschool children. The questionnaire was also pre-tested prior to data collection to ascertain content and face validity.

3.8.2 Reliability

Reliability concerns the quality of information sources, accuracy and precision of the data and their representativeness. For example, the accuracy of anthropometric measurements or the determination of age.

Reliability refers to quality control measure of data collected. Questionnaire was checked daily for completeness, consistency and clarity as mentioned earlier.

The methods used to increase the validity and reliability of the survey is mentioned in the different topics above.

3.9   Data Analysis

The anthropometric data was analyzed by the help of WHO Anthro v3.2.2. Other qualitative and quantitative data were analyzed by IBM SPSS and Microsoft Excel 2007

3.10   Measurement of Variable

Analysis of health and nutrition indicators should include the environmental and social determinants of disease, mortality, poor population group's quality of life and the inequality gaps between and within countries.

Social determinants of health and nutrition are factors that characterize environments to which individuals and the population are "exposed" and which can influence lifelong developmental and health outcomes. Social determinants act at different levels of influence, interact with each another and represent a broad array of characteristics that are not biologically or genetically based but rather are entrenched in interactions between individuals and socio-physical environments. Examples of the most important social determinants of child health, nutrition and development include living conditions, child parents-peers interpersonal relations, family socio-demographics, learning environments in day care centers and schools, access to premises, neighborhood safety and socio-political context. (Molina, 2012).

As the word suggests, an indicator gives an "indication" that is intended to reflect a particular situation or an underlying reality, usually by providing an order of magnitude, which means that it is difficult to meet the criteria directly. Indicators are variables that attempt to measure or objectify a quantitative or qualitative collective (especially bio demographic) event in order to support political action and evaluate achievements and goals. (Molina, 2012)

WHO defines them as "variables used to measure changes". Some indicators may be sensitive to more than one situation or phenomenon; for example, the infant mortality rate is a population health indicator and it is also sensitive enough for use in assessing the general population welfare. However, it may not be specific to any particular health measure because the reduction rate may be the result numerous factors of social and economic development. Health indicators are used to evaluate the effectiveness of courses of action and effects. (Molina, 2012)

There are many variables as suggested by the UNICEF framework. These variables play important role in the nutritional status of the community. These variables need indicators to measure. These variables and the required indicators are presented below:

Table 3.1 Nutrition Indicator

1.Nutritional status	2.Breastfeeding	3.Food Intake	4.Health factors
Weight for age	First breastfeeding	Weaning age	Morbidity
Height for age	Colostrum feeding	Types of weaning food	Facility of hospitals
Weight for height	Exclusive breasfeeding	Bottle feeding	Toilet facility
MUAC	Breastfeeding during diarrhea and other health problem	Food during illness	Waste disposal
Bilateral edema		Food consumption pattern	Priority of health care
Underfive mortality			
VitaminA capsule			
Iodized salt			
Birth weight			
5.Education and culture	**6.Demographic**	**7.Economic factors**	**8.WASH**
Literacy and illiteracy	No of family members	Income	Availability of drinkable water
Cultural believes	Types of family	Occupation	Time to fetch water
		Food expenditure	Hand washing practice
9.Gender concepts			
Priority for the health and economic decision			

(UNICEF Framework

PART IV

Results and Discussion

4.1   Nutritional Status

4.1.1   Weight for Height

Weight and height of child is measured using standard Seca digital balance and stadiometer respectively and index is expressed in standard deviation units from the median of WHO child growth standards adopted in 2006. Children whose weight-for-height is below minus one standard deviations is considered mildly wasted similarly below minus 2 and 3 standard deviations are considered moderately and severely wasted respectively.

Fig.4.1. Distribution of weight-for-height Z-score curve comparing with WHO standards 2006

The WHZ distribution curve obtained from the children is different than that of WHO standard curve. The median value of children is slightly shifted to the right indicating that some of the children in the population, and not only those below a given cut-off, were affected as shown in Figure.The median value of WHZ was 1.11

Table 4.1 Z-score for weight for height

WHZ	Frequency	Percent
-3-<-2	1	1.04%
-2-<-1	5	5.20%
-1-<0	22	22.91%
0-<1	30	31.25%
1-<2	23	23.95%
2-<3	15	15.65%
Total	96	100%

According to weight-for-height Z-score, 1.04% were below -2SD to -3SD, 5.20% were below -1SD to -2SD, 22.91% were below 0 to -1SD, 31.25 % were below 1SD to 0SD, and 23.95% below 2SD to 1SD and 15.65% were above 2 SD as shown in table 4.1

Regarding the weight for height index, the overall prevalence of wasting in children was 1.04 %. Severe wasting was null. The result for weight for height measurement in this study is low as compared to previously done studies in Nepal. It was 11 % (NDHS, 2011),

2.1 % (Maren Kvaalvag, 2013), 7 % (Chataut J, Khanal K, 2016) and 37.3 % (Ruwali D, 2010)

The wasting prevalence rate was low because of the proper dietary intake and education level was higher than compared to the rural areas of Nepal. Consumption of meat about daily basis and knowledge regarding the sanitation and disease was the major factors lowering the wasting rate.

Newar people mostly prefer buffalo meat and soyabean in each and every rituals. Therefore due to protein intake newar community has much more low prevalence of wasting in comparison to the other castes living in Nepal. As we know that protein is the major source of body building which in fact enhance the childs growth and weight. Similarly the survey site is developed area the food availability is easier and low chances of diseases which has lowered the wasting.

4.1.2 Weight for Age

Children whose weight-for-age is below minus two standard deviations from the median of the reference population are considered underweight. The measure reflects the effects of both acute and chronic under nutrition.
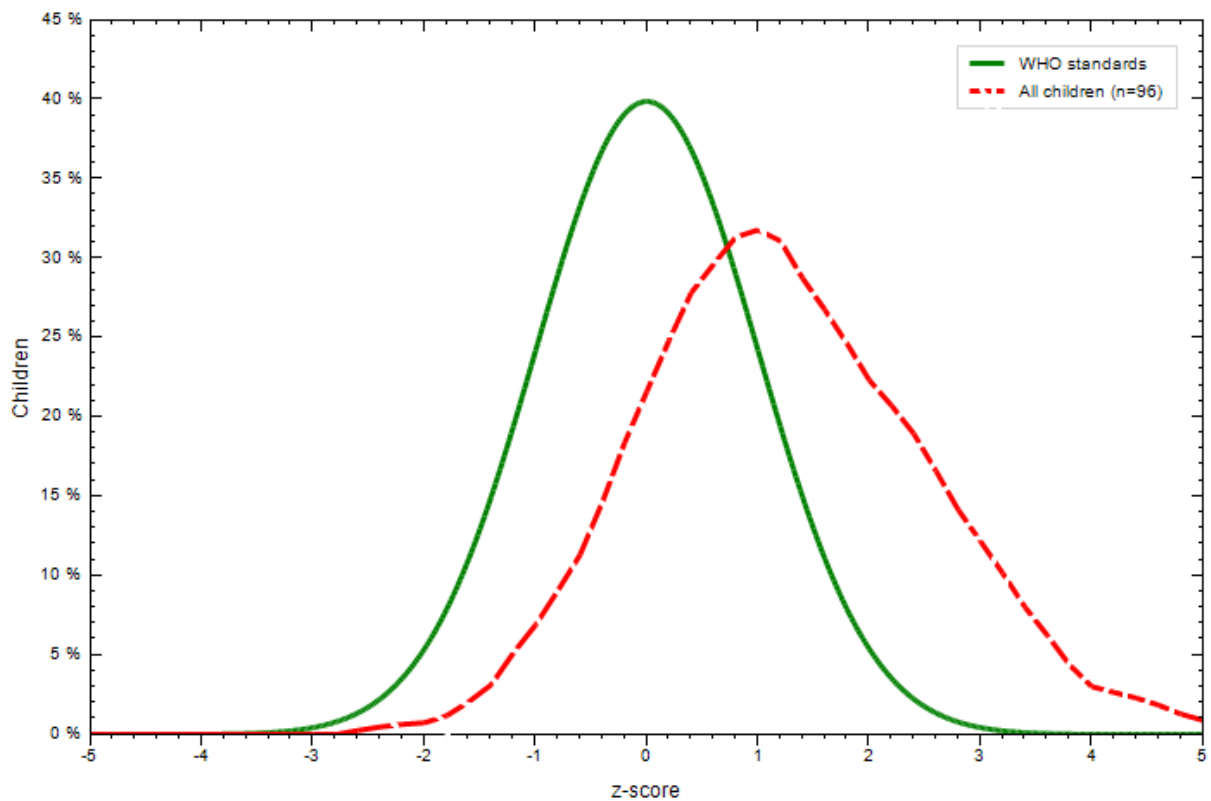

Fig.4.2. Distribution of weight-for-age Z-score curve comparing with WHO standards 2006

The WAZ distribution curve obtained from the children is different than that of WHO standard curve. The median value of children is slightly shifted to the left indicating that most of the children in the population, and not only those below a given cut-off, were affected as shown in Figure The median value of WAZ was -0.18

Table 4.2 Z-score for weight for Age

WAZ	Frequency	Percent
-3-<-2	1	1.04%
-2 - <-1	8	8.33%
-1 - <0	30	31.25%
0-<1	39	40.62%
1 - <2	14	14.58%
2-<3	4	4.18%
Total	96	100%

According to weight-for-age Z-score, 1.04% were below -2SD to -3SD, 8.33% were below -1SD to -2SD, 31.25% were below 0 to -1SD, 40.62% were below 1SD to 0, 14.58% were below 2SD to 1SD, 4.18% were more than 2SD as shown in table 4.2.

The result for weight for age measurement in this study 9.37 % are underweight (in which 1.04 % moderately underweight and 8.33 % mildly underweight) is low as compared to 29% (NDHS, 2011), higher than 5.5 % (Maren Kvaalvag,2013), lower to 18.9 % (Chataut J, Khanal K, 2016) and lower to 25.7 % (Ruwali D, 2010)

BMI of children were normal that means child has been provided with a good diet. Similarly there were no occurrences of tuberculosis, respiratory and circulatory disorders which are the major causes of underweight among children. During the time of survey, only few child were suffering from the diseases which means that there was no any significant disease for prolonged period of time and there was no associations with the certain medical conditions.

4.1.3 Height for Age

Children whose height-for-age is below minus two standard deviations from the median of the reference population are considered stunted or short for their age. Stunting is the outcome of failure to receive adequate nutrition over an extended period and is also affected by recurrent or chronic illness.
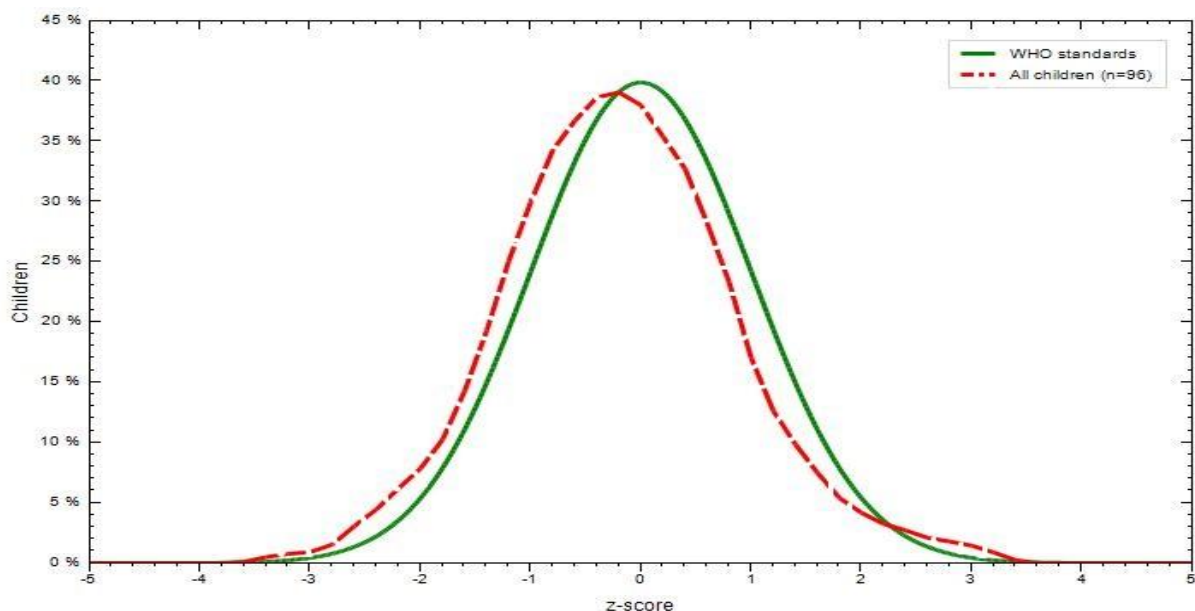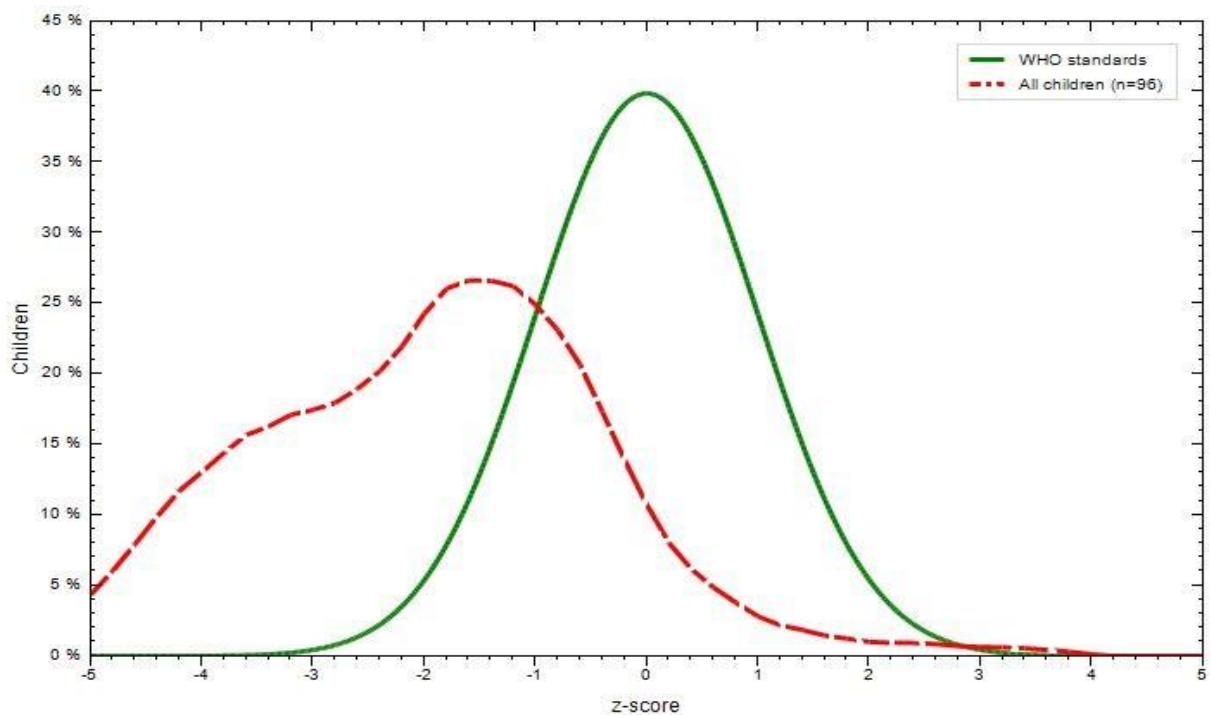

Fig.4.3 Distribution of height-for-age Z-score curve comparing with WHO standards 2006

The HAZ distribution curve obtained from the children is different than that of WHO standard curve. The median value of children is shifted to the left indicating that most of the children in the population, and not only those below a given cut-off, were affected as shown in Figure. The median value of HAZ was -1.78

Table 4.3 Z-score for height for age

HAZ	Frequency	Percent
-3-<-2	34	35.41%
-2 - <-1	20	20.83%
-1 - <0	30	31.25%
0-<1	8	8.33%
1 - <2	2	2.09%
2- <3	2	2.09%
Total	96	100%

According to height-for-age Z-score, 35.41% were below -3SD to -2SD i.e. severely stunted, 20.83% were below -2SD to -1SD i.e. moderately stunted, 31.25% were below -0 to -1SD, 8.33% were below 1SD to 0, 2.09% were below 2SD to 1SD, and 2.09% were below 3SD as shown in table 4.3.

The result showed that 35.41 % were stunted which is less than 41% (NDHS, 2011), more than 10 % (Maren Kvaalvag, 2013),closer to 39.9 % (Chataut J, Khanal K, 2016) and more than 22.7 % (Ruwali D. 2010)

Stunting is chronic malnutrition. The causes of stunting may be due to the maternal nutritional status and poor complementary feeding practices. Enteric infection and diseases like diarrhoea and respiratory infections are the major causes which can be from prolonged period of time.

Under-nutrition and weak immunological status can raise the chances of susceptibility and vulnerability to infections. In under-five children, main causes of malnutrition are inadequate dietary intake and frequent episodes of diarrheal and respiratory diseases. In addition to severe malnutrition, even mild to moderate malnutrition leads to various infections and risk to child health. All anthropometric indices in this study reveal that moderate acute malnutrition has higher prevalence than severe acute malnutrition. However, figures for severe acute malnutrition are such that it cannot be ignored and appropriate measures should be taken for its decrement.

4.2   MUAC (Mid upper arm circumference)

Out of 96 children, 84 children had MUAC greater than 124 mm and 12 had less than 124 mm that is 87.5% and 12.5% respectively.

Table 4.4 MUAC

MUAC	Frequency	Percent
Less than 124 mm	12	12.5 %
Greater than 124 mm	84	87.5 %

According to MUAC measurement, it was found that 12.5 % children were moderately acute malnourished as there MUAC was less than 124 mm. MUAC measurement is one of the commonly used methods for determining the nutritional status of the children. This result was slightly closer to the 11.1 % (Chataut J, Khanal K, 2016).

We know that more than 135 mm, MUAC is considered as normal. Similarly in between 125-135 mm it is considered as at risk of malnutrition. Similarly, 110-124 mm shows that children are moderately malnourished and less than 115 mm is considered to be severely malnourished.

Since no any child had MUAC less than 115 mm, no any child was severely malnourished. The proper arrangement of complementary foods and good dietary pattern is the key role in preventing the severe malnutrition.

4.3 Edema

No case of edema was seen .Bilateral pitting edema is a sign of Kwashiorkor, one of the major clinical forms of severe acute malnutrition. When associated with Marasmus (severe wasting), it is called Marasmic-Kwashiorkor. Children with bilateral oedema are automatically categorized as being severely malnourished.

But the children were fed with the adequate amount of protein as well as there were no any diseases which might cause nutritional edema or any other type of edema during survey. Children were not suffering from any kind of PEM.

4.4 Family Details

43.75% of family lives in nuclear family and 56.25% of family living in combine manner whereas in Danuwar Community of Sarlahi district 69.23% of family lives in a nuclear family and 30.77% of family lives in joint manner.(Karki A, 2015).We found that minimum number of family member was 3 and the maximum number of family member was 10.

Table 4.5 Family Details

Family Type	Percent
Nuclear	43.75 %
Joint	56.25 %

Many of the houses had large number of family members. So, there must be minimum 1 member available for caring the children. The children were receiving optimum level of care by their families.

High nutritional status was not just a function of income, however; within the same income group joint families had higher levels of consumption than nuclear families, suggesting that type of family influence nutrient intake.

Since either nuclear or joint due to the optimum care the prevalence of malnutrition is found to be low.

4.5 Mother's education

Most of the mothers were educated. 46.87 % had completed secondary level, 20.83% primary level, 15.63% higher secondary or above and only 16.67 % of mothers were illiterate which is low in comparison to the literacy rate among Muslim community of Sunsari district where 46 % of mother were uneducated. (Guragain K ,2015).Similarly literacy rate is more than the national literacy rate among females in Nepal which is 57 %.(NDHS,2011)

Table 4.6 Mother's education

Mother's education	Percent
Illiterate	16.67 %
Primary level	20.83 %
Secondary level	46.87 %
Higher Secondary or above	15.63 %

According to NDHS 2011, a mother's level of education generally has an inverse relationship with wasting levels, ranging from 6-10 percent of children of mothers with at least some secondary education to 13 percent of children of mothers with no education. As with wasting and stunting, mother's education is associated with underweight, with the percentage of children who are underweight being lowest among children of mothers with an SLC and higher (13 percent) and highest among children of mothers with no education (38 percent).

Here due to the good literacy rate of mother, the prevalence rate of wasting was only 1.04 %. It shows us that mother from this community has higher education in comparison to the national situation.

Better education of mother will ultimately improve the nutritional status of both mother and children. They can be fed with good complementary foods. They can get good health services, improve their lifestyle etc. In this way vicious cycle of poverty and malnutrition can be broken.

4.6 Occupation

Most (62.50%) of family's members were involved in business. Similarly 10.41% were outside country as foreign employment, 5.20% involved in services, 15.62% were involved in agriculture and 6.25% involved in labor. Whereas nationwide, agriculture is the major occupation among the people which is more than 60 %. (NDHS, 2011). Similarly the 70 % of family member worked as labor in Muslim Community of Sunsari district. (Guragain K.2015)

Table 4.7 Occupation

Occupation	Percent
Agriculture	15.62%
Foreign employment	10.41%
Service	5.20%
Business	62.50%
Labor	6.25%

Income of the family plays vital role in the nutritional status of under-five children. According to NDHS 2011, children from poorer households were likely to be four times underweight (40%) as compared to the children from wealthiest household (10%).

Due to the good job, they had higher income compared to the nationwide population. This income has broken the vicious cycle of malnutrition. Children whose parent's occupation is labor have high chances of being malnourished due to the low economic status and insufficient feeding. Since due to the good income, the prevalence of malnutrition has been low.

4.7 Water supply, Sanitation and Hygiene

59.37% of people used tap water as water sources 31.25% used well and remaining 9.37% were used hand pump water. 88.54% of household were used to found purifying water for drinking purpose (41.67% by boiling and 46.87% by filtration) where as 11.46% were not purifying for consumption which is higher in comparison to the nationwide where only 47.78% use tap water for drinking.(NDHS, 2011). Similarly purification of water was higher in comparison to the Muslim community of Sunsari where only 28 % purified water for drinking. (Guragain K,2015). Due to the easier availability of water and purification method children were protected from the disease which ultimately decreases the malnutrition.

All the people were found washing hand before meal, after toilet, after cleaning baby's stool, after the use of dirt and before the preparation of meal. To wash the hands, 84.37% of people used soap water, 15.63% by water only.

It was found that people were much aware about the purification and safe drinking water. Good hygiene were also maintained which has played effective role in prevention of diseases.

4.8 Toilet facilities and waste disposal

All of the houses had toilet facilities. 100 % household had modern toilet. While in context of national level 38.17 % population has no toilet facilities. (National Report, 2011). It means that due to the available facilities of modern toilet, the disease has been lowered.

In terms of waste disposal, 17.70% of households used pit to bury wastes, 20.83% of house incinerated waste product, 52.08% of household use container van of municipality to dispose waste product and 9.37% threw garbage in the river which is low compared to the 76.92 % people of Danuwar community in Sarlahi district throwing garbage in the river.(Karki A,2015)

Due to the proper management of the waste, no epidemic were found which has maintained the good health of children.

4.9   Source of fuel

100% used cylinder gas as fuel sources whereas it is only 21.03 % use cylinder gas. (National Report , 2011).

4.10   Diseases, its knowledge and others concepts

27.08 % of children were found having health problem in previous two weeks before survey and 72.92% of children were not found not having any health related problem.13.54 % of children suffering from common cold (rugha khoki),4.16% had fever, 2.08% had pneumonia , 5.20% had diarrhea and 2.08% had dysentery problem as shown in table.

Table 4.8 Child disease

Diseases	Percent
Common cold	13.54%
Fever	4.16%
Pneumonia	2.08%
Diarrhoea	5.20%
Dysentery	2.08%

Children suffering from common cold and diarrhoea for longer period of time are on high risk of stunting. Similarly the diseases are the major causes of acute malnutrition too.

97.91% of people had knowledge of causes of disease.89.58% of people thought that disease causes due to the lack of hygiene and sanitation also 91.67% of people thought due to germs or dirt as main cause of diseases. Similarly 87.5% of people said disease also causes from lack of balance diet. 1.04% believed on due to curse of god and 1.04 % believed on ghost. Only certain people believed in the supernatural power which was low as compared to the Danwar community of Sarlahi district where 33.33 % people believe in supernatural powers. (Karki A,2015)

Table 4.9 Concept for occurrence of disease

How disease occur	Percent
Lack of hygiene and sanitation	89.58%
Germs or dirt	91.69%
Lack of balance diet	87.55%
Curse of god	1.04%
Ghost	1.04%

This result shows that they knew how to control disease and how to improve health. They believe both in doctors and supernatural powers this means they were at transition phase of the modernization. They should be taught practical way to improve health and nutrition status of their children.

There were 97.91% of people thought that disease can be prevented by cleanliness, balanced diet and immunization and 2.09% of people believed that disease can be prevented by pleasing of god.

Table 4.10 Method of prevention of disease

Method of prevention of disease	Percent
Cleanliness	97.91%
Balance diet	97.91%
Immunization	97.91%
Pleasing of god	2.09%

93.75% people went to health post or hospital and 6.25% of people treatment from traditional healers. Most of the people are educated as compared to Danuwar community where 89.74 % people still go to the traditional healer as well as hospital where former is more preferred.(Karki A,2015)

Table 4.11 Place to go after disease

Place to go after disease	Percent
Health post or hospital	93.75%
Traditional healer	6.25%

People are well educated and only some of them still believe in traditional practices. Education has changed the people's habit and urbanization has changed the condition. Hence the proper attention is given to the child by taking them to the hospital which is due to the easily available medical facilities.

78.13% of children intake more fluid than normal during diarrhoea. Similarly, 20.83% intake as usual and 1.04% consumed less than normal intake as shown in table.

Table 4.12 Drinking liquid during diarrhoea

Drinking liquid during diarrhoea	Percent
More than usual	78.13%
As usual	20.83%
Less than usual	1.04%

4.11 Breastfeeding practices and child nutrition

100% of mother breast fed their child during the time of lactation but only 88.54% of mothers were breastfed her child within one hour after birth. Similarly, 7.29% of breast fed after one hour and 4.16% of women reported as they did not know exactly the time of breastfeeding after birth.

76.04% were exclusive breastfeeding.67.70% of mothers extend their breastfeeding.

All women introduced complementary feeding at the age of 5-6 months of children.

Table 4.13 Breastfeeding

Breastfeeding	Percent
Early initiation (within 1 hour)	88.54%
Exclusive (only breast milk up to 6 months)	76.04%
Extended (continue up to 2 years or more)	67.70%

Education of breastfeeding among mothers have played a crucial role in lowering the disease condition as well as malnutrition. According to NDHS 2011, Early initiation was 45% and exclusive breastfeeding was 70 %. The result obtained showed that the awareness related to the early initiation of breastfeeding have increased a lot. Due to the proper breast feeding, the prevalence rate of malnutrition is low.

Child having weight less than 2.5 kg were 12.50%, more than 2.5 kg was 72.91% and 14.58% of mother reported as they did not know to exact weight of children during the birth as shown in table.

Table 4.14 Weight of child at birth

Weight of child at birth	Percent
Less than 2.5 kg	12.50%
More than 2.5 kg	72.91%
Don't know	14.58%

There is statistically inverse relationship between children's birth weight and stunting. The chance of stunting decreased as the birth weight increased and vice-versa.

94.79% of children received vitamin A and albendazole where as 5.21% of children were unable to receive it. Biannual Vitamin A supplementation coverage among children 6-59 months of age was at 90% in 2011, and deworming of children 12-59 months during Vitamin A days was at 84%. (NDHS ,2011).Similarly 100% of children were immunized properly.

4.12 Mother's education on malnutrition

88.54% of mothers were known about the balance diet and 11.45% of the women did not know about the cause of malnutrition. Mothers who knew about the balanced diet have been found to provide the variety of foods than compared to that of unknown. Similar pattern was continued frequently making the children irritable toward the food.

4.13 Salt

From this study, it was found that 100% of house used iodized salt and all of them knew about the importance of iodized salt whereas only 80% are using adequately iodized salt (NDHS,2011).Due to the advantage of being at the capital valley, the people are familiar with the importance of iodized salt. Therefore there were no cases of goiter and dwarfism among children and all the children were physically and mentally active.

4.14 Nutrition of mother

71.87% of female were married after the age of 20 years and 28.13% got early married or before 20.Percentage of women consuming IFA during pregnancy was found to be 93.75% and rest 6.25 % of women were found that they did not consume IFA during pregnancy. When it was asked to the women if pregnant and lactating mother need extra food, among them 88.54% of women consumed additional foods whereas 11.46% women did not consumed additional foods during pregnant and lactation period. Extra additional foods like Fruits, meat and meat products, green leafy vegetable, milk, legumes and grains.

No consumption of alcohol and smoking during pregnancy was found.

24 hour recall

Same pattern of eating habit was found among all surveyed children of that community. Following dietary pattern has been found while observing 1 week recall.

Breakfast

Tea or milk with biscuits or rice or rice flakes or noodles biscuits was given.

Lunch

Rice, daal and vegetable. Buffalo meat was used as major meat sources.

<u>Tea time</u>

Tea with biscuits, Rice, roti, rice flakes and School children usually used fast food or junk food

<u>Dinner</u>

Same pattern as lunch

PART V

Conclusion and Recommendations

5.1   Conclusion

As the general objective was to assess the nutritional status of children between 6-59 months age children of Newar Community in Madhyapur Thimi Municipality and to identify the factors associated with the nutritional status,the general objective was fulfilled. Similarly, the specific objective which was to determine the nutritional status and to identify the associated factors and suggest the corrective measures , it can be concluded that:

1. 35.41 % of children were stunted, 1.04 % mildly wasted and 9.37 % were underweight which showed that prevalence of stunting was higher than wasting and underweight.

2. The factors that are directly associated with the stunting is the nutritional status of mother and the diseases like common cold and fever occurring frequently among some children and among the children whose family had lower income. Therefore the awareness program to improve the nutritional status of mother should be implemented.

3. The factors that have lower the wasting and underweight are education, urbanization and good knowledge about the concepts of disease and similarly the availability of the drinking water and its purification has played the vital role in lowering the diseases.

4. Similarly the dietary pattern consisting of the buffalo meat and soya bean has enhance the fulfillment of protein which has directly lowered the prevalence of malnutrition.

5.2 Recommendation

1. More than 80% brain development will be in golden 1000 days i.e. within 2 years, Early initiation breastfeeding and exclusive breastfeeding rate were still poor among some of the mothers. So to improve the nutritional status, child should be breastfed properly as well as mother should be counseled properly about the breastfeeding.

2. By using different media i.e. television, radio, leaflets, mass media etc, the awareness program about the Malnutrition, its causes and treatment should be given. These activities could lead to a good health and nutrition condition of the children as well as parents will be more focused about child's health.

3. Stunting rate was found in high percentage than underweight and wasting. So programs to improve the women's nutritional status are required.

4. Some of the women believed on traditional healer for treatment which should be discouraged.

5. There is the need for intervening nutritional and health education to the parents as educated parents are most likely to provide better care in terms of healthy eating behavior and thus good nutrition and better hygiene practices which in turn improve the nutritional status of children.

PART VI

Summary

The current study was a cross-sectional study undertaken to assess the nutritional status of under five aged children of Newar community in Madhyapur Thimi Municipality. 96 children were selected from random sampling. Anthropometric measurements were performed and a semi-structured questionnaire was used to collect the necessary information. WHO Anthro 3.2.2 version and SPSS 20 version were used for data collection.

According to the WHO z-score classification of malnutrition, the prevalence of stunting, wasting and underweight were 35.41 %, 1.04% and 9.37 % respectively where stunting is higher and other two are low compared to the national prevalence rate of Nepal according to NDHS 2011. The factors determining the nutritional status like family details, mother's education, occupation, water supply, sanitation and hygiene , toilet facilities and waste disposal, source of fuel, diseases and its occurrences, prevention, breastfeeding practices, malnutrition, feeding pattern were studied.

43.75% of family lives in nuclear family and 56.25% of family living in combine manner. Most of the mothers were educated. 46.87 % had completed secondary level, 20.83% primary level, 15.63% higher secondary or above and only 16.67 % of mothers were illiterate. Most (62.50%) of family's members were involved in business. Similarly 10.41% were outside country as foreign employment, 5.20% involved in services, 15.62% were involved in agriculture and 6.25% involved in labor.

59.37% of people used tap water as water sources 31.25% used well and remaining 9.37% were used hand pump water. 88.54% of household were used to found purifying water for drinking purpose (41.67% by boiling and 46.87% by filtration) where as 11.46% were not purifying for consumption. All the people were found washing hand before meal, after toilet, after cleaning baby's stool, after the use of dirt and before the preparation of meal. To wash the hands, 84.37% of people used soap water, 15.63% by water only.

All of the houses had toilet facilities. 100 % household had modern toilet. In terms of waste disposal, 17.70% of households used pit to bury wastes, 20.83% of house incinerated waste product, 52.08% of household use container van of municipality to dispose waste product and 9.37% threw garbage in the river. 97.91% of people had knowledge of causes of disease.89.58% of people thought that disease causes due to the lack of hygiene and sanitation also 91.67% of people thought due to germs or dirt as main cause of diseases. Similarly 87.5% of people said disease also causes from lack of balance diet. 1.04% believed on due to curse of god and 1.04 % believed on ghost.

100% of mother breast fed their child during the time of lactation but only 88.54% of mothers were breastfed her child within one hour after birth. Similarly, 7.29% of breast fed after one hour and 4.16% of women reported as they did not know exactly the time of breastfeeding after birth.

Thus the result obtained from this dissertation can be used by the government as well as other organizations for eradicating the malnutrition problem and motivate the people residing there to try to improve their existing poor nutritional status which can be done by improving dietary pattern of the under-five children.

PART VII

References

Beghin, I., Cap, M., & Dujardin, B. (1988). "A Guide to Nutritional Assessment". Geneva. World Health Organization. p. 63

Blakely, T., Hales, S., & Woodward, A. (2004). Poverty: assessing the distribution of health risks by socioeconomic position at national and local levels. (Vol. No. 10). Geneva: World Health Organization: vii.

Chataut J, Khanal K. Assessment of nutritional status of children under five years of age in rural Nepal.Kathmandu Univ Med J 2016;53(1):73-7)

Dr, Rajesh Gautam, Castes of Nepal

Gibson, Rosalind S. Nutritional assessment : a laboratory manual

Guragain Komal, Nutritional survey of Muslim Community in Itahari Municipality,2015

Jelliffe, D. B. (1996). The Assessment of Nutritional Status of community. Geneva: WHO monograph expert committee on Nutrition

Kandala N. B., Madungu, T. P., Emina, J. B. O., Nzita, K. P. D. and Cappuccio, F. P. Malnutrition among children under the age of five in the democratic republic of Congo [Report]. - [s.l.] : BMC Public Health, 2011. - pp. 1-15.

Katawal S.B. Nutritional status of children in Nepal [Report]. - 1995.

Karki Aaarem, Assesing the Nutritonal Status of 24-59 moths children in Danwari village of Harion Municipality ,2015

Maren Kvaalvag, Breast feeding Practices among infants in Bhaktapur Nepal, 2013

MoHP, New ERA, & ICF International Inc. (2012). *Nepal Demographic and Health Survey 2011*. Calverton, Maryland: 163.

Molina, H. (2012). Review of Health and Nutrition Indicators in Early Childhood: UNESCO: 4-5, 8 and 23.

Nepal demographic and halth survey 2011 [Journal]. - [s.l.] : Ministry of Health and population, 2011.

PC Joshi Malnutrition in children [Book]. - [s.l.] : Health Prospect, 2012. - pp. 61-62.

Raja Lakshmi, R. (1990). Applied Nutrition (pp. 354-355): Oxford and IBH publishing company

Ruwali D,Nutritional Status of Children Under Five Years of Age and Factors Associated in Padampur VDC, Chitwan, 2010

Sample Size Calculation; www.surveysystem.com

Save the Children, & S. G. N. C. D. (2000). Bringing up Child in a Changing World-Who's Right? Who's Right's: 15-17.

Swaminathan M. Essential of food and Nutrition [Book]. - 2 : Vol. 1 : pp. 142-476.

Srilaxmi, B, Dietetics, New Age International (P) Limited, 4th edition, 2002

Ulak, M., Chandyo, R. K., Mellander, L., Shrestha, P. S., & Strand, T. A. (2012). Infant feeding practices in Bhaktpur, Nepal: a cross-sectional, health facility based survey. International Breastfeeding Journal: 1.

UNICEF. (2009). Tracking Progress on Child and Maternal Nutrition; A Survival and Development Priority: 5-23.

UNICEF. (2011). Infant and Young Child Feeding. New York: 1.

UNICEF. (2015). Retrieved from http://www.unicef.org/

UNDP (2012) Human Development Index http:/www.undp.org/

WHO et. Al. (1983). Nutrition Essentials: A Guide for Health Managers: 2.

WHO. (2007). Indicators for assesing infant and yound child feeding practices: conclusion of a consensus meeting . Washington D.C., USA:1-5.

WHO.(2015).Retrieved from http://www.who.int/nutritiongrowthdb/index 4.html

PART VIII

Appendices

8.1 Maps

8.2   Questionnaire

<u>परिचय</u>

घरमुलिको नाम…………………………………………………

ठेगाना………………………………………………………

बच्चाको आमाको नाम…………………………………उमेर……

उत्तरदाताको नाम……………………लिङ्ग………उमेर……

पारिवारिकविवरण

प्र.नं.	प्रश्नहरू (कोडिङ्ग का साथ)
१.	परिवारको प्रकार १.एकल २. संयुक्त
२.	परिवार संख्या………………………………………… ५ वर्षभन्दामुनिको बच्चाको सङ्ख्या…………………
३.	शिक्षाआमा :- १.निरक्षर २.प्राथमिक ३. मा.वि. ४.उ.मा.वि. वा सो भन्दामाथि
४.	घरको मुख्यआम्दानीको स्रोत के हो ? १.कृषि २. सेवा ३.व्यापार ४.मजदुरी ५. वैदेशिक रोजगार
५.	तपाईंको घरको आम्दानीले घर परिवार चलाउन पुग्छ कि पुग्दैन ? १. पुग्दैन २.पुग्छ

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व्यक्तिगततथावातावरणीय स्वास्थ्य

प्र.नं.	प्रश्नहरू (कोडिङ्ग का साथ)
१.	पिउने पानीको स्रोत के हो? १. धारा २. कुवा ३. अन्य
२.	पिउने पानी शुद्धिकरण गर्नु हुन्छ कि हुदैन ? १. गर्दिन २.गर्छु यदिगर्नु हुन्छ भने कुनविधिप्रयोग गर्नु हुन्छ ? १. उमालेर २. फिल्टर गरेर (छानेर) ३. रसायनिक पदार्थ मिसाएर (औषधी) ४. घाममा राखेर
३.	तपाईंको घरमा कस्तो प्रकारको चर्पि छ ? १. आधुनिक २.परम्परागत
४.	फोहोर व्यवस्थापन कसरी गर्नुहुन्छ ? १. खाल्डोमा २. जलाएर ३.जथाभावी ४ अन्य
५.	तपाईं कुन-कुन बेला हात धुनुहुन्छ ?बहु उत्तर आउन सक्छ १. खानाखानु/खुवाउनु अघि २. दिसा गरेपछि ३.बच्चाको दिसा सफा गरेपछि ४.खाना तयार गर्नु अघि ५. अन्य (खुलाउनुहोस्)...........................
६.	हातधुन के प्रयोग गर्नुहुन्छ ? १. पानीमात्र २.साबुनपानी ३. खरानीपानी
७.	घरमाखानापकाउने इन्धन के छ ? १. दाउरा २. गोवर ग्यास ३.सिलिण्डर ४.अन्य

रोग सम्वन्धि ज्ञान/ विचार धारणा :

प्र.नं.	प्रश्नहरू (कोडिङ्ग का साथ)
१.	तपाईंको विचारमा रोग कसरी लाग्छ ? (बहुउत्तर आउनसक्छ) १. रोगका कीटाणुले /फोहोरले २. सरसफाईको कमी ३.देवी देवताको श्रापले ४.पूर्वजन्मको पापको कारणले ५. भुतप्रेत को कारणले ६. अन्य (खुलाउनुहोस्)
२.	रोग लाग्ननदिन के गर्नु पर्ला ? १. सरसफाई गर्नु पर्छ २. सन्तुलितखाना खाने ३. खोप लगाउनु पछ

	४. भगवानखुशीपार्नु पर्छ ५. अन्य (खुलाउनुहा
३.	तपाई अथवा परिवार बिरामीपर्दा उपचारको लागि सर्बप्रथमकहाँ जाने गर्नुहुन्छ? १. नजिकको स्वास्थ्य संस्था २. औषधि पस ३. धामीझाऋी ४.अन्य (खुलाउनुहोस्) ...... यदिकहि नलगेको खण्डमा के कारणले ? १. आर्थिक स्थितिको कमजोरी २. अविश्वास ३. अज्ञानता ४.अन्य.....................
४.	तपाईंको कुनै बच्चाको ५ वर्ष भन्दाकमउमेरमा मृत्यु भएको थियो ? १. थियो २ थिएन

पोषण तथा स्तनपान सम्बन्धि

प्र.नं.	प्रश्नहरू (कोडिङ्ग का साथ)
१.	बच्चालाई आफ्नो विगौतिदुधखुवाउनु भयो ? १.खुवाए २.सम्झना छैन यदिखुवाउनु भयो भने जन्मेको कति समयभित्रखुवाउनु भयो ? १ घण्टा भित्र १ घण्टा पछि
२.	तपाईंले आफ्नो बच्चालाई जन्मेको कत्ति महिना सम्म दुधमात्रखुवाउनु भयो १. ६ महिनासम्म २. ६ महिनाभन्दा कमउमेरसम्म
३.	तपाई बच्चालाई आफ्नो दूधकतिउमेरसम्मखुवाउनु हुन्छ /भयो ? १.६ महिना २. १ वर्ष ३. २ वर्ष वा सो भन्दा माथि
४.	तपाईंले आफ्नो बच्चालाई जन्मेको कत्तिमहिना पछि ठोस/झोल खानेकुरा खुवाउनु भयो ? …………………………
५.	तपाईंको बच्चाजन्मिदाउसको तौल कतिथियो ? १. २.५केजीभन्दाकम २. २.५ केजीभन्दा बढी ३.थाहा छैन
६.	सन्तुलनभोजन भनेको थाहा छ ? १.छ २ छैन
७.	के तपाईंले कुपोषण (रुन्चे/सुकेनास) को बारेमा सुन्नुभएको छ/थाहा छ ? १. छ २ छैन

	यदिथाहा छ भने यसकाकारणहरु के-के हुन् ? १. सन्तुलितभोजनको कमीले २. भगवानको श्रापले ३. कसैको आखालागेर ४.अन्य
८.	तपाईले बच्चालाई भिटामिन ए र जुकाको औषधिखुवाउनु भयो ? १. खुवाए २ खुवाइन यदि नखुवाएको भए किन? १.थाहानभएर २.उमेर नपुगेर ३. समय नभएर
९.	तपाईले आफ्नो घरमाखानको लागीकुननुनप्रयोग गर्नु हुन्छ ? १.२ बालबालिकाको चिन्हभएको प्याकेटको २. ढिक्के नुन यदिआयोडिनयुक्त नुन खानु हुन्छ भने किन आवश्यक छ ? १.गलगााडबाटबाच्न २.शारीरिक विकासको लागि ३. मानसिकविकासको लागि ४.अन्य

मातृस्वास्थ्य र नवजातशिशुको स्याहार सम्बन्धि

प्र.नं.	प्रश्नहरू (कोडिङ्ग का साथ)
१.	तपाई पहिलोपटक कतिउमेरमागर्भवतीहुनुभएको थियो ?……………………………
२.	गर्भवतीअवस्थामाआइरन चक्कीखानुभयो ? १.खाए २ खाइन
३.	गर्भवतीअवस्थामा पहिलाको भन्दा बढी खानेकुरा खानुभयो कि भएन? १. खाए २ खाइन यदिखानेकुरा खानुभयो भने के कस्ता खानेकुरा खानुभयो ?…………………………………
४.	गर्भवतीअवस्थामाधुम्रपान /मद्यपानगर्नुभएको थियो
५.	बच्चालाई सम्पुर्ण खोप लगाउनुभयो ? १.लगाए २. लगाएको छैन
६.	विगत २ हप्तामातपाईको बच्चालाई कुनै स्वास्थ्य सम्बन्धि समस्या छ ? १. छ २ छैन यदि छ भने कस्तो समस्या छ ? १.खोकी २.पखाला ३.निमोनिया ४.वरो ५.जन्डिस ६.अन्य
७	बच्चालाई झाडापखाला भएको बेलामाआफ्नो दूधवा तरल पदार्थ कतिको खुवाउनुहुन्छ ?

१.सधै भन्दा बढी	२.सधै जस्तो	३. सधैभन्दाकम

२४ घण्टामा खाएको खानेकुराहरु

खानाखाएको समय (६ बजे बिहान देखि अर्को दिनको ६ बजे बिहान सम्म)	खानाको परिकारहरु

बच्चाको नापतौल

नाम…………………………………   लिङ्ग ………………   जन्ममिति(उमेर)………………**…………**

तौल(kg)……………………………उचाई(cm):…………

MUAC(cm)……………………………

Edema :क) छ   ख) छैन

8.3   Informed Consent

INFORMED CONSENT

Date:………………

Namaste!

I Mr. Ayush Adhikari, graduate student in Department of Nutrition and Dietetics conducting a dissertation work for award of bachelor's degree in Nutrition and Dietetics

The topic for the study 'NUTRITIONAL STATUS OF 6-59 MONTHS OLD CHILDREN OF NEWAR COMMUNITY OF MADHYAPUR THIMI MUNICIPALITY-14, BHAKTAPUR DISTRICT, NEPAL'

I have been told in a language that I understand about the study. I have been told that this is for a dissertation procedure, that my and my son/daughter's participation is voluntary and he/she reserve the full right to withdraw from the study at my own initiative at any time without having to give reason and that refresh to participate or withdraw from the study at any stage will not prejudice my/his/her rights and welfare. Confidentiality will be maintained and only be shared for academic purposes.

I hereby give consent to participate in the above study. I am also aware that I can withdraw this consent at any later date, if I wish to. This consent form being signed voluntarily indicates participate in the study until I decide otherwise. I understand that I will receive a signed and dated copy of this form.

I have signed this consent forms before my participation in the study.

Signature of parent/guardian: _____   Sign of witness: _____

I hereby state the study procedures were explained in the detail and all questions were fully and clearly answered to the above mentioned participant /his/her relative.

Investigator's sign:………………

Contact address:………………….

केन्द्रिय प्रविधि क्याम्पस

हात्तिसार, धरान

पोषण तथा आहार विज्ञान, चौथो वर्ष

मन्जुरीनामा

नमस्कार,

मेरो नाम आयुष अधिकारी हो, म केन्द्रिय प्रविधि क्याम्पस, धरानमा पोषण तथा आहार विज्ञान,चौथो वर्ष अध्ययनरत विद्यार्थी हु । यस संकायको चौथो वर्षको पाठ्यक्रमअन्तर्गत म सोधपत्र गरिरहेको छु । मेरो सोधपत्रको विषय "भक्तपुर जिल्लामा रहेका ६ देखी ५९ महिना सम्मका बालबालिकाहरुको पोषण स्थितिको अध्ययन" रहेको छ । यो अध्ययनको उद्देश्य यस क्षेत्रका बालबालिकाको पोषण स्थितिको बारे जानकारी संकलन गर्नु रहेको छ । यो जानकारीले हाम्रो अध्ययनलाई सहजबनाई हामीलाई सहयोग गर्नेछ र यसले यस जिल्लाको पोषण स्थितिलाई सुधार गर्नकालागिपनि मद्दत गर्न सक्नेछ । तपाईंको छोरा ∕ छोरी यस अध्ययनको लागि सहभागीहुन छानिनु भएको छ र म तपाईंलाई यस सर्वेक्षणका प्रश्नहरु गर्नेछु र साथै तपाईंको बच्चाको केही नापहरु लिनेछु । अध्ययनका केहीप्रश्नहरु नितान्त व्यक्तिगतपनि हुन सक्छन् तर तपाईंले दिनुभएको सबै जानकारीहरु महत्वपूर्ण हुनेछन् र सो जानकारीहरु एकदमै गोप्य राखिनेछ, साथै तपाईंले दिनुभएको सूचनातथातथ्यांकको दुरुपयोग गरिने छैन । यो अध्ययनमा तपाईंको सहभागिता स्वैच्छिक हुनेछ । यदि तपाईंलाई कुनै वा सबै प्रश्नव्यक्तिगतवा सम्वेदनशीललागेम ाउत्तर नदिनपनि सक्नु हुन्छ । तर म यो आशा गर्दछु कि तपाईं यस अध्ययनमा सहभागी हुनुहुनेछ ।

के तपाईं यस अध्ययनमा सहभागीहुन इच्छुक हुनुहुन्छ ? (इच्छुक भएमात्रप्रश्नगर्ने नभएअन्तर्वार्ता टुंग्याउने ।)

म यस अध्ययनमा सहभागीहुन इच्छुक छु र यस अध्ययनकालागिआवश्यक पर्ने मेरो बच्चको नापतौल लिनअनुमति दिन्छु ।

....

अध्ययनमा छानिएको बच्चाको अभिभावकहरुको   सर्वेक्षण गर्नेको सही

सही ∕ औंठा छाप

सर्वेक्षण गरेको मिति : ....

60

8.4   Photos

| Asking survey questions to the children's parent. | Weight measurement using weighing machine |

| Height measurement using stadiometer | Measuremeent of mid upper arm circumference using MUAC tape |