

A Thesis Proposal on
STUDY ON NUTRITIONAL STATUS OF 6 MONTHS TO 59 MONTHS CHILDREN IN
PANCHGACHHI VDC AND FACTORS ASSOCIATED WITH IT



Submitted by: -

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Proposal for a Bachelor Thesis

Attached is a proposal that I, Milan Dhakal submit for approval for partial fulfillment of the requirements for a Bachelor degree in Nutrition and Dietetics.

Thesis Title:

STUDY ON NUTRITIONAL STATUS OF 6 MONTHS TO 59 MONTHS CHILDREN IN PANCHGACHHI VDC AND FACTORS ASSOCIATED WITH IT

Approved by:-

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Shyam K. Mishra

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Date:

1. INTRODUCTION

1.1 Background to the study

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 (World Bank 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 and external environmental factors: Internal or constitutional factors like: age, sex, nutrition, behavior, physical activity and diseases. External environmental factors like: food safety, cultural, social and economic circumstances (Joshi et al, 2011).

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).

Panchgachhi VDC lies in Terai region and is located about 9Km south of Mahendra highway on the bank of Kankai river. This VDC consists of people of different ethnic group and different economic status. Mostly Rajbanshi, Tajpuriya, Musahar resides here along with Brahmin, Chettri, Rai, Limbu etc. The major occupation of the place is agriculture. But nowadays most of the people are dependent on remittance and also large number of population work as labour in agriculture and construction. There are 2278 households, 12,301 total population and 959 children below five year of age. (Panchgachhi VDC office)

1.2 Problem of statement and justification

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.

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 [4]. 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 [5]. Major types of nutritional problems in developing countries are under-nutrition and nutritional disorders which are resulting from inadequate food intake both in

quality and quantity, particularly of calories, proteins, vitamins and minerals; and parasitic infection and disease (6).

Malnutrition remains a serious obstacle to child survival, growth and development in Nepal. Prevalence of malnutrition among under five children is high with 48.6% in the country. Protein-energy malnutrition (PEM) and micronutrient deficiency are most common types of malnutrition (7). 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 percent) are underweight and 8 percent 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 maldevelopment, 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 Panchgachhi VDC.

1.3 Purpose of the study

- a) To find out magnitude and distribution of malnutrition.
- b) To analyze the causes of malnutrition and the factors that are directly or indirectly associated with the nutritional status.
- c) To suggest corrective measures so that which could be intervened in order to uplift current nutritional status.
- d) To create ideas that will contribute to improve poor nutritional status of children in accordance to their socio-economic status, religion, culture, livelihood etc.
- e) To provide necessary information for the policy makers in the field of food and nutrition.
- f) To provide information regarding the nutritional situation of children below 5 year of age, to the governmental as well as non-governmental organization to initiate steps to eradicate the problem.
- g) To act as helpful guide for planning appropriate nutritional program in that particular place.

1.4 Objectives of the study

1.4.1 General Objective

The main objective of this thesis work is to assess the nutritional status of children between 6 – 60 months age, also to assess and analyze the factors that are directly

and indirectly associated with nutritional status and suggest appropriate measure against the problem assessed in that area.

1.4.2 Specific Objectives

- a) To determine the nutritional status of children aged 6-59 months at Panchgachhi VDC.
- b) To identify associated factors of malnutrition among children aged 6-59 months at Panchgachhi VDC.

1.5 Research Questions

- a) What are the underlying factors that are associated with malnutrition on the children of particular age group residing in these living areas and what parameters are responsible to induce low food availability in household level to cause malnutrition in child.

1.6 Significance

The findings of the study will be helpful to

- a) Encourage local people to improve current nutritional status by improving feeding pattern and habit of children, pregnant and lactating women.
- b) Serve as helpful guide to plan suitable nutritional and health programs for this community based on the facts and figures discovered from this study.
- c) Provide information to government and voluntary institution like NGOs and INGOs about nutritional status as well as different demographic factors.
- d) Encourage government and other stake holders for the development of programs and policies related to nutrition.
- e) Discover the problems related to nutrition, care practices and feeding behavior of this community.
- f) Act as tool to reflect sanitary condition, socio-economic variables, degree and types of malnutrition and condition of 6 to 60 months age group child.
- g) Identify individual or group of people who are at risk of being malnourished and who need special care and attention.

1.7 Scope of the study

The scope of the study done will be supporting and informing policy dialogue, strengthen knowledge and support policy development to implement intervention programs for the improvement of nutritional status of said age group children. This study will be able to categorize the severity of different form of malnutrition that had habitat in children. The study of nutritional status in society give the real image of condition of household occurrence of at national level and help to introduce intervention to uplift their status as healthy living. It is the study which generate the level of education on health, hygiene, sanitation, occupation, living standard, pattern care of children feeding , knowledge in food habit food consumption situation in particular moment. Nutritional status related survey is one of the best method to interact directly with people and most applicable method to bring out change in the faulty living practices.

1.8 Limitations

- a) Instrumental and personal errors may arise while measuring and recording anthropometric data.
- b) Difficulties may be encountered in assessing socio-economic information like family income, family property, expenditure on food and non-food items, food consumption pattern etc. as they are considered to be related with the family prestige.
- c) Correct age or birth date of child may not be obtained in some illiterate families and some tribal groups.
- d) Uneven floor surface for weight and height measurement and other circumstances for measuring weight and height might cause error.
- e) Problem may arise in measuring mid upper arm circumference.

1.9 Assumptions

It is assumed that majority of children under five year of age in Panchgachhi VDC are malnourished. The causes of malnutrition are assumed to be low economic status of family, low education of parents, unhygienic care practices, infectious diseases, improper feeding practices, discontinued breast feeding etc.

2. LITERATURE REVIEW

2.1. Nutritional Status

Nutrition has been defined as the food at work in the body. Nutrition includes everything that happens to food from the time it is eaten until it is used for various functions in the body (Srilakshmi 2002). Nutrition is a core pillar of human development and concrete large scale programming not only can reduce the burden of under nutrition and deprivation but also advances the progress of nations (Medical Gazzette, 2012) Nutritional status is the state of our body as a result of the foods consumed and their use by the body. Nutritional status can be good, fair or poor (Mudambi et al, 2012)

Currently, the infant mortality rate in Nepal is 46 deaths per 1,000 live births for the five year period before the survey, just two deaths below the infant mortality reported in 2006. Under-five mortality is 54 deaths per 1,000 live births, down from 61 deaths per 1,000 in 2006. Mortality rates are much higher in rural than urban areas. For example, infant mortality is 55 deaths per 1,000 live births in rural areas compared to only 38 in urban areas. According to the 2011 NDHS, 87% of Nepalese children age 12–23 months have received all recommended vaccines—one dose each of BCG and measles and three doses each of DPT and polio. Only 3% of children did not receive any of the recommended vaccines. Almost half (46%) of Nepalese children age 6-59 months are anemic. Eighteen percent of children have moderate anemia, and 1% are severely anemic. More than 70% of children age 6-17 months are anemic compared with 25% of children age 48- 59 months. Vitamin A, which prevents blindness and infection, is particularly important for children and new mothers. In the 24 hours before the survey, 47% of children age 6–23

months ate fruits and vegetables rich in vitamin A. Nine in ten children age 6–59 months received a vitamin A supplement (NDHS key findings, 2011)

According to the WHO, in 2011 over 101 million children under the age of 5 were underweight (low weight for age), 165 million were stunted (low height for age), and approximately 52 million were wasted (low weight for height)

2.1.1.1. Factors affecting nutritional status

The factors affecting nutritional status are mother's food security, breast feeding practices, types of food given to young children, feeding frequency, status of women and child nutrition and last but not the least who feeds the child and how the child eats (NMICS, 2010).

There are many other factors that influence the nutritional status some of which are food availability and its distribution system, consumption of food, income source and purchasing power, family size, illiteracy, sociocultural and religious belief, environmental sanitation and health facility.

2.1.1.2. Food Availability and Nutritional Status

Food is not just something to eat; it is an integral part of culture of a community, region, or nation. Food is a relative concept. Good health depends on an adequate food supply and this in turn on sound agricultural policy and a good system of food distribution (Adel P.den Hartog et al, 2006)

For the achievement of nutrition adequacy, increased production of food groups making the national diet balanced is one of the most important measures. Adverse consequences are manifested themselves if the national diet are deficient in nutrients. Vitamin A deficiency followed by iron deficiency, blindness among children, PEM and so on which could be overcome by supplying or consuming diets rich in these nutrients (Gyawali, Rajiv 2002)

2.2. Nutritional Requirements

Nutritional Requirements refers to the amount of food, energy and nutrient needed on an average per day by specific group and sex categories to meet the needs of healthy individuals for normal functioning of the body for work and growth (Burk, 1984).The energy supplies seem to occur important in those developing countries where the staple commodities are either very low in protein content or the protein is of very low quality. Most of the people of developing countries depend upon starchy food and derived their 80% of total calories from them. The people of those country are able to obtain about 87% of calorie intake and 79% of gross protein intake and they receive only 6.4% of their

calories and 8.9% of their protein from the consumption of meat, egg, milk and milk fats combined (Yadav DK,1994).

The recommended daily allowance (RDA) of nutrients for preschool children (1-5 years is shown in table below :

NUTRIENTS	YEARS	
	1-3	4-6
Calories (Kcal)	1240	1690
Protein (g)	22	30
Fat(g)	25	25
Calcium(mg)	400	400
Iron(mg)	12	18
Vitamin A(µg)	400	400
Thiamine(mg)	0.6	0.9
Riboflavin(mg)	0.7	1.0
Nicotinic acid(mg)	8	11
Pyridoxine(mg)	0.9	0.9
Ascorbic acid(mg)	40	40
Folic acid(µg)	30	40
Vitamin B12(µg)	0.2-1	0.2-1

Fig:- Table no.1 RDA of preschoolers. (Srilakshmi B, 2011)

2.3. Nutrition, Health promotion and Human Development

Nutrition and health education has been defined as educational measures for including desirable behavioural changes for the ultimate improvement in the nutritional and health status of individual. This is one of the most commonly implemented measures, not only of the health sector, but of other sector concerned with development of human resources. Growth is influenced by nutrition. Frequent attacks of infectious diseases affect their growth and increase the requirements of various nutrients. (Srilakshmi B 2011)

As we know nutritional status of individual has direct impact upon ones development and as a whole on the productivity too. It is hampered because of under nutrition and good nutrition is not possible with low productivity as it results in low living standard. Thus the developing and under developed countries generally have a vicious cycle of poverty resulting in malnutrition (Dahal P 2002)

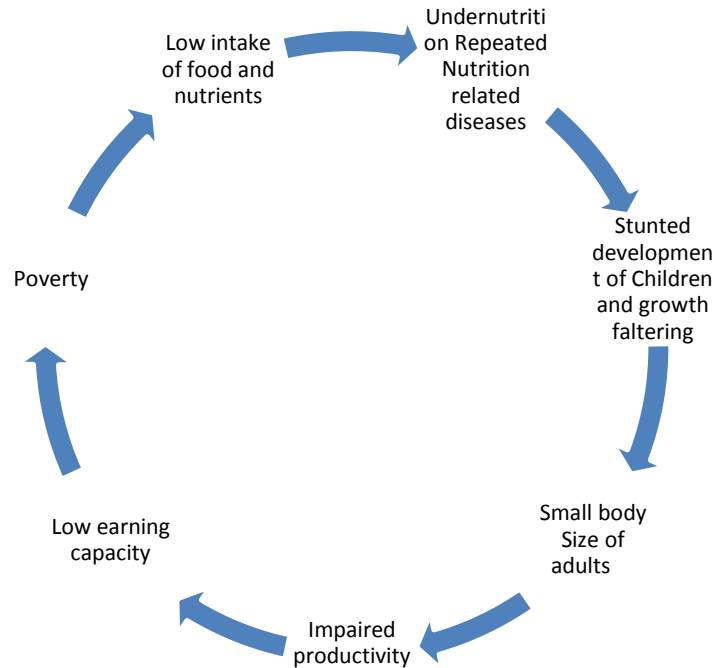


Fig: 1.1 The vicious cycle of poverty

(Source: National Nutrition Policy Government of India, Department of Women and child Development, Ministry of Human resource Development, New Delhi, 1993.)

2.4. Malnutrition

Nepal suffers from extensive malnutrition, ranking in the top 10 countries with the highest prevalence of stunting (less than -2 SD scores) and the top 20 countries by number of stunted children less than five years of age worldwide (UNICEF, 2009).

When the person is not getting enough food or not getting the right sort of food, malnutrition is just around the corner. Even if people get enough to eat, they will become malnourished if the food they eat does not provide the proper amount of micronutrient-vitamins and minerals-to meet the daily nutritional requirement (UN's WFP).

Disease and malnutrition are closely linked. Sometime disease is the result of malnutrition, Sometime it is the contributing cause. In fact, malnutrition is the single largest contributor to disease in the world, according to United Nation's Standing Committee on Nutrition (SCN).

According to United Nation report (2007), 46% of children under the age of five years suffer from under nutrition. Malnutrition is the direct or indirect cause for 50% of the total deaths among children (Srilakshmi 2014). Malnutrition has been defined as "a pathological state resulting from a relative or absolute deficiencies or excess of one or more essentials nutrients" (Park 2011).

2.4.1. Malnutrition and Infection

It is generally recognized that frequent occurrence of infectious diseases such as diarrhea, dysentery or malaria affects adversely the health of individuals. In developing countries , infection and infestation are important factors involved in the causation of severe malnutrition among preschool children consuming inadequate and ill balanced diets.(Swaminathan M, 2008) Some of the ill effects of infection and infestation area

- a) Decreased food intake due to poor appetite
- b) Decreased absorption of nutrients due to diarrhea, vomiting or long continued micro hemorrhage
- c) Increased needs of nutrients for human host due to increase in basal metabolism and catabolism of tissue proteins.

2.4.2. Malnutrition and Mental development

The result of studies performed by Dobbing and Coworkers (1968) have shown permanent deficits in the physical structure of the brain could be produced by under nutrition at the most vulnerable period. Malnutrition can significantly affect the intelligence and learning capacity of children. Similarly, Cravioto et al. (1966) reported that children who have recovered from severe malnutrition proved much inferior to normal well-nourished of the same age group with respect to their mental development and learning capacity (Swaminathan M, 2008)

2.4.3. Forms of Malnutrition

a) Undernutrition

The pathological state resulting from the consumption of an inadequate quantity of food over an extended period of time (Jelliff D.B 1966)

b) 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. (Jelliff, 1966)

c) Specific Deficiency

It is pathological state resulting from relative or absolute lack of an individual nutrient.

d) Imbalance

This state results from a disproportionate consumption of essential nutrients with or without the absolute deficiency of any nutrients as determined by the requirements of a balanced diet.

2.5. Protein Energy Malnutrition

Protein energy malnutrition, also known as starvation, is defined as a diet with insufficient amounts of all the major macronutrients: proteins, carbohydrates and fats. A starving person becomes skeletally thin and weak and is in danger of death. Protein energy malnutrition usually is seen during famines in Third-World countries and in eating disorders in Western societies (WFP 2011).

PEM is 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 infections (WHO).

Classification of PEM

- **Kwashiorkor:** It is derived from african word meaning “first child – second child”. It refers to the observation that the first child develops PEM when the second child is born and replaces the first child at the breast. Symptoms include oedema, diarrhea, apathy, dermatosis, old man face, failure to thrive, fatty liver etc. There is predominant deficiency of calorie than protein.
- **Marasmus:** It occurs due to the deficiency of protein. It is most predominant form of PEM in developing countries.
- **Marasmic Kwashiorkor:** Children suffering from this type PEM exhibit a mixture of some of the features of both marasmus and Kwashiorkor.

- Nutritional Dwarfing: Retardation of growth is observed in the children who are deprived of food for prolonged period of time. Weight and height are both reduced resembling children a year and more younger.
- Underweight Child: These children are growing up smaller than their genetic potential and of greater importance as they are at risk of gastroenteritis , respiratory and other infections, which can precipitate frank malnutrition.(Srilakshmi,2011)

2.6. Breast feeding practice and weaning process in Nepal

Breastfeeding in the first years of life protects children from infection, provides an ideal source of nutrients, and is economical and safe. However, many mothers stop breastfeeding too soon and there are often pressures to switch to infant formula, which can contribute to growth faltering and micronutrient malnutrition and is unsafe if clean water is not readily available. WHO/UNICEF provide the following feeding recommendations (NMISC 2010).

- a. Exclusive breastfeeding for first six months of life
- b. Continued breastfeeding for two years or more
- c. Safe, appropriate and adequate complementary foods beginning at six months of age
- d. Frequency of complementary feeding: two times per day for 6–8-month-olds; three times per day for 9–11-month-olds
- e. It is also recommended that breastfeeding be initiated within one hour of birth.

Breast-feeding is nearly universal among the Nepalese mothers, but its duration and frequency are not always optimal. In most communities, a mother begins feeding their infants almost immediately, but in some parts of the country (UNICEF 1987) feeding doesn't begin for a two days or after the colostrum has been discarded. Such practice means some new infants are deprived of the immunological qualities of colostrum (Swaminathan 1988). Breast feeding is usually continued together with the provision of cereal weaning until child is 2-3 years of old or until the mother is pregnant again. In certain communities, children receive only breast milk until they begin to eat adult's food. Mother will generally feed their infants on demand but workloads interfere with the frequency of feeding.

According to Nepal Demographic Health Survey 2011, 70 percent of children under age 6 months are exclusively breastfed, and 66 percent of children 6-8 months (breastfed and non-breastfed) are introduced to complementary foods at an appropriate time. Ninety-

three percent of all children are still breastfeeding at age 1, and the same proportion are still breastfeeding at age 2. Four of five Nepalese children ages 0-23 months are breastfed appropriately for their age. This includes exclusive breastfeeding for children age 0-5 months and continued breastfeeding along with complementary foods for children age 6-23 months. Four-fifths of children under 6 months are predominantly breastfed. This percentage includes children who are exclusively breastfed and those who receive breast milk and only plain water or non-milk liquids such as juice. Finally, 6 percent of children under age 2 are bottle fed.

Reasons for breast milk feeding are:-

1. Any milk other than breast milk has no anti-infective properties to protect the infant in the early months.
2. Bottle feeds are often too difficult. The mother makes the expensive milk lost as long as possible and often is unable to follow written instructions on the can or container (Cameron and, Hofvander 1983).

2.7. Population growth in Nepal

Although Nepal's birth and death rate are both relatively high, the population is growing at a fairly rapid rate. More than two fifths of the population is younger than 15 years of age. However, the population growth rate in 2011 is 1.41 % (NDHS 2011).

2.8. Infant mortality rate, Life Expectancy, and Birth-weight

Infant mortality, Life expectancy and birth-weight are commonly used indicators to reflect malnutrition. According to Nepal Demographic Health Survey (2011) Infant and under-five mortality rates in the past five years (2006-2007 to 2011-2012) are 46 and 54 deaths per 1,000 live births, respectively. At these mortality levels, one in every 22 Nepalese children dies before reaching age 1, and one in every 19 does not survive to his or her fifth birthday. Eighty-five percent of deaths among children under five occur during the first year of life: infant mortality is 46 deaths per 1,000 live births. During infancy, the risk of neonatal deaths and post neonatal deaths is 33 and 13 deaths per 1,000 live births, respectively. Infant mortality has declined by 42 percent over the last 15 years, while under-five mortality has declined by 54 percent over the same period. Childhood mortality is relatively higher in the mountain ecological zone than in the terai and hill zone and is highest in the Far-western region. The neonatal mortality rate in the past five years is 33 deaths per 1,000 live births, which is two and a half times the post neonatal rate. The perinatal mortality rate is 37 per 1,000 pregnancies. The average life expectancy of Nepalese men and women is around 60.1 and 60.7 respectively (NDHS 2001)

2.9. Assessment of Nutritional status

Assessment of nutritional status of community is one of the first steps in the formulation of any public health strategy to combat malnutrition. The principle aim of such an

assessment is to determine the type, magnitude and distribution of malnutrition in different geographic areas to identify at risk groups and to determine the contributory factors. In addition, factual evidence of the exact magnitude of malnutrition is essential to sensitize administrators and politicians to obtain allocation of materials and human resources and to plan appropriately (Srilakshmi 2002)

The nutritional assessment may require encompassing nations, communities, vulnerable segments of communities or individuals. It may be done as a part of an exercise to document current status as compared with past status or as a specific attempt to evaluate the impact of an intervention program. (Ramchandran, 1987).

2.9.1. Direct method

2.9.1.1.1. Anthropometric Measurement

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 (Jelliffe 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 pre school 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 deviation 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.

- Oedema: Accumulation of fluid in interstitial cells is called as oedema 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)

2.9.1.1.2. **Biochemical 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.

2.9.1.1.3. **Clinical Examinations:** 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.

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

2.9.2. Indirect methods

2.9.2.1. 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.

2.9.2.2. 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. (RajaLakshmi ,1987)

Part II

3. METHODOLOGY

3.1 Research Design

A community based cross-sectional survey will be conducted to assess the nutritional status and associated factors among children aged 6-59 months which includes

- a) Anthropometric measurement of 6-59 months children at household level.
- b) General household survey by the application of questionnaire to the parents of children under study to find out the situation of household.

3.2 Study Area

The study will be conducted at Panchgachhi VDC of Jhapa district, Mechi zone, Nepal. Panchgachhi is located about 9Km south from Mahendra highway. This VDC is divided into 9 wards with 12,337 total populations, 2,278 households and 959 under five year children. (Source: Panchgachhi VDC office)

3.3 Target Population

Source population or universe of the study will be all 6-59 months children living in the VDC and the study population will be children of 6-59 months age randomly selected and included in the study.

Inclusion and exclusion criteria

Inclusion criteria: - Children aged 6-59 months who live in Panchgachhi VDC will be included in the study.

Exclusion criteria: - The study participants who are seriously ill or who are not available at household during the time of survey will not be included in the study.

3.4 Sampling Techniques

Cluster sampling technique followed by simple random sampling will be used to select children from households. From 9 wards of the VDC, 2 wards will be selected by simple random sampling (lottery method). The basic criterion for the selection of household sample is that the household containing at least one child of 6-59 months of age will be included in the sample.

Study Variables

Dependent variable: - Malnutrition indicated by stunting and wasting.

Independent variable:-

- Socio-economic and demographic variables; head of household, ethnicity, family size, income, occupation, education
- Child characteristics; Age, sex, breastfeeding status and morbidity status
- Child care practices; Feeding, hygiene
- Maternal characteristics; age, no. of children born,
- Environmental health condition; water supply, sanitation and housing condition.

3.5 Sample Size

The sample size is determined by using a single proportional formula assuming the prevalence rate of malnutrition to be 50% in the survey area, 95% confidence interval (CI), 8% margin of error (d) and 10% non-response rate is added to the total calculated sample size.

Calculation of sample size for infinite population:-

$$\text{Sample size } (n_0) = Z^2 \times p(1-p)/d^2$$

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

P= estimated prevalence of malnutrition (50%)

d= margin of error (8%)

Now

$$\begin{aligned} N_0 &= 1.96^2 \times 0.5 \times (1-0.5) / (0.08)^2 \\ &= 150.06 \\ &\approx 150 \end{aligned}$$

Calculation of sample size for finite population:-

From personal communication of this village we found that the total no. of children of 6 - 60 months are 959. Thus we apply finite population sample formula to obtain new sample size to conduct survey in this particular village.

Therefore,

$$\text{New SS} = n_0 / [1 + \{(n_0 - 1) / \text{POP}\}]$$

Where,

New SS = New sample size for finite population

n_0 = Sample size in infinite population

POP = Total number of population (in this case total number of population is number of 6-59 months age children in this village)

New sample size obtain as

$$\begin{aligned} &= n_0 / [1 + \{(n_0 - 1) / \text{POP}\}] \\ &= 150 / [1 + \{(150 - 1) / 959\}] \\ &= 129.8 \\ &\text{i.e., } 130 \end{aligned}$$

Thus calculated sample size is adjusted for non-response. Considering non-response rate as 10%, the adjusted sample size is calculated to be 143.

3.6 Research Instruments

Instruments and equipment's 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 (stadiometer) :- 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 prepared sets of questionnaire and anthropometric instruments will be pre-tested among few parents/caretakers of 6-59 months children and 6-59 months children respectively who are under sampling plan. Pre-testing should be conducted in order to maintain accuracy and clarity of questionnaire, to check the consistency in interpretation of questions by respondents and to identify ambiguous item. After pre- testing all the ambiguous, misleading and wrongly interpreted questions will be omitted and questionnaire will be revised in accordance with the findings of pre-testing.

3.8 Validity and Reliability

To ascertain the degree to which the data collection instruments will measure what they purposed to measure, the instruments will be validated at Central Campus of Technology, Central department of Nutrition and Dietetics. The expected testes in the questionnaire would also be drawn according to the available literature in nutrition education for young children. The questionnaire would also be pre-tested prior to data collection to ascertain content and face validity.

Reliability refers to quality control measure of data collected. Before data collection, detailed study will be based on the objectives of the study and on data collection techniques. Questionnaire will be checked daily for completeness, consistency and clarity as mentioned earlier. In addition, the thesis supervisors may also visit the research site periodically to monitor the process of data collection.

3.9 Data Collection Techniques

Data will be collected using structured questionnaire and anthropometric measurement. Interview will be conducted with parents/care takers of the children to fill the questionnaire. In households with more than one children of age between 6-59 months, one child will be collected by lottery method.

3.10 Data Analysis

First the data will be checked for completeness and consistency. Then it will be coded and entered in the computer using statistical software. Likewise qualitative data will be transcribed and coded by assigning labels to various categories. Verified test parameters will be used to establish the relationships between the variables and nutritional status of students.

3.11 Logistic and Ethical Considerations

Ethical clearance will be obtained from Central Campus of Technology, Department of Nutrition and Dietetics and office of the Village Development Committee of Panchgachhi VDC. Verbal consent from parents/care taker of study subjects will be obtained and the objective of the study was explained to them. Privacy and confidentiality of collected information will be ensured at all level.

3.12 Conceptual Framework

UNICEF's Conceptual Framework showing causes of malnutrition is given below

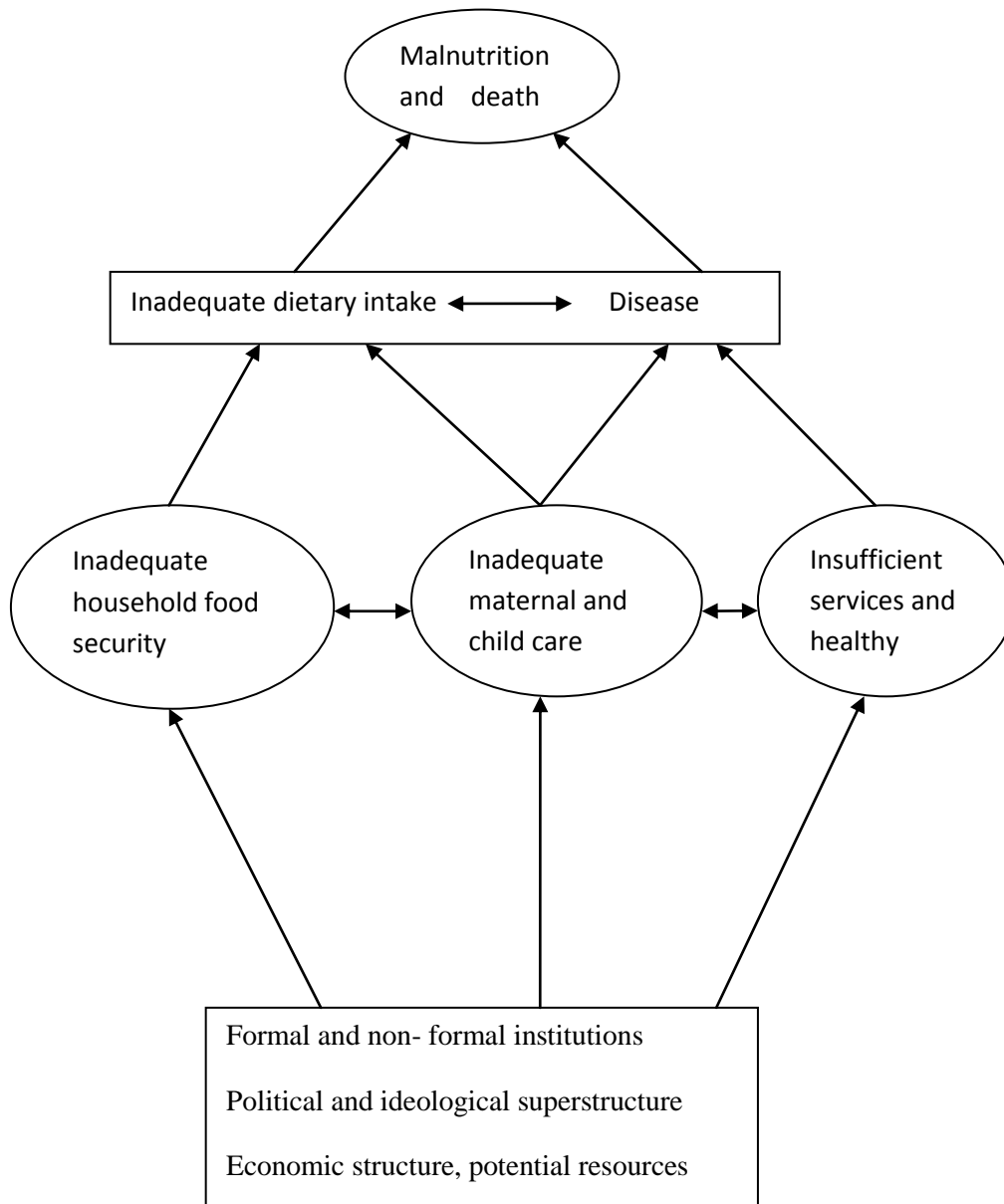


Fig: A conceptual Framework for Causes of Malnutrition by UNICEF

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APPENDICES

Questionnaires:

General Descriptions

1. Area of Survey:
2. Name of family head:
3. Child Name:
4. Family Size:
Male Female
5. Number of Children:
Male: Female: Below Five Year:
6. Child death: Yes: No:
If yes how many?
Cause of death: known: Unknown:
7. Main Occupation of Family:
Business: Agriculture: Service: Labor:
8. Your educational level:
Primary: Secondary: Collage:
9. Total annual income sufficient for family living:
Yes: NO:
10. What is your staple food?
11. House occupied by the family?
Own: Rental:

12. House type?

Temporary: Permanent:

Nutrition

1. Do you have kitchen garden?

Yes: No:

2. What food items do you feed to your children/baby?

Milk/ Rice/ Chapati/ Vegetable/ Fruits/ Pulses/ Litto/ Fish and Meat/ all

3. Do you know about weaning and supplementary food?

Yes: No:

4. At which age weaning food should be started?

4 months: 5 months: 6 months: 7 months:

5. What do you do after extracting starch while cooking food?

Mix in curry: Mix in animal feed: Donot extract:

6. What are the foods given when you are pregnant?

Milk/ Meat/ Pulses/ Green leafy vegetable/ All

7. Is there any person who does not see properly in presence of light in night?

Yes: No:

If yes how many?

8. Do you know what malnutrition is?

Yes: No:

9. Are any of your children suffering from malnutrition?

Yes: No:

10. Do you feed colostrum to your baby?

Yes: No:

11. Did you breast-feed the baby from the same day of the birth?

Yes: No:

12. When do you stop breast-feeding?

Immunization

1. Is your child being immunized?

Yes:

No:

2. Are you being vaccinated during pregnancy?

Yes:

No:

3. If yes what vaccine have you taken? Or would you take?

DPT/ BCG/ POLIO/ T.T

5.1.4 Environmental Sanitation

1. How do you dispose the garbage disposal?

2. Toilet Facility?

Yes:

No:

3. How do you use the water?

By Filtration/ by Boiling/ Without any Treatment

5.1.5 Mother and Child Health (MCH)

1. Have you ever been to Health Post to take information for any pregnant women in your family?

2. How do you manage to feed the food when anybody in your family is pregnant?

a) Give more food than usual

b) Less than usual

c) In the same ratio as usual

3. Do you feed colostrum to your baby?

Yes:

No:

4. Is it necessary for pregnant women to take rest?

Yes:

No:

5. Do you know the method of preparing oral rehydration solution (ORS)?

Yes:

No: