NUTRITIONAL ASSESSMENT AND FACTORS ASSOCIATED WITH NUTRITIONAL STATUS AMONG THE CHILDREN (6-59 MONTHS) OF BRICK KILNS WORKERS OF BHAKTAPUR DISTRICT

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Nutritional Assesment and Factors Associated with Nutritional Status Among the Children (6-59) Months of Brick Kilns Factory Workers of Bhaktapur District

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Acknowledgements

Abstract

The study was conducted to assess the nutritional status of under-five year children of brick kiln workers and to find out the factors associated with it in Bhaktapur district. A community based cross sectional study was conducted among 108 children aged 6-59 months at brick kilns of Bhaktapur district. Children were selected by simple random sampling technique. Anthropometric measurements and semi-structured questionnaire were used. Anthropometric measurement was then used to determine if children were underweight (weight-for-age), wasted (weight-for-height) and stunted (height-for-age) based on WHO reference. Statistical Package for the Social Science (SPSS) version 20 and World Health Organization (WHO) Anthro version 3.2.2 were used for analyzing the data. Fisher exact test was used to identify the associated factors of malnutrition.

The study revealed that 6.5, 30.6, and 22.3% of children were wasted, stunted and underweight respectively. The main associated factors of wasting were caste, health issue, prelacteal feed and artificial milk fed. Stunting was associated with type of family, child feeding without hand washing, number of children below five years in a family, feeding sarbottam pitho. whereas family size, type of family and mortality rate were found to be associated with underweight. From the findings of this study, it is concluded that malnutrition is still an important problem among children aged 6-59 months Therefore, special attention should be given on intervention of malnutrition.

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List of Abbreviations

Abbreviation	Full form
HAZ	Height for age Z-score
LBW	Low Birth Weight
MDG	Millennium Development Goal
MOHP	Ministry of Health and Population
NDHS	Nepal Demographic Health Survey
MUAC	Mid Upper Arm Circumference
WAZ	Weight for age Z-score
WHZ	Weight For Height Z-score
NGO	Non- Governmental Organization
INGO	International Non-Governmental Organization
PEM	Protein Energy Malnutrition
RDA	Recommended Daily Allowance
UN	United nations
UNICEF	United Nations International Child Emergency Fund
WHO	World Health Organization
WFP	World Food Programme

Part-I

Introduction

1.1 Background

Nutrition is defined as the science of food and its relationship with health. It is concerned primarily with the parts played by the nutrients in body growth, development and maintenance. Nutrition is one of the essential functions of living beings necessary for the utilization of food. Human beings need to have adequate nutrition to attain normal physical growth and for a healthy life. Adequate nutrition is a fundamental right for every human being. If people fail to consume sufficient quality and quantity of nutrients, they will suffer from hunger and malnutrition. The common types of malnutrition in Nepal are: protein energy malnutrition, iodine deficiency disorder, iron deficiency anemia and vitamin A deficiency. (Malla *et al.*, 2011)

Nepal is one of the least developed nation in South –East Asia Region (SEAR), which was ranked 157 among 187 countries in the Human Development Index (Malik, 2013). 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 32 and 21per 1000 respectively. The population growth rate in 2011 is 1.41% (NDHS, 2016b)

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 and Mahajan, 2011)). As Nepal Demographic Health Survey (NDHS) 2006, 49% of children below 5 years of age are stunted and 20% are severely stunted. The survey also showed that 13% of the children are wasted and 3% are severely wasted and 39% of children below 5 year of age are underweight and 11% are severely underweight.(NDHS, 2006) Similarly, NDHS 2011 shows that 41% of the children under 5 year of age are stunted 16% are severely stunted. The surveys also showed that 11% of the children are wasted and 3% are severely wasted and 29% of the children below 5 years of age are underweight 8% are severely underweight.(NDHS, 2011) Similarly, NDHS 2016 shows

that Thirty-six percent of children under age 5 are stunted, 10% are wasted , 27% are underweight (thin for their age), and 1% are overweight. Overall, 36% of children under age 5 are stunted, with 12% being severely stunted, 10% are wasted, with 2% severely wasted, and 27% are underweight, with 5% severely underweight, while around 1% of the children are overweight.(NDHS, 2016a)

Nutritional status is recognized to be a prime indicator of health of individuals or community. Growth assessment is the single measurement that best defines health and their etiology, invariably affect child growth. 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.(NDHS, 2011)

Brick manufacturing has become one of the fastest growing industrial sectors in Nepal with increasing numbers of brick kilns spreading across the three districts: Kathmandu, Bhaktapur, and Lalitpur. There are more than 500 brick factories in Nepal employing more than 400,000 workers. Since the year 2000, the amount of brick kilns in the Valley has increased by 200%. There are total 62 brick kiln factories in Bhaktapur district. The work in brick kilns is seasonal and attracts the poorest of the poor. Although the moulding of bricks only starts in November, the contracting of labourers, starts as early as August. Naikis, or middle men, sign deals with kiln owners on the number of labourers to be provided. Those who cannot afford to go to India or abroad end up working in brick factories. A study by Chhimeki, an NGO working in urban health and nutrition, revealed that almost all workers taking up a seasonal job in a kiln live below the poverty line and suffer from a food deficit. The Nepali workers come with their families. Women and children support the men in moulding and drying the bricks. Sanitation facilities are almost absent, further encouraging disease. The workers come from rural areas of the country with most labourers coming from Western part of Nepal (Rukum, Rolpa, Dang) and few coming from Sindhuli, Kavre and Ramechhap (Neupane, 2008).

1.2   Problem statement and justification

Nutritional status of people of developing countries is significantly poor. Malnutrition, especially under-nutrition and various forms of nutrient deficiencies are wide spread and mostly prevalent in rural areas. 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 (Burk, 1984).

According to recent study malnutrition during childhood can lead to a risk of life-style diseases in the future as well as immediate risk of morbidity and mortality (ACC/SCN, 1999). The World Health Report 2002 clearly describes how childhood and maternal underweight are the greatest risk factor among several main factors that affect people's health and disease status in the world, particularly in Asia.(WHO, 2002) Malnutrition especially under-nutrition among under five year age group children may lead to the consequences like, failing to grow (underweight, stunted and wasted), reduced learning ability, reduced resistance and immunity against infection and reduced productivity in future (Dangol, 2018).

It is estimated that about 1100 Brick kilns are in operation in Nepal. Although work conditions are inhumane, the brick industry provides jobs to thousands of unskilled labourers. Over 175,000 workers, of whom as many as 60,000 are children. Labour in unhealthy and unsafe conditions in Nepal's brick kilns. Brick workers are some of the most marginalized of unskilled workers, often bonded by debt to exploitive labour brokers, and working at wages insufficient to pay off "recruiter" advances. Currently, around 65,000 underage children live in factory premises during the dry season. They accompany their families from the villages, who work for minimum pay, and help their parents in whatever way they can. Their children are at increased risk of suffering from malnutrition because of various reasons such as, restricted access to health services, pollution in the surrounding of the factory, lack/poor medical facilities, poverty, recurrent infections, lack of nutritious food, illiteracy and ignorance about nutrition and health care. Therefore, this study is designed to assess the nutritional status of the children of 6-59 month of brick kiln factory workers.(Forum, 2016)

1.3 Conceptual framework
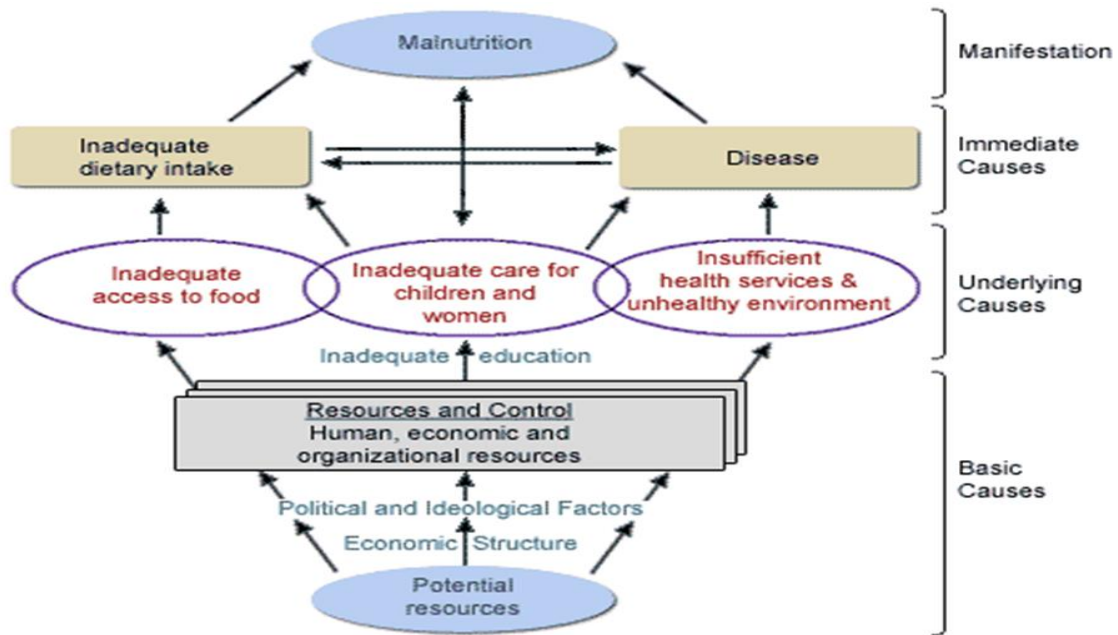
Fig.2.1 Conceptual framework of malnutrition by UNICEF

Source: (Victora *et al.*, 1997)

1.4 Objectives of the study

1.4.1 General objective

The general objective of the study was to assess factors associated with nutritional status of 6 – 59 month children of brick kiln factory workers of Bhaktapur District.

1.4.2 Specific objectives

The specific objectives of the study were:

1. To determine the Nutritional status of 6 to 59 months children of brick kiln factory workers of Bhaktapur district

2. To identify associated factors of malnutrition among brick klin worker children aged 6-59 months in Bhaktapur district.

1.5 Research questions

1. What is the existing nutritional status of 6 - 59 months children of brick kiln factory workers of Bhaktapur district?
2. What are the factors associated with the nutritional status of 6-59 months children of brick kiln factory workers of Bhaktapur District?

1.6 Significance of the study

The findings of this study will be helpful to

1. Provide information regarding the nutritional status of children between 6 – 59 month of age to the governmental and non-governmental organization which will be helpful to initiate corrective measures for the problem.
2. Make people aware about the current real situation of nutritional status in their surroundings.
3. Encourage people for the improvement of their present status by improving their feeding practices of their children and hygienic condition of their surroundings.
4. Act as guide for the development of proper nutritional program in this community by undertaking the discovered facts.
5. Act as tool to discover the problems related to nutrition and feeding practices of this community.

1.7 Limitations

1. The study was conducted with limited resources due to which other important assessments like biochemical, dietary survey and clinical assessment could not be done.
2. The study is cross-sectional in design, it neither represents seasonal variation of nutritional outcomes particularly to wasting status nor establishes correct temporal causal relationship of predictors and the outcomes variables.

PART II

Literature Review

2.1   Nutritional status

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 well beings. In other word nutrition is the science that deal with absorption, digestion, and metabolism of a food in the body (Basnet, 2018).

Nutritional status has been defined as the condition of the body resulting from the intake, absorption and utilization of food. It can be measure directly(Burk, 1984). Nutritional status is the condition of health of the individual as influenced by the utilization of nutrient. It can be determined through a careful medical and dietary history, a thorough physical examination, and appropriate laboratory investigation (Robinson, 1973).

The prevalence of poor nutrition status on developing country is mainly due to the low income, low production of food, low productivity of crops and livestock, unequal distribution of food, low literacy, socio-culture and poor environmental sanitation(Nabarro, 1984). The poor nutritional status has both direct and indirect effect on learning skills, mental performance, mental performance as well as a working capacity resistance to disease. Broadly speaking the development of nation depends on the nutritional status of its people(N. S. Scrimshaw, 1997).

2.2   Factors affecting nutritional status

A number of factors affect acceptability and utilization of food such as availability, cultural practices, economic condition, familiarity, taste and knowledge about health (Bhatta *et al.*, 1998).

Factors influencing the nutritional status are food availability, its distribution system, consumption, income and purchasing power, price of commodities, illiteracy, family size, socio cultural and religious beliefs, environmental sanitation, health facilities etc. Among the above given factors the availability of food and its proper distribution and

consumption, income and its proper distribution and purchasing power and proper environmental sanitation play a very important role in the nutritional status of the people in developing countries (Basnet, 2018).

Nutritional status is clearly compromised by diseases with an environmental component, such as those carried by insect or protozoan vectors, or those caused by an environment deficient in micronutrients. But the effects of adverse environmental conditions on nutritional status are even more pervasive. Environmental contamination (e.g. destruction of ecosystems, loss of biodiversity, climate change, and the effects of globalization) has contributed to an increasing number of health hazards (Johns and Eyzaguirre, 2000).

Good health depends on an adequate food supply and this in turn on a sound agricultural policy and a good system of food distribution. The social, economic and agricultural factors that determine the food supply also determine the state of health and incidence of disease among the population. These are the basic etiological factors causing nutritional diseases and they are closely linked with danger that arises from failure to control on excessive increase in the population. Even a good supply and preparation of food in the home, lack of education is responsible for much malnutrition, especially in poor rural areas and urban slums (Davidson., 1986).

Main causes of the low nutritional status in poorly developed city are market cycle, food habits, agricultural season or seasonality in food availability, religious cycle, low income, spacing in child birth, food habit, and child birth frequency, food accessibility and economic level (Den Hertog, 1973).

2.3 Food availability and nutritional status

Food availability is a factor of production capacity, amounts of imports and amount that is normally used at a given period of time and of the availability of storage. Food availability is also influenced by the availability of seeds, pest infestation, weather condition, availability of pasture, land acreage under cultivation, labor and insecurity issues. The amount of food used by households, traded or stored all influence availability at the household level (Gyawali, 2002).

Food plays a primary role in the nutritional status, information on the composition of foods incorporated in the diet is considered essential background material. Today the great contribution of the science of nutrition to the health and welfare of all the people are facts accepted without question by the professionals and lay groups(Chany and Ross, 1979).

Good health depends on the adequate food supply and consumption. This is turn, on a sound agriculture policy and good system of food distribution. The food distribution determines the state of health and the incidence of disease among population. If the food supply is inadequate than the physiological needs, malnutrition and under nutrition could result (Yadav, 1994).

Increased production of food groups making the national balance is one of the most important measure of achieving nutritional adequacy. Where the national diet are deficit in nutrients, adverse consequences manifest themselves, e.g. there is high prevalence of anemia due to iron deficiency, blindness among children due to vitamin A deficiency, etc. Thus, the real solution is to overcome the deficiency diseases is to consume diets rich in these nutrients (Katawal, 1992).

2.4   Malnutrition

Since the diet consumed by a large majority of the low income groups of the population in most of the developing countries are inadequate both in quantity and quality, malnutrition, particularly under nutrition, is widely prevalent among the vulnerable group of the people (Swaminathan, 1997).

Malnutrition has been defined in different ways some believe that it is a result of an imbalance in the intake of nutrients; 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 sign and symptoms depending on the types of nutrients 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 is defined as a pathological condition of varying degree of security and disease clinical manifestations, resulting from the deficient assimilation of component of

nutrient complex. The disease affect the physiological patterns of tissue, reduce the defensive capabilities to withstand different environmental condition and lower both the efficiency and ability in work shortens life (Gomez, 1955).

Malnutrition remains one of the most common causes of morbidity and mortality among children under five years of age throughout the world (UNICEF, 2005). Worldwide over 10 million children under the age of five years die every year from preventable and treatable illness despite effective health interventions. At least half of these deaths are caused by malnutrition. Malnourished children have lowered resistance to infection; therefore, they are more likely to die from common childhood aliments such as diarrheal diseases and respiratory infections. In addition, malnourished children that survive are likely to suffer from frequent illness, which adversely affects their nutritional status and locks them into the vicious cycle of recurring sickness, faltering growth and diminished learning ability. In developing countries, malnutrition is a major health problem (Caulfield *et al.,* 2004).

Malnutrition and the state of deficiency or excess of energy, protein and other nutrients lead to measurable adverse effects on tissues, body functions, appearance and clinical outcomes (Nikolaos, 2010). The causes of malnutrition are numerous and multifaceted. These causes are intertwined with each other and are hierarchically related. The most important determinant are poor diet and disease which are themselves caused by a set of underlying factors; household food security, maternal/child caring practices, access to health services and healthy environment. These underlying factors themselves are influenced by the basic socio economic and political conditions (Muller *et al.*, 2005).

Study conducted on malnutrition among under five children in Bangladesh revealed that household economic status, mother's education, father's education, mother's antenatal visit, mother's age at birth and mother's BMI are the most significant factor/ determinant of child's malnutrition (Siddiqi, 2011).

2.4.1   Forms of malnutrition

2.4.1.1   Undernutrition

Under nutrition can be defined as a disturbance of form or function arising from the deficiency of one or more nutrients. Under nutrition can be mild or severe, helpful (if it results in appropriate weight loss in someone who is obese), or dangerous. Weight loss is the manifestations of energy depletion. Serious attention to the problem of under nutrition in hospitals was first given in 1992 with the publication of the King's Fund report, *A positive approach to Nutrition as Treatment* (King Fund, 1992).

It is the pathological state results from the consumption of an inadequate quantity of food over an extended period of time (Jellife, 1966).

In 2010, an estimated 171 million children (167 of whom live in developing countries) were stunted (De Onis, 2012). Children who are stunted are at greatest risk of having difficulty learning, playing, engaging in normal child hood activities and being productive members of the society later in life (Nathan, 2008). Undernourished children are also more susceptible to frequent and repeated disease and illness due to a weakened immune response, as well as at a greater risk of becoming underweight or obese later in life (SAVE, 2012). A child's nutritional future begins with the mother's nutritional status in adolescence and during pregnancy (WHO, 2012).

2.4.1.2   Over nutrition

Alongside under nutrition, a 'double burden' of malnutrition is emerging with rates of obesity and chronic diseases associated with urbanization, aging populations, technological development and globalization of food supply and industry (Galal, 2010). Billions of dollars are spent annually by the food industry to promote the consumption of highly refined, high calorie foods with little or no nutritional value (Ebbeling, 2002). A 'nutrition transition' is thus taking place, where disease pattern are shifting away from infectious illness towards a higher rate of non-communicable diseases such heart disease, diabetes, and some types of cancer (WHO, 2012).

It is the pathological state resulting from the consumption of an excessive quantity of and hence the calorie excess over and extended period of time. (Jellife, 1966)

2.4.1.3   Specific deficiency

It is the pathological state resulting from a relative or absolute lack of an individual nutrient (Jellife, 1966).

2.4.1.4   Imbalance

It is the pathological state resulting from a disproportion among essential nutrient with or without the absolute deficiency of any nutrients (Jellife, 1966).

2.4.2   Types of malnutrition

The different type of malnutrition is as follows (Katawal, 1989).

2.4.2.1   Acute malnutrition

Acute malnutrition relates to the present state of nutrition, for example weight for height (wasting).

2.4.2.2   Chronic malnutrition

Chronic malnutrition relates to the past state of nutrient, and the measurable parameters are height for age (stunting).

2.4.3   Most common malnutrition problem of Nepal

2.4.3.1   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, 1966).

a) Kwashiorkor

Kwashiorkor is a Ghanian word meaning "the sickness affecting children deprived of mother's breast". Kwashiorkor is far more common among poor communities and the depressed social classes than among privileged people.

It occurs at the time when the calories are adequate but the protein is inadequate. Growth is retarded and although the muscles are wasted and flabby, there is usually more subcutaneous fat than marasmic children. There is also edema; the child appeared 'moon faced' and the hair often turns red brown or gray (Cameron and Hofvander, 1993). In many rural areas where kwashiorkor is endemic, the food supply become scarce each year before the harvest, at during this hungry season the incidence of kwashiorkor in other nutritional disease increases (Passimore and Eastwood, 1986).

b) Marasmus

Nutritional marasmus is principally due to the consumption of diet markedly deficit in both protein and calories and is usually participated by diarrheal disease (Swaminathan, 1991).

It usually occurs in children under 1 year of age when the quantity of mother's breast milk is insufficient to provide adequate amount of protein and calories for a growing child and when the supplementary feeding is inadequate (Cameron and Hofvander, 1993).

A child suffering from marasmus is less than 60% of normal weight for its age. There is little or no subcutaneous fat, so the skin is loose and seems to be too big for the body. The infant looks as an 'old man' or has a 'monkey face'. The muscles are markedly wasted. They are flabby; this can be easily felt on the thigh and buttocks where the muscles should be thick and strong. There is no edema and no change in hair color (Cameron and Hofvander, 1993).

c)   Marasmic kwashiorkor

When the incidence of PEM is high, a large number of cases show some of the feature of both marasmus and kwashiorkor A child suffering from marasmic kwashiorkor weighs less than 60% of expected weigh for his age and has oedema. Feature of both marasmus and kwashiorkor are present in different degree of severity. Children weighing less than 60%

despite having oedema are in great danger of dying of various complications and need urgent attention and treatment. (Passimore, 1986).

2.4.4 Different types of micronutrient Deficiencies

2.4.4.1 Vitamin A deficiency

Vitamin A deficiency (VAD) is a nutritional deficiency of high magnitude that can be caused by insufficient intake of vitamin A food sources or by vitamin absorption, transport or metabolism process. The importance of adequate vitamin A is indisputable, as it has very diverse physiological roles in the visual process, in the integrity of epithelial tissue and immune system, as well as in other metabolic function (WHO, 2009).

Usually VAD develops in an environment of ecological, social and economic deprivation, in which a chronically deficient dietary intake of Vitamin A coexists with severe infections, such as measles, and frequent infections causing diarrhea and respiratory disease that can lower intake through depressed appetite and absorption, and deplete body stores of vitamin A through excessive metabolism and excretion (Alvarez et al, 1995). Vitamin A deficiency impairs numerous functions and, as a result, can lead to many health consequences, to which infants, young children and pregnant women appear to be at greatest risk. Xeropthalmia is the most specific VADD, and is the leading preventable cause of blindness in children throughout the world (Sommer, 1996). Night blindness often appears during pregnancy, a likely consequence of preexisting, marginal maternal vitamin A status superimposed by nutritional demands of pregnancy and inter-current infections (Christian, 1988). Anemia can result from VAD in children and women, likely due to multiple apparent roles of vitamin A in supporting iron mobilization and transport, and hematopoiesis (West *et al.*, 2007). Preexisting VAD appears to worsen infections (N. Scrimshaw, Taylor, CE., Gordon, JE, 1968) and vitamin A supplementation has been shown to reduce the risk of deaths in 6-59 months children by about 20-30% (Beaton et al., 1993).

2.4.4.2 Iron deficiency Anaemia

Iron deficiency anemia is a global health problem and common medical condition seen in everyday clinical practice. Iron deficiency has a substantial effect on the lives of young children and premenopausal women in both low-income and developed countries (McLean, 2009).

Iron deficiency affects more than 2 billion people worldwide (McLean, 2009), and iron deficiency anemia remains the top cause of anemia, as confirmed by the analysis of a large number of reports on the burden of disease in 187 counties between 1990 and 2010 (Kassebaum, 2014) and by a survey on the burden of anemia in person at risk, such as preschool children and young women (Stevans et al, 2014). Preventions programs have decreased the rate of iron deficiency anemia globally; the prevalence is highest in Central and West Africa and South Asia (Kassebaum, 2014).

In developing countries, iron deficiency anemia typically result from insufficient dietary intake, loss of blood due to intestinal worm colonization, or both. In high income countries, certain eating habits (e.g., a vegetarian diet or no intake of red meat) and pathological conditions (e.g., chronic blood loss or mal absorption) are the most common causes. Paradoxically, it appears to be more difficult to reduce the prevalence of iron deficiency anemia in high income countries than in low income countries. One reason for this seeming paradox is the high rate of iron deficiency in ageing populations (Stevens, 2013).

2.4.4.3 Iodine deficiency disorder

Iodine deficiency disorders (IDD) refers to all the adverse effects and consequences of iodine deficiency in a population that can be prevented by ensuring an adequate intake of iodine (United Nations Children's Fund). Effects of iodine deficiency-goiter and cretinism have been observed since ancient times. Dietary treatment has been known nearly as long, making iodine deficiency perhaps the earliest nutritional disease to be recognized (Gillie, 1978).

Iodine deficiency disorder (IDD) is a public health problem in Nepal and government programs have been geared towards promoting universal salt iodization (USI) since 1998 under a five year Plan of action for Control of IDD (1998-2003) in collaboration with UNICEF and JICA (MOHP., 2005). The fortification of salt with iodine is the most

common method of preventing IDD. Fortified salt that contains 15 parts per million (ppm) or more iodine at the consumption level is considered s adequately iodized to prevent IDD. Previous national surveys in Nepal have indicated that nearly 95% of the households in Nepal use salt with some iodine(MOHP., 2005).

73 percent of children live in household that use adequately iodized salt, with more children in urban (91 percent) than rural (71 percent) areas living in such households. The percentage of children living in such households that use adequately iodized salt is lowest in the Far-western development region (51 percent), particularly the Far-western hill sub regions (41 percent). Eighty percent of the household use salt that is adequately iodized (15+ ppm) (MOHP, 2011). The proportion of households that use adequately iodized salt has increased by 38 percent since 2005, when the figure was only 58 percent (MOHP., 2005).

2.5 Breastfeeding and weaning practice in Nepal

2.5.1 Breastfeeding pattern in Nepal

The word Nutrition is derived from "nutricus which means to suckle at breast". The infant should be put to breast feed within half an hour after normal delivery and within four hours after caesarian sections. Exclusive breast feeding is recommended from birth until at least 4month and if possible 6 months of age. (Shrilakshmi, 2014)

Breast feeding is nearly universal in among Nepalese mothers, but its duration and frequency are not always optimal. Breast milk is the optimal source of nutrients for infants. Exclusive breastfeeding is recommended during the first six months of a child's life because it limits exposure to diseases as well as provides all of the nutrients that a baby requires.

WHO/ UNICEF provide the following feeding recommendations (NMICS, 2010).

- Exclusive breastfeeding for the first six months of life.
- Continued breast feeding for two years or more.
- Safe, appropriate and complementary foods beginning at six months of age.
- Frequency of complementary feeding: two times per day for 6-8 months old; three times per day for 9-11months.
- It is also recommended that breastfeeding be initiated within 1 hour of birth.

Breastfeeding decreases the incidence or severity of diarrhea (Dewey, 1995), lower respiratory infection(Wright, 1989), bacterial meningitis(Cochi, 1986) botulism (Arnon, 1984), urinary tract infections (Pisacane, 1992), and necrotizing enterocolitis (Lucas , 1990). Other studies suggest that breastfeeding may protect against sudden infant death syndrome (Ford, 1993), insulin dependent diabetes mellitus (Gerestein, 1994), Crohn's disease (Koletzko, 1989), ulcerative colitis (Rigas and 1993), lymphoma (Davis, 1988), allergic disease and other chronic digestive diseases (Sveger, 1985). According to AAP, breastfeeding also enhances cognitive development. A number of studies indicate possible health benefits for mothers as well, specifically, a reduction in hip fractures after menopause (Cumming, 1993), less postpartum bleeding(Chua, 1994), reduced risk of ovarian cancer and premenopausal breast cancer (Newcomb, 1994).

According to Nepal Demographic Health Survey 2011shows that almost all last born children under age 2 (99%) are breastfed some of the time. Over half (55%) of children were breastfed within 1 hour of birth. Early breastfeeding is more common among children born at a health facility (59%) than among those born at home (47%). The percentage of children breastfed within 1 hour of birth is higher in mountain zone (61%) and Province 7 (71%). Stunting in children by province Percentage of children under age 5 who are stunted. Stunting in children by household wealth Nutrition of Children and Adults • 227 born in the lowest wealth quintile (62%). Among the last born children under age 2 who had been breastfeed, 3 in 10 (29%) were given pre-lacteal food within 3 days of birth. The practice of giving prelacteal food is higher in terai zone (38%), in Central region (40%), and in Province 2 (48%), and is also more common among children from families in the highest wealth quintile (38%) (NDHS, 2016a).

Reasons for breast milk feeding are:

- Any milk other than breast milk has no anti-infective properties to protect the infant in the early months.
- 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 (Hop *et al.*, 2000).

2.5.2 Weaning pattern

Weaning pattern is the process of providing other nutritive food to the child besides mother's milk. Such foods helps the child to grow in healthy way and to keep the children away from the malnutrition; growing child cannot only depends on the mother's milk, so other foods should be given to the child on the required quantity. Similarly, most of the mother's start to work in the field after one month of their child birth and they have less time to feed their infants. If the baby is hungry when the mother is absent, the baby may be fed with *Jaulo*, milk etc. This provides the temporary relief, although it is inappropriate for infants less than four months old (Y. Vaidya, 1988).

During the weaning period, good food source of protein, energy, calcium and iron are particularly important. On the basis of body weight, twice as much as protein, calcium and iron as adults. In many traditional societies, the weaning child seldom receives especially formulated food rather they are gradually introduced to adult food. Some of the weaning foods given to child in different regions of Nepal are *dalbhat, dhindo, sarbottampitho, sattu, etc.* (Vaidya, 1987).

In an under developed country like Nepal the average family food, "*Dal bhat*" in small quantities and in diluted form is given to the child, especially in the hills among low income group families, is "*Dhindo*". Roasted soybean or corn, flattened rice (*chiura*) and puffed rice are also given as snacks food (Vaidya, 1987).

2.6. 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 principal 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, fractural 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 assessment of nutritional status can be done by using following information (WHO, 1966).

a) Direct method: Deals with the individual and measures objective criteria. e.g. anthropometric, clinical examination, biochemical and bio-physical parameters.

b) Indirect method: Use community indices that reflect the community nutritional status or need. e.g. dietary intake, morbidity and mortality rates, as specific mortality and vital statistics.

c) Ecological factors: e.g. Socioeconomic status, housing and environmental hygiene, health and education services, conditioning infection (WHO, 1966).

2.7.   Anthropometric measurement

Anthropometry is the study of the measurement of the human body in terms of the dimensions of bone, muscle, and adipose (fat) tissue. The word "anthropometry" is derived from the Greek word "anthropo" meaning "human" and the Greek word "metron" meaning "measure" (Ulijaszek, 1994). The field of anthropometry encompasses a variety of human body measurements. Weight, stature (standing height), recumbent length, skinfold thickness, circumferences (head, waist, limb, etc.), limb lengths, and breadths (shoulder, wrist, etc.) are the examples of anthropometric measures.

Growth assessment is the single measurement that best defines the health and nutritional status of children because the disturbance in health and nutrition, regardless of their etiology, invariability affect child growth. The most commonly used anthropometric indices for assessing child growth are weight for age, weight for height, height for age and mid upper arm circumference(Onis, 1997).

2.7.1   Height for age

The height of an individual is made up of the sum of four components; leg, pelvis, spine and skull. While for detailed study of body proportions, all of these measurements are required, in the field nutritional anthropometry usually only the total height is measured(WHO, 1966).

The height for age index provides an indicator of linear growth retardation and cumulative growth deficits in children. Children whose height for age z-score is below minus two standard deviation (-2 SD) from the median of WHO reference population are considered short for age (stunted) or chronically malnourished. Children below minus three standard (-3 SD) deviation are considered severely stunted. Stunting reflects failure to

receive adequate nutrition over a long period of time and is affected by recurrent and chronic illness. Height for age, therefore, represents the long term effects of malnutrition in a population and is not sensitive to recent, short term changes in dietary intake.

2.7.2. Weight for height

The weight for height index measures body mass in relation to body height or length and describes current nutritional status. Children with z-score below minus two standard deviation (-2SD) are considered thin (wasted) or acutely malnourished. Wasting represents the failure to receive adequate nutrition in the period immediately preceding the survey and may be the result of inadequate food intake or recent episode of illness causing loss of weight and the onset of malnutrition. Children with a weight for height index below minus three standard deviation (-3 SD) are considered severely wasted. The weight for height index also provides data on overweight and obesity. Children more than two standard deviations (+2 SD) above the median weight for height are considered overweight or obese.

2.7.3 Weight for age

Weight is the anthropometric measurement most in use. Its potential value, especially for children, is appreciated not only by health personnel, but often by less educated parents, for whom it is useful as a source of health education (WHO, 1966).

Weight for age is a composite index of height for age and weight for height. It takes into account both chronic and acute malnutrition. Children whose weight for age is below minus two standard deviations (-2 SD) are classified as underweight. Children whose weight for age is below minus three standard deviations (-3 SD) are considered severely underweight.

2.7.4 MUAC (Mid Upper Arm Circumference)

The use of mid upper arm circumference (MUAC) has improved the ability of front line health workers to screen and assess for acute malnutrition among children by increasing the reach and enhancing the quality of Community Based Management of Acute Malnutrition (CMAM) services (Collins, 2006). In 2009, the World Health Organization (WHO) and UNICEF published updated guidelines recommending a MUAC cutoff of <11.5 cm as one of three screening criteria for identifying and managing severe acute

malnutrition in infants and children 6-60 months (WHO and UNICEF, 2009). Largely due to guidance from WHO and UNICEF on a standardized cut off, MUAC has become a widely used and successful diagnostic tool for screening children and determining eligibility for services to manage acute malnutrition(Brown, 2009). Measurement if MUAC requires minimal equipment and calculations as compared to height and weight measurements for calculation of body mass index (BMI) (weight [in kg] / height [in meters]^2) or other anthropometric measurements, such as skin fold thickness.

Numerous studies have shown that MUAC correlates well with BMI in adult populations (Mazicioglu, 2010). However, globally recognized MUAC cut offs have not been established to classify malnutrition among adolescents and adults. Many countries and programs have established their own MUAC cut offs to determine eligibility for program services (Republic of Zambia Ministry of Health and FANTA 2011, Federal Democratic Republic of Ethiopia Ministry of Health and Social Services and FANTA 2008), but there is limited evidence supporting these cutoffs and it is not known whether these cut offs are optimal.

Part III

Material and Methods

3.1   Research design

A community based cross-sectional survey was conducted from 28th May to 1st June of 2019 in Bhaktapur Municipality city to assess nutritional status of the 6-59 months children of the brick kiln factory workers using semi- structured questionnaire on formal interview basis. Anthropometric measurement such as height, weight and MUAC measurement was done and the socio-economic status was assessed.

3.2 Materials

 Instruments and equipment used during the survey were:

1. Weighing machine: The weight of the child was measured using weighing machine.
2. Height measuring scale (Stadiometer): The height measuring tape of five feet capacity (1 piece). The instruments was designed according to UNICEF standards which were easily transportable and accurate within the limits required (0.1 cm).
3. MUAC tape: Shakir's tape was used to measure the MUAC reading. The tape was flexible, non-stretchable and made of fiber glass used to measure to the nearest 0.01 cm.
4. Questionnaire: A well designed and pretested set of questionnaires to collect information on household characteristics, maternal characteristics, child caring practices, hygiene and environmental characteristics, etc.

3.3   Study site

The study was done in the Bhaktapur Municipality city brick kiln factory. Bhaktapur is an ancient Newar city located in the east corner of the Kathmandu Valley, approximately 13 Km (8 miles) from the Kathmandu Valley. Also known as an open museum, it is home to some of the best preserved historical monuments including palaces, courtyards, temples, pagodas, monuments, craftwork, hand-crafted peacock windows, etc, reflecting mostly Hinduism. It has two of the seven monument zones within the Kathmandu Valley listed as a World Heritage Site by UNESCO. Sixty two brick kiln factory are found in the Bhaktapur where more than 20,000 workers work there.

3.4 Study Variables

Study variables were categorized into two groups: dependent variable and independent variable. Dependent variable of this study was nutritional status of 6-59 months children as indicated by stunting, wasting and underweight. Whereas independent variables of the study were:

a) Socioeconomic and demographic variables: head of households, religion, ethnicity, family types, family size, income, occupation, education and food availability.
b) Child characteristics: Age, sex, birth weight
c) Child caring practices: Feeding, hygiene, health care seeking
d) Maternal characteristics: Age, ANC visits, extra food during pregnancy/lactation, care during pregnancy/lactation, intake of iron tablets.
e) Environmental health condition: Water supply, sanitation, fuel for cooking.

3.5 Target population

Children under five years of age were included as target population of the study.

Inclusion and exclusion criteria:

Inclusion criteria: Children aged 6-59 months who came from different rural areas of Nepal were included in the study.

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

3.6 Sampling technique

A cross – sectional study followed by simple random sampling was used to select children from households. The basic criterion for the selection of household sample was that the household with at least one child of 6-59 months of age was included in the sample. In households with more than one child of age between 6-59 months, one child was chosen by lottery method.

3.7 Sample size

The sample size was determined using a single proportion formula by assuming 50% of prevalence of malnutrition in brick kilns of Bhaktapur district, 95% confidence interval

(CI), 8 % desired precisions, some children may be unavailable so 8% non-response rate is added to the total sample size. A Z-value 1.96 is used at 95% CI and d of 8 %. (N= sample size, P= prevalence, d= margin of error).

Calculation of sample size for infinite population: -

Sample Size $n_0 = Z^2 \times p(1-p)/d^2$

$\qquad\qquad = (1.96)^2 \times 0.5(1-0.5)/ (0.08)^2$

$\qquad\qquad = 150.0625$

$\qquad\qquad \approx 150$

From the Municipality office of Bhaktapur, we found that the total no. of children of 6-59 months were 296. Thus, we apply finite population sample formula to obtain new sample size to conduct survey in this particular community.

Therefore,

New SS = n0 / [1+{(n0-1) / POP}]

Where,

 New SS = New sample size for finite population

no = Sample size in infinite population

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

New sample size obtains as

 = n0 / [1+ {(n0-1) / POP}]

 = 150 / [1+ {(150-1) / 296}]

 = 100

Thus, calculated sample size was adjusted for non-response. Considering non-response rate as 8%, the adjusted sample size was calculated to be 108.

3.8   Pretesting

The study was conducted among under five children from selected area under sampling procedure. The pretesting was conducted to establish accuracy of questionnaire, to check

for consistency in the interpretation of questions ad to identify ambiguous items. After review of instruments all suggested change was made before being administrated in the actual study.

3.9 Validity and reliability

For the purpose of ascertaining the degree to which the data collection instruments measure what they were purposed to measure, the instruments were validated by a group of professionals from Central Campus of Technology, Central Department of Nutrition and Dietetics. The questionnaire was also pretested prior to data collection to ascertain content and face validity.

Questionnaire was checked daily for completeness, consistency and clarity. In addition the academic supervisor also checked the collected questionnaire during the process of data entry and analysis.

3.10 Data collection technique

Primary data was collected using semi structured questionnaire and anthropometric measurements. Interview was conducted with caretakers/ parents of the children according to the questionnaire.

Secondary data was obtained from Bhaktapur Municipality, Nepal Demographic Health Survey (2006, 2011, 2016), Central Bureau of Statistics, and key informants like Female community health volunteers (FCHVs) and local leaders.

There were two sets of tools to gather information. First was the structured interview schedule to generate data pertinent to factors associated with nutritional status of children and second a form consisting of child information anthropometric measurements. Foam was developed to record the measurements of height, weight, mid upper arm circumference and structured pre tested information schedule was used to collect information from the respondents. The questionnaire comprised mainly of details on household profiles like age, sex, educational level, occupation of household members, etc. Anthropometric measurements taken for children aged (6-59) months included:

Date of birth: Date of birth was inquired from caretakers and recorded in months.

Height/Length: The length of each child aged 6-24 months was lying flat and centrally on measuring boards placed on a hard flat surface on the ground. The length was read to the nearest 0.1 cm. The height of the children aged above 24 months was measured standing straight on measuring board placed on hard flat surface with line of sight perpendicular to the horizontal surface. Children were made to stand bare foot on height board, with feet parallel and joined together, with heels and buttocks touching the wall. It was made sure that that the head was erect and hands were hung closely at the sides. The child weight was measured to the nearest one decimal place.

Weight: Measured by weight scale and read to the nearest 0.1 kg with minimum or no clothing. For children who were unable to stand, weight was obtained from the difference between weights of mother as she hold the child and weight of mother alone. The difference in weight made the child weight. For children who were capable of standing, weight was measured by standing on the centre of weighing machine without touching anything else. Shoes were removed ad were on minimal cloths.

MUAC: Shakir's tape was used. MUAC was taken on left hand midway between elbow and shoulder joint so that the hand was simply relaxed and hanging by the side.

3.11   Data analysis

Data was checked for completeness and consistency. The collected data was organized, coded and entered into Microsoft excel 2007 and then to Statistical Package for Social Sciences (SPSS) version 20.0 and into WHO Anthro 3.2.2. The collected data was analyzed by using both descriptive and interferential analysis. Descriptive analysis was done to describe the percentage and number distribution of respondents and the data was presented in the table. The nutritional status was measured by WHO standard and MUAC standards.

Anthropometric indices were calculated using reference medians recommended by WHO and classified according to standard deviations units (z scores) based on the WHO criteria. The chi-square test was applied to test the association between nutritional status and its associated factors.

3.12   Logistical and ethical considerations

Permission to conduct survey in brick kiln factories of Bhaktapur district was obtained from the office of Bhaktapur municipality.

Prior consent to conduct the research was obtained from the parents of the respective children. General discussion with the respondents was held to take their consent as well as inform the importance of the study to get their actual prevailing nutritional status. They were assured that the data collected only be used for study purpose with the uttermost confident.

Part IV

Results and Discussion

The study was conducted to assess the nutritional status of under-five year children of brick kiln workers and to find out the factors associated with it in Bhaktapur district. A community based cross sectional study was conducted among 108 children aged 6-59 months at brick kilns of Bhaktapur district. There are total 62 brick kiln factories in Bhaktapur district. The work in brick kilns is seasonal and attracts the poorest of the poor. The children of brick kilns are at increased risk of suffering from malnutrition because of various reasons such as, restricted access to health services, pollution in the surrounding of the factory, lack/poor medical facilities, poverty, recurrent infections, lack of nutritious food, illiteracy and ignorance about nutrition and health care. Therefore, this study is designed to assess the nutritional status of the children of 6-59 month of brick kiln factory workers and following results were found from the study.

4.1   Socio-economic and demographic factor

A total of 108 under- five children were included in the study with a response rate of 100%. Among 108 children studied, higher proportion 55.6% (60) were from single family, 41.7 %(45) were from joint family and the rest 2.8% (3) were from large family. Out of 108 children, 38.9% (42) were from the family whose family size was less than five, 24.1% (26) were from family whose family size was equal to five, and the rest 37% (40) were from family whose family size was more than five.

Survey showed that brick kiln factory workers worked only for six months in the brick factory. For the next six months, they were involved in new occupation viz., 51.9% (56) engaged in own agriculture, 36.1% (39) went India for job and 11.1% (12) involved in labor work in the country. After six months, they again returned back to brick kilns for their living. Looking into the workers' annual income, 39.8 %(43) workers had income equal to the average Nepali annual income, 30.6% (33) had more than the average Nepali annual income and 29.6% (32) workers had annual income less than the average Nepali annual income.

As workers work only for six months in brick kilns, survey showed that 40.7% (44) workers utilize their income from brick kiln for six to nine months, 29.6%(32) workers

utilized for nine to twelve months and 29.6%(32) workers utilized their income for six months.

The highest percentage of households (60.2%) were dalit, 28.7% janajati (31), 8.3% chhettri (9) and 2.8% others (3). Almost 90.7% (98) respondents followed hindu religion whereas 9.3 (10) followed Christianity. Almost 65.7% (71) children fathers' were educated upto primary level, 8.3% (9) were educated upto higher secondary level, 13.9%(15) were educated upto secondary level while 12% (13) were illiterate.

According to the survey 54.6% (59) mothers were literate whereas 45.4 % (49) were illiterate, among which 46.3% (50) had primary level education and 8.3% (9) had secondary level education. All mothers under the survey were laborers.

Table 4.1 Socio-economic and demographic factors

Variables	Frequency	Percent
Type of family		
Single	60	55.6
Joint	45	41.7
Large	3	2.8
Family Size		
< 5	42	38.9
> 5	40	37
5	26	24.1
Source of income after factory		
Agriculture	56	51.9
Labor	12	11.1
foreign employment	39	36.1
Others	1	0.9
Yearly income		
> 1 lakh	33	30.6
Approx. 1 lakh	43	39.8
< 1 lakh	32	29.6
Brick kiln Income utilization		
until work (6 months)	32	29.6

6 to 9 months	44	40.7
9 to 12 months	32	29.6
Caste		
Chhettri	9	8.3
Janajati	31	28.7
Dalit	65	60.2
Others	3	2.8
Religion		
Hindu	98	90.7
Christian	10	9.3
Fathers education		
not literate	13	12
primary level	71	65.7
secondary level	15	13.9
higher secondary level or above	9	8.3
Mothers education		
not literate	49	45.4
primary level	50	46.3
secondary level	9	8.3
Mothers occupation		
Labour	108	100

4.2 Maternal characteristics

Out of 108 children, 95.4% (103) were born normal, while only 4.6% (5) were born through operation. Higher proportion of mother [64.8% (70)] had knowledge about extra food during pregnancy and 35.2% (38) percent of mothers thought that they did not need extra food during pregnancy. Only 6.5% (7) of mothers had taken more foods during pregnancy, while 93.5%(101) were deprived of extra food and had taken same amount of food as normal days.

   During survey higher proportion of mothers, 60.2% (65) mentioned that they had taken iron and folate tablets during pregnancy, 35.2% (38) did not take iron and folate tablets

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during pregnancy and the rest 4.6% (5) of mothers were unknown about whether they took iron or folate tablets during their pregnancies. Among 108 respondents,72.2% (78) mothers had taken vaccination during pregnancy, while 27.8% (30) did not take vaccines during pregnancy.

Almost 91.7% (99) got married in early age (<20), 0.9 % (1) got married after twenty and 7.4% (8) got married at the age of twenty. Survey showed that maximum women [69.4% (75)] became pregnant at the age of less than twenty, 19.4% (21) at the age of greater than twenty and 11.1% (12) at the age of twenty.

Majority of mothers did not have appropriate knowledge about kwashiworker Although more than half respondents [65.7% (71] mentioned that they had heard about kwashiworker but were lack of proper knowledge about kwashiworker and only 54.3% (37) mentioned that they had no knowledge about kwashiworker. 63.9% (69) mentioned that other factors resulted kwashiworker in children, while 20.4% (22) thought that kwashiworker resulted from touch of pregnant women. 15.7%(17) mentioned that kwashiworker in children resulted from *akha lagera*. Survey showed that mothers were completely unknown about the exact reason of kwashiworker.

Table 4.2 Maternal characteristics

Variables	Frequency	Percentage
Type of birth		
Natural	103	95.4
Operation	5	4.6
knowledge about extra food during pregnancy		
Yes	70	64.8
No	38	35.2
Food eaten during pregnancy		
more than normal	7	6.5
same as normal	101	93.5
knowledge about IFA during pregnancy		

Yes	65	60.2
No	43	39.8
Vaccination during pregnancy		
Yes	78	72.2
No	30	27.8
Age during marriage		
less than 20	99	91.7
more than 20	1	0.9
equal to 20	8	7.4
Age during first child		
less than 20	75	69.4
more than 20	21	19.4
equal to 20	12	11.1
knowledge about malnutrition		
Yes	71	65.7
No	37	34.3
Reasons of kwashiworker		
Akha lagera	17	15.7
Touch of pregnant women	22	20.4
Others	69	63.9

4.3   Child characteristics

In this survey, children of both gender were involved in almost equal proportion [male 49.1% (53) male and 50.9% (55) female]

Most of the family [88% (95)] had one child below the five years while only 12% (13) of the family had two children of below five years. Most of the children surveyed [67.6% (73)] were first child of the family, 13.9% (15) were second child, 9.3% (10) were third child, 5.6% (6) were fourth child, 2.8%(3) were fifth child and 0.9% (1) were sixth child of the family.

According to the survey ,90.7% (98) of the families had no previous child death where in 9.3% (10) families there were previous child death. Survey showed that most of the children [65.7% (71)] preferred eating junk foods while 34.3% (37) preferred eating food made at home. High proportion of children [75% (81)] birthweight was found to be more than 2.5 kg and only 8.3% (9) children had birthweight less than 2.5 kg. 16.7% (18) of the respondents were unknown about the children's' birthweight.

Out of 108 children surveyed, majority of them [94.4% (104)] were immunized with vaccination whereas only 5.6% (6) were not given vaccination. 88.9% (96) of the children were given vitamin capsule while 11.1% (12) respondents mentioned that they did not give vitamin capsule to their children.

Table4.3 Children characteristics

Variables	Frequency	Percent
Gender		
Male	53	49.1
Female	55	50.9
no. of children below five years		
less than 2	95	88
Equal to 2	13	12
Birth order		
First	73	67.6
Second	15	13.9
Third	10	9.3
Fourth	6	5.6
Fifth	3	2.8
Sixth	1	0.9
Child death		
Yes	10	9.3
No	98	90.7
Food that child prefer to eat		
made at home	37	34.3
junk foods	71	65.7
Birth weight		
less than 2.5	27	25
more than 2.5	81	75
Vaccination to child		
Yes	102	94.4
No	6	5.6
Vitamin A		
Yes	96	88.9
No	12	11.1

4.4 Hygiene, sanitation and environmental factors

All the workers lived in the small temporary cottage made of brick near the factory

premises during the working season and their living condition was really pathetic. Most of the surveyed families [47.2% (51)] used tap water as a source of drinking water, 43.5% (47) used well water and 9.3% (10) used jar water According to this survey, most of the families [89.8% (97)] did not use the water purification method while only 10.2% (11) used purified water.

72.2% (78) of the respondents used latrines whereas 27.8% (30) did not use latrines. Most of the parents [83.3% (90)] mentioned that they washed their hand before feeding their children whereas 16.7% (18) did not wash their hand before feeding their children. Most of the respondents [63% (61)] were found to wash their hand with water only without using soap and 37% (40) used soap water for their hand washing. A high proportion of the surveyed family [56.5% (61)] managed their waste product by throwing and the rest 43.5% (47) managed their waste by firing. In most of the respondents [53.7% (58)] major source of fuel was LPG gas, while 46.3% (50) respondents used firewood as the major source of fuel.

Workers in the kilns are not aware of the environmental and health impact of the kilns that leads to exposure to various chemical hazards present in the emissions from brick kilns which has affected not only the workers but also their children and families residing in the premises. Survey showed that high proportion of children [96.3% (104)] were affected by the environment of the factory and only 3.7% (4) were unaffected by brick factory environment.

8.3% (9) of the respondents mentioned that their children had some health issues and most of the respondents [91.7% (99) mentioned that their children did not have any health issues. Out of 108 respondents, 86.1% (93) go to the nearest medical shop, 13% (14) go to the nearest health post and 0.9% (1) visit with dhami/Jhakri for the treatment of their children.

Due to polluted environment and also lack of hygiene and sanitation, most of the children were suffered from different health issues such as diarrhea, 87% (94), eye problem 7.4% (8), allergy 3.7% (4) and fever, 0.9% (1).

Table 4.4 Hygiene, sanitation and environmental factors

Variables	Frequency	Percent
Place to live		
near work	108	100
Source of drinking water		
Well	47	43.5
tap water	51	47.2
Others	10	9.3
water purification		
Yes	11	10.2
No	97	89.8
Latrine use		
Yes	78	72.2
No	30	27.8
Hand washing before feeding child		
Yes	90	83.3
No	18	16.7
Use of soap water		
soap water	40	37
Only water	68	63
waste management		
Firing	47	43.5
throw away	61	56.5
Source of fuel		
Firewood	50	46.3
cylindrical gas	58	53.7
Effect of environment		
Yes	104	96.3
No	4	3.7
Child health issue		
Yes	9	8.3
No	99	91.7
Child treatment		
medical shop	93	86.1
dhami/jhakri	15	13.9
Health issue of child		
Diarrhea	94	87
Eye problem	8	7.4
Fever	1	0.9
Allergy	4	3.7

4.5   Breastfeeding and complementary feeding

Out of total respondents of 108, 43.5% (47) were initiated breastfeeding during the first hour of birth, 13% (14) were breastfed within eight hours, 11.1% (12) within twent four hours of birth, 32.4% (35) mentioned that they don't remember about initiation of breastfeeding.

Survey showed that 59.3% (64) respondents fed colostrum milk to their children, 25% (27) mentioned that they did not feed colostrum milk to their children and threw away by leaching and 15.7% (17) did not remember about colostrum feeding. Among 108 children, higher proportion [92.6%(100)] were not given any prelacteal feed whereas 2.8%(3) were given other foods as prelacteal feed followed by 1.9%(2) with milk. same proportion, 1.9%(2) were given jaand/raksi and only 0.9%(1) were given honey/water/ghee as prelacteal feed.

51.9% (56) of the respondents had breastfed their children for less than three times a day, 35.2% (38) had breastfed their children for exactly three times a day and 13% (14) children were breastfed for more than three times a day. Among the 108 children, 77.8% (84) were not fed with artificial milk and 22.2% (24) were fed with artificial milk. 42.6% (46) of the children were started complementary food at the age of 6 months, 25.9% (28) children at the age of 4 months, 22.2% (24) at the age of 5 months, and 9.3% (10) children at the age of 7 months. Majority of the respondents [92.6% (100)] did not have knowledge about *balaahar* and mentioned that they had not heard about the *balaahar* while very less proportion [7.4% (8)] mentioned that they had heard about *balaahar*. Among 108 children studied, high proportion [90.7% (98)] were not fed with *sarbottam pitho* and only 9.3% (10) were fed with the *sarbottam pitho*. Those who fed *sarbottam pitho* to their children were unknown about the proportion of different ingredients to be mixed while preparing *sarbottam pitho* and mixed the ingredients according to their wish.

Table 4.5 Breastfeeding and complementary feeding

Variables	Frequency	Percent
initiation of breastfeeding after birth		
1 hour	47	43.5
within 8 hours	14	13
within 24 hours	12	11.1
Don't remember	35	32.4
Colostrum feeding		
Yes	64	59.3
n0/leaching and threw	27	25
Don't remember	17	15.7
Pre-lacteal feed		
Nothing	100	92.6
honey water/ghee	1	0.9
Milk	2	1.9
Jaand/raksi	2	1.9
Others	3	2.8
number of times of breastfeeding in a day		
greater than 3	14	13
less than 3	56	51.9
equal to 3	38	35.2
artificial milk feeding		
Yes	24	22.2
No	84	77.8
age to start complementary feeding		
4-5 months	52	48.1
6 -7 months	56	51.9
knowledge about baalahar		
Yes	8	7.4
No	100	92.6
Sarbottham pitho		
Yes	10	9.3
No	98	90.7
knowledge to prepare Sarbottham pitho		
No	98	90.7
as their wish	10	9.3
green leafy vegetables		
Sometimes	55	50.9
if available	53	49.1
use of iodized salt (Yes)	108	100

4.6   Prevalence of malnutrition

Overall results of prevalence of malnutrition among the children are shown in the graph (Fig 4.1). The magnitudes of under nutrition among children age 6-59 month were 3.7, 24.1 and 16.7% for wasting, stunting and underweight respectively. Among them 2.8, 6.5 and 5.6% were severely wasted, stunted and underweight respectively.
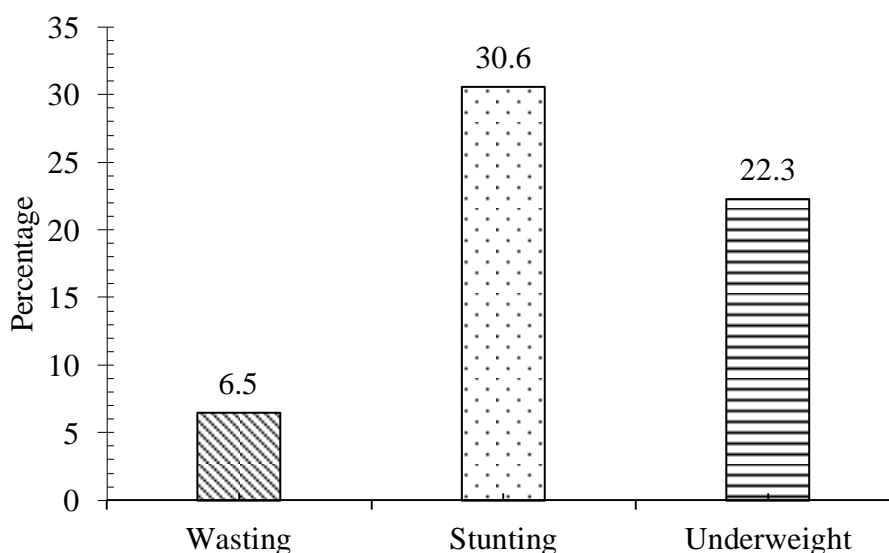
Fig 4.1 Prevalence of malnutrition

Table 4.6 Gender-wise prevalence of malnutrition

Variable	Normal	Moderate	Severe
Wasting			
Male	98.1%(52)	1.9%(1)	0.00
Female	89.1%(49)	5.5%(3)	5.5%(3)
Stunting			
Male	69.8%(37)	20.8%(11)	9.4%(5)
Female	69.1%(38)	27.3%(15)	3.6%(2)
Underweight			
Male	81.1%(43)	15.1%(8)	3.8%(2)
Female	74.5%(41)	14.5%(8)	10.9%(6)

On the basis of the gender wise distribution in the case of wasting, more number of

females were found to be wasted compared to males. 5.5% (3) female were found to be moderately wasted and 5.5% (3) were found to be severely wasted. In the case of the male, 1.9% (1) were only moderately wasted and no males were found to be severely wasted. Majority of females were found to be stunted as compared to males where 27.3% (15) were moderately stunted and 3.6% (2) were severely stunted. While in the case of male, 20.8% (11) were moderately stunted and 9.4% (5) were severely stunted.

Similarly, high proportion of females were found to be underweight than males. 16.7% (18) females were found to be moderately underweight and 5.6% (6) were found to be severely underweight whereas 15.1% (8) males were moderately underweight and only 3.8% (2) males were severely underweight.
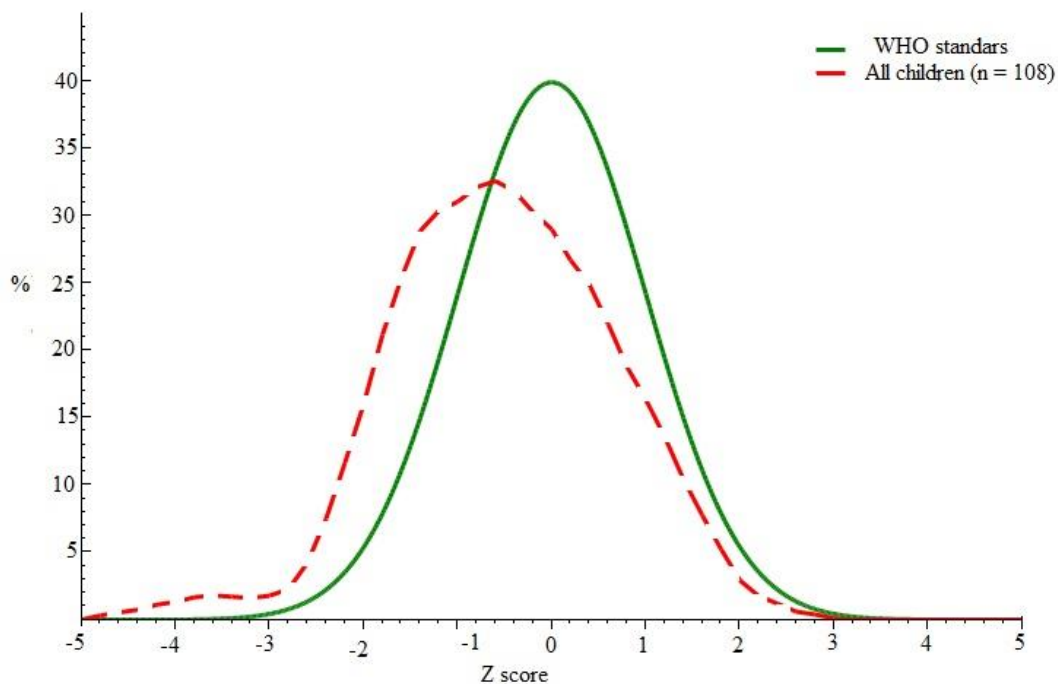
Fig.4.2 Weight-for-Height. Regarding Weight for height, below -2 SD (zscore) was 3.7% and 2.8% were below -3 SD.
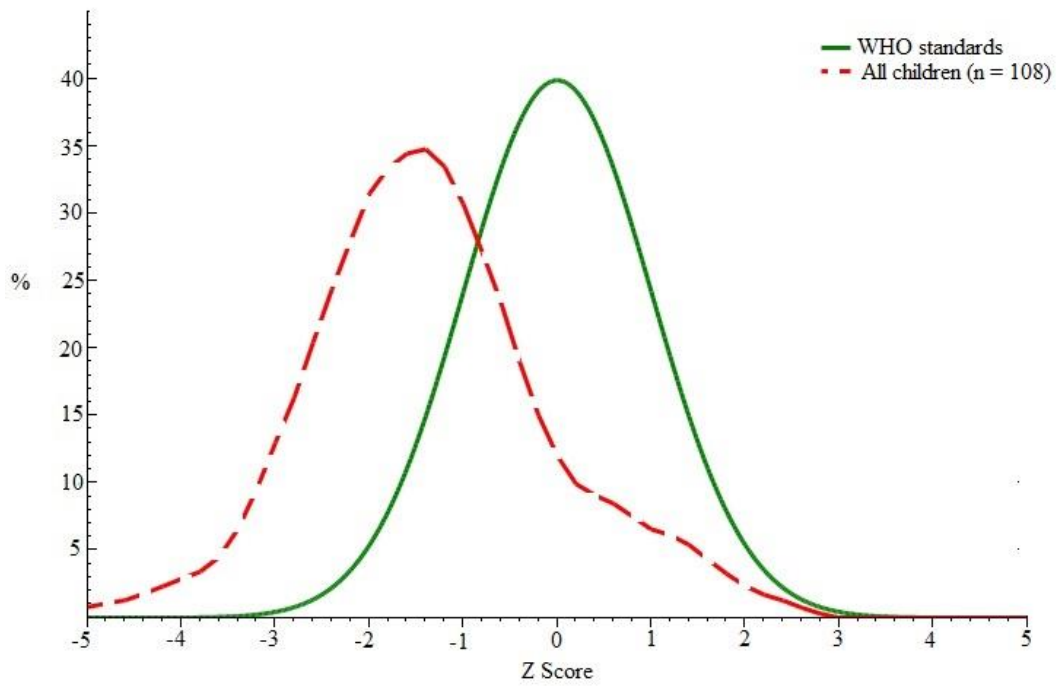
Fig 4.3 Height-for-Age. Regarding Height for Age, 24.1% were below -2 SD (z-score) and 6.5% were below -3 SD.
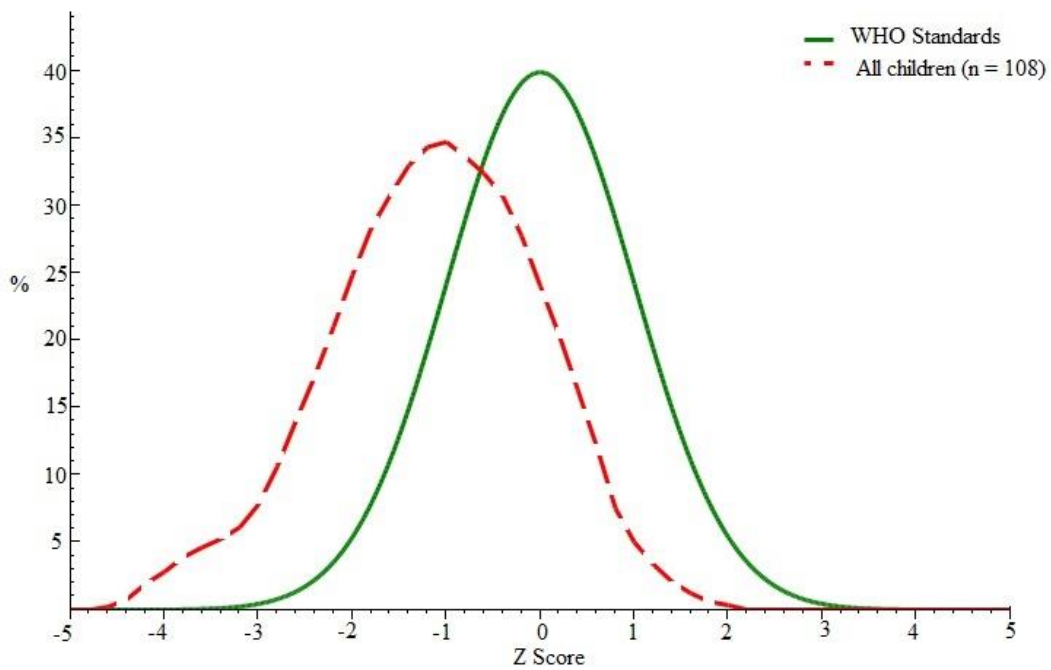
Fig 4.4 Weight-for-Age. Regarding Weight for Age, 16.7% were below -2 SD and 5.6% were below -3 SD.

NDHS 2016 showed that thirty-six percent of children under age 5 were stunted, 10% were wasted, 27% were underweight (thin for their age), and 1% were overweight. Overall, 36% of children under age of five are stunted with 12% being severely stunted, 10% are wasted with 2% severely wasted, and 27% are underweight with 5% severely underweight, while around 1% of the children were overweight. Compared to the national data, the prevalence of wasting, underweight and stunting were was found lesser and could be because of the study period, study area, socioeconomic characteristics, health service delivery, and environmental characteristics of study area, seasonal work in the brick kilns, variation in data due to workers from different parts of the country and less number of samples as compared to national data.

On the basis of the MUAC categorization 9.3% (10) were found to be moderately acute malnourished and 1.9% (2) were found to be severely acute malnourished.

Table 4.7 MUAC categorization

MUAC category	Frequency	Percent
Normal	96	88.9
Moderately acute malnourished	10	9.3
Severely acute malnourished	2	1.9
Total	108	100

The finding of the survey was found to be lower than the result of stunting and wasting in the study of nutritional status of under-five year children in Akure, South Local Government Ondo State, Neigeria (Akorede, 2013).

Prevalence of malnutrition was also found to be lower than cross-section study conducted on Beta-Israel children in Amhara region, where 37.2, 14.6 and 4.9% of children age 6-59 months were stunted, underweight and wasted, respectively. The result of this finding showed similarity with the result of wasting in Amhara region (Asres, 2011). The result also revealed that prevalence of malnutrition was lower than a cross-sectional comparative study conducted in Belahara VDC of Dhankuta district in Nepal

where the prevalence of underweight, stunting and wasting was 27%, 37% and 11, respectively (Sapkota, 2009).

4.8 Factors associated with wasting

Table 4.8. Factors associated with wasting

Factors	Normal	Wasting	P-value
Caste			
Chhetri	6(5.9%)	3(42.9%)	0.001
Others	95(94.1%)	4(57.1%)	
Health issue to child			
Yes	7(6.9%)	2(28.6%)	0.045
No	94(93.1%)	5(71.4%)	
Vaccination to child			
Yes	97(96.0%)	4(4.0%)	0.006
No	5(71.4%)	2(28.6%)	
Prelacteal feed			
Nothing	96(95.0%)	4(57.1%)	0.00
honey/water/ghee/jand/others	5(5.0%)	3(42.9%)	
Birthweight of child			
less than 2.5	8(7.9%)	1(14.3%)	0.556
more than 2.5	93(92.1%)	6(85.7%)	
Exclusive brestfeeding			
Yes	97(96.0%)	6(85.7%)	*0.289
No	4(4.0%)	1(14.3%)	
Vitamin A			
Yes	91(90.1%)	5(71.4%)	0.129
No	10(9.9%)	2(28.6%)	

* = fishers test

From the table the Chi- square test revealed that there is significant association for wasting with Caste (p=0.001). health issue to child (p=0.045), artificial milk feed (p=0.022), prelacteal feed (p=0.00) and there is no significant association for wasting with exclusive

breast feeding to child (p=0.289), vaccinations to child (p=0.006) and vitamin capsules to child(p=0.129).

In present study children of other caste mainly of scheduled caste were found to be more wasted. This could be because of discrimination in many things including food distribution system. Study conducted in India shows that there is significant   inter-group disparities in the nutritional levels between poor and non-poor, between caste, ethnic and religious groups (Sabharwal, 2011). These group-specific factors generally relate to the discrimination that these communities face in accessing income earning assets, education and government schemes providing services like food and health. There is some evidence for the Scheduled castes. These children faced discrimination in accessing food (mid-day meal) in schools and anganwadi centres, which adversely affects their food intake and thereby their nutritional levels (Thorat and Lee, 2010).

Health issues to child is significantly associated with wasting and main health issues of children were found to be diarrhea. Children's of mothers who did not know what kinds of food are given to the children during diarrhea was more wasted than other children. NDHS 2011 report showed that 71% of children who had diarrhea were given the same amount of fluid as usual, 14% were given more, 10% were given somewhat less than the usual amount and 1% were given much less fluid. Four percent of children with diarrhea were not given any liquids.

In present study prelacteal feed (p= 0.00) is found to be significantly associated with wasting. Prevalence of wasting was found in children who were fed with prelacteal feed as butter in a study conducted in East Belasa District, Northwest Ethopia (Fentahun *et al.*, 2016).

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4.9   Factors associated with stunting

Table 4.9 Factors associated with stunting

Factors	Normal	Wasting	P-value
Caste			
Chhetri	6(5.9%)	3(42.9%)	0.001
Others	95(94.1%)	4(57.1%)	
Health issue to child			
Yes	7(6.9%)	2(28.6%)	0.045
No	94(93.1%)	5(71.4%)	
Vaccination to child			
Yes	97(96.0%)	4(4.0%)	0.006
No	5(71.4%)	2(28.6%)	
Prelacteal feed			
Nothing	96(95.0%)	4(57.1%)	0.00
honey/water/ghee/jand/others	5(5.0%)	3(42.9%)	
Birthweight of child			
less than 2.5	8(7.9%)	1(14.3%)	0.556
more than 2.5	93(92.1%)	6(85.7%)	
Exclusive brestfeeding			
Yes	97(96.0%)	6(85.7%)	*0.289
No	4(4.0%)	1(14.3%)	
Vitamin A			
Yes	91(90.1%)	5(71.4%)	0.129
No	10(9.9%)	2(28.6%)	

From the table it can be concluded that there is significant association between type of family (p=0.02), handwashing before feeding a child (p=0.012), number of children below five years in a family (p=0.003), feeding sarbottam pitho (p=0.034) whereas there was no significant association with stunting with birthweight of a child, continuation of breastfeeding, mother's age, yearly income and health issue to child.

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In the study type of family was significantly associated (p=0.02) with stunting. Prevalence of stunting was positively associated with family size of six and above i.e. joint family in the study conducted in Northwest Ethopia (Geberselassie *et al.*, 2018)

Feeding sarbottam pitho was found to be significantly associated (p=0.034) with stunting. Similar study conducted in Akpabuyo local government area, Nigeria association between complementary feeding practices among mothers and nutritional status of their infants was found (Udoh and Amodu, 2016). similarly in a study performed in rural communities of Sidana, south Ethopia it was found that children who started complementary food either before or after the recommended six month time were more likely to be stunted (Tessema *et al.*, 2013)

Handwash before feding a child (p=0.012) was significantly associated with stunting. Similar findings can be seen in research conducted in India which shows inverse association between washing hand before meals and child stunting (Rah *et al.*, 2015).

4.10 Factors affecting underweight

Table 4.10 Factors associated with underweight

Variables	Normal	Underweight	p-value
Type of family			
Single	53(63.1%)	7(29.2%)	0.003
Joint	31(36.9%)	17(70.8%)	
Family size			
<5	37(44.0%)	5(20.8%)	
>5	31(36.9%)	9(37.5%)	0.038
5	16(19.0%)	10(41.7%)	
Mortality rate			
Yes	5(6.0%)	5(20.8%)	0.027
No	79(94.0%)	19(79.2%)	
Birth weight of child			
<2.5	8(9.5%)	1(4.2%)	0.402
< or =2.5	76(90.5%)	23(95.8%)	
Mother age			
less than 18	9(10.7%)	2(8.3%)	
18-20	18(21.4%)	5(20.8%)	0.937
greater than 20	57(67.9%)	17(70.8%)	

Statistically significant association was found between Family size (p=0.038), type of family (p=0.003) and mortality rate (p=0.027) with underweight.

In present study there was significant association between family size (p=0.038) with underweight. Similar study conducted in Lamjung, Gorkha and Tanahaun districts of Nepal shows association between prevalence of underweight with family size (Dhungana, 2017). Significant association between mortality rate (p=0.027) and underweight was also found in present study. Article published in American Journal of Clinical Nutrition shows The RR of mortality because of low weight-for-age was elevated for each cause of death and for all-cause mortality (Caulfield *et al.*, 2004a).

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Part V

Conclusion and Recommendations

5.1   Conclusion

The study has generally assessed the nutritional status of 6-59 months children of brick kiln factory workers and factors associated of Bhaktapur district. Based on the study the following conclusions were made:

1. The magnitudes of malnutrition among children age 6-59 months were 3.7, 24.1 and 16.7% for wasting, stunting and underweight respectively. Among them 2.8, 6.5 and 5.6% were severely wasted, stunted and underweight respectively.
2. Female children were more affected by the under nutrition than male children.
3. There was significant association of stunting and underweight with type of family
4. Mortality rate of children were associated with underweight.
5. There was significant association of wasting with Caste, health issue to child ,artificial milk feed and prelacteal feed.
6. The malnutrition rate among the children under five years in Brick kilns of Bhaktapur district was found comparatively lower than the national data.

5.2   Recommendations

Based from the results of the study the following are the recommended points to improve the nutritional status of brick kiln factory worker's children

1. Nutrition awareness programmes should be done at root level to improve the feeding practices of parents on appropriate child feeding and care practices
2. Because of large number of people living in temporary brick made houses, hygiene and sanitation problem were seen which may spread different diseases mainly diarrhea. Therefore, improvements in hygiene and sanitation should be made.
3. Effective intervention should be addressed to reduce stunting, wasting, underweight and micronutrient deficiency.
4. Economic status of people are very poor so wages should be increased to decrease the risk of malnutrition due to poverty.

5. Survey of this nature should be carried out at regular interval so that it will assist the stakeholder to formulate plan policies for the betterment of Nutrition status.

6. Most of the women marry and give birth before 20 years. So mother should aware about appropriate marriage age and child birth.

Part VI

Summary

In developing countries like Nepal, malnutrition is a major public health problem. According to NDHS 2016 shows that, 36% of children under five years of age are stunted, 10% are wasted and 27% are underweight (MoHP., 2016). A community based cross-sectional study was conducted to assess the factors associated with nutritional status of 6 – 59 months children in Brick kilns of Bhaktapur District, Nepal. The study included 108 children selected using simple random sampling technique; anthropometric measurements (weight, height, MUAC) were performed to find the nutritional status of children. A structured questionnaire was administered to the mother or caretaker of children to determine the associated factors. Data collected was analyzed using WHO Anthro version 3.2.2 and SPSS version 20. Fisher test were used to analyze the factors associated with nutritional status.

According to weight-for height, 3.7% were found to be wasted out of which 2.8% were found to be severely wasted and remaining were found to be normal.

According to length/height-for-age, 24.1 % were found to be stunted out of which 6.5% were found to severely stunted and remaining were found to be normal.

According to weight-for-age, 16.7% of the children were found to be underweight, out of which 5.6% were severely underweight.

Survey result showed that Prevalence of underweight, wasting and stunting was 22.3%, 6.5%, and 30.6% respectively. When analysis was done to find the possible factors associated with malnutrition it was seen that prevalence of malnutrition was higher in females. Regarding family type, 55.6% of families were from nuclear family while 44.5% from joint families. Most of the mothers (81.9%) were in the age group between 18-30 years. All 100% of mothers under the survey were labourers and 91.7% of mothers were married in age group between 15 to 19 years. Nearly half (45.4%) of mothers were illiterate.77.8% of children were still breastfeeding at the time of survey and 22.2% of mothers were gave artificial milk to their children. Low proportion (49%) of mothers gave green leafy vegetables to their children if available whereas 50.9% of mothers gave green leafy vegetables sometimes to their children. 94.4% were given vaccination and 88.9% of

children were supplemented with vitamin A capsules. Only 9.3% of mothers gave sarbottam pitho to their children. Higher proportion of mothers (63.9%) believed that kwashiworker can be caused by other factors. 20.4% of mothers believed that touch of pregnant women is the main reason for kwashiworker while 15.7% of mothers replied that bad sight (akha lagnu) can cause kwashiworker. 43.5% of household used well for drinking water while 47.2% used tap water and 9.3% used other sources of water. Only 10.2% of household purified/treated water before they drink. More than half household 83.3% have toilet facility. All household (100%) resides near workplace in temporarily made brick house.

Chi–square test analysis of the determinants of nutritional status indicated that, type of family was significantly associated with stunting and underweight. There was significant association of wasting with caste, health issue to child, artificial milk feed and prelacteal feed. Stunting was significantly associated with type of family, handwashing before feeding a child, number of children below five years in a family, feeding sarbottam pitho and underweight was significantly associated with family size, type of family, mortality rate.

The result obtained from my 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, pregnant and lactating women. This result can be helpful in designing better nutritional intervention for management and prevention of the malnutrition problem prevalent in the community.

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Part VII

Appendices

Appendix-A

Consent letter

INFORMED CONSENT

Namaste!

I Miss Anita Karki, graduate student in Department of Nutrition and Dietetics conducting a dissertation work for the award of bachelor's degree in Nutrition and Dietetics.

The topic of my study is "NUTRITIONAL ASSESMENT AND FACTORS ASSOCIATED WITH NUTRITIONAL STATUS AMONG THE CHILDREN (6-59 MONTHS) OF BRICK KILN WORKERS OF BHAKTAPUR DISTRICT".

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 son/daughter's participation is voluntary and he/she receives 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 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 participation 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 form before my participation in the study.

Signature of parent/guardian: Signature of witness:

Date: Date:

Place: Place:

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 rrelative.

Investigator's sign:

Date:

Appendix B

Survey Questionnaire

<u>सर्वेक्षण प्रश्नपत्र</u>

कोड नम्बर :   अन्तर्वार्ताको मिति:

२०७३/   /

१० सामान्य जानकारीहरु

१। घरमुलीको नाम :

२। वडा नम्बर :

३। उत्तरदाता :   १. आमा   २. बुवा   ३. अन्य सदस्य

४। आमाको नाम :

५। आमाको उमेर :

६। सर्वेक्षणमा परेको बच्चाको   नाम :

२० पारिवारिक विवरण

७। जम्मा परिवार सदस्य संख्या:

महिला संख्या :   पुरूष संख्या:

बालबालिका संख्या :   महिला:   पुरुष:

60

५ बर्ष मुनिका बच्चाको संख्या :

८। तपाइको घरमा अहिले सम्म कुनै बच्चाको मृत्यु भएको छ ?

      १ छ   २. छैन

        छ भने ☐ कति जना

        मृत्युको कारण ....

९। परिवारको प्रकार ?   १. एकल   २. संयुक्त   ३. बृहत

१०। तपाईको जात क हो ?

१. ब्राह्मण   २. छेत्री   ३. जनजाति   ४. दलित   ५. मधेसी   ६. अन्य...................

११। तपाई कुन धर्म मान्नुहुन्छ ?

    १. हिन्दु   २. बौद्ध   ३. क्रिश्चयन   ४. इस्लाम   ५. अन्य (खुलाउनुहोस्)

१२। तपाईको मुख्य पेशा के हो ?

    १. कृषि   २. सेवा(जागिर)   ३. श्रमिक   ४. व्यापार   ५. बैदेशिक रोजगार   ६. अन्य

१३। तपाईको घरको मुख्य आम्दानीको श्रोत के हो ?

    १. कृषि   २. सेवा(जागिर)   ३. श्रमिक   ४. व्यापार   ५. बैदेशिक रोजगार   ६. अन्य

१४। तपाईको घरको मुख्य पेशाको आम्दानीले कति महिना सम्म खान पुग्छ ?

    १. ३ महिना भन्दा कम   २. ३-६ महिना सम्म   ३. ६-१२ महिना सम्म

४. १२ महिना भन्दा बडी   ५. बेच्न पुग्ने

१५. तपाईको घरको बार्षिक आम्दानी कति छ ?

१. १ लाख भन्दा कम   २. १-३ लाख सम्म   ३. ३ लाख भन्दा बडी

१६. आमाको शैक्षिक योग्यता कति छ ?

१. निरक्षर   २. प्राथमिक तह   ३. मा.वि. तह   ४. उ.मा.वि. तह वा सो भन्दा माथि

१७. बाबुको शैक्षिक योग्यता कति छ ?

१. निरक्षर   २. प्राथमिक तह   ३. मा.वि. तह   ४. उ.मा.वि. तह वा सो भन्दा माथि

१८. आमाको पेशा के हो ?

१. घर गृहस्थि   २. सेवा   ३. श्रमिक   ४. व्यापार   ५. अन्य (खुलाउनुहोस)

२० व्यक्तिगत तथा वातावरणिय स्वास्थ

१९. तपाईले पिउनका लागि प्रयोग गर्ने पानीको श्रोत क हो ? (बहु उत्तर प्रश्न)

१. कल   २. खोला   ३. इनार   ४. खानेपानीको धारा   ५. अन्य ....

२०. तपाईले पिउने पानीको सुद्धिकरण गर्नु हुन्छ कि हुदैन ?

१. गर्छु   २. गर्दिन

२१. तपाइको घरमा चर्पी छ ?

१. छ   २. छैन

२२. दिसापिसाब गरेपछि साबुनपानीले हात धुनुहुन्छ ?

१. धुन्छु   २.धुन्न

२३. फोहोरमैलाको व्यवस्थापन कसरी गर्नुहुन्छ?

१. गाडेर   २. जलाएर   ३. फालेर   ४. अन्य ....

२४. घरमा खाना पकाउन इन्धन के प्रयोग गर्नुहुन्छ ?

१. दाउरा   २. गुइठा   ३. स्टोभ   ४. गोबरग्यास   ५. सिलिन्डर ग्यास   ६. अन्य

४० पाँच वर्ष मुनिका बालबालिकाकी आमालाई सोध्ने प्रश्नहरु

२५. तपाईको घरमा ५ वर्षमुनिका कति जना बालबच्चाहरु छन्? ....

२६. तपाईको आनुपस्थितिमा तपाइको बच्चाको प्राय: कसले हेरविचार गर्छन ?

१. सासु/ससुरा   २. श्रीमान्   ३. बच्चाको दाजु/दिदि   ४. परिवारको अन्य सदस्यहरु

५. नातेदार   ६. छिमेकि/साथी   ७. घरमा एक्लै छाड्ने   ८. आफैले   ९. अन्य

२७. अध्ययनमा परेको बच्चाको जन्म क्रम कति हो ? .... (पहिलो बच्चा भए प्रश्न २७ मा जाने)

२८. यो बच्चा जन्मिदा अघिल्लो बच्चाको उमेर कति थियो ? .... वर्ष/महिना

२९. तपाईको बच्चालाई कुनै किसिमको स्वास्थ समस्या छ ?

१. छ   २. छैन

३०. छ भने कस्ता समस्याहरु छन?

१. दिर्ग रोगहरु जस्तै मुटु रोग / स्वासप्रस्वास समस्या / क्यानसर / अन्य

२. झाडापखाला   ३. कुपोषण   ४. सबै   ५. अन्य....................

३१. बिगत २ हप्ता भित्र तपाइको बच्चालाई कुनै किसिमको स्वास्थ समस्या देखिएको छ ?

१. छ   २. छैन   ३. छ भने क स्वास्थ समस्या छ ?

३२. तपाईको बच्चा बिरामी पर्दा उपचारको लागि सर्वप्रथम कहाँ जाने गर्नुहुन्छ ?

१. नजिकको स्वास्थ चौकी   २. औसधि पसल   ३. महिला स्वास्थ स्वयंसेविका

४. धामी झाक्री   ५. कहिँ पनि जान्न   ६. अन्य ....

५० पोषण तथा स्तनपान सम्बन्धी जानकारी

३३. के तपाईको बच्चालाई जन्मकै दिन देखि आफ्नो दुध खुवाउनुभएको थियो ?

   १. थियो   २. थिएन

३४. के तपाईले बच्चालाई आफ्नो दुध खुवाउनुभएको थियो ?

   १. थियो   २. थिएन   यदी थियो भने ३ मा जाने

३५. यदी खुवाउनुभएको थिएन भने किन ?

   १. चलन नभएर   २. हानी गर्छ भनेर   ३. फोहोर हुन्छ भनेर   ४. बच्चाले निल्न सक्दैन
५. अन्य

३६. यदी थियो भने बच्चालाई जन्मेको कति समयपछि तपैले पहिलो पटक आफ्नो दुध खुवाउनुभएको
थियो ?

   १. १ घण्टा भित्रै   २.८ घण्टा भित्र   ३.२४ घण्टा पछि   ४ सम्झना छैन   ५. अन्य............

३७. बच्चालाई आफ्नो बिगौती दुध खुवाउनु भयो ?

   १. खुवांए   २. खुवाईन / निचोरेर फाले   ३. सम्झना छैन

३८. आमाको बिगौती दुध खुवाउनु भन्दा पहिला बच्चालाई क खुवाउनु भएको थियो ?

   १.केहि खुवाएको थिएन   २. महपानी, घिउ   ३. गाइको दुध   ४. जांड / रक्सी   ५. अन्य

३९. तपाई अहिले बच्चालाई आमाको दुध खुवाउदै हुनुहुन्छ ?

   १. छ   २. छैन

४०. यदी छ भने दिनमा कति पटक खुवौनुहुन्छ? .... पटक

४१. बच्चालाई कति महिना ⁄ बर्षसम्म आफ्नो दुध खुवाउनु भयो/पर्छ ? .... महिना ⁄ बर्ष सम्म

४२. बच्चालाई ६ महिना सम्म आफ्नो दुध खुवाउनु भयो ?

१. खुवाएं २. खुवाइन्

४३. तपाइले बच्चालाई बजार ⁄बट्टाको दुध खुवाउनु भएको छ ?

१. छ २. छैन

४४. बच्चालाई आफ्नो दुधबाहेक अन्य केहि खानेकुरा पनि खुवाउदै हुनुहुन्छ ?

१. छु २. छैन

४५. तपाइको बिचारमा बच्चा कति उमेरको भएपछि उसलाई आमाको दुध साथसाथै अन्य खानेकुरा खुवाउनुपर्छ ?

१. ४ महिना २. ५ महिना ३. ६ महिना ४. ७ महिना

४६. स्तनपान बाहेक अन्य खानेकुराहरु बच्चालाई दिनमा कति पटक खुवाउनु हुन्छ ? ....पटक

४७. बच्चालाई क कस्तो खानेकुरा खुवाउनु हुन्छ ?

१. लिटो २. जाउलो ३. सर्वोत्तम पिठो ४. परिवारका अन्य सदस्य जस्तै ५. अन्य

४८. के तपाईलाई बालआहरको बारेमा थाहा छ ?

१. छ २. छैन

४९. बच्चालाई सर्वोत्तम पिठोको लिटो खुवौनुहुन्छ ?

१. खुवाउछु २. खुवाउदिन

65

५०. यदी खुवाउनुहुन्छ भने बजारबाट खरिद गर्नुहुन्छ कि घरमा आफै बनाउनुहुन्छ ?

१. बजारबाट   २. घरमा आफै   ३. कहिले बजार/ कहिले घरबाट

५१. सर्वोत्तम पिठो बनाउदां कति भाग अन्न र गेडागुडी मिसाउनुपर्छ ?

१. बराबर भाग   २. २ भाग गेडागुडी ∕ १ भाग अन्न   ३. १ भाग गेडागुडी/ २ भाग अन्न

४. जे मन लाग्यो तेही

५२. तपाईको बच्चाले कस्तो प्रकारको खानेकुरा खान रुचाउंछ ? (१ बर्ष भन्दा माथिको बच्चा भए)

१. घर मै बनाएको खानेकुरा   २. बजारको

५३. के तपाईले कुपोषण (रुन्चे ∕सुकेनास) को बारेमा सुन्नु भएको छ ?

१. छ   २. छैन

५४. यदी थाहा छ भने यसका कारणहरु के के हुन् ?

१. सन्तुलित भोजनको कमीले   २. आँखा लयु   ३. गर्ववती महिलाले छोएर

४. भगवानको श्रापले   ५. अन्य ....

५५. तपाईले आफ्नो घरमा खानको लागि कुन नुन प्रयोग गर्नुहुन्छ ?

१. ढिक्के नुन   २. प्याकेटको नुन   ३. दुई बालबालिकाको चिन्न भएको

५६. तपाईले आयोडीनयुक्त नून खाईरहनुभएको छ ?

१. छ   २. छैन

५७. के तपाईले आफ्नो बच्चालाई भिटामिन ए र जुकाको औसधि खुवाउनुभएको छ ?

१. खुवाए   २. खुवाईन

५८. हरियो सागपात कत्तिको खाने र खुवाउने गर्नुहुन्छ ?

१. सधै   २. कहिलेकाही   ३. उपलब्ध भएको बेलामा   ४. कहिले पनि नखाने   ५. अन्य

६० मातृस्वास्थ्य र नवजातसिसुको स्वास्थ्य सम्बन्धि जानकारी

५९. तपाईको बिबाह हुंदा कति बर्षको हुनुहुनथियो ? ....बर्ष

६०. पहिलो बच्चा जन्मिदा तपाइको उमेर कति थियो ? -------- बर्ष

६१. बच्चाको जन्म कस्तो प्रकारको हो ?

१. प्राकृतिक   २. शल्यकृया गरेर

६२. तपाइको यो बच्चा जन्मिदा उसको तौल कति थियो ?

१. २.५ के. जी. भन्दा कम   २. २.५ के. जी. भन्दा बडी   ३. थाहा छैन

६३. के गर्भवती आमालाई थप आहार चाहिन्छ ?

१. चाहिन्छ   २. चाहिदैन

६४. तपाइको परिवारमा कोहि गर्भवती हुदा खानपानको व्यवस्थापन कसरि मिलाउनु हुनुहुन्छ ?

१. सधै को भन्दा बडी खाना दिनुहुन्छ   २. सधै को भन्दा कम खाना दिनुहुन्छ   ३. सधैको जस्तो खाना दिनुहुन्छ

६५. गर्भावस्थामा तपाइले आइरन चक्की खानुभएको थियो ?

१. थियो   २. थिएन   ३. थाहा छैन

६६. यदी खानुभएको थियो भने कति अवधिसम्मखानुभएको थियो ? .... दिन

६७. यदी तपाइलाई कुपोषण सम्बन्धित अनुभव भए सुनाउनुहोस्   ?

....

७० खोप सम्बन्धि जानकारी

६८. तपाईले आफ्नो बच्चालाई खोप लगाउनुभयो ?

    १. छ   २. छैन

६९. तपाईले आफ्नो बच्चालाई जुकाको औषधी, भिटामीन A खुवाउनुभयो ?

    १. खुवाए   २ खुवाइन

७०. गर्भावस्थामा खोप लगाउनु भयो ?

    १. लगाए   २. लगाइन

    यदी लगाएको भए कुन लाउनुभयो ?.............................

८० ५ बर्ष भन्दा मुनिका बच्चाहरुको पोषण स्थिती

उमेर (months)	लिङ्ग (M/F)	तौल (Kg)	उचाई (Cm)	MUAC (mm)	Oedema (Y/N)

अन्तर्वार्ता दिनेको सहि :   आन्तार्वार्तिकारको सहि :

....

....

सर्वेक्षणमा सहभागी भएर सहयोग गर्नु भएकोमा धेरै धेरै धन्यवाद

Photo Gallery