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**”Breastfeeding practices among infants in
Bhaktapur, Nepal”**

Maren Kvalvaag

Faculty of Health Sciences
Department of Health, Nutrition and Management



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Abstract

Introduction: Adequate nutrition status during the first two years of life is important for health throughout life. Breastfeeding is the optimal way of providing infants with the nutrients they need for normal physical and psychological development. This is one of the most effective ways to ensure a child's health and survival

Background and objectives: As one of the poorest countries in the world, Nepal has high infant and maternal mortality rate and a high prevalence of undernutrition. World Health Organization (WHO) recommends early initiation of breastfeeding, exclusively breastfeeding for 6 months and introduction of complementary foods from 6-8 months. The overall objective was to explore the breastfeeding practices in Bhaktapur, Nepal and compare them to WHO's recommendations.

Methods: During 2008-2009 a cross-sectional study was conducted among 489 randomly selected mother-infant pairs in Bhaktapur. Data regarding breastfeeding and socioeconomic status were collected. The children were between 1 and 12 months, with a median age of 7 months.

Results: According to the WHO indicators on Infant and Young Child Feeding (IYCF), 80% of the mothers reported initiation of breastfeeding within one hour after birth and 92 % reported that colostrum was given. At 3 and 6 months, respectively 55 % and 40 % were exclusively breastfeed. About 32% introduced complementary feeding between 6-8 months. The most common liquid to give as first liquid after birth was breastmilk, while lito was the most common complementary food. Socioeconomic status of the parents significantly affected the feeding practices. Mothers who were unemployed or working in agriculture were less likely to introduce breastfeeding within one hour after birth ($p=0.048$) and to maintain exclusive breastfeeding for 6 months ($p=0.042$). Literacy level was also associated with feeding practices, and we found a significant correlation between the mothers' knowledge about WHO's recommendations on exclusive breastfeeding and duration of exclusive breastfeeding ($p<0.001$).

Conclusions: Our results emphasize the influence of the parents' socioeconomic status on infant feeding practices and suggest that women of poor socioeconomic status should be given special attention with regard to breastfeeding support.

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Abbreviations and Acronyms

ACCN – United Nations Administrative Committee on Coordination

ARI – Acute respiratory infection

BMI – Body Mass Index (kg/m^2)

IFPRI - International Food Policy Research Institute

IUGR – Intra Uterine Growth Retardation

IYCF – Infant and Young Child Feeding

MOHP – Ministry of Health and Population

NDHS – Nepal Democratic and Health survey

RCT – Randomized Controlled Trial

SCN – Sub-Committee on Nutrition

SD – Standard Deviation

UN – United Nations

UNDP – United Nations Development Program

UNICEF– United Nations Children’s Fund

WHO – World Health Organization

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1. Introduction

According to United Nations Development Program, Nepal is one of the poorest countries in the world, and is ranked 157 on the human development index (UNDP, 2013). The country has high infant and maternal mortality (UNICEF, 2003b) and undernutrition among children is one of the most widespread health problems (WHO, n.d). Undernutrition and micronutrient deficiency is associated with increased risk of mortality and morbidity (Black et al., 2008). Of children under the age of 5, about 35 % of the disease burden is associated with undernutrition (WHO, 2010b). To improve child survival and healthy growth, infant and young child feeding practices are important. WHO emphasize the importance of focusing on feeding practices the child's first two years because optimal nutrition during this period can reduce morbidity and mortality (WHO, 2010b). The feeding practices in this period are so critical that the appropriate practices can save the lives of 1.5 million children under the age of 5 every year (WHO, 2010b).

WHO recommends all women to exclusively breastfeed their children the first 6 months after birth and that introduction of solid foods should start at the age of 6 months with continued breastfeeding until the child reaches two years of age or beyond (WHO, 2010b, 2012a). WHO also emphasize the importance of early initiation of breastfeeding; within one hour after birth (WHO, 2010b, 2012a). Breastfeeding is the optimal way of providing infants with the nutrients they need for normal physical and psychological development. This is one of the most effective ways to ensure a child's health and survival (WHO, 2012a). To calculate the duration, the prevalence and the quality of the breastfeeding practices in a country, WHO have made a document; Indicators for assessing infant and young child feeding practices (IYCF).

During 2008-2009 a large study on micronutrient status among breastfeeding women and their infants in Bhaktapur, Nepal was conducted. Our study only addresses the breastfeeding practices, which was a small part of the collected information.

During the fall of 2012 I had 5 weeks of fieldwork in Bhaktapur, Nepal. For more information about the fieldwork see appendix 1.

1.1. Nepal: Country profile

Out of the 29,959,000 inhabitants in Nepal (WHO, 2013b) about 19 % live in urban areas (WHO, 2012b). The country is divided into 3 regions: Terai, Hills and Mountains. Bhaktapur is located in the Hill region. The hills range from an altitude of 610 to 4876 meters above sea level (Ministry of health and population (MOHP) 2011). This area is densely populated, and about 43 % of the population lives here. Bhaktapur is located in the Kathmandu valley and this area is the most urbanized part of the country. For administrative purposes Nepal is also divided into 5 regions: far western, mid-western, western, central and eastern. Bhaktapur is located in the central region (Government of Nepal Ministry of home affairs, n.d.). The regions are divided into 14 zones and 75 administrative districts (MOHP, 2011). Districts are further divided into smaller units, called village development committees (VDCs) and municipalities. Bhaktapur is divided into 160 geographic areas, called toles.

Nepal is classified as a low-income country, and is among the least developed countries in the world with a GDP per capita of US \$294 (WHO, 2012c). About 80 % of the population is dependent on agriculture as a livelihood (WHO, 2012c). Since the 1990s and early 2000s life expectancy has increased for both males and females and is now on 65 and 69 years, respectively (WHO, 2013b). Urbanization has increased and the population living below the poverty line has decreased and is now 25 % (WHO, 2012c). Nepal has several ethnic groups in the population. The major groups are Chetri, Brahmins, Magar, Tharu, Tamang, and Newar (MOHP, 2011). There are also several different languages in Nepal. Nepali is the official language, but in total the country has about 92 different mother tongues (MOHP, 2011).

Nepal borders to India in east, south and west, and China in north (MOHP, 2011). The country is land-locked and rectangular in shape (Figure 1).

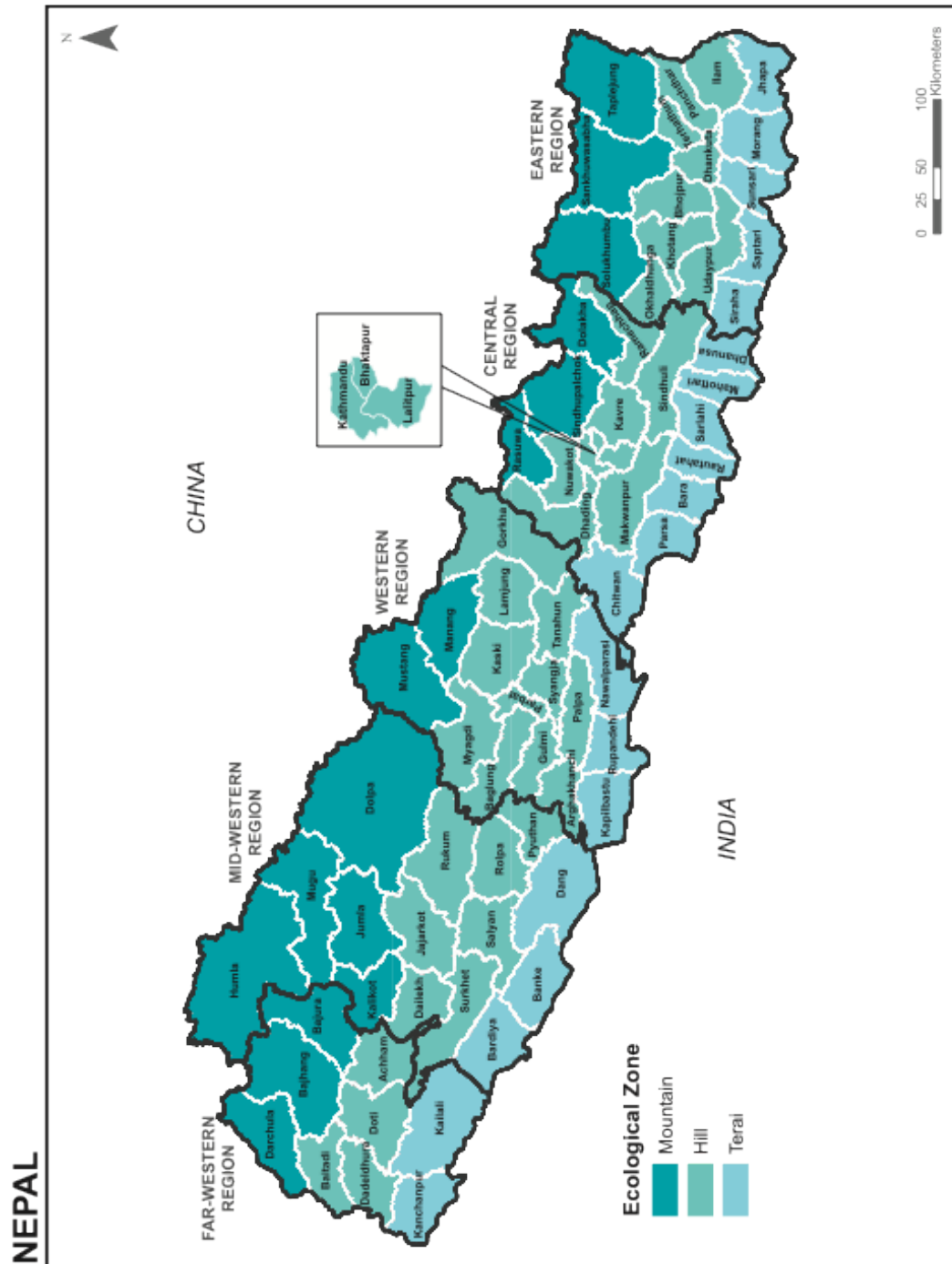


Figure 1 Map over Nepal (MOHP, 2011).

1.2. History and climate

Today Nepal is a democratic nation, and the country had its first election in 2008 (MOHP, 2011). Nepal has formerly been a country of conflicts. In more recent times it is especially the riots of the Maoists (1996-2005) and the massacre of the king and his family (MOHP, 2011) that has created political and economical insecurity as well as insecurity among the people. After 10 years of conflict, the parliament regained its power in 2006 while the king was dethroned. In 2006 a piece agreement was signed between the alliance of the major political parties and the Maoist party, and this was one of the factors that lead to democracy (MOHP, 2011). In 2008 a constitution was developed to manage the underlying causes of the conflicts that have been affecting the country (MOHP, 2011).

Nepal is a country that is prone to natural disasters, and the Kathmandu valley is vulnerable to earthquakes. According to WHO (2012c), the health sector is not sufficiently prepared to handle disasters of this kind.

1.3. Health profile

The life expectancy in Nepal is 69 years of age for women and 65 years of age for men. The under-five mortality rate is 50/1000 live births, and the maternal mortality rate 170/100 000 live births (WHO, 2012b). According to MOHP (2011), one out of twenty-two Nepalese children does not survive their first year while one in every nineteen does not live to their fifth birthday (MOHP, 2011). Nepal is suffering from communicable diseases and incidents of lifestyle related non-communicable diseases is increasing (WHO, 2012c). Malnutrition is a serious health problem, especially among women, children and adolescents (WHO, 2012c). About 50 % of children under the age of five are stunted, while about 29 % are underweight (WHO, 2012c).

The two leading diseases in causing children's deaths are diarrheal disease and acute respiratory infection (ARI). These are both preventable by improving water and sanitation (WHO, 2012c).

1.4. Breastfeeding in Nepal

Several studies on breastfeeding in Nepal have been carried out and the results vary. Studies that have been looking at early initiation of breastfeeding varies from 3.4 % (Mullany et al., 2008) to almost 73 % (Chandrashekhar, Joshi, Binu, Shankar, & Rana, 2006). MOHP (2011) concludes in Nepal Democratic and Health Survey (NDHS) that 44.5 % initiated breastfeeding within one hour after birth. Fewer studies have been looking at feeding with colostrum, but one study has found that about 90 % followed the WHO recommendation (Chandrashekhar, Joshi, Sreekumaran, Giri, & Chuni, 2006).

Several studies conclude that the duration of exclusive breastfeeding might be too short (Moffat, 2002; Ulak, Chandyo, Mellander, Shresta, & Strand, 2012). It appears there has been a positive development on exclusive breastfeeding from 2007 to 2011. MOHP (2007) reports that less than half of the children younger than 6 months were exclusively breastfed, while MOHP (2011) reports that 70 % of children younger than 6 months were exclusively breastfed (MOHP, 2007, 2011). Numbers on introduction of solid, semi-solid or soft foods have been consistent over time and about 70 % had timely introduction (MOHP, 2007, 2011; Senarath et al., 2011).

It looks like breastfeeding in general is much more common than exclusive breastfeeding (MOHP, 2007, 2011; Osrin et al., 2002; Panter-Brick, Lunn, Langford, Maharjan, & Manandhar, 2008; Ulak et al., 2012).

Several studies have been looking at the influence on socioeconomic variables on nutrition, and conclude that education does influence the dietary behavior (Bhatta, 2013; Martorell, Leslie, & Moock, 1983; Senarath et al., 2011). A randomized controlled trial on health information given at birth from 1998 did not find any differences on breastfeeding practices when the mothers were given information on health and breastfeeding right after giving birth (Bolam, Manandhar, Shresta, Ellis, & de Costello, 1998).

Most of the studies are conducted in different areas, and Nepal is a country with many different groups and traditions. Therefore, more studies are needed to draw any conclusions on the breastfeeding practices, and studies in different areas might not be suited for comparison. Bhaktapur is an urban area, and is thereby more ahead on literacy level, and has better health facilities than the rural areas (MOHP, 2011).

2. Theoretical background

2.1. WHO's recommendations

According to WHO, breastfeeding should be initiated within one hour after birth (WHO, 2013f). WHO recommend all women to exclusively breastfeed their children the first 6 months after birth with only a few exceptions where breastfeeding is not recommended (WHO, 2010b, 2012d, 2013f). After the first 6 months of exclusive breastfeeding, breastfeeding is still recommended as a supplement to complementary food until the child reaches two years of age or beyond (WHO, 2010b). It is also recommended that colostrum (the first milk) is given to the child within the first hour after birth (WHO, 2010b, 2013e).

WHO recommends using the indicators of Infant and Young Child feeding Practices (IYCF) to calculate the breastfeeding practices. The IYCF indicators are divided into core indicators and optional indicators. The IYCF indicators marked with red are used in our study

The core indicators are:

- **Early initiation to breastfeeding**
- **Exclusive breastfeeding under 6 months**
- Continued breastfeeding at 1 year
- **Introduction of solid, semi-solid or soft food**
- Minimum dietary diversity
- Minimum meal frequency
- Minimum acceptable diet
- Consumption of iron-rich or iron fortified foods

The optional indicators are:

- Children ever breastfed
- Continued breastfeeding at 2 years
- Age-appropriate breastfeeding
- Predominant breastfeeding under 6 months
- Duration of breastfeeding

- Bottle feeding
- Milk feeding frequency for non-breastfed children

Description of the IYCF indicators used in our study

Early initiation of breastfeeding

Definition: Proportion of children born in the last 24 months who were put to the breast within one hour of birth.

To know how early the child was initiated to breastfeeding IYCF recommends the interviewer to ask how long after birth child was put to the breast.

In this question it does not matter whether or not the mother was able to provide milk at the time the child was put to the breast (WHO, 2010a).

Calculation:

$$\frac{\textit{Children born in the last 24 months who were put to the breast within one hour of birth}}{\textit{Children born in the last 24 hours}} \times 100$$

Exclusive breastfeeding under 6 months

IYCF recommend asking the respondent about normal drinks/foods to give children, and to ask about everything eaten/drunken yesterday to know if the child is exclusively breastfed.

Definition: Proportion of infants 0–5 months of age who are fed exclusively with breast milk (WHO, 2010a).

Calculation:

$$\frac{\text{Infants 0 – 5 months who received only breastmilk the previous day}}{\text{Infants 0 – 5 months of age}} \times 100$$

Introduction to solid, semi-solid or soft food

IYCF recommends to ask about feeding practice of solid, semi-solid, and soft food the day before (WHO, 2010a).

Definition: Proportion of infants 6–8 months of age who receive solid, semi-solid or soft foods (WHO, 2010a).

Calculation:

$$\frac{\text{Infants 6 – 8 months of age who received solid, semi – solid or soft foods during the previous day}}{\text{Infants 6 – 8 months of age}} \times 100$$

2.2. Definitions

The following definitions of breastfeeding will be used in the current thesis (WHO, 2008).

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

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

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

Complementary feeding: When infant receives breast milk, from mother or wet nurse,

including milk expresses and solid or semi-solid food.

WHO recommends in IYCF to calculate breastfeeding practices by using the following groups of children:

Early initiation to breastfeeding: <24 months

Exclusive breastfeeding: <6 months

Introduction of solid, semi-solid or soft food: 6-8 months

2.3. Benefits of breastfeeding and disadvantages of non-breastfeeding

Exclusive breastfeeding

Exclusive breastfeeding for 6 months is the best for infants to ensure optimal growth, health and development (UNICEF et al., 2010; WHO, 2011). Studies show that exclusively breastfed children have reduced risk of gastrointestinal infection (Kramer et al., 2001; Kramer & Kakuma, 2012; WHO, 2001, 2010b), and that exclusive breastfeeding for 6 months protects against infectious diseases (UNICEF et al., 2010; WHO, 2012a), for instance diarrheal disease, and mortality (Bhutta et al., 2013; WHO, 2001, 2012a). Antibodies in breastmilk increases the child's immune system (UNICEF et al., 2010; WHO, 2012a). UNICEF et al. (2010) estimate that if the majority of infants were exclusively breastfed for 6 months, the deaths of at least 1.2 million children could be avoided. WHO estimates that correct feeding practices for children under the age of 5 years could save about 1.5 million lives a year (WHO, 2010b). Other milk than breast milk, such as animal or formula milk can threaten the baby's health (UNICEF et al., 2010). According to UNICEF et al. (2010) breast milk is easier to digest for the baby, and it nourishes the baby more efficiently. No other liquid can give the child as much protection against disease as breast milk (UNICEF et al., 2010). A negative aspect to the breast milk substitutes in addition to the fact that they do not contain antibodies, is that it also increases the probability for the child to get infectious diseases because it might contain contaminated water, or the bottles/cups might not be clean (UNICEF et al., 2010; WHO, 2012a). Studies also shows that children fed with breast milk substitutes are at greater risk of developing childhood

obesity and some chronic diseases later in life (UNICEF et al., 2010; WHO, 2010b, 2012a).

Exclusive breastfeeding also benefits the mother (Kramer & Kakuma, 2012; WHO, 2012a). It makes it easier for her to gain her pre-pregnancy weight faster, and she is more likely to keep amenorrhea for six months (Kramer & Kakuma, 2012; WHO, 2012a). Breastfeeding also reduces the mother's risk of developing breast and ovarian cancer. It increases the family's and the national resources and it is safe for the environment (WHO, 2013c). In addition to benefit the mother breastfeeding also contribute to bonding between the mother and the child (UNICEF et al., 2010).

Breastfeeding in general

Breast milk is an important source of energy, it contains protein, vitamin A and iron, and is still important even after the baby starts to consume other foods (UNICEF et al., 2010). As long as the child is breastfed it will have decreased probability of severe diseases (UNICEF et al., 2010). When the child is 6 months old it will need a variety of other foods to ensure enough energy and nutrients. If the foods are introduced too late, growth and development can slow down (UNICEF et al., 2010). Therefore foods in combination with breastfeeding are important for an optimal nutritional status from 6 months of age to the two first year of a child's life. Inadequate nutrition status at this time of life can have impact for the child's physical and mental development for the rest of her/his life (UNICEF et al., 2010).

In general, breastfed babies are healthier, have better growth and development compared to those who are fed with formula (UNICEF et al., 2010). Thus by increasing the rates of children who are breastfed up to two years or beyond, improvements of health and development for millions of children worldwide could be achieved (UNICEF et al., 2010).

3. Theoretical frameworks

3.1. A life course approach to nutrition and a thousand days

Figure 2 gives an overview over a lifetime, and the nutritional aspects. Every stage of life is important for both the person's life and his/her descendants. Our study focuses on the nutrition in infancy and early childhood: A time that is very important for the rest of the child's life. From the moment the woman gets pregnant and until her child reaches two years of age is called "the window of opportunity" or a thousand days (Thousand days, 2011). The right nutrition for the child's two first years can increase the child's ability to grow and learn (Thousand days, 2011).

Infant malnutrition can cause impaired mental development and gives a higher mortality rate. Untimely or inappropriate introduction of complementary food, inappropriate food, health and care and frequent infection over time can lead to inadequate catch up growth, and stunting if the child is already malnourished, or it can lead to a state of malnourishment (Figure 2). Inappropriate feeding practices also leads to more frequent infections, which makes it harder for the child to eat, and this circle ultimately leads to malnutrition. Malnourishment in childhood can have many consequences. The short-term consequences can be reduced intellectual potential and higher risks of infectious diseases. If malnourished, the child gets weaker and is more exposed to diseases such as pneumonia, diarrhea and malaria, all of which can cause death (Thousand days, 2011). Reduced intellectual potential can have more severe long term consequences, i.e. shorter and poorer cognitive performance at school education (ACC/SCN & IFPRI, 2000; Barker, Eriksson, Forsén, & Osmond, 2005; Jukes, McGuire, Method, & Sternberg, 2002; UNICEF, 2012a). Low literacy level can have adverse health outcomes (Jukes et al., 2002; Weiss, Hart, McGee, & D'Estelle, 1992), and result in a life of poverty (UNICEF, 2012b). A childhood of malnutrition also increases the risk for the child to get chronic diseases like diabetes and coronary heart disease if the energy intake increases later in life (ACC/SCN & IFPRI, 2000; Hales & Barker, 2001; WHO, 2012a).

A state of malnutrition for young girls also increases the risk of giving birth to small children later in life (Figure 2). The women are more likely to have a low weight gain during pregnancy, which also increases the maternal mortality rate. Nor will she be

able to give the fetus the nutrition it needs. This can lead to intrauterine growth retardation (IUGR) (Barker, 1997; Chiswick, 1985), where the infants are shorter and lighter than recommended. Infants with IUGR do not have the best conditions in life, because of inadequate nutrition in uterus (ACC/SCN & IFPRI, 2000; Jukes et al., 2002; Thousand days, 2011). This cycle can continue for generations (ACC/SCN & IFPRI, 2000; UNICEF, 2011). According to ACCN/SCN and IFPRI (2000) low birth weight is especially common in South Central Asia. This makes it even more important to focus on this age group in Nepal. In developing countries the main reasons for IUGR is inadequate maternal nutrition status before conception, short maternal stature, mainly as a result of undernutrition and infection during her childhood, and poor nutrition during her pregnancy (ACC/SCN & IFPRI, 2000)

The life course approach to nutrition underlines the importance of optimal nutrition early in life to prevent children from getting chronic diseases, to get the best possibilities for education and to ensure future generations the best start in life.

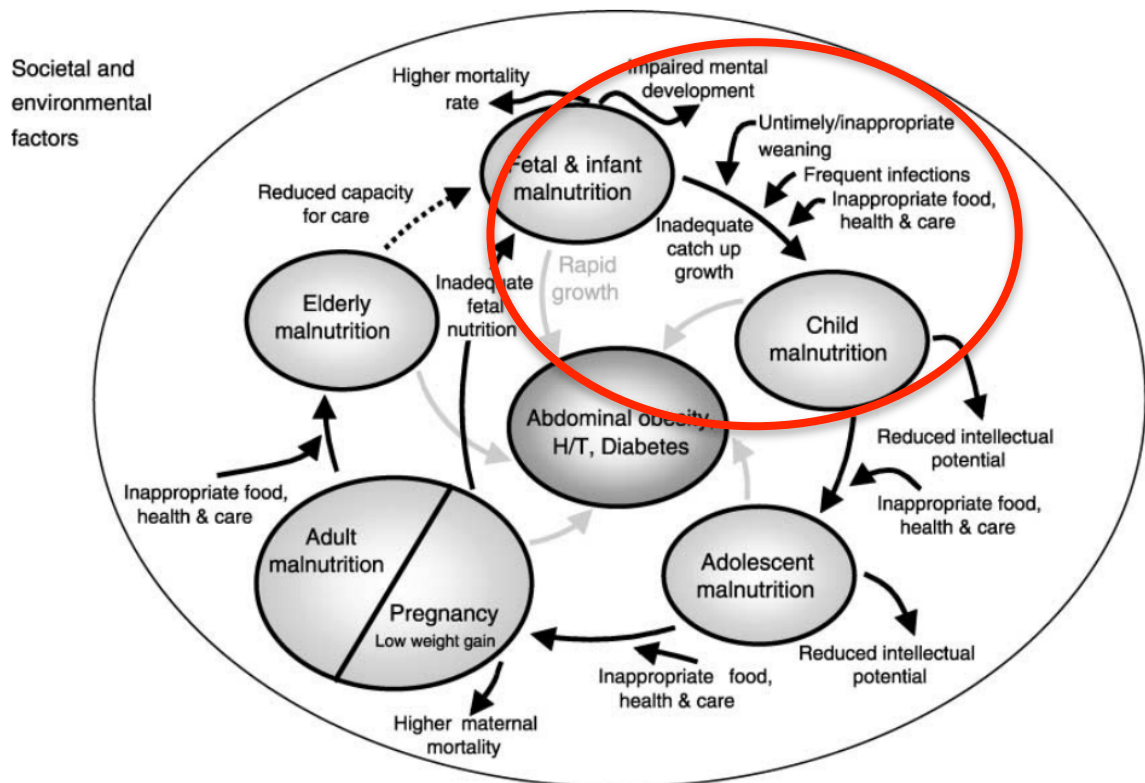


Figure 2 Nutrition throughout the life cycle (ACC/SCN & IFPRI, 2000)

4. Objectives

4.1. Overall objectives

The overall objective is to explore the breastfeeding practices in Bhaktapur, Nepal and compare them to the WHO's recommendations.

4.2. Specific objectives

1. Investigate of the breastfeeding practices in Bhaktapur by using the WHO indicators for assessing infant and young child feeding practices (IYCF)
 - a. Early initiation of breastfeeding
 - b. Exclusive breastfeeding under 6 months
 - c. Introduction of solid, semi-solid or soft food
2. Investigate other breastfeeding and feeding practices in Bhaktapur.
 - a. Fed with colostrum
 - b. First liquid given after birth
 - c. Type of complementary food first introduced
 - d. Caregivers knowledge about duration of exclusive breastfeeding
3. Investigate associations between WHO's recommendations on breastfeeding and selected background factors. The selected background factors are:
 - a. Parent's occupation
 - b. Parent's education level
 - c. Gender of the child
 - d. Age of the mother
 - e. Mother's BMI
 - f. Birth order of the child
 - g. Where was the child born
 - h. Birthweight of the child

5. Subjects and Methods

5.1. Study site

The study site was Bhaktapur, a city located in the Kathmandu valley in Nepal. Bhaktapur has a population of approximately 75 000. The study was conducted at Siddhi Memorial Children's Hospital. Newar is the predominant ethnic group, and the majority of the population is farmers, semi-skilled or unskilled laborers and daily wage earners (Ulak et al., 2012).

5.2. Study design and subjects

This cross-sectional survey was carried out from 2008 to 2009 and 500 healthy lactating women were randomly selected from Bhaktapur municipality. A two stage sampling approach was used involving the random selection of 66 of 160 geographic areas (*toles*) in Bhaktapur. Each *tole's* probability of being sampled was proportional to its size. In the second stage, all women living in the 66 *toles* were listed and selected randomly. We had to approach 582 to reach the targeted 500, of these, 489 gave information on breastfeeding (Figure 3). The mother's inclusion criteria's were that they were lactating, had no on-going infection (clinically assessed), were consent available and had availability of household information, as well as having given informed consent. The infants' inclusion criteria's were that they were breastfed, had no on-going infections (clinical assessed), were not severely malnourished (weight for length z-score <3 SD), and were singletons between 1 and 12 months old.

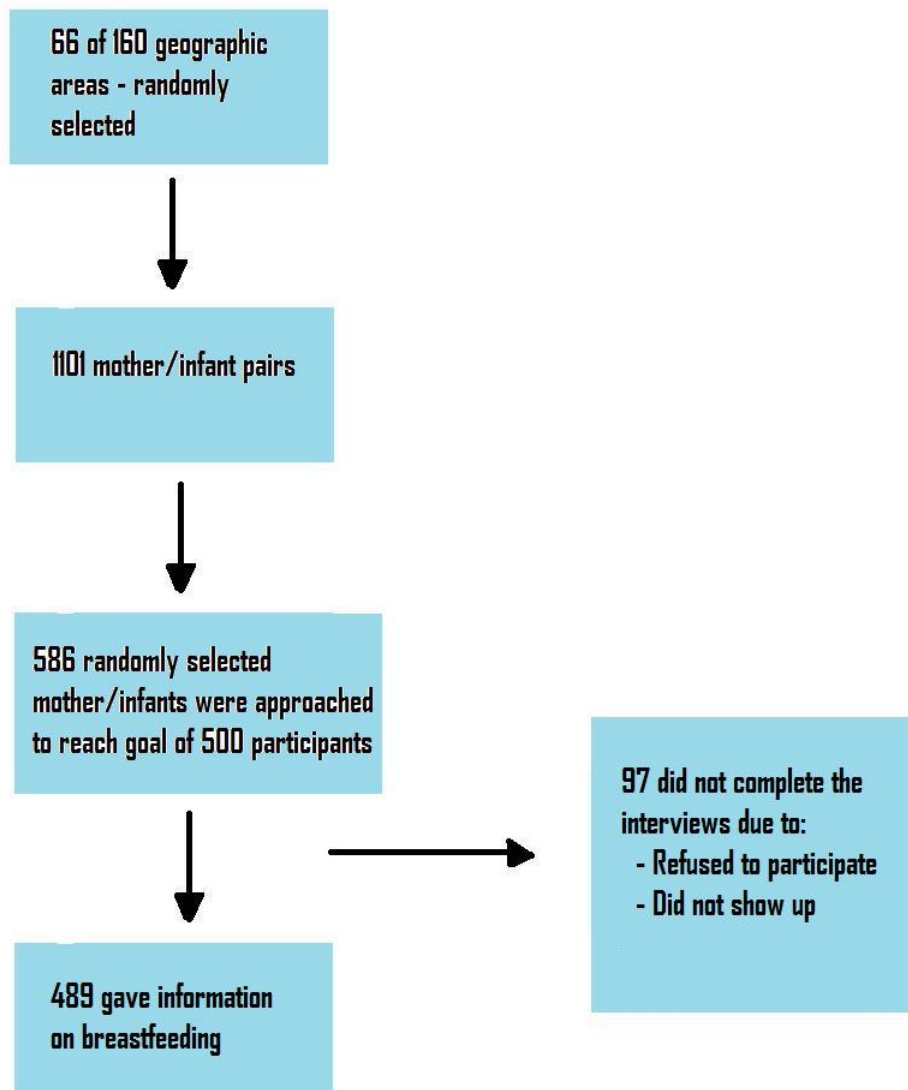


Figure 3 Flow chart

5.3. Method

The questionnaires

The interviews were conducted face to face by a team of trained fieldworkers. The fieldworkers were informed about the definition of breastfeeding (see definitions in chapter 2.2). The questionnaire was developed in English and translated into Nepalese, the main language spoken in the area. The interviews lasted for 30-45 minutes and included both the questionnaires and anthropometric measurements. In our study, two forms were used: Form B (Appendix 2) and Form E (Appendix 3).

Description of form B (Appendix 2)

Form B is a general questionnaire that everyone who gives birth at the hospital fills out. It gives information on socioeconomic indicators and anthropometric measurements of the child. This form is filled out within the first year of the child's life. Questions 1-4 (BFB_1-BFB_4) concern the child (weight and gender). Questions 5 and 8-11 (BFB_5 and BFB_8-BFB_11) gives information about socioeconomic indicators. These indicators are the number of children living in the house, level of education and occupation of the parents. Data on birth weigh are given in questions 13 and 14 (BFB_13 and BFB_14), and these data were self-reported.

Description of form E (Appendix 3)

The information about breastfeeding is obtained from form E. Questions 6, 8-9 and 13 (E_6, E_8-9 and E_13) are used to do the calculations in objective 2 (exploring other breastfeeding practices from WHO). Questions regarding objective 1 are addressed in questions E_7, E_11 and E_12. The majority of the questions had fixed categories and the respondents were told to give only one answer. The category 'other' was possible to choose if none of the listed alternatives were appropriate to describe the respondents' behavior. This form did not WHO's standardized indicators on breastfeeding (IYCF), and the same questions were given regardless of the child's age. This was done because more than 2/3 of the children were older than 6 months during the study, and it was difficult to use the IYCF indicators, without modifying them.

Training of the fieldworkers

The fieldworkers were trained in interview techniques. They had both plenum lectures, and got to practice on each other and on women who were in the hospital that day for other reasons.

The IYCF indicators (objective 1 a-c)

The document from WHO; Indicators for assessing infant and young child feeding practices (IYCF) was used to compare breastfeeding practices (objective 1a-c) Some

adjustments have been made to get as accurate results as possible since the way the data has been collected differs from the recommended way to collect data in the IYCF document (WHO, 2010a) (Table 1).

Table 1 Adjustments made in our study compared to the indicators from IYCF

IYCF	My adjustments
1.a Early initiation of breastfeeding	No adjustments made
1.b Exclusive breastfeeding under 6 months	<p>The calculations undertaken in our study</p> <p>1. Children under 6 months of age:</p> $\frac{\text{Children < 6 months of age exclusively breastfed}}{\text{Children < 6 months of age}} \times 100$ <p>2. All children participating in the study</p> $\frac{\text{Children who reported that exclusive breastfeeding was ended at 6 months of age (1 – 12 months of age)}}{\text{all children that was not exclusively breastfed during the study (1 – 12 months of age)}} \times 100$ <p>* Calculations will be done for 3 months as well as 6 months * Festivals where infants are given water as a ritual was not taken into account</p>
1.c Introduction of solid, semi-solid or soft food	$\frac{\text{Children 6 – 12 months of age who reported initiation of complementary foods at 6 – 8 months of age}}{\text{Children 6 – 12 months of age}}$

Other breastfeeding and feeding practices in Bhaktapur (objective 2 a-d)

Other indicators for infant feeding practices have been used in our study. This chapter gives an overview these indicators, and how the calculations have been done:

2.a Fed with colostrum

How many of the children who were fed with colostrum.

Calculation:

$$\frac{\text{Children/infants fed with colostrum}}{\text{Children/infants}} \times 100$$

2.b First liquid given after birth

This indicator gives an overview over which liquid that's given most often as the first liquid after birth. It differs from the indicator on initiation of breastfeeding after birth, since it does not take into account the time of when the liquid is given. Breast milk is one of the alternatives here, and this indicator thereby fulfills the question about initiation of breastfeeding. This indicator was calculated by looking at the percentage distribution between the most common liquids given after birth. These liquids are: Breast milk, glucose water, formula milk, animal milk and water.

2.c Type of complementary food first introduced

This indicator shows a percentage distribution of the most common complementary foods that were first introduced. It does not tell anything about frequency or amount, but it gives information about what the mothers chose to give their children, and that again can be used to calculate nutrient density and show which nutrients the child got/did not get for their first meals. The complementary foods asked about in our study are lito (mixture of various grains), rice, formula, cerelac (nestle porridge), and animal/dairy milk. The energy percent from fat and the amount of macronutrients in each food have been calculated by using a combination of the Indian food table, the Norwegian food table and nutrient values on the package for the

readymade foods. For lito, each ingredient was calculated by using the food tables. The recipe for lito was a standardized recipe where maize, rice, chickpea and soybean were the core ingredients. Lito is made by using double the amount of maize and rice compared to chickpea and soybean (Ratio 2:1). All is grinded together to a thick paste. It is also common to add other ingredients like cashew nuts and almonds, but these have not been taken into the calculation.

2.d Caregivers knowledge about duration of exclusive breastfeeding

A question about how long the mother thought exclusive breastfeeding was sufficient for the child was asked. The results are divided into those who answered 6 months and the ones who said they didn't know, or answered something other than 6 months.

Calculation:

$$\frac{\text{Number of mothers who answered 6 months on question e}_6}{\text{all mothers who responded to question e}_6} \times 100$$

The statistical tests

SPSS (The Statistical Package for the Social Sciences) (Version20) was used to perform the statistical tests. Tests for correlation, association and regression were done. The data was mostly not normally distributed, and therefore non-parametric tests were used. Median has been used where the data was not normally distributed, while the mean has been used when the data was normally distributed. Chi-square test was used to compare selected background factors to see if anyone were more likely to follow the recommendation of WHO, while Spearman's Rho test for correlation was used to compare the continuous variables.

Microsoft Excel 2011 was used to create graphs and histograms.

The significance level used in our study is 0.05, which leaves a 5 % possibility of misleading results.

For anthropometric measures, the median or mean values of height, weight and birthweight have been calculated. To assess the nutritional status among the children

Emergency Nutrition Assessment (ENA for SMART) (Version: 2007) has been used to calculate Z-score. Z-scores from WHO 2005, which were used as a standard in the program, have also been used as a standard in our study. Z-score for height/age, weight/age and weight/height was calculated using this program.

5.4. Calculations

Regression analyses

Multiple logistic regression analysis with dichotomous variables was used to find the strongest predictors for breastfeeding practices.

The dependent variables are the WHO's recommendations while the independent are the selected background factors (Objective 3). The dependent variables was divided into 'follow WHO's recommendation' and 'does not follow WHO's recommendation'. The independent variables were also dichotomous. The parents occupation was divided into 'no work/agriculture' and 'other work', the literacy level was divided into 'illiterate/primary' and 'up to class 10 or more'. Where the child was born was divided into 'health facility' and 'other', while birth order of the child was divided into 'less than two' and 'more than two'. Birth weight of the child was divided into 'less than 2500 grams' and 'more than 2501 grams'. Odds were calculated by using the anti logarithm to the log coefficient from the regression test. The risk was calculated by dividing the odds on 1 + odds and multiplied with 100 to find the percentage.

$$\text{Risk} = \frac{\text{Odds}}{1+\text{odds}}$$

5.5. Ethics

Before the study was initiated, clearance from relevant medical ethics committees in Nepal was obtained, and all the aspects of the study were in agreement with the latest version of the Helsinki declaration. Approval of the cover-page picture was obtained from the woman in the picture.

6. Results

6.1. Background characteristics of the children and the mothers in Bhaktapur.

The median age of the children were 7 months and the age ranged from 1 to 12 months. Of the children, 55 % were girls and the medium birthweight was 2800 grams. Most of the children (91 %) were born in a health facility, and experience of different diseases varied between 10 % (Positive finding of clinical examination) and 31 % (Difficult breathing and cough) (Table 2).

Table 2 Background characteristics of the children.

Variable	N = 489
Age in months (Median (range))	7 (1-12)
Girls (n (%))	269 (55)
Birth weight in grams (Median (25th, 75th percentile))	2800 (2500, 3150)
Where was the child born (n (%))	
Home	44 (9)
Health facility	445 (91)
Experience of disease (n (%))	
Positive finding of clinical examination ¹	47 (10)
Difficult breathing and cough ²	148 (31)
Fever	119 (24)
Vomiting ²	77 (16)
Pneumonia ³	57 (12)
Diarrhea ¹	78 (16)

¹ missing: 12

² missing: 14

³ missing: 11

Table 3 gives an overview over z-scores of the children. Out of the 477 children about 10 % were stunted (Low height for age). Of these 7.8 % were moderately stunted while 2.1 % were severely stunted. About 5.5 % were underweight (low weight for age) whereas 4.6 % were moderately underweight and 0.8 % were severely underweight. Measurements of wasting (low weight for height) showed that 2.1 % of the children fell into this category. Almost 1 % were moderately wasted, while 1.3 % were severely wasted (Table 3). Table 3 is not divided into genders. However while doing the statistical tests, the majority of the children below -2 in z-score were boys, with the exception of severe stunting where a larger percentage were girls.

Table 3 Z-scores for stunting, underweight and wasting among of the children in Bhaktapur

Z-score	n (%) <-2 z-score	n (%) <-3 z-score	Mean ± SD
Stunting (Height for age) (N=477)	47 (9.9)	10 (2.1)	-0.47 ± 1.34
Underweight (Weight for age) (N=477)	26 (5.5)	4 (0.8)	-0.31 ± 1.05
Wasting (Weight for height) (N=478)	10 (2.1)	6 (1.3)	0.00 ± 1.08

Background information of the parents is presented in Table 4. Most of the mothers were in the middle of their twenties, did not have more than two children and had a normal BMI (between 18.5 and 25 kg/m²). More mothers were overweight (15.4 %) than underweight (4.2 %). Most of the mothers stayed at home (65 %), while the fathers worked (93 %). About one third of the mothers (34.8 %) had primary school as their highest degree of education, while almost 40 % of the fathers had 10 years of education. The literacy level was higher among the fathers where 95 % were literate compared to 81 % of the mothers (Table 4).

Table 4 Background information of the parents

Variable	Mother n (%)	Father n (%)
Age (years)(median (25th, 75th percentile)) (Range) ¹	25 (23, 28) (17-44)	-
Parity (median (25th, 75th percentile))	2 (1,2)	-
BMI ²		
<18.49	21 (4)	-
18.5-24.9	361 (72)	-
>25.0	77 (15)	-
Occupation		
No work:	325 (65) ³	2 (0.4) ⁴
Agriculture:	38 (8)	28 (6)
Carpet worker:	14 (3)	7 (1)
Daily wage earner:	75 (15)	233 (47)
Self employs:	38 (8)	116 (23)
Services:	8 (2)	53 (11)
Other:		23 (5)
School		
Illiterate:	97 (19) ³	25 (5) ⁵
Primary school:	174 (35)	140 (28)
Up to class 10:	144 (29)	194 (39)
Intermediate:	74 (15)	81 (16)
Bachelor:	9 (2)	22 (4)
Above:	0	1 (0.2)

¹Missing: 1

²Missing 30

³Missing: 2

⁴Missing: 38

⁵Missing: 37

6.2. Investigation of the breastfeeding practices in Bhaktapur (Objective 1)

In the following chapter the modified IYCF indicators are calculated and presented (Table 5).

Table 5 Breastfeeding practices in Bhaktapur by using the modified IYCF indicators

IYCF indicator	n (%)
1 a. Early initiation of breastfeeding	
Within one hour after birth	388 (80)
1.b Exclusive breastfeeding under 6 months	
< 6 months of age during the study	
Exclusively breastfed for 3 months	19 (55)
Exclusively breastfed for 6 months	70 (40)
1 – 12 months of age during study	
Exclusively breastfed for 3 months	58 (14)
Exclusively breastfed for 6 months	45 (11)
1.c Introduction of solid, semi-solid or soft food	
Introduction between 6-8 months of age	80 (26)

1.a Early initiation of breastfeeding

Most of the women (80 %) in Bhaktapur followed the WHO's recommendation and reported that breastfeeding was initiated within one hour after birth (Table 5). The remaining 20 % distributed between 2-4 hours after birth (10 %), 5-24 hours after birth (3 %) and more than 24 hours (8 %).

1.b Exclusive breastfeeding under 6 months

Exclusive breastfeeding was self-reported and divided into two groups. The first group was children under 6 months of age. In this group the proportion of those who were still exclusively breastfed was calculated. The second group was all children participating in the study who were no longer exclusively breastfed. All of the caregivers were asked to recall when they stopped exclusively breastfeeding (Table 5).

Children under 6 months of age

By using the modified IYCF indicators, about 55 % were exclusively breastfeeding their child at 3 months, while at 6 months 40 % were exclusively breastfeeding their child. The median age of the children whose mothers responded that they were still exclusively breastfeeding was 3 months (25th percentile = 2, 75th percentile = 4). The older the child was; the less likely it was to be exclusively breastfed (Figure 3).

All children participating in the study

A large proportion had stopped exclusively breastfeeding their child before the study was initiated. These mothers were asked to remember when they stopped exclusively breastfeeding their child. It was reported that 14 % stopped exclusively breastfeeding their child at 3 months while 11 % stopped at 6 months (Table 5). Figure 3 shows the percentage distribution of exclusive breastfeeding for each month, and compares the groups who were still exclusively breastfeeding their child with the ones who had stopped exclusively breastfeeding.

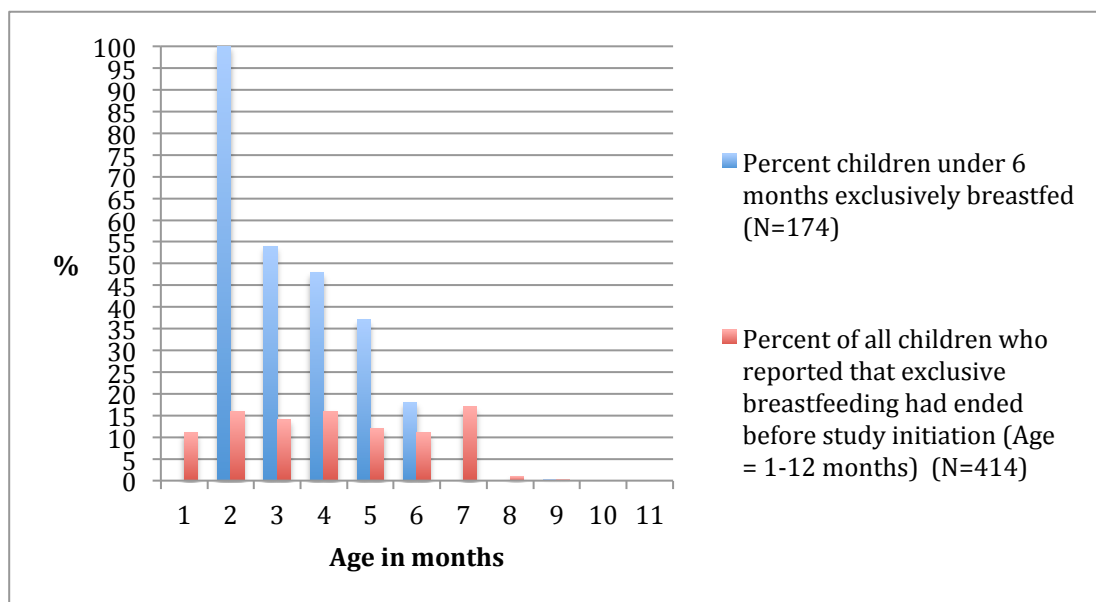


Figure 4 Difference on recall on exclusive breastfeeding between children older and younger than 6 months

1.c Introduction of solid, semi-solid or soft food

The median age for introduction of complementary foods were 3 months (25th percentile = 1, 75th percentile = 5). When the modified IYCF indicators were used 26 % reported that they introduced complementary foods at 6-8 months of age. Most of these children were introduced to complementary foods at 6 months while none at 8 months. Almost 90 children had not yet been introduced to complementary foods.

Figure 5 gives an overview of the recommended duration of exclusive breastfeeding and timing of initiation to complementary foods compared to the median duration in Bhaktapur

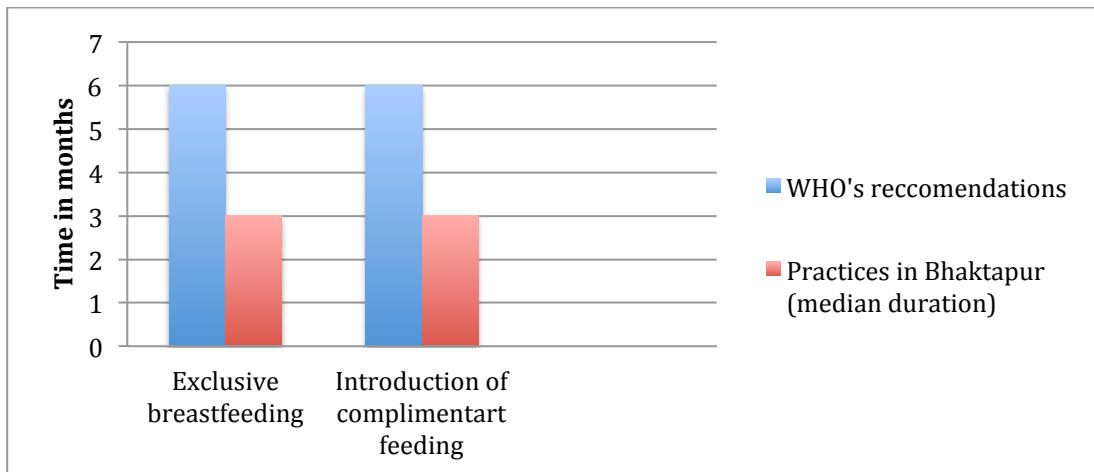


Figure 5 Median duration of exclusive breastfeeding and complementary feeding in Bhaktapur compared to WHO's recommendations.

Figure 6 gives an overview over children under 12 months of age who are exclusively breastfed and receiving complementary food. In this figure all children in the study are taken into account.

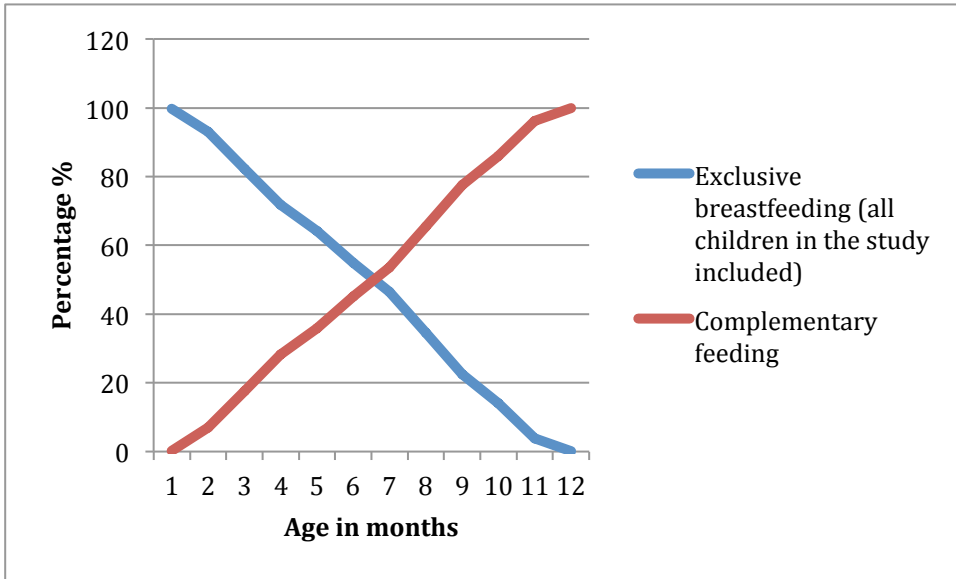


Figure 6 Percentage of infants 1-12 months who are exclusively breastfed and receiving complementary food

6.3. Investigation of other breastfeeding and feeding practices in Bhaktapur (Objective 2)

2.a Fed with colostrum

Table 6 gives an overview of the breastfeeding practices in Bhaktapur other than the IYCF indicators. It describes how many infants that were fed with colostrum, most common liquids given first after birth. It also gives a description of common complementary foods in Bhaktapur and a summary of the mothers' knowledge about WHO's recommendation of 6 months exclusive breastfeeding (Table 6).

Table 6 Summary of the other breastfeeding practices in Bhaktapur (N=489)

Variables	n (%)
Fed with colostrum	447 (92)
First liquid given after birth	
Breast milk:	457 (93)
Glucose water:	2 (0.4)
Water:	21 (4)
Formula milk:	1 (0.2)
Animal milk:	4 (1)
Other:	2 (0.4)
Type of complementary foods¹	
Lito	211 (57)
Cerelac	31 (8)
Animal/dairy milk	13 (4)
Formula	40 (11)
Rice	41 (11)
Other	33 (9)
Knowledge: for how long does the mother think only breast milk is sufficient?²	6 (6, 6) [*]
Less than 6 months	30 (6)
6 months	256 (53)
More than 6 months	4 (0.8)
Did not know	195 (40)

¹Missing: 118

²Missing: 2

* Median (25th percentile, 25th percentile)

2.b First liquid given after birth

The majority of the women (93.8 %) followed the recommendation of WHO and gave breast milk as the first food after birth. The remaining 6 % distributed between glucose water, formula milk, animal milk and water (Table 6).

2.c Type of complementary food first introduced

More than 40 % of the participants responded that lito (mixture of various grains) was the first complementary food introduced. Other food frequently given as first food was rice, formula, cerelac (commercial porridge/cereals from Nestlé), animal or dairy milk (Figure 5 and Table 6).

Table 7 gives an overview of the energy percent from fat in the most common complementary foods and the recommended energy percent from fat. Lito is the only complementary food that cover the recommendation of energy percent from fat for the children older than 9 months (Table 7).

Table 7 Energy percent from fat in complementary foods frequently given

Complementary food	Fat E%
Lito ¹	14.69
Rice	1.54
Cerelac	2.27
Recommended	Needed fat from complementary feeding: 0-34% at 6-8 months, 5-38% at 9-11 months, and 17-42% at 12-23 months ²

¹ Calculated by a standardized recipe.

² Recommendations from PAN AMERICAN HEALTH ORGANIZATION (2003)

Table 8 gives an overview of all of the macronutrients and vitamin A in the most common complementary foods.

Table 8 Overview of all the macronutrients and vitamin A in the most common complementary foods in Bhaktapur.

	Energy (kcal)	Carbohydrates (g)	Protein (g)	Fat (g)	Vit A (µg)
Lito	427.25	66.73	22.73	6.975	134.5
Rice parboiled hand pounded	349	77.4	8.5	0.6	9
Formula¹	67	7.4	1.3	3.6	68
Cerelac²	55	12.5	1.0	0.2	N/A
Buffalo milk	117	5.0	81.0	6.5	48

Amount per 100 grams (Source nutritive value of Indian foods (Gopalan, Rama Sastri, & Balasubramanian, 2000; Mattilsynet & Helsedirektoratet, 2012)

N/A – Not available

¹ Based on NAN pro1 gold infant formula (Nestlé., n.d.-a)

² Information from cerelac, rice made for children, 4-6 months (Nestlé., n.d.-b).

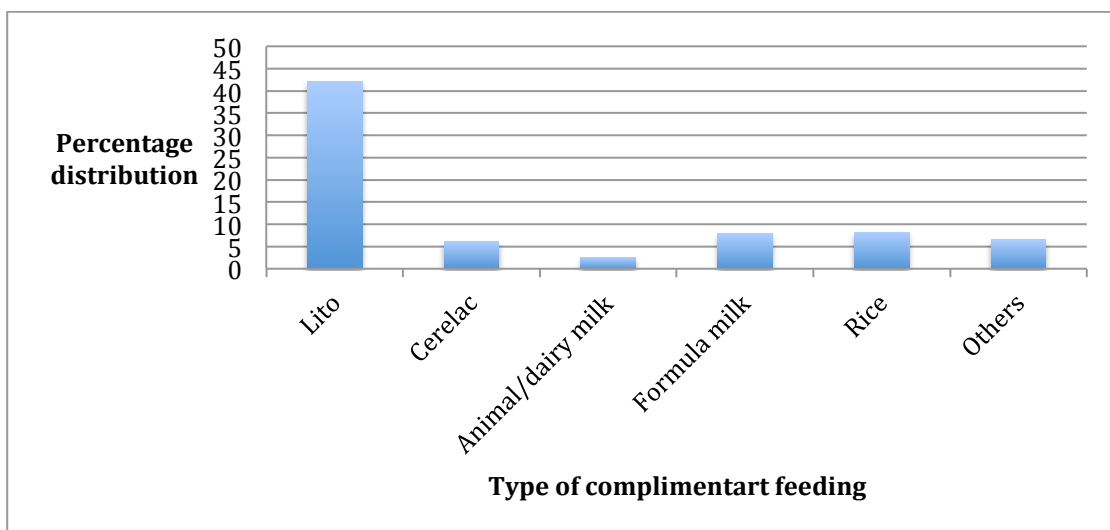


Figure 7 Distribution of common complementary foods introduced as a first meal for the children in Bhaktapur, 2008.

*Missing: 131 (26.2 %)

According to WHO’s recommendation, lito, cerelac and rice have the right texture as complementary foods since they are all semi-solid. Therefore, 56.6 % follows the recommendation on texture of first complementary foods given. Lito is the complementary food with the highest percentage of fat, and from the age of 9 months a higher energy percentage of fat in complementary food would be needed (PAN AMERICAN HEALTH ORGANIZATION, 2003).

2.d Caregivers knowledge about duration of exclusive breastfeeding

We questioned how long the mothers thought that exclusive breastfeeding was sufficient for the child. More than half of the women (52.8 %) responded 6 months, while 6.2% responded that they thought that less than 6 months would be enough for the child. Less than one percent thought that the child would be fine on exclusive breastfeeding for more than 6 months. Additionally, 40.2 % answered that they did not know how long exclusive breastfeeding would be sufficient for the child (Table 6).

6.4. Investigation of associations between WHO's recommendations on breastfeeding and selected background factors (Objective 3)

IYCF indicators

Early initiation of breastfeeding

A significant difference was found between the fathers occupation and timing for initiation of breastfeeding. The fathers' who were unemployed or worked in the agriculture were more likely to be in families where initiation of breastfeeding came later than one hour after birth ($p=0.048$) (Table 9). A significant difference was also found between the mothers BMI and introduction of breastfeeding after birth. Mothers with a low BMI (<18.5) were less likely to initiate breastfeeding within one hour than mothers with a BMI between 18.5 and 24.9 ($p<0.001$). The mothers with a normal BMI were also more likely to initiate breastfeeding than the mothers with a high BMI. A significant difference was also found between where the child was born and early initiation to breastfeeding, where the children born in a health facility were significantly less likely to be introduced to breastfeeding within one hour after birth ($p=0.014$). A weak, but significant negative correlation was found between the timing of initiation of breastfeeding after birth and duration of exclusive breastfeeding ($r=-0,1$, $p=0.041$).

Exclusive breastfeeding under 6 months

A significant correlation between the duration of exclusive breastfeeding and how long the mothers believed that only breastmilk would be enough for the child ($r=-0.17$ $p<0.001$) was found (Table 10). The longer the mother thought only breastfeeding was enough for the child, the longer she exclusively breastfed her child. In addition, there was also a significant correlation between the duration of exclusive breastfeeding and the timing of introduction of complementary foods ($r=0.93$, $p<0.001$).

A significant difference was found between the mothers' choice of occupation. The mothers who were unemployed or in the agriculture business were less likely to exclusive breastfeed their infants for 6 months than the mothers who worked in other sectors ($p=0.042$).

Caregivers knowledge on duration of exclusive breastfeeding

A significant difference was found between the mothers education level and for how long she believed that breastmilk is adequate as the only food for the child ($p < 0.001$) (Table 9). Significantly more of the mothers, with 10 years or more education, thought that 6 months would be enough for the child (Table 8). As for the mothers' education, the fathers' education also seems to affect the knowledge about breastfeeding practices ($p = 0.001$) (Table 9). Tests showed there was a higher probability for the young mothers (<20 years) to have less school than the older mothers ($p < 0.001$). The youngest mothers were also more frequently married to a man with primary school or less education ($p = 0.001$) than the mothers who were older than 20 years old.

However, mothers with a low BMI seemed to be less likely to have knowledge of the recommendation of 6 months exclusive breastfeeding (Table 9).

Table 9 WHO's recommendations on breastfeeding compared to different background factors (N=487)

	Early initiation of breastfeeding		Exclusive breastfeeding		Knowledge about WHO's recommendation	
	Within one hour	p	Under 6 months	p	Knows the recommendation of 6 months	p
Mothers occupation²		0.279		0.042*		0.477
No work/ agriculture:	81.6 %		23.5%		52.9 %	
Other work:	77.0 %		32.8 %		49.2 %	
Fathers occupation³		0.048 *		0.230		0.310
No work/ agriculture:	66.7 %		16.7 %		43.3 %	
Other work:	81.4 %		26.6 %		52.9 %	
Mother school²		0.171		0.303		<0.001 **
Illiterate/ primary:	78.8 %		27.9 %		41.4 %	
Up to 10 years or more:	81.5 %		23.7 %		63.6 %	
Father school⁴		0.473		0.105		0.001 **
Illiterate/ primary:	78.8 %		21.6%		41.2 %	
Up to 10 years or more:	81.5 %		28.4 %		58.1 %	
Gender of the child²		0.511		0.300		0.451
Girl:	79.3 %		28.4%		53.5 %	
Boy:	81.7 %		24.1 %		50.0 %	
Mother age⁵		0.373		0.286		0.467
<20	77.1 %		35.4 %		52.1 %	
21-29	81.8 %		24.7 %		53.2 %	
>30	75.3 %		26.0 %		45.5 %	
Mother BMI⁶		<0.001 **		0.423		0.724
<18.5	57.1 %		38.1 %		42.9 %	
18.5-24.99	84.2 %		25.5 %		51.8 %	
>25	70.1 %		24.7 %		51.9 %	
Birth order of the child		0.103		0.894		0.459
1-2	80.8 %		17.8 %		47.9 %	
>3	72.4 %		17.1 %		52.6 %	
Where was the child born		0.014 *		0.927		0.360
Health facility	78.1 %		17.6 %		51.8 %	
Other	92.5 %		17.1 %		58.5 %	
Birth weight		0.311		0.685		0.875
<2500 g	82.0 %		16.7 %		51.9 %	
>2501 g	78.1 %		18.3 %		52.6 %	

¹X²

²missing: 23

³missing: 26

⁴missing: 24

⁵missing: 22

⁶missing: 28

* Significant at the 0.05-level

** Significant at the 0.01-level

No significant difference was found on introduction of solid, semi-solid or soft food, Feeding of colostrum, and first liquid given after birth and these results are thereby not included in table 9.

Table 10 Correlations on knowledge about the recommendation of 6 months exclusive breastfeeding

Variable	Correlation coefficient	p
Exclusively breastfeeding ¹	-0.174	<0.001
Introduction of complementary feeding ¹	0.000	0.998
Mother BMI ¹	-0.009	0.855
Mother age ¹	-0.073	0.117

¹ Spearman's Rho test for correlation

6.5. Regression analyses

Literacy level of the mother was the strongest predictor for knowledge about the recommendation of 6 months exclusive breastfeeding. The mothers with 10 years or more of education were 67 % more likely to know the recommendation than the less educated mother (Odds = 2) (p=0.001). Mothers with lower literacy level were more likely to introduce breastfeeding within one hour than the mothers with higher education, and the mothers with less than 10 years of education were 33 % more likely to introduce breastfeeding within one hour (Odds = 0.5) (p=0.022) (Figure 8).

Fathers' literacy also significantly predicted some of the breastfeeding practices. The higher level of education he had, the higher the odds his child had to get timely introduction to complementary foods, and to be exclusively breastfed for 6 months. Fathers with more than 10 years of education was 66 % more likely to follow the recommendation on complementary feeding (Odds = 2) (P= 0.01), and 71 % more likely to follow the recommendation on exclusive breastfeeding (Odds 2.5) (p=0.007). Fathers' literacy level also affects which liquid that was given to the child first after birth. The fathers who had 10 years or more of education were 52 % more likely to have children that was given breastmilk as the first liquid (Odds 3) (p=0.031) (Figure 8).

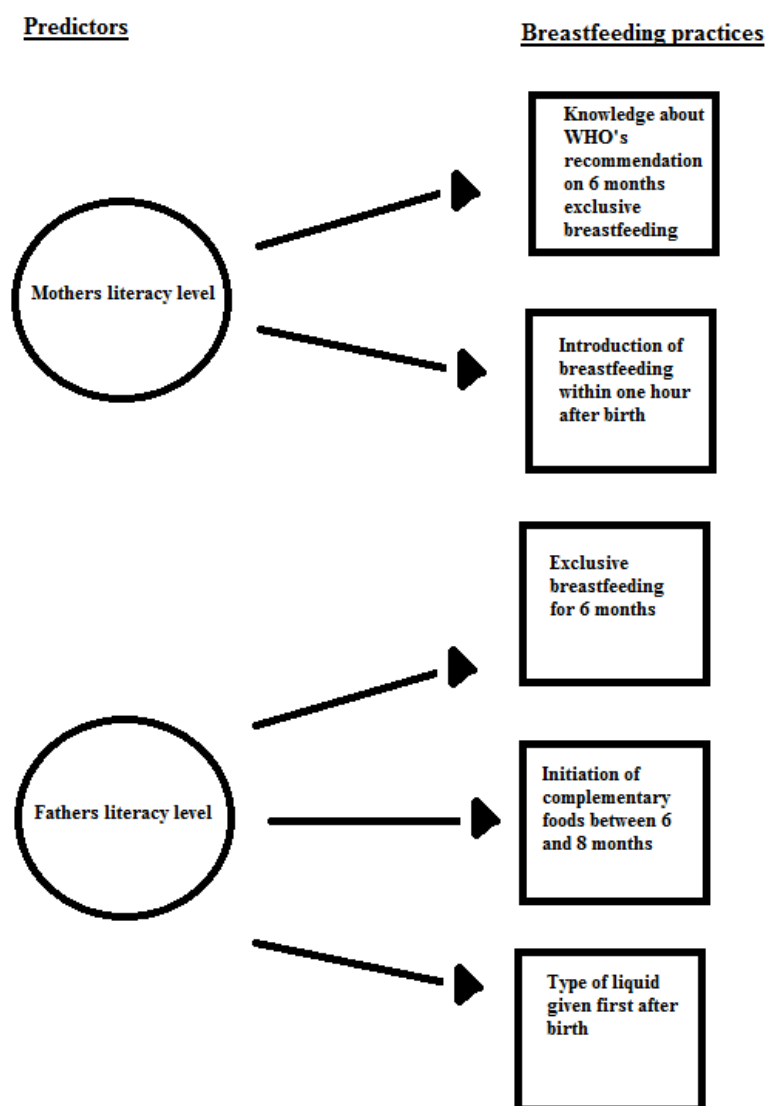


Figure 8 Predictors for breastfeeding practices in Bhaktapur

7. Discussion

This chapter is divided in two sections. First, results from our study are discussed and compared to previous studies in Nepal and other countries. Second issues concerning method are discussed.

7.1. Discussion of the results

7.1.1. Short description of the main findings

Most of the children were early initiated to breastfeeding after birth (80 %), were fed with colostrum (92 %), and were given breastmilk as the first liquid after birth (94 %). Few were however introduced to complementary feeding between 6 and 8 months, and the duration of exclusive breastfeeding was too short with a median duration of 3 months. Forty percent of the mothers with children < 6 months reported that the child was exclusively breastfed, and around 10 % of the mothers who no longer exclusively breastfed their child reported that the child was breastfed for 6 months. Women who were more likely to follow the recommendations of WHO had BMI within the normal range, longer education and knowledge about the recommendation of 6 months exclusive breastfeeding. Also, longer duration of exclusive breastfeeding and women who had given birth another place than a hospital increased the probability of timely introduction to breastfeeding. The results from the regression analyses showed that the strongest predictors of breastfeeding practices in Bhaktapur were the parents' literacy level.

Table 11 Mothers'/fathers' significantly more/less likely to follow the recommendations of WHO

WHO's recommendation	More likely to follow WHO's recommendation	Less likely to follow WHO's recommendation
Early initiation to breastfeeding (within one hour after birth)	<ul style="list-style-type: none"> • Mothers with normal BMI • Longer duration of exclusive breastfeeding • Given birth at a different place than a health facility 	<ul style="list-style-type: none"> • Fathers: unemployed or working in the agriculture industry • Mothers with low /high BMI
Exclusive breastfeeding under 6 months	<ul style="list-style-type: none"> • Mothers' knowledge about exclusive breastfeeding 	<ul style="list-style-type: none"> • Mothers: unemployed or working in the agriculture business
Knowledge about WHO's recommendation of 6 months exclusive breastfeeding	<ul style="list-style-type: none"> • 10 years or more of education for both parents 	<ul style="list-style-type: none"> • Younger mothers

7.1.2. Background characteristics

Most of the children were born in a health facility, which differs from other studies conducted in Nepal (Dhakal, van Teijlingen, Raja, & Dhakal, 2011; Shrestha et al., 2012). The mean birth weight was 2800 grams, which is about -1 SD according to the growth charts of WHO (WHO, 2013a). The prevalence of stunting, underweight and wasting was low: 9.9 %, 5.5 % and 2.1 %. According to the WHO, the prevalence on stunting, underweight and wasting is low in a population if it is below 20 %, 10 % and 5 % (WHO, 2013d). The prevalence on stunting, wasting and underweight found in our study are however low compared to MOHP (2011). MOHP (2011) reported that 41 % of children under the age of 5 are stunted, 11 % wasted and 29 % underweight. Bhaktapur is an urban area, and according to MOHP (2011) it is more common for children in rural areas to be stunted, wasted or underweight than it is in urban.

7.1.3. IYCF Indicators

Early initiation of breastfeeding

The proportion of women who initiated breastfeeding early, are higher in our study than in other studies (Mullany et al., 2008; Chandrashekhar, Joshi, Binu, et al., 2006; Chandrashekhar, Joshi, Sreekumaran, et al., 2006). MOHP (2011) concluded that 44.5 % of the population in Nepal initiated breastfeeding within one hour after birth. These results show a positive trend in Bhaktapur since almost twice as many had an early initiation to breastfeeding in Bhaktapur compared to Nepal in general. A former study in Bhaktapur did however find that only 57 % of the children were initiated to breastfeeding within one hour, which is a lot fewer than in our study (Ulak et al., 2012). Some groups in the society did however stand out as more likely to initiate breastfeeding within one hour. In our study mothers with a BMI within the normal range were more likely to have early initiation to breastfeeding, and these findings are supported by Krause, Lovelady, and Østbye (2011), Hilson, Rasmussen, and Kjolhede (1997), Amir and Donath (2007) and Baker, Michaelsen, Sørensen, and Rasmussen (2007).

There was also a significant correlation between timing of initiation of breastfeeding and duration of exclusive breastfeeding. The mothers who initiated breastfeeding early, were also more likely to exclusively breastfeed their child for

longer. A study from Japan has similar results, where the mothers who introduced breastmilk within 2 hours after birth were more likely to exclusively breastfeed their infants for 4 months (Nakao, Moji, Honda, & Oishi, 2008). The reason for this might be that the mothers who chose to postpone initiation of breastfeeding, chose to give their infant other foods during the first hours after birth.

Another interesting finding is that the father's occupation affected the timing of initiation to breastfeeding. Fathers working in the agriculture industry or stood without work were less likely to have wives who initiated breastfeeding early. It was curious that the father's occupation was associated with the breastfeeding practices. It might be some confounding factors not taken into account since the fathers in general are not present at the birth. When mothers gave birth at a health facility it is the personnel at the hospital that takes most of the decisions right after birth, and it is hard to believe that the fathers' occupation/education should have anything to do with it, even though it is a significant result. Children born in a health facility were however less likely to receive breastmilk within one hour after birth than children born in other places. There might be a higher degree of knowledge in the family when the father has a better job/education and this again might influence the breastfeeding practices. Former studies have found associations between parents literacy level and nutritional status among their children (Ali, Chaundry, & Naqvi, 2011; Arya & Rohini, 1991).

Exclusive breastfeeding under 6 months

In 2011, the proportion of children under 6 months, who was exclusively breastfed in Nepal was 70 % (MOHP, 2011). This is a much higher proportion than in our study, where 40 % of the children under 6 months were exclusively breastfed. The median duration of exclusive breastfeeding in MOHP (2011) was 3.4 months in urban areas, while in our study it was 3 months. Thus in our study, fewer women exclusively breastfed their children and the median duration was shorter than at the national level. One possible explanation the high exclusive breastfeeding rate on a national level compared to our study might be that Bhaktapur is an urban area, which means that the mothers have more access to infant formula than they do in rural areas. MOHP (2011) followed the WHO recommendation on calculations of the IYCF indicators, while we

used the modified formula. Our study is thereby difficult to compare to MOHP (2011), and the differences on the formulas might be an explanation for the different results.

Few former studies have been looking at exclusive breastfeeding for as long as 6 months, but one study, conducted in Bhaktapur found that only 9 % of the children were exclusively breastfed at 6 months of age (Ulak et al., 2012). Our study did not follow the IYCF calculations and is thereby not suited for comparison with the results from our study on 'exclusively breastfeeding under 6 months'. It could however be compared to other results we have found in this study where all the mothers who were no longer exclusively breastfeeding their infants were asked to recall when they stopped exclusively breastfeeding. Our results on this indicator shows 10 %, which is much closer to the results of Ulak et al. (2012). A study who followed their participants for two months concluded that more than 80 % were still exclusively breastfeeding their child (Chandrashekhar, Joshi, Binu, et al., 2006).

In our study, factors influencing the duration of exclusive breastfeeding were the mother's knowledge about the recommendations and the employment of the mothers. The higher educated the parents were, the more likely they were to know the recommendations. Other studies support this. One study found that if the fathers had formal employment they were more likely to encourage exclusive breastfeeding (Bhatta, 2013). The same study, did however find that fewer years of education was more positive for duration of exclusive breastfeeding than longer education. There might be several reasons for choosing not to exclusively breastfeed your infant. The strongest associations found in our study was for how long the mother thought breastmilk was sufficient for the child, and mothers who had an income (different work than agriculture). A study from Japan that looked at factors that affected the breastfeeding practices suggested that mothers who were older than 24 years, who didn't decide to breastfeed before giving birth and who didn't give breastmilk as first food, were less likely to ever exclusively breastfeed their infant (Qui, Zhao, Binns, Lee, & Xie, 2009). In our study, we looked at age of the mother, but no significant difference was found between older and younger mother. We did however find that if breastmilk was initiated early, the mother were more likely to exclusively breastfeed her infant for six months, which supports the findings of Qui et al. (2009).

In the results section a model has been made to illustrate the differences between children younger than 6 months who were still exclusively breastfed and the children who had stopped exclusively breastfeeding. This illustrates the differences on recall incidents that happened a long time ago and the day before. It is however curious that the mothers who were not exclusively breastfeeding their children anymore seemed to underestimate and not overestimate the duration of exclusive breastfeeding. Some of the results are in the mean time impossible to compare. There were much fewer children in the group younger than 6 months who were still exclusively breastfed compared to the children who had stopped exclusively breastfeeding. For instance, it was only one child in the group of children who were 2 months of age during the study, and this child was still exclusively breastfed. Thus 100 % of the children were still exclusively breastfed at 2 months. This cannot be used to draw any conclusions on exclusive breastfeeding. The mothers' knowledge and on the timing of introduction to complementary foods, correlated with duration on exclusive breastfeeding. Different cut off values for strength of correlation have been suggested (Pallant, 2011). Pallant (2011) suggested to use the following definition: A small correlation is $r=0.10-0.29$, a medium correlation is $r=0.30-0.49$, and a large correlation is $r=0.5-1.0$. According to these indicators, the mother's knowledge and exclusive breastfeeding correlated, but the correlation coefficient was small. In regard to the duration of exclusive breastfeeding and introduction to complementary foods the correlation coefficient was large.

Introduction of solid, semi-solid or soft food

We found that the median age for introduction of complementary foods was 3 months, and that 26 % followed the recommendation and initiated complementary foods between 6 and 8 months. Former studies in Nepal that have been looking at initiation of soft, solid or semi-solid foods have concluded that half of the mothers had introduced foods before the child was 3 months of age (Moffat, 2002), while another study found that 70 % introduced complementary foods at the right time (6-8 months) (Senarath et al., 2011). Ulak et al. (2012) conducted a study in Bhaktapur and found that 79 % introduced complementary feeding at 6 months. This is much higher than in our study from the same area. MOHP (2011) reported that 66 % of the children in Nepal were introduced to solid, semi-solid or soft food at the age of 6-8 months. The results from

the studies on introduction of solid, semi-solid and soft food varies a lot, but most of the studies shows that timely introduction of complementary foods happens more often than in our study.

The IYCFs' indicator on introduction of solid, semi-solid and soft food is recommended to use on children from 6-8 months of age. Since our study have children from 1-12 months of age, and since they were asked about introduction of complementary foods at different ages in addition to have to remember the age of the child when the food was introduced, the IYCF indicator was difficult to use. By selecting only the children older than 6 months it was possible to calculate the proportion that reported initiation of complementary foods between the age of 6 months and 8 months. Here, as well as with the question on exclusively breastfeeding, recall bias might be a problem. However it might be a smaller problem with the question on complementary feeding than with the question of exclusively breastfeeding since it's has a shorter recall-time (maximum 4 months).

7.1.4. Other breastfeeding and feeding practices in Bhaktapur

Colostrum

Former studies that have been investigating feeding of colostrum show similar results to the results of our study. Ulak et al. (2012) found in their study that 91 % gave their children colostrum, which is almost the same as the results of our study, while Chandrashekhar, Joshi, Sreekumaran, et al. (2006) found that 11 % discarded colostrum which is a little lower than what we found in our study. In general there are few studies on infants fed with colostrum. This indicator questions an incidence right after birth. The shorter the time period from birth until the question is asked, the easier it is for the mother to remember whether or not she fed her child with colostrum. It is important to know if the mothers are aware of what colostrum is. This is an easier parameter to remember than some of the other parameters asked in our study. The reason for this is that to avoid feeding your child with colostrum the woman either has to avoid breastfeeding, or she has to remove the first milk by pumping.

First liquid given after birth

By asking the mothers what liquid they first gave to their child after birth we got more information on breastfeeding practices right after birth. Even though 20 % did not introduce breastmilk within one hour, almost 94 % of the mothers did give breastmilk as first liquid after birth. Although it has taken more time than WHO recommend, breastmilk is still the first choice for most of the women. There may be various reasons for postponing initiation of breastfeeding. Qui et al. (2009) suggested that maternal age and education are important factors for initiation of breastfeeding. When given birth at a hospital it is not necessarily the mother who decides when the child is put to her chest, but the health personnel. Our study showed that the mothers who gave birth at a health facility were less likely to initiate breastfeeding within one hour than the mothers who gave birth elsewhere. This might implicate that other practices has a higher priority than early initiation of breastfeeding at hospitals.

Type of complementary foods first introduced

The most common complementary food was vegetarian. According to WHO, vegetarian diets cannot meet nutrient needs at this age unless nutrient supplements or fortified products are used (PAN AMERICAN HEALTH ORGANIZATION, 2003). Calculation on energy percent was done and Lito (local semi-solid porridge based on maize and rice) seems to be the best choice of the complementary foods that are presented in our study. Lito was also common to give as complementary food in another study conducted in Bhaktapur (Ulak et al., 2012). Lito is high in energy and in unsaturated fat, but it is not fortified with the vitamins or minerals. Micronutrient deficiency is not unusual in developing countries, especially deficiencies in vitamin A, iodine and iron is common for children (UNICEF, 2003a). By giving complementary foods that are fortified, it is possible to meet the dietary need of an infant. For the child to meet its dietary needs without using fortified products, it is important to include food from animals in addition to a variety of vegetables, fruits, legumes and staple foods.

It is however not done any estimation on meal frequency nor amount of food, so it is thereby not possible to know whether or not the children get enough energy and nutrients to cover their needs.

Caregivers knowledge about WHO's recommendations

There was only one question in this form to measure knowledge on WHO recommendations on breastfeeding. The question they were asked was ‘How long (months) do you think only breastmilk is enough for child?’ It could be useful to ask about the other indicators from IYCF as well, to get more indicators on knowledge. For example we could have asked about initiation of breastfeeding after birth and timing of introduction of complementary feeding as well. The results from our study show that knowledge among the parents affects several of the breastfeeding indicators/practices, and there is a link between the duration of education received, and the probability to know the recommendation of six months of exclusively breastfeeding. This again emphasizes the importance of promoting school and education. By increasing the education rates and the duration children stay in school, the literacy rate will improve. By attending school, children can improve both their literacy rate and their health literacy rate which will help them making better decisions about their own health later in life. Improved health literacy might help people to do better health enhancing choices (Nutbeam, Harris, & Wise, 2010).

Also, it is important to add that the respondents do not necessarily know that 6 months of exclusive breastfeeding is the recommendation of WHO. The question they were asked did not directly ask about the recommendation from WHO on 6 months exclusively breastfeeding. It is simply a question about for how long the mothers believe that breastmilk is sufficient. It is thereby misleading to call the parameter for knowledge about WHO's recommendation, even though it gave an indication on that.

7.2. Discussion of the method

7.2.1. Design and study sample

Our study had a cross-sectional design, which has both advantages and disadvantages. First of all, the data are relatively easy to collect (Carneira & Howard, 2011). Second it is a study type that is rapid to complete, and it is a good choice when prevalence is one of the parameters that are measured. The negative aspects are that the outcomes and the exposures are measured at the same time and it is therefore not possible to know if exposure preceded the outcome (Carneira & Howard, 2011). As a

result causes and effects of the breastfeeding practices cannot be concluded. A cross sectional study can however produce hypotheses and associations.

According to Carneira and Howard (2011) cross-sectional studies have medium probability of selection bias and medium probability of confounding. There are many types of biases, which can affect the results. In our study, information bias, recall bias and selection bias, will be discussed more thoroughly in the chapter 'Bias and confounding'.

Cluster randomization of the different areas in Bhaktapur was used, and the women-children pairs in the different areas were randomly selected. A limitation of the study sample was that only the women who were breastfeeding their infants were chosen to participate. It would have been interesting and useful to include the women who were not breastfeeding their infants to estimate the proportion of this group as well. Our study had many contestants, and a low dropout rate. In total, 500 women/infant-pairs were asked to join the study, and 489 gave information on breastfeeding, which gives a dropout rate of 2.2 %. There were also an equal proportion of girls and boys.

7.2.2. Questionnaire and interview

Our study was a part of a larger survey, where breastfeeding practices was only a small part. A more detailed questionnaire, equal to the IYCF, would make our study easier to compare to other studies. It would also be easier to calculate the different IYCF indicators and to draw conclusions since WHO recommends this method. Strength of our study was that trained fieldworkers conducted the interviews. The fieldworkers had the same gender, and came from the same cultural and geographic areas as the women who were interviewed.

The interviews were conducted at the hospital, which has both strengths and limitations. The strengths of conducting an interview at the hospital is that it is more time efficient, than it is for the fieldworkers to walk from house to house. It might also increase the probability for honest answers from the participants since it reduces the probability of interference from family members/friends who are curious about the project. If many people are listening to the woman's answer, she might answer different than she would if the interviewer and the woman were the only ones present. Another positive factor by doing the interviews at the hospital is that every participant gets equal

conditions in the interview situation. A negative aspect is that it is not possible for the fieldworker to do observations in the woman's/child's natural environment. To make observations is more important in qualitative research, but it might be useful in this type of study as well. Elwood and Martin (2000) agrees in this statement and stresses the importance of observation in addition to the interview. To our knowledge little research has been done on the importance of location in quantitative interviews. Even though it might not be as important in quantitative research as in qualitative research, location might influence how the women in our study respond. For example, the interview situation might feel more "serious" at the hospital than in the participant's home, which could make her nervous.

The interview form was structured, which means there was little room for the women to explain their answers, and most of the questions had fixed categories. This could mean that the women at some point had to choose the category that was closest to the truth, but not necessarily the exact truth. However, since this survey had almost 500 participants, it would be too much to analyze if the categories were not fixed, and the women were able to respond to the questions freely. The interview technique would hence be more qualitative and it would be too time-demanding to analyze as many as 500 interviews.

7.2.3. Bias and confounding

In our study there might have been an information bias in the question of exclusively breastfeeding. If the mothers have not been given proper information on the strict rules about exclusive breastfeeding, the results from this question may be biased. If none of the fieldworkers have explained to the participants what exclusive breastfeeding is, and asked the question precisely as in the questionnaire, the results may have systematic errors, or information bias. If most of the respondents were explained what exclusively breastfeeding is, random errors might have occurred. Random errors are not as severe as information bias (Carneira & Howard, 2011).

Recall bias might also be a problem with this study design. Several of the questions demanded that the mother remembered events from the past. It can be difficult to remember exactly when an incidence took place, and according to Olinto, Victoria, Barros, and Gigante (1995) you can recon a 19 % error on 24 hour recall on

breast feeding on malnourished children and a 3 % error on normal weight children. Few of the children in our study were malnourished, so based on the statement of Olinto et al. (1995), the recall bias should be low. However, since the interviews conducted in our study required a longer period of recall, the error might be larger than 3 %. A study from 2008 compared 3 days weighed food records with a 24 hour recall and concluded that 24 hour recall could lead to an overestimation of 13 % among infants, while the 3 day weighing were only within 5 % of the estimated energy requirement (Fisher et al., 2008). A study conducted in Norway had different results (Natland, Andersen, Nilsen, Forsmo, & Jacobsen, 2012). The study collected data on breastfeeding practices during the first year after birth. Then they asked the women about the breastfeeding practices 20 years later, to see how well the women remembered the duration of breastfeeding. Two thirds of the women recalled their breastfeeding to within one month, and the median overestimation was 2 weeks (Natland et al., 2012). One way to overcome recall bias as a source of error is by having a prospective design. A prospective design can however, lead to improvements in breastfeeding practices (Ulak et al., 2012).

Selection bias is another source of error that might occur in clinical science. The only way to avoid this bias is to do a randomized controlled trial (RCT). To reduce the probability of selection bias in our study, the contestants were randomly selected from different areas of Bhaktapur.

Our study had a cross sectional design and it is not possible to say anything about cause-effect. It is therefore important to be careful drawing any conclusions on what factors that may be causing what. Caste might have been a confounder, since caste is a difficult factor to measure. People of lower caste might not admit to belonging to that particular caste. Our study was cluster randomized, and the participants in the chosen clusters were also randomized. By randomizing the participants, the probability of confounding is reduced (Carneira & Howard, 2011).

7.2.3. Reliability and validity of exclusive breastfeeding

Aarts et al. (2000) question the validity of using 24 hour recall as the only method to measure breastfeeding practices. Since only a tablespoon of water is enough for the child not to be exclusively breastfed this might be the most important IYCF indicator to discuss. Although the method used, is not 24-hour recall, it is still similar, and it is

likely that the interview method in our study has the same weakness as a 24-hour recall-interview does. Aarts et al. (2000) propose that ‘exclusive breastfeeding since birth’ should be added to the studies on exclusive breastfeeding in addition to ‘exclusive breastfeeding during the last 24 hours’ to strengthen the probability of knowing the true proportion of infants that were exclusively breastfed (Aarts et al., 2000). To know if the results from our study were reliable, more studies on breastfeeding in Bhaktapur would have been needed. Since the IYCF indicators are not used in the exact way as the report suggests it is difficult to see if the results are correlating with other studies on breastfeeding practices. Ulak et al. (2012) findings are similar to the findings in our study on colostrum, one of the indicators on exclusive breastfeeding under 6 months and type of complementary foods first introduced. This strengthens the reliability on these indicators. However, the large difference in our study on the results on exclusive breastfeeding under 6 months between ‘children under 6 months of age’ (40 %) and ‘all children participating in the study’ (11 %) indicate that there might be a difference on how well this question was understood and interpreted by the mothers, as well as recall period. This again affects the reliability of the study. Either the mothers of the children under 6 months have misunderstood the difference of exclusive and predominant breastfeeding, or the mothers of the children older than 6 months have underestimated the duration of exclusive breastfeeding. It could have been more accurate to call this indicator predominant breastfeeding under 6 months, especially considering the fact that festivals where infants are given water as a ritual are not taken into account.

Our study can only be generalized to women who are breastfeeding their infants in an urban area in Nepal. It cannot be generalized to all women with infants in Nepal, nor women from more rural areas because of differences in culture (MOHP, 2011), access to health facilities and degree of education (MOHP, 2011). People living in urban areas of Nepal does more often have electricity, clean drinking water and a higher education (MOHP, 2011). We do believe that the study population was representative for the local population. This is because the Siddhi Memorial Hospital, where the study took place, is widely used in the community (Ulak et al., 2012), and because all infants from the area were screened during the study period (Ulak et al., 2012). This again made it possible to see if the children/parents participating in the study had similar characteristics to the rest of the population).

7.3. Potential for improvements and future studies

There are several potential for improvements in our study. The questionnaire should have used the same questions and the same age-groups as the recommended indicators (IYCF) by WHO. This would make it easier to do the calculations, and easier to compare our study to other studies, and it would thereby be easier to draw conclusions that can be used in studies in the future. For example, mothers with infants older than 6 months should not have been asked about exclusively breastfeeding, instead they should have been asked about breastfeeding in general. More questions on breastfeeding in general should have been included. There is no possibility to know from the questionnaire if the child was still breastfed unless it was still exclusively breastfed. Other indicators, such as questions about types and amount of food could also be important to investigate. By collecting information on minimum dietary diversity, minimum meal frequency and minimum acceptable diet we could see if the children who were no longer exclusively breastfed had an acceptable diet that met their nutritional requirements. Therefore, in future nutritional research in Nepal I would like to encourage more research on *all* of the IYCF indicators.

8. Conclusion

In our study the breastfeeding practices in Bhaktapur have been compared to some of the indicators from WHO's 'Indicators for assessing infant and young child feeding practices' (IYCF), and other breastfeeding recommendations from WHO. The results show that duration of exclusive breastfeeding is too short and that introduction to complementary foods happens too early. The proportion of mothers that have an early initiation to breastfeeding and feeding with colostrum are high. The most common complementary foods are vegetarian, and without fortification, this food is not enough to cover the basic needs for micronutrients in an infant. Degree of education among the parents seems to affect the feeding practices of the children, and this makes education for both genders important to focus on for the future generations. Our results emphasize the influence of the parents' socioeconomic status on infant feeding practices and suggest that women of poor socioeconomic status should be given special attention with regard to breastfeeding support.

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10. Appendices

Appendix 1: Summary of fieldwork in Nepal

Appendix 2: Questionnaire

Appendix 3: Questionnaire

10.1 Appendix 1: Summary of the fieldwork in Nepal

Objectives and results of the field work

5 weeks of fieldwork was conducted at Siddhi Memorial Hospital during the fall of 2012. The fieldwork was primarily to support a follow up study from the study in 2008. This study looks at the same participants as in this survey and will look at micronutrient deficiency and mental development among others.

My main objectives from the fieldwork in Nepal was:

- Learn about the Nepali culture to better understand my data from my thesis, and to make it easier to interpret the data. Cultural understanding is important when it comes to drawing conclusions.
- Train the fieldworkers in the new project in 24 hour recall interview technique for a follow up study.

The first objective demanded observation of children eating in their natural feeding settings, as well as talking to parents in with experience of feeding infant and small children. Cultural belief about the uncleanliness of bringing cooked rice into other households is one example. Most of the home visits were also done by the field workers who walked by foot from house to house. The training of the new fieldworkers was mainly done at the hospital, but after completing the course, the fieldworkers practiced in the field.

Notes from the fieldwork

During my first days of fieldwork I early got to know the Siddhi Memorial Hospital in Bhaktapur and the staff at the Project. Together with the fieldworkers I did home visits, which was an excellent way of observing families in their living conditions. I both talked with fieldworkers about children's food habits, and observed how the caregivers prepared the children's food in their homes. I learned how they interviewed the participants and saw their living conditions. Practical issues like how much equipment the field workers were able to carry and the logistics for the home visits were also observed.

Observing and talking to caregivers (with fieldworkers translating) also took place at the hospital. I was also fortunate enough to be accepted in a Nepali family, where I spent a lot of time learning about their religion, food habits, family life and rituals.

10.2 Appendix 2: Questionnaire

Form B, Household survey

Child serial no.	CHSNO	
Name of child	BFB_1	
Date of birth	BFB_2	
Age in months (completed)	BFB_3	
Sex (1=Male, 2=Female)	BFB_4	
Birth order of the child	BFB_5	
Date of Interview	BFB_6	
Informant (3=mother, 4=Grandparents, 5=Father, 6=Other relative)	BFB_7	
Mother's Occupation	BFB_8	
Father's Occupation	BFB_9	
Occupation: 1=no work, 2= agriculture, 3=Carpet worker, 4=Daily wage earner, 5= Self employs, 6 = Services, 7 = other, 9 = Not applicable		
Literacy father	BFB_10	
Literacy mother	BFB_11	
(1=Illiterate, 2= Primary, 3= Up to class 10, 4= Intermediate, 5 = Bachelor, 6= Above		
Where was the Child born? (1= Home, 2= Health facility, 3= Others)	BFB_12	
Written documentation of birth weight (1=Yes, 2= No)	BFB_13	
Birth weight in grams according to card/Mothers recall (Not applicable: 9999)	BFB_14	
Hours spent away from child every day by mother	BFB_15	
If BFB_15 is not zero, who is taking care of the child during absence of mother? (1= Father, 2= Grandparents, 3= Older sister, 4= Day-care center, 5= others)	BFB_16	

Does the child still breastfeed? (1=yes, 2= No)	BFB_17	
If yes, numbers of breastfeeding in the last 24 hours	BFB_18	
If no, at what age breastfeeding stopped (in months) (99= Not applicable)	BFB_19	
Child was exclusively breastfed till what age (In months) (99= Not applicable)	BFB_20	
If not exclusively breastfed, at what age complementary food was introduced (in months) (99= Not applicable)	BFB_21	
	Supervisor	
	Data Entry 1	
	Data Entry 2	

10.3 Appendix 3: Questionnaire

Form E - Breastfeeding form

To be filled during enrollment of child (Code 1=yes, 2=No, 9= Not applicable)		
	CHSUNO	
Child Enroll Number	E_1	
Date (DMY, according to English calendar)	E_2	
FW code	E_3	
Age in months	E_4	
Did you get any information on breastfeeding? (1= yes, at ANC, 2=no, 3=yes, from other sources, specify)	E_5	
How long (months) do you think only breast milk will be enough for child? (99 if do not know)	E_6	
When was breastfeeding initiated after birth? (1=within 1 hour, 2=2-4 hours, 3= 5-24 hours, 4=after 24 hours)	E_7	
Which food was given first after birth (1=breast milk, 2= glucose water, 3=formula milk, 4=animal milk, 5=others, specify)	E_8	
Did you feed with colostrum?	E_9	
Was the child hospitalized during the first month after birth? (2=no, 3=Meningitis, 4= Pneumonia, 5=Preterm, LBW, 6= Sepsis, 7= Others)	E_10	
If others, specify	E_10txt	
How long child was feed on exclusively breastfeeding (months)?	E_11	
If not exclusively breastfed, at what age complementary food was introduced (in months) 99 Not applicable	E_12	

<p>Which complementary food was given first? (1=Lito, 2=Cerelac, 3=Animal/dairy milk, 3=Formula milk, 5= Rice, 6=Others</p>	<p>E_13</p>	
<p>Reason for introducing other food before 6 months of age (1= crying/hungry, 2=mother illness, 3= no enough breast milk, 4=working mother, 5= others, 9=NA)</p>	<p>E_14</p>	
<p>Who gave advice for introduction of other food before 6 months of age (1=mother self, 2=maternal grand mother, 3=paternal grand mother, 4=relatives/ neighbors, 5=others.</p>	<p>E_15</p>	
<p>Supervisor signature</p>		