

**Knowledge, attitudes, beliefs and behaviour of mothers of young
children related to healthy eating: Comparing rural and urban
perspectives in Nepal**

**A thesis submitted in partial fulfilment of the requirements of
Bournemouth University for the degree of
Doctor of Philosophy**

Jib R. Acharya

**Faculty of Health and Social Sciences
Bournemouth University**

November 2017

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DEDICATION

This work is dedicated to my father Lt. Shri Lok Prasad Acharya, I had lost him in my early childhood and my father-in-law Lt. Shri Ganesh Prasad Chaulagain whom I lost during this study. Moreover, I would like to dedicate this study to all the undernourished children of Kaski District of Nepal.

ABSTRACT

Knowledge, attitudes, beliefs, and behaviour of mothers of young children related to healthy eating:
Comparing rural and urban perspectives in Nepal.

Jib R. Acharya

Introduction

Mothers' misconception of a healthy diet is one of the major causes of nutritional problems in preschool-aged children in Nepal and these beliefs and attitudes can result in the inappropriate feeding of young children. There is growing research on this topic in Nepal but very little from a public health perspective. This thesis has been designed to cover gaps in this understanding, especially mothers' decision-making around feeding their children and is based on a general public health/behavioural change model conceptualised by Marks *et al.*, (2001).

Aim

The aim of this thesis was to compare food knowledge, beliefs, attitudes and behaviour related to feeding preschool-aged children in rural and urban Nepalese mothers.

Objectives

The objectives were to:

- i. assess the knowledge, attitudes, and beliefs about nutritious food amongst mothers.
- ii. identify major barriers that are associated with existing cultures, religions and ethnic divisions; including public opinions for recommending healthy food for preschool-aged children.
- iii. assess health-seeking behaviour for rural and urban children of low socio-economic status.
- iv. determine factors that affect the availability of food locally.
- v. measure the mothers' knowledge of and attitudes towards health promotion and food security.
- vi. evaluate the health-seeking behaviours for undernourished children and the reasons why.
- vii. seek mothers' suggestions for a better nutritional environment.
- viii. evaluate the perceptions about healthy diet amongst the stakeholders, such as policy people, health professionals (low level to mid-level), pharmacists and spiritual healers.

Methods:

This research used a mixed-methods approach in two different locations in Nepal, including a quantitative survey and qualitative focus group discussions. The questionnaire comprised open-ended and structured questions on knowledge, beliefs, and attitudes about nutritious food, child-feeding patterns, food recommendations, major barriers, food insecurity, and health-seeking behaviours. A descriptive data analysis approach was used to analyse the quantitative data by using SPSS version

21.0. The qualitative focus groups aimed to collect in-depth information around attitudes and beliefs and data were thematically analysed.

Results:

A total of 524 mothers completed the questionnaire. All had children aged 36 – 60 months and were no longer breastfeeding at the time, from rural (n=228) and urban (n=296) localities. In addition, 50 key informants participated in seven focus groups. The findings revealed that 66% of children were being fed by mothers and only 5% by fathers. The major barriers to recommending nutritious foods perceived by mothers included: lack of knowledge (19%); high prices (45%); and cultural influences or beliefs (13%). Almost 12% of mothers never fed colostrum to their children and 34% were unable to identify nutritious food when shopping at grocery stores, whilst 19% lacked food at home. Nearly 57% of children had been taken at least once to a spiritual healer for treatment and 16% more than once. The focus group analysis suggested that important factors associated with knowledge, attitudes, and beliefs about a healthy diet are: poverty, education level, strong cultural beliefs, family size, household income, time, and a growing preference for fast food.

Conclusions:

Levels of knowledge on what types of food are nutritious were low in both urban and rural mothers and their attitudes and views appear to be poorly-informed. Mothers from both rural and urban communities had great faith in spiritual healers. This study suggests that a public health approach is needed to address nutrition problems associated with behaviour and revealed major barriers to maternal knowledge, which were associated with poverty, resources, mothers' education level, and climate change. Diversified and conflicting views were also found to be a major barrier preventing mothers from making better decisions. Thus, special attention should be paid at the practitioner and policy-maker level on appropriate interventions and approaches, based on changing these cultural beliefs and behaviours, to help reduce undernutrition in poor communities.

Keywords:

Malnutrition; knowledge, attitudes, beliefs, food; nutrition, poverty; health, South Asia.

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ACKNOWLEDGEMENTS

I would like to express my heartiest gratitude to those individuals who have made this study possible and helped me untiringly at every step. It would not be possible to bring this work to completion without them.

I am deeply indebted to my most respected supervisors Prof. Edwin van Teijlingen, Prof. Jane Murphy and Senior Lecturer Dr Martin Hind for their invaluable support, guidance, and assistance being available at any time, and for supervising me very patiently and calmly even at their busiest moments.

I acknowledge the SIGHT and LIFE (Basel, Switzerland) who is one of my highly respected organisations on this earth, who open my destiny through its generous support from 2000 to the present day. It is no exaggeration to say that but for this organisation, I would not have come so far on my journey as a Ph.D. scholar and researcher that also made possible my preliminary education in the UK many years ago. I consider myself very fortunate and lucky to have been able to have this association with Sight and Life and its excellent including entire team. Consequently, I would in particular like to offer my sincere thanks to Dr Klaus Kraemer and the Late Dr Martin Frigg for their always fair judgement and support.

I also must convey many thanks to the PGR Development Fund of Bournemouth University and the Santander Universities Fund which through their support made it possible for me to undertake my fieldwork and encouraged me to attend a prestigious conference which as a result qualified me to reach a still higher level of outreach for my specialist area of research.

I would like to express my sincere thanks to the Global Supplementary Grant Program (GSGP)/ Open Society Foundations (OSF) –Europe, who gave me an award to partly cover my tuition fees for the academic year 2012-13 and 2013-14, which in turn also helped to strengthen my confidence level and encouragement this support provided. Without this, it would have been very difficult for me to achieve wider knowledge on my subject area.

I am grateful to the British Library for getting religious and historical information through relevant books which are associated with food and health-seeking behaviours including food classifications based on culture and religion. It helped me to decorate my thesis appropriately.

I am most grateful to the research administrator from the Faculty of Health & Social Sciences who always kept me aware of my milestones and other crucial practical matters and for their invaluable cooperation and hospitality throughout.

I would like to give many thanks to La' Grandee International College of Pokhara, Nepal, who provided skilful manpower support for my field study and helped me to complete it on time. I also thank to team CWSN/Asha Health Care and Pokhara Sub-Metropolitan City who provided written consent to collect data from its working area. I also would like to thank the Western Regional

Health Directorate, Western Health Training Centre, District Public Health Office Kaski, Vaccine Surveillance office of WHO, Nepal Health Sector Support Programme (DFID) Office, District Development Committee Kaski, SUAAHARA Project (Save the Children/USAID). I also like to give my sincere thanks to all the mothers and participants in the study population, and those who gave their valuable time to participate in focus group discussions.

I would like to express my sincere thanks to the Nepal Research Council who provided ethical approval and enabled me to collect data, and also for its invaluable feedback and moral support in the process to gain ethical approval.

I would like to thank all of my colleagues who shared their skills, experiences and co-operated with me at every stage of my research journey.

I would like to thank my family members Nirmal and Amrita including my sweet 'Avyud' who always anxiously waiting to meet up and play with his lovely 'Viju', and Alan Mercel-Sanca for their dedication, morale and enthusiastic support as family members. They have given to me through every step of undertaking my Ph.D. journey.

I would like to convey my hearty thanks to my mother (got a partial paralysis due to the earthquake) who kept her distance and stayed alone at home with my whole family and even at the very tragic earthquake situation during my study period: this care for my necessary concentration and the space from the normal recourse of family life was given to me by my mother and family with the greatest goodwill and thoughtfulness. I also heartily thank my beloved wife Mrs Raj Kumari Chaulagain Acharya for taking care of me and my children, and house during my engagement in study and also from my flourishing loving children Pramesh and Protshana who kept their distance from me due to my study.

DECLARATIONS OF AUTHORSHIP

I, Jib R. Acharya, declare that the thesis entitled “Knowledge, attitudes, beliefs, and behaviours of mothers of young children related to healthy eating: Comparing rural and urban perspectives in Nepal.” and the work presented in it are my own. I confirm that:

- This project was solely completed by me while in candidature for a research degree at Bournemouth University;
- Where any part of this thesis has previously been submitted for a degree or any other qualification in any other institution or at this university, this has been clearly mentioned;
- Where I have consulted the published work of others, this is always clearly accredited;
- Where I have quoted from the work of others, the source is always given. With the expectation of such quotations this thesis is entirely my own work;
- I have acknowledged all primary sources of help;
- Where the thesis is based on work done by myself, I have made clear exactly what I have contributed myself;
- Any personal data have been processed in accordance with the provisions of the Data Protection Act 1998;
- The sources of information specifically acknowledged;
- All quotations have been distinguished by quotation marks;
- Some part of this effort has been published before this submission as:
 1. Acharya, J., van Teijlingen, E., Murphy, J. and Hind, M., 2015. Assessment of knowledge, beliefs, and attitudes towards healthy diet among mothers in Kaski, Nepal. *Participation*, 17 (16), 61-72.
 2. Acharya, J., van Teijlingen, E., Murphy, J. and Hind, M., 2015. Study on Nutritional Problems in Preschool-Aged Children of Kaski District of Nepal. *Journal of Multidisciplinary Research in Healthcare*, 1(2), 97-118.
 3. Acharya, J., van Teijlingen, E., Murphy, J. and Hind, M., 2014. A comparative study of nutritional problems in preschool-aged children in Nepal. *International Journal of Community Nutrition*, 0(Suppl), 135
 4. Acharya, J., van Teijlingen, E., Murphy, J., Subedi, K., Dahal, M. and Mercel-Sanca, A., 2017. Impact of parental food beliefs on preschool-aged children in Kaski district of Nepal: A qualitative study (this paper has been submitted to SAGE/Inquiry Journal for the publication and waiting for the result).

Signed : 

LIST OF ABBREVIATIONS

AAP	American Academy of Paediatrics
AC	Asha Clinic
ADB	Asian Development Bank
AHC	Asha Health Care
AHW	Auxiliary Health Worker
ANC	Antenatal Care
ANM	Auxiliary Nurse Midwife
BF	Breast Feeding
BMI	Body Mass Index
BPH	Bachelor of Public Health
BU	Bournemouth University
CBOs	Community Based Organizations
CBS	Central Bureau of Statistics
CF	Complementary Food
CFP	Complementary Feeding Practices
CI	Confidence Interval
CMA	Community Medical Auxiliary
CWSN	Child Welfare Scheme Nepal
CWSUK	Child Welfare Scheme United Kingdom
DDC	District Development Committee
DEO	District Education Office
DFID	Development Fund for International Development
DH	District Hospital
DHO	District Health Officer
DPHO	District Public Health Office
DV	Diversified Views
EBF	Exclusively Breast-Feeding
F	Female
FAO	Food and Agriculture Organization
FCHV	Female Community Health Volunteer
FF	Food Fortification
FGD	Focus Group Discussion
GDP	Gross Domestic Product
DHS	Demography Health Survey

GHI	Global Hunger Index
GII	Gender Inequality Index
GNI	Gross National Income
GNII	Gross National Income Inventory
GoN	Government of Nepal
GONESA	Good Neighbour Service Association
GSGP	Global Supplementary Gant Programme
GLVs	Green Leafy Vegetables
HA	Health Assistant
HDI	Human Development Index
HH	Hidden Hunger
HIB	Haemophilus Influenza Type b
HIV	Human Immunodeficiency Virus
HKI	Helen Keller International
HP	Health Post
HSC	Health and Social Care
HW	Health Worker
IC	Identity Card
IDD	Iron Deficiency Disorders
IFPRI	International Food Policy Research Institute
IMCI	Integrated Management of Childhood Illness
INGO	International Non-Governmental Organisation
IYCFP	Infant, Young Child Feeding Practices
KI	Key Informant
Kms	Kilometres
KNS	Kaski Nutrition Study
LBW	Low Birth Weight
LMP	Lekhnath Municipality
LPG	Liquefied Petroleum Gas
M	Male
MCH	Maternal Child Health
MD	Micronutrient Deficiency
MDGs	Millennium Development Goals
Mg	Milligram
MG	Mother's Group
MoHP	Ministry of Health and Population

MP	Mega Pixel
MSNP	Multi-Sector Nutrition Plan
NA	Not Applicable
NDHS	Nepal/National Demographic and Health Survey
NeKSAP	Nepal Khaddya Surakskhya Anugaman Pranali
NGO	Non-Governmental Organization
NHRC	Nepal Health Research Council
NHSSP	Nepal Health Sector Support Program
NMSS	Nepal Micronutrient Status Survey
NNS	National Nutrition Survey
NPC	National Planning Commission
NRC	Nutritional Rehabilitation Centre
NRCS	Nepal Red Cross Society
OD	Odds Ratio
ORS	Oral Rehydration Solutions
OSF	Open Society Foundations
PHC	Primary Health Care
PhD	Doctor of Philosophy
PNC	Postnatal Care
PO	Post Office
PSMC	Pokhara Sub-Metropolitan City
RCV	Red Cross Volunteer
Rs	Rupees
UNSCN	United Nations Standing Committee on Nutrition
SD	Standard Deviation
SDGs	Sustainable Development Goals
SES	Socio Economic Status
SHP	Sub Health Post
SLC	School Leaving Certificate
SN	Staff Nurse
SPSS	Statistical Package for the Social Sciences
SSQ	Semi-Structure Questionnaire
SUA AHARA	Sudha Santulit Ahar
SUN	Scaling Up Nutrition
UK	United Kingdom
UN	United Nations

UNICEF	United Nations Children's Fund
US	United States
USA	United States of America
VDC	Village Development Committee
WFP	World Food Program
WHO	World Health Organization
WO	Ward Office
WRH	Western Regional Hospital
WRGH	Western Regional Gandaki Hospital
WRHD	Western Regional Health Directorate
WRHTC	Western Regional Health Training Centre

DEFINITIONS/TERMINOLOGY

1. **Acute malnutrition (Wasting):** Low weight-for-height defined as more than two SD (Standard Deviations) below the mean of the sex-specific reference data. It is usually the result of a recent shock such as poor energy and nutrients and or illness and is strongly associated with mortality.
2. **Childhood obesity or overweight:** Weight-for-height that is more than 2 SD (Overnutrition or overweight). Childhood obesity is associated with a higher probability of obesity in adulthood, which can lead to a variety of disabilities and diseases, such as cardiovascular and type 2 diabetes. For the adult, it is a condition characterized by excess body fat, defined as a BMI of 30 or more.
3. **Colostrum:** thick fluid rich in immune factors and protein which is first fluid secreted by the breast during late pregnancy and the first few days after birth.
4. **Complementary feeding practices:** A set of 10 practices recommended for caregivers to implement from 6 to 24 months, at which point breast milk and/or its substitutes alone are no longer sufficient to meet the nutritional needs of growing infants. Poor breastfeeding and complementary feeding practices, attached with high rates of infectious disease, are the principal proximate causes of malnutrition during the first two years of life.
5. **Complimentary food:** Any food, whether locally prepared or manufactured, suitable as a complement to breast milk or to infant formula, when either becomes insufficient to satisfy the nutritional requirements of the infant about six months of age.
6. **Exclusive breastfeeding:** The feeding of an infant only with breast milk from a mother or a wet nurse, or expressed breast milk, and no other liquids or solids except vitamins, mineral supplements, or medicines in drop or syrup form.
7. **Food fortification:** It is a function of adding of vitamins and minerals (micronutrients) to food during processing. Food fortification provides a public health benefit with minimal risks to health in the population.
8. **Food security:** The concept of food security includes the pillars of food availability, access, utilization, and stability or vulnerability. According to the UN, food security exists when all people, at all times, have physical and economic access to sufficient, safe, and nutritional food to meet their dietary needs and food preferences for an active and healthy life.
9. **Global Hunger Index (GHI):** By using these three indicators, the GHI captures various aspects of hunger and undernutrition such as the proportion of people who are undernourished; the prevalence of underweight children under the age of five years; and the under-five mortality rate.

10. **Healthy food:** A food believed to be highly beneficial to health, especially food grown organically and free of chemical additives; including high fibre, natural vitamins and fructose. For example animal products (meat, fish, eggs, and dairy products), green leafy vegetables and fruits, various legumes, dry fruits.
11. **Hidden hunger:** It is which can compromise growth, immune function, cognitive development, and reproductive and work capacity due to micronutrient malnutrition or vitamin and mineral deficiencies.
12. **Human Development Index (HDI):** A summary composite measure of a country's average achievements in basic aspects of human development: health, as measured by life expectancy at birth; knowledge, as measured by the adult literacy rate and the combined primary, secondary and tertiary gross enrolment ratio; and a decent standard of living, as measured by Gross Domestic Product (GDP) per capita in purchasing power parity.
13. **Hunger:** A feeling of discomfort, illness, weakness, or pain due to prolonged involuntary lack of food that goes beyond the usual uneasy sensation of temporary absence of food in the stomach.
14. **Infant and young child feeding (IYCF):** It refers to specific dietary recommendations and guiding principles for health, and development of children.
15. **Joint family:** In the context of Nepal, the joint family generally includes two to four generations, all living together in the same household and utilizing a shared kitchen.
16. **Low birth weight (LBW):** birth weight $<2,500\text{g}$ which is associated with long-term maternal malnutrition, ill health, physical work, and poor health care in pregnancy.
17. **Malnutrition:** Poor nutritional status caused by excessive or poor diet (Overnutrition or Undernutrition). Malnutrition is a broad term commonly used as an alternative to undernutrition but technically it also refers to overnutrition.
18. **Micronutrient deficiency:** Deficiencies in one or more essential vitamin or mineral, often caused by disease and/or lack of access and/or consumption of micronutrient-rich foods such as fruit, vegetables, animal products, and fortified foods. More than two billion people in the world are estimated to be deficient in iodine, vitamin A, iron, or zinc.
19. **Micronutrients:** Vitamins and minerals, iodine, vitamin A, iron, and zinc that are needed in small amounts by the body to produce enzymes, hormones, and other substances essential for proper growth and development.
20. **Overnutrition:** A state in which nutritional intake greatly exceeds nutritional need. Overnutrition manifests itself at overweight ($\text{BMI} > 25 \text{ kg/m}^2$) and obesity ($\text{BMI} > 30 \text{ kg/m}^2$) people. In children, overnutrition is defined as weight-for-height more than 2 SD ($> 2 \text{ SD}$ is overweight and $> 3 \text{ SD}$ is obese).

21. **Stunting:** Moderate and severe which falls below minus two standard deviations from median weight for height of children.
22. **Undernutrition:** Undernutrition is defined as the outcome of insufficient food intake and repeated infectious diseases. It includes being underweight for one's age, too short for one's age (stunted), dangerously thin for one's height (wasted) and deficient in vitamins and minerals (micronutrient malnutrition).
23. **Underweight:** Moderate and severe is defined as below minus two standard deviations from the median weight for age of children.
24. **Wasting:** Moderate and severe conditions which fall below two standard deviations from median weight for height of children in the community.
25. **Sukenas:** When children suffer from severe malnutrition (marasmus) the term used is Sukenas (drying up) in the Nepali language.
26. **Phukenas:** When children suffer from Protein-Energy malnutrition (kwashiorkor), the term used is Phukenas (swelling up) in the Nepali language.

CHAPTER ONE: INTRODUCTION

1.1 Introduction

The term 'health' is defined by the World Health Organization (WHO) as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO 1948, p.1). This chapter presents a summary of nutritional problems at the global, regional level and specifically in the Nepalese context. It provides brief information about the epidemiology of nutritional problems (WHO, 2015). Background information is provided on knowledge, attitudes, beliefs, and behaviour of mothers of young children in relation to healthy eating which contributes to the prevalence of malnutrition specifically in Nepal. The determinants that may influence maternal knowledge, attitudes, beliefs, and behaviour of mothers from rural and urban areas are also considered. In the later sections of this thesis, the words 'undernutrition' or 'poor nutrition' will be understood or referred to as 'malnutrition'.

1.2 Malnutrition

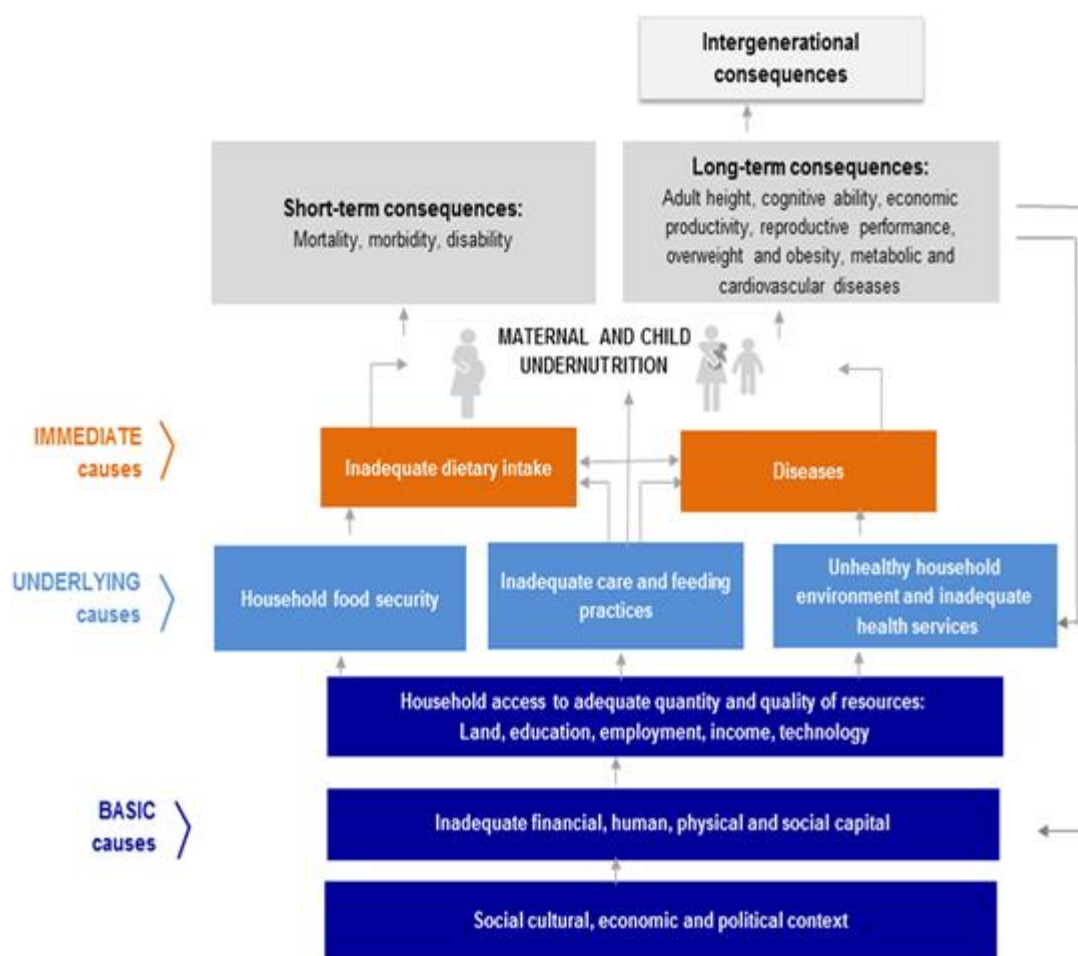
Malnutrition is commonly the major nutrition-related problem in developing nations (Tull, 1997; WFP, 2009; Kremer, 2014). Malnutrition, in general terms, refers to lack of enough food to eat, not eating the right quantity of healthy food items or being unable to consume food that is generally available for a human being to eat for proper diet (Tull, 1997). The World Food Programme (WFP) provided the definition of malnutrition as "a state in which the physical function of an individual is impaired to the point where he/she can no longer maintain sufficient bodily performance process such as growth, pregnancy, lactation, physical work and resisting and recovering from ailment" (WFP, 2012a cited in Bain *et al.*, 2013, p. 120). The WFP also explained that malnutrition can be influenced by the lack of micronutrients and macronutrients (WFP, 2012b). Malnutrition often occurs in developing countries with low-income households (Kraemer, 2014). It occurs in communities affected by natural disasters such as drought, landslides, excessive rainfall and earthquakes (Jha, 2010; The Lancet, 2015).

Hunger seriously affects nearly 8% of the global population (WFP, 2012a). Nearly 7 million children aged 5 and less than 5 years die from malnutrition annually (Smith and Haddad, 2000; WFP, 2012a; You *et al.*, 2013).

Malnutrition is the consequence of two main factors: infectious diseases and inadequate food consumption (UNICEF, 2012; WFP, 2012b). The primary causes of malnutrition are the practice of poor child care; health and hygiene; food insecurity and inadequate health services (UNICEF, 1990). In addition, the lack of physical infrastructure, appropriate knowledge about nutritious food, economic and political resources, and cultural beliefs, all contribute to the cause of malnutrition (Khare and Rao, 1986; UNICEF, 1990; Smith and Haddad, 2000; Whitney and Rolfes, 2004; Sibeko *et al.*, 2005). Walton and Allen (2011) identified that malnutrition has become a major problem in the developing countries with severe acute problems that have a direct impact on child mortality and lead to several diseases among children (Whitney and Rolfes, 2004; WHO, 2011).

Muller and Krawinkel (2005) showed that malnutrition, specifically, lack of protein and deficiencies in micronutrients, has continually been the major health issues for young children in the developing countries. UNICEF has developed the conceptual framework (Figure 1.1) for the causes of malnutrition in 1990 as part of its nutrition strategy (UNICEF, 1990). In this framework, the major causes of malnutrition involved food, multi-sector approaches, caring practices and health (UNICEF, 1990). The causes are also categorised as basic, underlying and immediate, with each level influencing other levels (UNICEF, 1990; Ruel, 2008). This framework assists as a guide to examine and assess the aetiology of poor nutrition and also helps to identify the most appropriate actions (UNICEF, 1990).

Figure 1.1: UNICEF Conceptual Framework



Source: UNICEF, 1990

1.3 Importance of nutrition

A good diet is crucial for the growth and development of children (Karkee *et al.*, 2014). Reproductive and antenatal women, young children and breastfeeding mothers require various forms of nutritious food and a diet that includes essential nutrients such as proteins, fats, vitamin A, iodine and iron (Setwe, 1994; Victora *et al.*, 2008). Malnutrition reduces the body's resistance to infections (Tull, 1997); they affect many children and diminish their quality of life and their productivity (Bhutta *et al.*, 2008; Victora *et al.*, 2008). For instance, if a pregnant woman or her child is diagnosed with malnutrition in the first few years of life, the child will likely show delays in physical and mental development (Nair, 2007; Martorell *et al.*, 2010) that has long-term consequences on lifelong health (Ruel, 2008; Martorell *et al.*, 2010; WFP, 2012a).

Poor nutrition in lactating and pregnant women can influence the growth and development of the infant (Paudel *et al.*, 2013). In particular poor diet can delay foetal growth that results in low birth weight and at a later stage the child's development can be stunted (Victora *et al.*, 2008; Paudel *et al.*, 2013). Bhutta and colleagues (2008) found that approximately 33% of all child deaths are due to malnutrition. Whilst 20% of infant mortality is caused by stunting and wasting there are about 10% micronutrient deficiencies amongst children who are not wasted and stunted (Paudel *et al.*, 2013). Malnutrition is associated with a higher risk of cardiovascular disease, diabetes, and obesity in later life among children (Bhutta *et al.*, 2008; Ruel, 2008; Paudel *et al.*, 2013). Likewise, stunting is responsible for poor development and low productivity, sometimes in entire communities (Bhutta *et al.*, 2008; Ruel, 2008). Therefore, for these reasons, it is very important to overcome malnutrition to reduce mortality and improve livelihoods. Overall, adequate nutrition in the first 1000 days of the child's life is essential for optimal nourishment (WHO, 2010b, 2012). The next section highlights the global scenario of malnutrition.

1.4 Global scenario of malnutrition

According to assessments by the WHO, UNICEF, and the World Bank, global malnutrition has been diminishing very slowly since 1990 in the Sub-Saharan African and Asian countries, yet, it is still increasing at a high rate in South Asia (The World Bank, 2013b; UNICEF, 2013; WHO, 2013a; 2013b). In Pacific and East Asia areas, many countries have encountered serious problems of chronic malnutrition and micronutrient deficiencies (UNICEF, 2013; WHO, 2013a; 2013b).

More than 18,000 children aged under-five die every day (UNICEF, 2013; WHO, 2013a; 2013b). According to the annual report of UNICEF UK, every 10 seconds a child dies of malnutrition somewhere on earth (UNICEF, 2013). Of those that live, one in four under the age of five is stunted due to lack of healthy food, and malnutrition is the cause of 45% of deaths of children under the age of five globally (Bhutta *et al.*, 2103; UNICEF, 2013). A collaborative report published by the WHO, UNICEF and The World Bank (2013), stated that approximately 33 million children aged less than five years died globally, amounting to some 18,000 deaths per day.

Stunting, wasting and being underweight are cited as major reasons and these are now highlighted below.

1.4.1 Children stunting

- ★ In the global context, about 161 million children less than 5 years of age were estimated in 2013 to be stunted (WHO *et al.*, 2013).
- ★ Moreover globally, the trend of prevalence of stunting has been decreasing. From 2000 to 2013, the percentage of children who were stunted decreased from 33% to 25% or numerically from 199 million to 161 million (WHO *et al.*, 2013).
- ★ Geographically, half of all stunted children resided in Asia and more than one-third were in Africa (WHO *et al.*, 2013).

1.4.2 Wasting and severe wasting

- ★ In the global context, 51 million children that were aged 5 years or less were wasted among whom, 17 million were classified as severely wasted in 2013 (WHO *et al.*, 2013).
- ★ In 2013, wasting was estimated at about 8% of global population and of these 3% were severely wasted (WHO *et al.*, 2013).
- ★ It was estimated in 2013 that two-thirds of wasted and severely wasted children were from Asia and the remaining third were from Africa (WHO *et al.*, 2013).

1.4.3 Underweight

- ★ In the global context, the number of children under the age of 5 years who were underweight was 99 million in 2013 among whom; two-thirds were in Asia and a third in Africa (WHO *et al.*, 2013).
- ★ The overall trend for children who were underweight globally has decreased from 25% to 15% for the period 1990 to 2013 (WHO *et al.*, 2013).

- ★ Among all the continents, Africa has seen the smallest decrease in children who were underweight i.e. from 23% in 1990 to 17% in 2013. Comparatively, Asia has observed a decrease from 32% to 18%, Latin America and Caribbean have decreased from 8% to 3% overall. The next section outlines the global hunger scenario and its importance.

1.5 Global hunger scenario

Malnutrition and hunger are closely associated factors and are both considered to be equally important in the field of public health (WFP 2015). As explained before (section 1.2), the major causes of hunger are poverty, poor investment for agriculture, weather and climate, war and conflicts, uncertain markets and wastage of food (Jin *et al.*, 2002; GII, 2014; WFP, 2015). The WFP (2015) argued that if any household of the community is not receiving sufficient food, that household will suffer from malnutrition (GLSS, 1995). It also stated that despite household members receiving sufficient food, they will still become malnourished because the available food would not fulfil their daily nutritional requirements (Gittelsohn *et al.*, 1997; UNICEF, 2009; WFP, 2012b). Ill-health and malnutrition are closely related as malnutrition can be the actual cause of disease (Setswe, 1994; Sluik *et al.*, 2015). Textbox ‘1.1’ below presents the global magnitude of malnutrition associated with food insecurity (UNSCN, 2004).

Textbox 1.1: Global food insecurity (magnitude)

1. About 795 million people in the entire world do not have access to enough food to lead a healthy and active life; this is therefore 1 in 9 people globally (FAO, 2015).
2. Most of people deprived of food and having hunger problems reside in developing countries; among which 13.5% of the population is malnourished (FAO, 2015).
3. Among all the continents, Asia has the most number of hungry people which is two-thirds of the total. The percentage of hungry people living in South Asia has decreased considerably, although in Western Asia, the ratio has increased slightly (FAO, 2015).
4. Another major area facing hunger problems is Sub-Saharan Africa which has the highest ratio with one in every four people being malnourished (FAO, 2015).
5. Malnutrition is the cause of nearly half (45%) of the deaths in children aged less than 5 years. Statistically, 3.1 million children die each year of malnutrition (Bhutta *et al.*, 2013).
6. One in 6 children in developing countries, i.e. 100 million, are underweight (WHO, 2012).
7. One in four children globally are stunted wherein developing countries, this ratio becomes one in three (PHN, 2012)
8. Among all the developing countries globally, approximately 66 million school-going children arrive at school hungry, Africa accounts for 23 million of these children (WFP, 2012a).

1.6 Malnutrition and its consequences

If children are suffering from chronic malnutrition, it may have life-threatening and serious health consequences which have the following main impacts (Bhutta *et al.*, 2013; FAO, 2014a). The textbox 1.2 below summarises malnutrition and its consequences.

Textbox 1.2: Malnutrition and its consequences.

Effects on health	Effects on social and economic development
<ul style="list-style-type: none">• Malnutrition is the basis of physical and cognitive stunting that makes children vulnerable to various diseases and infections.• The deficiency in micronutrients can lead to severe illness and damage to physical health and impairments such as anaemia, blindness, mental disability and can cause neural tube defects in-utero	<ul style="list-style-type: none">• Prevent people from reaching their full potential.• Children with malnutrition show poor performance in school thus limiting their future and their opportunities.• Adults with malnutrition are less productive, and cannot provide a health care for their families.• Women and mothers with malnutrition are likely to have underweight babies at high risk of cognitive and physical impairment.• Continued cycle of poverty and economic stagnation.
Source : Bhutta <i>et al.</i>, 2013 ; FAO, 2014a	

1.7 Magnitude of malnutrition

Many studies show that in developing countries, more than 10 million children aged less than 5 years old die annually (Ng *et al.*, 2013). If recommended or scientifically proven interventions for these diseases were to be applied, more than 60% of these deaths could be reduced on an annual basis (Edris, 2007; WHO, 2013a; 2013b; FAO, 2015). According to joint estimations of the WHO, UNICEF and The World Bank (2013b), in some countries malnutrition accounts for a large percentage of all child deaths, with more than half of all such deaths being reported in six countries, and furthermore, 90% of deaths reported in the world occur in 42 countries. Most of these deaths are reported in regions of Sub-Saharan Africa and South Asia (Edris, 2007; UNICEF, 2013; Ogden *et al.*, 2014; FAO, 2015). More than 50% of all children who die from communicable diseases are diagnosed with malnutrition (whether over or undernutrition) as a major contributing factor (Eksmyr, 1970; Pinstруп-Andersen, 1981; Olds *et al.*, 2014). Similarly, approximately 0.52 million women are estimated to die every year from diseases related to

pregnancy with associated poor nutrition, 99% of these deaths are in developing countries (Simkhada *et al.*, 2006).

Many studies reveal that nutrition has a major role in strengthening the immune system and physical, mental and cognitive development in children (Marcos *et al.*, 2003; Ygberg and Nilsson, 2011). Nutrition is directly or indirectly related to the mortality rate of the maternal side of a family. This is also one of the key indicators for appropriate health care service delivery and utilization of these services, in addition to women's overall status within society (Defo, 1997; Stephenson and Hennink, 2004; Bezner-Kerr *et al.*, 2008). Underfed children all over the world face great risk of mortality and morbidity (Mosley and Cowley, 1991; Griffiths *et al.*, 2002). The WHO (cited in UNICEF, 1998), estimated that among all the deaths of children aged less than five years, approximately 55% is caused by undernourishment. Amongst those who survive, inadequate nutrition reduces their cognitive development (Litcher, 1997; de Onis *et al.*, 2000; Behrman and Rosenzweig, 2004) which limits their educational accomplishment (Pollit, 1984). Undernourished children are also likely to develop poor health and disability (UNICEF, 1998; Smith and Haddad, 2000). This creates an intergenerational cycle of malnutrition, infirmity, and poverty not only within the family but also at the national level (Kayastha *et al.*, 1999; Bryce *et al.*, 2005; Dewey and Begum, 2011). The next section focuses on the malnutrition scenario in the context of Nepal.

1.7.1 Malnutrition in the Nepalese context

In the context of Nepal, the nutritional status or health of mothers and children aged less than five years is poor and the toll is increasing rapidly (NDHS, 2017). There have been no significant or even minor improvements in the nutritional status of children for the 25 years between 1991 and 2016 (see Appendix 19). Annually 10% of these children are wasted, 36% stunted and 27% underweight (see Appendix 19). Furthermore, Nepali women are extremely vulnerable to malnutrition-related diseases due to their residence in hilly and plain regions (NDHS, 2011) (see Appendix 19).

The FAO reported in 1992 that among the reasons for malnutrition in Nepal, seasonal food shortages are a major factor. Poor maternal nutritional status and seasonality of food shortages affect the birth weight of children and further continues to affect growth throughout later stages of life (FAO, 1992). The FAO estimated that the population that was malnourished in Nepal was about 29% during 1990 to 1992 which was comparatively better than the 45% of the population that was malnourished during 1969 to 1971 (FAO, 1992). However, no recent data for a reliable source regarding the annual food consumption in Nepal is available. Existing data from FAO (1992) found that in the late 1960s and early 1970s, the nutritional requirements of individuals were not met. However, in 1985, the situation had slightly improved and nutritional requirements were met (FAO, 1992). Apart from the aforementioned reasons, there are several other reasons that account for malnutrition in Nepal. Factors such as maternal education, poverty, change in climate, war and natural disasters all contribute to food shortages in Nepal that influences malnutrition among the population, specifically young children (Jolly, 2010). Other reasons that contributed to malnutrition in Nepal are severe earthquakes as experienced in 2015, poor coverage of health services, morbidity and socio-economic issues (Bennett *et al.*, 1997; Acharya, 2000; Bennett *et al.*, 2008; Bhutta *et al.*, 2013).

1.7.2 Nepal: demographic outline

The population of Nepal was 26.6 million in 2011 with children younger than 15 years making up nearly 40% of the total population (CBS, 2011; NDHS, 2011). The population growth rate is 1.4%. The rate of urbanisation has been rapidly increasing from 14% in 2001 to 17% in 2011 (NPHC, 2012), however, most of the population of Nepal still reside in rural areas. Life expectancy at birth continues to rise for both males and females; increasing from 55 years for males and 53.5 years for females in 1991 to 67 years for males and 68 years for females in 2011 (NPHC, 2012). The 2011 census revealed that 37.2% of the population were below 15 years, 54.4% between 15 and 59 years, and 8.4% aged 60 years and above.

The main ethnic groups are Chhetri, Brahmin, Magar, Tharu, Tamang, and Newar (Subedi, 2010; 2011). More than 92 mother tongues are spoken in Nepal (CBS, 2003a; 2003b; Subedi, 2010;

NDHS, 2011). Most of the languages originate from two major groups: Sino-Tibetan (Slusser, 1982), spoken by about 18% of the population, and Indo-European, about 79% (CBS, 2003a; 2003b; Sharma, 2004). Nepali is the official language and it is used and understood by most people in the country (NDHS, 2011). Besides Nepali, the other two major languages are Maithili and Bhojpuri, spoken by about 12% and 8% of the population, respectively (Subedi, 2010; NDHS, 2011).

Most of the people in Nepal are of the Hindu religion (81.3%). Many identify themselves as Hindu and Buddhist, reflecting the syncretic nature of these religions in Nepal (Shrestha, 2005). Buddhism is the second-largest religion, accounting for 16% of the population, followed by Kirat 5.1%, Islam 4.4%, Christianity 1.4%, and others 0.4% (CBS, 2011; NLSS, 2011; NPHC, 2012). The next section focuses on the socioeconomic situation of Nepalese households.

1.7.3 The socioeconomic situation in Nepal

This section describes the socioeconomic situation of Nepal which is one of the major factors contributing to the malnutrition problem. Nepal is still one of the world's least developed countries coming 205th out of 228 countries ranked by gross domestic product (GDP) (CIA, 2013). Nepal ranks 157 out of 187 nations on the Human Development Index (UNDP, 2013). However, there is significant unrest within the country fuelled by factors such as poverty, food insecurity, and political instability. The country is still facing important political challenges in the post-conflict transition to stability. The UN Human Development Index for Nepal continues to improve, increasing from 0.398 in 2000 to 0.458 in 2011 (Human Development Report, 2011) although extensive inequalities persist between districts. In the Gender Inequality Index (GII), however, Nepal ranks 113th with a value of 0.558 (UNDP, 2014), indicating the low rank of women in the country.

While the majority of the population depend on agriculture for their livelihood, the contribution of agriculture to the national economy has been gradually declining, accounting for 33% of GDP in 2009 (UNDP, 2014). Remittances from abroad, which account for 18% of national income in 2008, are one of the principal contributors to poverty reduction with 30% of households having

received remittances in 2008 (UNDP, 2014). The socioeconomic situation and poverty are virtually linked each other. The next section highlights the prevalence of poverty in Nepal.

1.7.4 The prevalence of poverty in Nepal

Poverty is another major reason for malnutrition in Nepal because of low incomes, the people do not have enough food to eat (WFP, 2009). Absolute poverty or destitution refers to the deprivation of basic human needs, which commonly includes food, water, sanitation, clothing, shelter, healthcare, and education (INE, 2009; Ferreira *et al.*, 2011). Relative poverty is defined contextually as economic inequality in the location or society in which people live (INE, 2009; Ferreira *et al.*, 2011). Nepal's economic system is surrounded by absolute and relative poverty with people living in rural areas and the problem of malnutrition is very real (Basnett, 2009; WFP, 2009; World Bank, 2012).

The FAO argued that malnutrition has a direct link with poverty where it is the principal cause of malnutrition (FAO, 2012). The World Bank (2008) estimated that 1.35 billion of the developing world was living on \$1.25 income a day or even less. In addition to poverty, other key causes of malnutrition are war and conflict, harmful economic systems and climate change (DFID *et al.*, 2006). The countries with the lowest economic indicators also have the highest rates of malnutrition (BLS, 2013; The Borgen Project, 2013).

In Nepal poverty is one of the key reasons for malnutrition but food production and family economics are adding further difficulties. According to the policy brief based on NDHS (2001) report, the improvement in nutrition gap is less when compared to the income growth in other countries (Lawrence *et al.*, 2003, p.110). In addition to this, a high prevalence of malnutrition, coming from poor nutritional practices or lack of micronutrients, continues even in families with sufficient earnings for sufficient food intake (Ergo *et al.*, 2009; UNDP, 2014). As the effects of recent global crises in food, fuel, and finance have clearly shown, it is the poor that suffer the most from these; the undernourished become even more undernourished and death rates rise (UNICEF, 2009; UNSCN, 2010). Thus, effective strategies for social protection, whether in current or future crises, must address malnutrition (UNSCN, 2010; World Bank, 2014b).

Intense poverty and an era of violent governmental insecurity have taken a big toll on Nepalese society. According to the World Bank's world development indicators for 2012, more than one in three people in Nepal live in extreme poverty, surviving on less than US\$1 per day (World Bank, 2000; 2011; Enterprise Survey, 2013; UNDP, 2014). According to the World Bank (2012) report, nearly one-quarter of the population of Nepal is living under the poverty line. This group cannot afford adequate nutrients in the diet for their children and always live under conditions of food scarcity (WFP, 2009). Poor and marginalized ethnic groups are more concerned with survival than a nutritious diet because healthy food items are relatively expensive (Subedi, 2010). They are often forced to buy cheap, poor quality foods.

Poverty is a potent factor for food shortages and poor nutrition (FAO, 2012; UNDP, 2014). The Nepal Demographic and Health Survey (NDHS, 2011) found that the magnitude of malnutrition amongst children from the poorest households is almost double that of children from the wealthiest households. Table 1.1 below shows the incidence of poverty by ethnic group (Kayastha *et al.*, 1999). It also shows the poverty distribution by the ethnicity of the two different geographical locations of Nepal. According to NLSS (2011), the mountains Brahmins' are poorer than those on the plains. However, Dalits and Janajati from the mountains area are economically more deprived than those on the plains. The table shows Chhetris (middle castes) from the plains are poorer than those from the mountains.

Table 1.1: Poverty incidence by ethnicity

Caste and ethnic groups	Poverty headcount rate (%)	Poverty (%)
Mountains		
Brahmans	10.3	5.2
Chhetris	23.4	16.6
Dalits	43.6	15.2
Janajati	28.3	24.4
Plains		
Brahmans	18.6	0.4
Middle castes	28.7	17.6
Dalits	38.2	6.9
Janajati	25.9	7.3
Newars	10.3	2.5
Muslim	20.2	3.5
Other	12.3	0.5
NEPAL	25.2	100.0

Source: NLSS, 2011

As per the UNDP Human Development Index report (2014), Nepal ranks 145th among 187 countries and the average annual income of a person in Nepal is US\$ 707 (World Food Programme, 2015).

Available data suggests that Nepal is one of the least developed countries in the world and Nepalese people are equally as poor with the average annual income of US\$707, comparatively lower to other high-income countries globally (WFP, 2015). In this regard, it can be stated that malnutrition is clearly linked to household and community income. People with a low socioeconomic status cannot afford nutritious food for their children (Karkee, 2008). These identified gaps in the literature suggest that there is a need for research that examines the link between people with low SES (Socio-economic status) and energy intakes of rural and urban areas. The next section considers the socio-cultural scenario of Nepal.

1.8 The socio-cultural scenario in Nepal

Nepal has three ecological regions (mountains, hills, and plains) extending from east to west with 105 recorded ethnicities (Gellner, 1986; Gurung, 2005; MoHP, 2012). These regions and ethnicities are associated with diverse cultures (Gellner, 1986; Khare and Rao, 1986; Subedi, 2010; 2011). One ethnicity is very different to another (Gurung, 2001; ADB, 2010). For example, food consumption patterns and customs are quite different between these three ecological regions (WFP, 2009). The culture of the plains, including custom and diet, is very different from the hills and mountains due to the plains having a much hotter and more humid climate (Kleinman, 1981; Gittelsohn *et al.*, 1997; WFP, 2009).

A strongly embedded caste system based on feudal patriarchy prevails in Nepalese society, which defines the social stratification by ethnicity (Gellner, 1986; Sharma, 1999; Gurung, 2005; Bennett *et al.*, 2008; Subedi, 2011). While it is officially outlawed there is still a high level of social differentiation related to ethnicity and caste in this society (Dahal *et al.*, 2002; Bhattachan *et al.*, 2009). People of lower caste are still frequently discriminated against and stigmatised (Bhattachan *et al.*, 2009). The nation has a strong patriarchal social and cultural structure and gender inequality are still very high in the community (Kleinman, 1981; Bennett *et al.*, 2008; Bishwakarma, 2009; Bisset, 2014). The gender inequality can be understood by the fact that in the household, Nepalese women have little influence on the decision making regardless of household decisions or high-level authoritative and legislative decisions at the highest bureaucratic posts (Bold *et al.*, 2013). This study demonstrated that there are wide differences between castes and socio-culture issues which include issues related to religion among the Nepalese community. Hence, the study suggests that there is a gap in the current knowledge particularly about culture, caste, and religion. Thus there is a need for further focused research on the culture, caste, and religion of the Nepalese population. The next section focuses on religion which is known to influence food behaviours of others.

1.8.1 The religion scenario in Nepal

In the context of Nepal, the caste system and religions are strongly inhibited within the society (Kleinman, 1981; Subdei, 2010; Adhikari, 2012). Hinduism is one of the oldest and largest religions in the world (Hinduism, 1999; Sharma, 2002; Shankar *et al.*, 2006; Purnell, 2009). About 1200 BC, the Vedas which is a body of hymns that originated in North India which set out the theological and logical principles of Hinduism, was created (Ives and Messerli, 1889; Bishop, 1990; Lewis, 1994; Flood, 1996; Ives, 2006). Nepalese society is still deeply affected by traditional customs, norms, values, and models. Hindu philosophy and religion is responsible for having encouraged the patriarchal feudal system in Nepal (Bishop, 1990; Fisher, 1990; Craig, 2011; Adhikari, 2012). To understand the causes for dietary and nutritional customs prevailing in religion needs to be in line with rationale and logical thinking for such laws and practices (Pool, 1987; Christian *et al.*, 2006; Acharya, 2013). Furthermore, there are many laws of religion and ethics that are concerned with health safety with regards to consumption of food and drink within the religious context (Hinduism, 1999). Preservation techniques were limited in the past (Subedi, 2010; Upreti and Müller-Böker, 2010; Adhikari, 2012). Previous researchers were unaware of theories related to the prevention and management of diseases in relation to different health problems that exist in the modern-day world (Jin *et al.*, 2002; Biza-Zepro, 2015). Yet, for that time, the religious leaders formulated some laws about the consumption of food and drink in line with religious practices and limitations within the context of one's religion (Storer, 1977; Khare and Rao, 1986; Purnell, 2009). This practice is even followed today with specific laws regarding the consumption of food and drink prevailing with the religious practices of previous times (Sharma, 2002; Purnell, 2009; Tamang and Brown, 2010).

It is important to be familiar with Hindu culture and spirituality (Hinduism, 1999; Purnell, 2009) which is closely associated with food science (Barasi and Mottram, 1990) within this community in which more than 81% of the people are Hindu (CBS, 2011; NDHS, 2011). In the Hindu culture, it is widely believed that the soul of humans is immortal and there is life after death, with one sovereign Supreme God having all the power in the world (Sharma, 2002; Purnell, 2009). Most of

the migrant Hindu populations in developed countries continue to practice traditional activities such as fasting, worshipping and celebrating major rituals (Siega-Riz *et al.*, 2001; Christian *et al.*, 2006; Ellahi, 2014). Many Hindus also believe that some foods can be considered cold or hot (Appendix 14), and these should only be consumed during specific seasons and not in combination with one another (Ronquest-Ross *et al.*, 2014; Biza-Zepro, 2015). Attention to specific food consumption practices such as vegetarian foods, use of alcohols or drugs, overeating, were also combined into the principle of religious practice (Shakya, 2006; Upreti and Müller-Böker, 2010). Furthermore, the laws of eating and drinking prohibition exist alongside the laws of fasting and restraining from eating and drinking in fast in numerous religions that are still being practised widely (Christian *et al.*, 2006; Subedi, 2009; Acharya, 2012; 2013). In addition to this, there have been several religious and moral norms still present in society that apply certain restrictions on food and drink consumption (Hinduism, 1999). The literature demonstrates that religion is a major factor influencing food and health-seeking behaviours of mothers (Christian *et al.*, 2006; Shakya, 2006). Furthermore, it is noted that this is a highly complex issue which is strongly embedded within all ethnic groups in Nepal (Subedi, 2010). The following section describes food taboos and practices in Nepal.

1.8.2 Food practices and taboo's related issues in Nepal

Certain taboos and practices are strongly related to the dietary patterns of Nepalese people (Hinduism, 1999; Subedi, 2010). Such taboos and practices are also closely linked to food buying habits. For example, Brahmin and Chhetri ethnic groups would never buy pork, beef or buffalo meat even if it is readily available in the nearest market because of the religious prohibition against consuming it (Hinduism, 1999; Shakya, 2006; Upreti and Müller-Böker, 2010).

One of the taboos in Hindu culture is against women making direct eye contact with men (Hinduism, 1999; Purnell, 2009). Other taboos are: never greet someone with a left hand and do not eat meat – it is the human's soul that is within the animal, and all of this is due to believing in reincarnation (Meyer-Rochow, 2009; Purnell, 2009; Subedi, 2010). In Hindu culture, the central philosophy that is the basis of all health practices is the system of Ayurveda and Unani (Lewis,

1994; Hinduism, 1999; Dhama *et al.*, 2009). The main philosophy behind this practice is that the root of the illness has to be removed and sometimes that does not mean it comes from within the body (Hinduism, 1999; Adhikari, 2012; Biza-Zepro, 2015). Ayurvedic medicine is a mostly natural herb which has very little side effects on the body and that is why it is popular in Hindu culture (Lewis, 1994; Dhama *et al.*, 2009; Meyer-Rochow, 2009). Moreover, the food taboos that exist in Nepal such as the prohibition of certain food items for consumption of people, specifically in children, has been another major cause for malnutrition in Nepal in the context of food taboos (Acharya *et al.*, 2015). The food taboos are strongly connected with caste systems. The next section considers existing caste systems among Nepalese society.

1.8.3 Caste systems in Nepal

Nepal is a country with multi-lingual, multi-castes, multi-cultural society (Ingold, 1994) and has diverse geographical environments (Gellner, 1986; Subedi, 2011). One critical part in Nepal is the caste system, precisely the Hindu caste system, (Sharma, 1999; MoHP, 2012; NPHC, 2012) that is in line with ancient and traditional Brahman system in the Indian religion (Hinduism, 1999; Bennett *et al.*, 2008; Subedi, 2011). However, the existence of caste system can be dated back, before 1500 BC, to Indo-Aryans arrival who promoted it which was not presented before them (Bennett, 1983; Bishop, 1990; Hinduism, 1999; Shankar *et al.*, 2006; Subedi, 2011). The economic structure of Nepal is based upon the feudalism similar to upper-caste. This caste system in Nepal has started to erode gradually by Indo-Aryans, where people have started to classify themselves as humans rather than castes (Ives and Messerli, 1889; Lewis, 1994; Bennett, 2006; Bennett *et al.*, 2008).

The caste or ethnicity system of Nepal is one of the potential barriers which influence food and health-seeking behaviours of the community. It also strongly associated with the affordability, availability, and accessibility of food (Acharya *et al.*, 2014). For example, the caste system was also one of the main causes for civil war in 1996 (NSW, 2001; The World Bank, 2006; Basnett, 2009; Devkota and van Teijlingen, 2010; Upreti and Müller-Böker, 2010). The caste division is prevalent in Nepal but the rules are not as fixed as they were in the past. In 1962, a law was

passed that made the casting difference illegitimate and thus, all the castes are to be treated equally in the eyes of law. For example, education is free and open to all castes (Subedi, 2011). The status of women is discussed in the following section.

1.8.4 Status of women in Nepal

A woman's status in Nepalese society is lower compared to men because Nepal is a masculine society dominated by male gender (Malla Pradhan, 2000; Majupuria, 2007). The discrimination against women in society is one of the major reasons that affect a women's development within society (Majupuria, 2007). The position of women in society is crucial due to the development of future generations through their upbringing (ADB, 2001; Furuta *et al.*, 2006; Adhikari, 2013). According to Hindu as well as Nepalese culture, women usually move to their husband's home after marriage and frequently have less power or rights than men in family decision making (Bennett, 1983; Alder *et al.*, 1993; Bennett, 2006; Adhikari, 2013). There is also some social pressure to behave in support of their marital home. Women regularly give priority to the requirements of the family before their own needs, such as choosing to deliver their baby at home and to do all the household chores rather than care for their own health (Bennett, 2006; NSSO, 2012; Adhikari, 2013).

In Nepal, women are mainly responsible for cleaning, cooking, domestic work and family care and they are dominated by men (Malla Pradhan, 2000). Society creates a distinct role for men and women. The situation for women living in rural areas was very poor until two decades ago (Malla Pradhan, 2000; Gandhi, 2012; Bisset, 2014). Girls were not allowed to go to school and were disempowered due to patriarchy, cultural and social discrimination (Subedi, 2010). Political and civil inequality enabled and maintained unequal power relations between women and men in both private and public spheres (Niaz, 2003; Gandhi, 2012; Bisset, 2014). Violence against women is common in the South Asian region (Niaz, 2003). Women may be treated like child-bearing machines (Malla Pradhan, 2000). Most parents prefer to have sons rather than daughters (Malla Pradhan, 2000; Furuta and Salway, 2006; Martin, 2008). Many women are obligated to continue childbearing until they have a son. Traditional families believe that if the son is born in the family,

he will pave the pathway to heaven for the entire family (Bandura, 1986; Malla Pradhan, 2000). The proverb still exists in Nepalese society that sons will brighten the whole world but daughters only the kitchen (Basu *et al.*, 1986; Niaz, 2003; Adhikari, 2013). Girls are discriminated against from birth in Nepalese society (Malla Pradhan, 2000; Furuta and Salway, 2006; Martin, 2008). A girl is treated as if she is not as good as a boy; a young girl is fed after her brother; a wife looks after husband; an old woman looks after her son (Basu *et al.*, 1986; Subedi, 2010).

In the Nepali context, a woman who is educated is not always ranked above her uneducated counterpart (Acharya and Bennett, 1981; ADB, 2001; Niaz, 2003; Bennett *et al.*, 2008; Bhattachan, 2009; ADB, 2010). Moreover, woman's status is linked to the authority of her husband rather than her own status of education and individual identity (Bennett, 1983; Bishop, 1990; Fisher, 1990). Therefore, women's status within households as well as communities plays a vital role towards food and health-seeking behaviours including child care (Acharya, 2000; ADB, 2001; 2010; NSW, 2001; Niaz, 2003; Adhikari, 2013). The next section describes the major determinants of malnutrition in Nepal that includes health care services, knowledge, attitudes, and beliefs about nutritious food, infant and child feeding practices, agriculture and food security, climate change and effects, internal conflict and political instability.

1.9 Nepal: major determinants of malnutrition

1.9.1 Healthcare services

The healthcare service is a crucial component with regard to management of malnutrition. Thus, this section gives a brief introduction to existing health care services in Nepal. There are complex problems associated with health care in Nepal (Adhikari *et al.*, 2002; Adams, 2007; Solid Nepal and Merlin, 2012). Healthcare facilities are generally poor (Stone, 1986; Acharya, 2000; Rai *et al.*, 2001) and directly mirror the living status of the people (Acharya, 2000; Adhikari, 2004) – unaffordable and unsystematic. One of the major reasons for the high prevalence rate of malnutrition in Nepal is due to unaffordability of healthcare services for the poor. The provision of childcare is included within the healthcare system of Nepal and is facing a lack of funding.

People from lower socio-economic groups are not able to afford healthcare services and healthy food in Nepal is expensive (Rahman, 2000; Ali *et al.*, 2005; German Technical Cooperation, 2009).

The various healthcare practices (Hill, 1999; MoHP, 2011; Acharya, 2012) in the country can be categorized into the following three major segments: (1) medical care for people who rely on a *jhankri* or *dhami* (spiritual/traditional healer) (Stone, 1976; Hill, 1999; Prothero, 1999; Colville, 2008; Adhikari, 2012), (2) shamanic or Ayurvedic treatment and (3) allopathic medicine (Western medical sciences) (Cueto, 1996; Rai *et al.*, 2001). The ‘folk medicine’ is made up of general assumptions regarding the spiritual and the magical or paranormal causes of illness (Stone, 1976; Hill, 1999; Subedi, 1999; Shankar *et al.*, 2006). Disease and death are frequently attributed to demons, ghosts and evil spirits (Prothero, 1999; Subedi, 1999) which are assumed to be a result of the evil eye, wrath of ancestors and the planetary effects (Stone, 1976; Shanker *et al.*, 2006). Several protections against these dangers are taken, such as the wearing of gems or avoidance of certain foods and sights and the placation of gods and essence (ghosts) with gifts to them for the sacrifice of different kinds (Prothero, 1999; Subedi, 1999; Adhikari, 2012). People generally consult a *dhami/jhakri* (Prothero, 1999) for treatment when they are struck by any type of sickness (Stone, 1976; Hill, 1999; MoHP, 2011). In many rural parts of Nepal, a *dhami/jhakri* is the only source of medical care available that is familiar and affordable (Stone, 1976; Hill, 1999; Prothero, 1999). Even those who are well educated or well off and who regularly use modern medicine also regularly visit *jotishi* (Brahmin astrologers) for advice (Bek-Var, n. d.; MoHP, 2011; Khanal, 2013). In the current practices within Nepal, an arranged marriage proposal is not accepted or rejected before consulting with a priest or *Jyotish* (Ingold, 1994; Khanal, 2013).

Private health care services are very active in various parts or regions of Nepal but they are generally focused on profit rather than providing services (Stone, 1986; German Technical Cooperation, 2009; Gautam, 2011). Most health care services, in the government and private sectors, generally are given by certified doctors, professionally trained paramedics, nurses and certified health workers (German Technical Cooperation, 2009; MoHP, 2011; Hamal, 2012).

However, a problem with the provision of healthcare services is that mostly the hospitals are located within the urban areas and provide different healthcare services as compared to health centres and health posts throughout the rural areas (Hanson and Berman, 1998). Pharmacy and laboratory services along with modern equipment are also attached to health institutions (Haper and Jeffery, 2009; Harper *et al.*, 2011; MoHP, 2011; MoHP, 2014a). The small health centres, health posts and sub-health posts (Hanson and Berman, 1998) which are located in rural parts are mainly established to provide primary level health care services to rural communities (Chalker *et al.*, 1990; Bennett *et al.*, 1997). Generally, they are run by paramedics, health auxiliaries and other minimally trained staff (MoHP, 2011). The rural health services are not effective and generally fail to provide basic health care services on a regular and reliable basis due to poor management (German Technical Cooperation, 2009; Gautam, 2011; MoHP, 2011; Maru *et al.*, 2013). Commonly the community does not trust or accept this service. The other main reason is also the name or word used for the primary care service (Bandura, 1986; Klement and Silverman, 2003). In the mind of communities, it has been illustrated that health centres provide first aid services rather than full fledged healthcare and they seek to access proper hospital services in urban areas where hospitals are located. In Nepali vocabulary, the real meaning of primary is *Prathamik* which is linked closely to priority or first aid (MoHP, 1997; Klement and Silverman, 2003). Almost the whole of Nepalese society is still using traditional medicine as the first step of health care and they go to traditional or spiritual healers with any health problems (Tamang and Broom, 2010). The healthcare infrastructure within the country is poor (Maru *et al.*, 2013) with the traditional ways of curing diseases being followed rather than following the innovations in the healthcare industry (Stone, 1976).

1.9.2 Knowledge, attitudes and beliefs about nutritious food in Nepal

This section presents maternal views about healthy food. Nepalese people have negative attitudes and beliefs about nutritious food particularly recommending healthy food for pregnant and lactating mothers and children (Sharma, 2002; Subedi, 2002; Shakya, 2006). However, the food recommendation system is completely dependent on local traditional and religious norms and

values of the ethnic group (Stone, 1976; Sharma, 2002; Shankar *et al.*, 2006). The supporters of these conventional practices and beliefs in spirits are due to the dominance of Hindu religion within the country and its priests that preach such knowledge (Tamang and Broom, 2010; NDHS, 2011; NPHC, 2012; MoHP, 2012). In rural parts of Nepal, many traditional beliefs still exist; for example, leprosy is believed to be caused by sin in one's past life or to be a curse from God (Acharya, 2012), colostrum lays harm to new-born babies, and mothers may become ugly and weak in health by long-term breastfeeding (Odent, 2011; Sah, 2011; Acharya *et al.*, 2015) The poor community has strong trust in traditional/spiritual healers and their first choice is the spiritual/traditional healer in case of a minor health issues (Stone, 1976; Sharma, 2002; Bezner-Kerr *et al.*, 2008; Biza-Zepro, 2015). The priesthood, illiterate households, spiritual healers, and elderly parents still have high trust in misbeliefs about food and health which are still being practised by them in society (Storer, 1977; Sudedi, 1999; Adhikari, 2012).

An example is provided by Odent (2011) about mothers' attitudes towards colostrum or first milk, which are divided into two contradictory camps – positive and negative opinions (Sibeko *et al.*, 2005). For example, mothers in Nepal believe that milk produced from mammary glands, including humans, provides protection and curing of diseases, nourishment with vitamins, strength and overall health development of children (Odent, 2011), vitamins and nutrition, strength and overall advantage (Sibeko *et al.*, 2005). The negative beliefs are that colostrum can cause evil spirits to enter the infant, or that it is dirty, or generally harmful to the new-born's health (Haider *et al.*, 2010; Odent, 2011).

The practice of using colostrum as the cure of illness has existed in Nepalese society especially among women and they use different terminologies for colostrum such as *bighaouti*, *pip*, *khoti*, *bikh*, *khil*, and *Phohar* as spoken in Nepali language (Sibeko *et al.*, 2005; Haider *et al.*, 2010; Odent, 2011). It is also highly debatable whether colostrum can be considered as 'milk' at all; *bigouti* is the direct translation of colostrum which is very often described as yellow or thick by the mothers (Odent, 2011). Colostrum is also called pus within illiterate communities because it looks like pus by its nature (Sibeko *et al.*, 2005).

Many people still believe that colostrum from mammary glands is unsafe which should be discarded. There are thus certain barriers to the feeding of colostrum to the new-born (Haider *et al.*, 2010; Odent, 2011). Surprisingly, it has even been observed that the owners of cattle do not give the colostrum to the calves of buffalo or cows in rural areas of Nepal (Subedi, 2002).

In Nepalese society, food is considered pure or impure (Subedi, 2002; Shakya, 2006; Subedi, 2010) depending upon the food type, source, and handling (see Appendix 14). In Nepalese and even in Indian society or culture, the concept of cold and hot food is very significant and still exists, especially in rural communities (Pool, 1987; Subedi, 2002; Shakya, 2006). Similarly, cold items are foods that are to be kept in cool temperature for preservation purpose examples of which include fruits, green leafy vegetables and other types of vegetables (Subedi, 2002; Shakya, 2006). Likewise, hot items are also prohibited when someone needs to cool off and they are preferred for extra energy and nutrition (Pool, 1987; Foster, 1994; Subedi, 2002).

1.9.3 Infant and child feeding practices in Nepal

In Nepal, infant and child feeding practices vary widely due to differences in ethnicity as well as cultural and religious norms and values (Khare and Rao, 1986; Kakute *et al.*, 2005; Karkee *et al.*, 2015). Infant feeding practices applied by mothers play a significant role in influencing the health of children under five (WHO, 1998; ACCSCN, 2000; Horton, 2001; PAHO and WHO, 2002). During weaning, children should be fed larger amounts of healthy foods with increasing frequency. Inappropriate feeding practices during this period are the major cause of malnutrition (WHO, 1998; PAHO and WHO, 2002). According to WHO (1998) recommendations, in addition to breastfeeding, children of six to eight months should be fed complementary food two or three times a day (PAHO and WHO, 2002). Similarly, children of 9–11 months should be fed three or four times a day and at 12–14 months they should be fed in addition nutritious snacks twice a day (WHO, 1998; PAHO and WHO, 2002). Some studies about feeding practices in Nepal (Pelto *et al.*, 2003; Ulak *et al.*, 2012) have revealed that supplementary feeding practices among Nepalese mothers are still very poor (Ulak *et al.*, 2012.) The next section considers the agriculture system and food insecurity in Nepal.

1.9.4 Agriculture and food security in Nepal

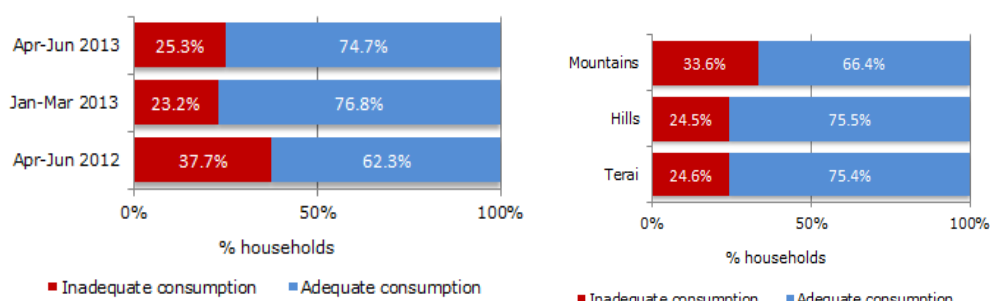
In 1996, the World Food Summit described food security as the people living in the world who have sufficient access to the food all the times that is safe and nutritious in order to meet their dietary needs and the presence of food in the human body for an active and healthy lifestyle (WFP, 1996: objective 2.2, pp. 2).

The reports of Nepal Food Security Monitory Survey (*Nepal Khaddya Surakchhya Anugaman Pranali*) (NeKSAP, 2013) show that there have been significant developments in food security in Nepal. However, some places such as Karnali, Rapti, and Bheri-Zones that are mountainous regions still face a scarcity of food (MoAD, 2014; NFSB, 2014). In the past, food security in many areas of Bajhang and Bajura districts was likely to be affected by seasonal variations (Khadka, 1985; MoAD, 2014; NFSB, 2014). In Nepal, although the economy is heavily dependent upon agricultural output, growth is weak in comparison to other neighbouring Asian countries. It accounts for 33% of GDP and employs about 67% of the workforce in the agricultural sector (Khadka, 1985; FAO, 2011a; NFSB, 2014).

Currently, almost 60% of the people living in rural areas do not have sufficient land to meet their requirements for food (Kayastha *et al.*, 1999; WFP, 2008; 2009; Wily *et al.*, 2008; NPC, 2012). The WFP currently estimates that people requiring food assistance in Nepal has been 3.4 million approximately (Khadka, 1985; NFSB, 2014; Douglas, 2015) and the reason accounted for this is due to natural disasters particularly the winter drought that affect the agricultural products and the high prices of food (NDRI, 2008; Nolon, 2009; NPC, 2013). The families that are endangered with such effects are encouraged to undertake coping strategies such as having a reduced intake, skip meals and sell valuable assets including livestock and migrate to other areas to seek employment (IFPRI, 2010; Muzzini *et al.*, 2013; NeKSAP, 2013). Another reason for food insecurity in Nepal is that the country was severely affected by the global financial crisis and experienced unexpected food price inflation in 2007/08 as a result (Douglas, 2009; FAO, 2011a; FAO, 2011b).

In poor farming communities, there are various reasons for food insecurity which include limited access to the markets, poor materials and lack of technology for agriculture, landslides damaging lands and floods in rainy monsoon seasons causing poor soil fertility. (Pinstrup-Andersen, 1981; Regmi and Adhikari, 2007; Poudel, 2008). Figure 1.2 below shows that the largest proportion of families with insufficient food consumption (33.6%) reside in the mountainous regions and households in the hills and Terai districts (NeKSAP, 2013). Thus, poor agricultural development and food scarcity but are key factors that contribute to malnutrition in Nepal (NLIS, 2010).

Figure 1.2: Food consumption evaluation (Source: NeKSAP, 2013)



1.9.5 Climate change and effects in Nepal

Nepal is a country that is vulnerable to natural disasters (NPC, 2013) with farmers being the most affected community, because of variable disruptive weather conditions that causes flood and landslide risks. (NFSMS, 2015).

The rainfall pattern in Nepal is highly unpredictable which causes an increase in food insecurity and thus, migration of people to other places for safety from disasters, but this increases the burden for families that are left behind in these regions. The isolation in these areas increases because of mountainous and hilly areas; poor roads and infrastructure which is further worsened by floods and landslides (Jha, 2010; 2011). This is compounded by difficulty in gaining access to government services and markets in urban areas and the lack of information and support technically (Mohanty, 1993; Moser, 1998). The change in climate affects the agricultural output for the country which leads to scarcity of food and thus contributes to malnutrition in Nepal. The political instability and internal conflict are also impacted by the scarcity of food.

1.9.6 Internal conflict and political instability in Nepal

Civil war is another major reason that accounts for malnutrition in Nepal (Basnett, 2009). Civil war has had an adverse impact on the country because of increased poverty due to the devastation caused by forcing people to migrate from the war in the affected area. (Devkota and van Teijlingen, 2009; 2010; Upreti and Müller-Böker, 2010; Jha, 2011). In Nepal, the civil war lasted from 1996 to 2006 with the rebels seeking to end the monarchy and form a communist republic. Many people (nearly 17000) were killed in this war including both national security and Maoist forces (Basnett, 2009; Jha, 2011). The conflict had a devastating impact on the whole nation. The state suffered in important sectors along with the economy (Upreti, 2006; Devkota and van Teijlingen, 2007; 2010; Upreti and Müller-Böker, 2010; Jha, 2011). Many communities continue to struggle to cope with a severe shortage of skilled health workers (Devkota and van Teijlingen, 2009), health facilities and supplies (Gannon and Liu, 1997; Devkota and van Teijlingen, 2007; 2010; NSSO, 2012). Through this internal conflict, the whole eco-system of society has collapsed and poverty has increased (Jha, 2010; Partap and Hill, 2012). Likewise, the education sector was also badly affected by the conflict. Many schools were closed, many teachers resigned and more than 100,000 pre-school children failed to have an education (Manchanda, 2004; Basnett, 2009). Similarly, during the war, many children became porters, housekeepers, cooks, sex slaves, and soldiers and were used as human shields (Upreti, 2010).

1.10 Researcher's interest

Considering the above-mentioned problems, the researcher's interest has increased to study the problem of malnutrition in Nepal. As a native of Nepal, I have continued to be enthusiastically interested in public health issues to raise awareness particularly food and health-seeking behaviours of the community. However, my curiosity about this study area strongly emerged while working at the Asha Clinic (paediatric clinic). Here, I observed that several barriers on food and health-seeking behaviours were associated with poor knowledge, negative attitudes and significant food beliefs/taboo which are strongly embedded with existing cultural and religious

norms and values amongst mothers who had visited the clinic along with their sick/ill children. However, my major interest was how food beliefs, cultural, and religious norms and values influence maternal knowledge, attitudes, and behaviours on the ground. Thus, I selected the topic “Knowledge, Attitudes, beliefs and behaviour of mothers of young children related to healthy eating: Comparing rural and urban perspectives in Nepal” for my PhD journey. My M.Sc. empowered me to carry out further study on public health nutrition mainly focusing on maternal food and health-seeking behaviours in two different localities.

The core focus of the present research is to add knowledge related to malnutrition in Nepal and public health nutrition and healthcare focusing on knowledge regarding food variety, nutrition, cultural influences in food and beliefs/taboo about food prevailing within Nepali society (Whitefield-Brown *et al.*, 2009). Malnutrition in Nepal is accounted for different reasons including geographic, social, economic and family problems which tend to give rise to malnutrition problems within the country. For this purpose, there have been different interventions suggested for eradicating the malnutrition problems for communities in Nepal. In an effort to contribute to the knowledge about food beliefs and practices, this thesis will be a crucial resource for a better understanding of the major barriers to food recommendations, health-seeking behaviours and how cultural beliefs and practices affect nutritional food habits (Ellahi, 2014). This research has focused on an exploration of maternal knowledge, beliefs, and attitudes amongst rural and urban mothers about nutritional foods and has focused on the public health aspect only. Additionally, this thesis will add further to the literature by addressing effective strategies for social protection and the future crisis of malnutrition (UNSCN, 2010).

1.11 Brief outline of the researcher’s background

The researcher has experience working in Nepal in the field of eye care for 22 years and as a health manager for five years. During this period, the researcher has collected significant knowledge on health care focusing on differences between urban and rural geographical locations including food and health-seeking behaviours in the community. The researcher has developed his

own interest in child nutrition and food and health-seeking behaviours, after the Xerophthalmia survey in Jumla district, he conducted under the aegis of JSI (The John Snow Inc.) and Nepal Netra Jyoti Sangh. The survey for this study was conducted in the high mountainous regions of Nepal for the International Vitamin A Consultative Group (IVACG, 1990). The researcher also has wide experience of conducting surveys while being part of different NGOs such as WHO, Norwegian Church Aid, Swiss Red Cross, Nepal Red Cross, Nepal Netra Jyoti Sangh (NJJS), JSI, UCL London, and AOCA Japan. Due to considerable work experience in the field of healthcare and research, the researcher has gained the following competencies: extensive knowledge of institutional development, fundraising, project management, evaluation, research, networking and public relations. In the past, the researcher has played a leading role in establishing and implementing a better eye-care service system in Nepal. The researcher has also developed a very effective and efficient awareness strategy, called the '3P awareness model', which has been tested in three different health organizations to accomplish different aspects such as increased service demand from the community, institutional management, and fundraising in Nepal. In the '3P awareness model', which is associated with one of the objectives of this thesis, (see Section 2.13.1), the main focus is on policymakers, professionals, and the public. This means that the model can be applied for creating awareness of public health services among policy makers, professional and public with regards to nutrition. The researcher is confident that it is possible to reduce the prevalence rate of malnutrition by using this model mainly in the developing countries including Nepal. The researcher has supervised numerous health professionals in Nepal for their development and help build capacity. Furthermore, the researcher has been a leading health-advisor to community-based organisations and health institutions such as Kantipur Dental College, Child Nepal in Nepal.

1.12 Overview of the thesis structure

This thesis is divided into nine chapters. The development of this manuscript is subject to the ethical norms and values of Bournemouth University. A brief summary of the chapters is given below.

Chapter 1: Introduction

This first chapter is an introductory section. This chapter considers the global problem of malnutrition and hunger and specifically in Nepal. It presents issues about climate, culture, poverty, health scenario and beliefs associated with religious norms and values of Nepal.

Chapter 2: Literature review

The second chapter critically reviews previous research on maternal views of nutritional attitudes and beliefs about healthy food. The chapter establishes a theoretical framework and methodological focus to inform the research questions and aims and objectives.

Chapter 3: Methodology and methods

The third chapter of the thesis outlines and describes the methodological aspects of the research. It describes more specifically the methods applied and the significance of using a mixed-methods approach including its strengths and weaknesses. In addition, this chapter presents the data collection process including piloting, data management including details of the sample and sampling frame analytical approach.

Chapter 4: Quantitative results

This chapter outlines the quantitative outcomes in two forms: overall (see Section 4.2) and comparative (see Section 4.3). Section 4.2 demonstrates the demographic, socio-economic and health characteristics, child care and feeding trends, knowledge of nutritious food, weight, and height of children, and signs and symptoms of malnutrition. Similarly, it informs cultural beliefs about healthy diets, breastfeeding and colostrum, major food barriers, and mothers' views. Section 4.3 helps in comparing the urban and rural areas with respect to demographic characteristics in section 4.2. Health promotion issues are also examined.

Chapter 5: Qualitative results

This chapter summarises the findings from a qualitative focus group-based approach (Kitzinger 1995). First, the results start with the demographic profile of respondents as part of focus group discussion. Furthermore, it presents the following thematic outcomes based on seven key headings: financial issues/poverty, knowledge/education, resources (availability, accessibility, and affordability), policy/strategy issues, environment/time/situation and beliefs and cultural influences. The qualitative findings are illustrated by 94 quotations delivered by 50 respondents from seven groups.

Chapter 6: Discussion

This chapter presents an interpretation of the study results and discusses the mixed-methods outcomes from chapters four and five. The quantitative results are discussed in the light of the qualitative findings and the wider literature (Kitzinger, 1995). This chapter particularly focuses on six main variables such as knowledge about healthy diet, beliefs (food beliefs or misconceptions, and about breastfeeding and colostrum), attitudes, child-feeding practices, recommendations and major barriers, health-seeking behaviours and cultures, and mothers' views. Furthermore, this chapter highlights the strengths and limitations which comprises of strengths and weaknesses of this thesis.

Chapter 7: Conclusion

This chapter presents the conclusions of the study and is divided into six sections: knowledge, attitudes, beliefs, barriers, and mothers' views followed by an overall conclusion.

Chapter 8: Recommendations

Chapter eight of this thesis discusses the recommendations from the investigation. The recommendations for further research are focused on the following three key areas: i) recommendations for the community (short-term), ii) policy level or government agency (medium-term), and iii) academicians, researchers, and donors (long-term).

1.13 Chapter summary

The following chapter has discussed the basic foundation of study by examining key concepts in the study and focused on providing the background of study through different context on what is to follow in the next sections of the study. It has been found that malnutrition is a practice that is prevailing in the developing and under developing countries with shedding light upon global hunger scenario such as stunting, wasting and underweight problems. Furthermore, this study has highlighted the consequences of malnutrition within the global context. The shift is then focused towards the problems with malnutrition in Nepal and the causes of these problems along with the effects of malnutrition on Nepalese people, especially women and children. This study has discussed the socio-cultural scenario that leads to malnutrition problems such as religious scenario, food taboo, caste system and status of women in the society. Then, the study has highlighted major reasons for malnutrition in Nepal such as the inappropriate provision of health care services, knowledge, and beliefs of people, infant and child feeding practices, agriculture and challenges in agriculture in Nepal. The changing climate and its adverse effects on Nepal and its contribution of malnutrition are discussed. Furthermore, the civil war, political instability, and internal conflict have also been reported as major reasons for malnutrition in Nepal. Finally this chapter has discussed the researcher's interest in this topic, outlining the researcher's background, an overview of thesis structure which describes the outline and what each chapter discusses.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

Having considered the background to the research problem in Chapter 1, this chapter now reviews and discusses the evidence-based literature on all the different yet related concepts involved, this involves the identification of 'gaps' in the evidence-base.

In support of this proposed study, this chapter provides a synthesis of the literature on nutritious food associated with maternal views on knowledge, attitudes, and beliefs about a healthy diet for rural and urban preschool-aged children of the study population.

2.2 Strategy of literature search

A thorough literature search strategy was employed and this involved utilisation of different databases to identify and retrieve journal articles, books, and reports. Also the databases of the World health organization (WHO), World Bank, United Nations (UN), and UNICEF were used for the purpose of collecting relevant information in accordance with the aim and objectives of the research. This review includes the following headings; an overview of Nepal; the health situation including nutritional status; and major contributing factors for poor nutrition.

Search terms used included maternal knowledge about healthy diet, attitudes and practices, beliefs/taboo, cultural impact, major food barriers, child and maternal health, undernutrition, malnutrition, religious and culture issues on food, and epidemiology of malnutrition. Besides these, the researcher has sought related publications in various journals and conference/workshop proceedings by multinational companies, universities, and organizations such as Sight and Life, WFP, FAO, and IFPRI.

A literature search approach was developed to address the inquiry question including the aim and objectives of this study. 'My Search', which is the Bournemouth University electronic database for research, was used to find relevant journals, articles, reviews and information because it enables access to a large number of journals via one sign-in process and includes the social

sciences, agriculture, and major publications on health, child nutrition, and poverty which are likely to contain relevant information for this thesis (see Appendix 22). The chief source of information used was online databases. In the majority of cases, research articles were cited by online libraries as soon as and often before general publication. A specific e-database search was used which helped to retrieve the newest literature and information. These specific databases strive to make as much material as possible available in the form of full text which makes it easy to reach each article in each journal.

The databases which were used for this search strategy includes CAB, Medline Complete, Science Direct, Global Health, Academic Search Complete and various other academic journals. Moreover, certain articles were searched with the help of the database of EBSCOHOST in order to gain relevant and wide range of information in this regard. The EBSCO offers wider ranges of library resources to researchers including academics and its products include EBSCONET and EBSCOHOST with a complete e-resource management system. EBSCOHOST helps the researchers to get access to full-text journals and articles, moreover, it also has the functionality of showing different articles available in each database.

A search strategy was employed to identify both academic and 'grey' literature using general purpose electronic databases, such as "web of knowledge", web searches, hand searching of key academic journals and consultation with content experts. The date of publication of literature was between 1970 and 2017, with some additional older literature on the medieval history of Nepal, Hinduism, spiritualism and cultural issues.

Lastly, the Boolean expressions "AND" or "NOT" were applied to filter the articles, focus the search, and increase relevancy. The keywords relating to undernutrition including its influencing factors such as malnutrition, knowledge, attitudes, beliefs, food, nutrition, poverty; health, South Asia, and Nepal were combined using these operators to utilize search terms better. However, to broaden the search with the use of these operators, the OR operator was used, the keywords were used to come up with relevant search terms which include; nutritious food OR healthy OR nutrients OR animal products OR energy food. Due to the fact that a vast amount of literature was

produced which was impossible to investigate, the search was then narrowed down using AND operators and this resulted in a more manageable number (see Appendix 22). The keywords that were used were truncated to search for different spellings, for example, consum* to cover consumer, consuming, consumed, consumption.

The literature review is the main part of any study which gives a theoretical basis for the research and helps to determine the nature of research including enabling the researcher to learn from the previous theory of the focused issues (Tashakkori *et al.*, 2003; MacKenzie-Bryers *et al.*, 2014). In literal terms, a literature review is an evaluative report of investigation and has a strong correlation with aim, objectives and the research questions of the study. One of the fundamental functions of carrying out a literature review is to provide a detailed and comprehensive theoretical review which helps the researcher to create a link between the objectives of the research and the part which has already been covered in the previous studies. It helps in terms of correlating the findings of the research with the already available data in order to bring clarity and focus to the research problem. The theoretical review of the literature provides the researcher with wide knowledge regarding the research topic or problem (Greene, 2008; Creswell *et al.*, 2011).

The literature review describes and illuminates the targeted subjects. For example, in this study, poverty, malnutrition (under and overnutrition), social and religious frameworks, knowledge, attitudes, beliefs and others issues which are directly or indirectly associated with the investigation described, evaluated and clarified the related matters. The articles and sources of data which is selected for this research are limited in numbers; the articles which are selected for this research are in accordance with the aim of this research. This literature has focused on including the articles which triangulate the relationship between the available literature and public health nutrition. However, it should be noted that format of literature review for different research varies. While conducting a literature review the researcher takes into consideration the context of the research, research justification, avoids replication of the study, where the research knowledge fits, how the subject has been deliberated previously, errors and outline gaps in the study, what sort of knowledge added to the literature on public health nutrition and lastly helps refine, refocus

or even change the research topic (see Appendix 22). Besides these, government reports are also included in the study. To start with 1716 mixed articles, journals, and published papers, as well as news articles, were collected (Appendix 22). The researcher also searched reports on nutritional problems published by relevant agencies of the government of Nepal, such as the Planning Commission, Ministry of Health, and Ministry of Education, as well as universities and many more institutions directly or indirectly involved in nutrition, education and agricultural development in Nepal. Most of the literature used in the study, were from South Asia, Africa, Europe and the United States. 23 key papers were most relevant to the aim and objectives of this thesis (See Appendix 22).

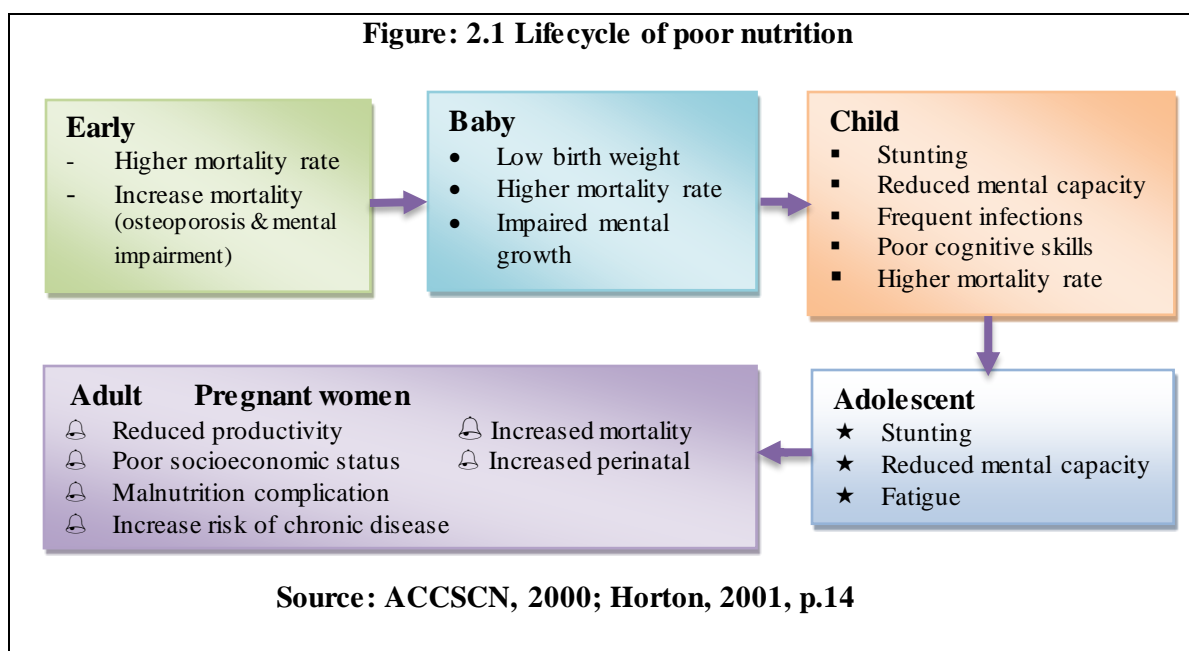
2.3 Overview of undernutrition

Today child nutrition is a commonly discussed and a well-known issue around the world. According to Fildes (1991), scientific investigation on this subject began as early as the late nineteenth century within industrialized countries, mainly in Europe. Since then, GOs, NGOs, and researchers have started intervention programmes and a number of studies on child malnutrition have been conducted. Due to this effort, the overall malnutrition rate for the entire world has dropped. Almost 40 million children were able to escape malnutrition in the last 20 years of the twentieth century (de Onis *et al.*, 2000). de Onis and his team found that 47% of children under five were malnourished in 1980, dropping to 33% in 2000. Global malnutrition has decreased further since 2000 (World Bank, 2006b). However, some argue that the reduction might have stopped or reversed in recent years due to economic downturns, global food crisis and worldwide climate change (USAID, 2008; WHO, 2009). The above section has discussed the magnitude of undernutrition at the global level. However, next section outlines the life cycle of poor nutrition based on the literature.

2.4 The life cycle of poor nutrition

Gillespie (1996) pointed out that malnutrition is not a disease that runs its course, bringing immunity, malnutrition is a condition with significance that may extend not only into later life but

also through future generations (Gillespie *et al.*, 1996). Its course often begins in utero and may last a lifetime, for females especially as it affects their life and also future generations (Gillespie *et al.*, 1996). A girl with low height for her age may develop into a stunted teenager and hence a stunted woman. This will affect her health and productivity. Poor nutrition that influences underweight and stunting in adult life escalates the chance of giving birth to malnourished or low-birth-weight children, and so the cycle goes on (Gillespie *et al.*, 1996). Figure 2.1 clearly summarises the life cycle of poor nutrition.



2.5 Consequences of undernutrition

Black and colleagues (2008) revealed that underweight problems, wasting, and stunting are the consequences of undernutrition and a key cause of child mortality. For instance, Black *et al.*, (2008) highlighted in their “study of maternal and child undernutrition” that a severely stunted toddler faces four times greater risk of dying. Similarly, a severely wasted child is at nine times higher risk and this group further added that undernutrition can cause several diseases such as of the eye, and neural tube defects due to micronutrient deficiency (vitamin A and iron).

The wider understanding of the shocking implications of undernutrition was strongly associated with poor and low levels of schooling, reduced economic productivity, shorter adult height, and

for woman-lower child birth weight (Victora *et al.*, 2008). Similarly, Martorell *et al.*, (2010), Douglas and Currie (2011) argue that the influence of stunting, wasting, underweight and overweight from undernutrition on the health of public, financial growth and human capital has been supported by studies which are conducted in recent times.

Martorell *et al.*, (2010) and Douglas and Curie (2011) has conducted a laboratory-based research in this regard and it is shown that there are harmful impacts of inadequate intakes of particular nutrients and micronutrients. These micronutrients include folic acid, iron, and iodine which have a significant negative impact on the development of the brain and nervous system and hence it impacts the performance of children at school.

Large-scale epidemiological studies indicate that undernutrition early in life clearly have major consequences for future educational, income and productivity outcomes. Stunting is associated with poor educational achievement and performance (Grantham-McGregor *et al.*, 2007; Dewey and Begum, 2011). There was a longitudinal study which was conducted by Martorell *et al.*, (2010) the sample of the research were children from India, Brazil, Philippines, South Africa. Guatemala. The results of the research show that there is an association between stunting and reduction in school performance. Moreover, it was also indicated by the research that stunting is a predictor of grade failure. Besides this fact, in Nepal, there are limited studies conducted on consequences of undernutrition particularly using mixed-methods. The next information highlights the current global situation of undernutrition.

2.6 Current global situation of undernutrition

The literature shows the current global scenario of undernutrition and progress, which estimates that undernutrition is responsible for almost half (1.3 million) of all deaths (3 million) of under-five years of age children with Asian and African regions most affected (WHO *et al.*, 2013). The joint report concluded that undernourished children are at extreme risk of dying from contaminations and development of severe infections, and they make the slow recovery from ailments (UNICEF, 2014a; WHO, 2014; World Bank, 2014). Similarly, the joint report

highlighted the effects of undernutrition and infection which leads to worsening disease and declining nutritional status. According to the joint report, malnourishment in the first 1000 days of a child's life can lead to poor growth and development, and permanently affect cognitive ability, learning ability and work performance (WHO *et al.*, 2013). The joint report data, of WHO, UNICEF, and the World Bank, showed that the prevalence of the underweight conditions has reduced. On the other hand, the report estimates that the improvement is not enough to achieve the undernutrition-related Millennium Development Goals (MDG) (goal 1, 4 and 5) for Asian and African regions generally.

Mosley and Cowley (1991) argued that underfed children are at greater danger of morbidity and mortality and this statement was further supported by Griffiths *et al.*, (2002). According to WHO cited in a UNICEF report (1998), about 55% of illnesses of children aged under-five worldwide are caused due to undernourishment. Several studies, conducted by Pollit (1984), Litcher (1997), de Onis and colleagues (2000), and Behrman and Rosenzweig (2004), has suggested that the undernourished children who survive, end up with reduced cognitive development and therefore their educational accomplishments are hindered and limited. In addition, UNICEF (1998) and Smith and Haddad (2000) have further added to the above statement that people who have suffered from malnutrition in their earlier life are more likely to develop illness and disability in their future lives. Furthermore, these conditions involve an inter-generational cycle of malnutrition, infirmity, and poverty not only within a family but also nationwide. Further, three sub-sections outline the global magnitudes of stunting, underweight and wasting

2.6.1 Stunting

The worldwide prevalence of stunting remains very high (25%) with 90% of all stunted children living in African and Asian regions; one in four children under five years are stunted (WHO *et al.*, 2013). The magnitude of stunting in children under five was 199 million (33%) in 2000 and although reduced (by 8%) it remained still elevated at 161 million (25%) in 2013 (WHO *et al.*, 2013). Among them, half of the stunted children are in African and Asian regions.

2.6.2 Underweight

The magnitude of the underweight condition has been dropping slowly worldwide between 1990 and 2013 (WHO *et al.*, 2013). The report states that the condition of underweight has decreased by only 10% from 25% to 15% within 23 years. This report argues that if the existing declining trend remains the same, there is no doubt it will fail to meet the MDG number-one objective (see Textbox 2.1). The total number of children under five who were being underweight was 99 million in 2013 (WHO *et al.*, 2013). According to the joint report (2013), the African region has had a slow decline from 23% (in 1990) to 17% (in 2013) and the underweight population has declined by almost 50% in the Asian region at the same time from 32% to 18% (WHO *et al.*, 2013; WHO, 2014).

2.6.3 Wasting

Globally, 51 million (8%) children less than five years of age were wasted and 17 million (3%) were severely wasted in 2013. Nearly one-third of all wasted children were in Africa and two-thirds were in Asia and also severely wasted children were in the same numbers (UNICEF, 2014a). WHO *et al.*, (2013) has highlighted the circumstances of severe wasting in the South and Asian region and shows a serious public health problem. The next section comprises of three sub-sections (i.e. 2.7.1; 2.7.2 & 2.7.3) which highlights the development plans to tackle the nutritional problem at the global level.

2.7 The global development plans and undernutrition

This section briefly discusses the global development strategy which was the aim to tackle undernutrition problems. Firstly, it highlights the Millennium Development Goals (MDGs), Global targets 2025, SUN movement and Sustainable Development Goals (SDGs) 2016-2030. In 1948, the United Nations officially documented in the Universal Declaration of Human Rights that “Everyone has the right to have an adequate standard of living for the health and well-being of an individual and their respective family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness,

disability, widowhood, old age or other lack of livelihood in circumstances beyond his control” (UDHR, 2015, p. 52). Similarly, the UN convention on the rights of the child has stressed the importance of the right to health and nutrition (World Bank, 2006b). Since then, nutrition and child health have been elevated to the main agenda on the international platform. Most of the civil society carries the demand for rights-based development methods to address the problems accompanying malnutrition and child health (Micklewright and Stewart, 2000; World Bank, 2006b; Gurung, 2009; SUN Movement, 2012). The following sub-section relates with MDGs.

2.7.1 Millennium Development Goals (MDGs)

In September 2000, world leaders adopted the UN Millennium Declaration and committed their states to a new global partnership to minimize poverty. The UN (2005) announced that they want to address poverty in its many dimensions: hunger, disease, lack of adequate shelter and exclusion while promoting gender equality, education and also environmental sustainability. The UN-led mission focused on basic human rights such as the right of each individual to health, shelter, education, and security. The members of the United Nations (including Nepal) approved the eight MDGs in September 2000 (UN Millennium Project, 2005). The table below shows eight MDG which signifies the global resources and policies to eradicate poverty from the world. The first and fourth MGD indicates child nutrition. Particularly the first goal focused on reducing the malnutrition and hunger moreover after it the percentage of children who are under five and underweight should be 50% by 2015. On the other hand, the fourth goals were to reduce the mortality of children by two-thirds of what it was in 1990 by the year 2015 (UN Millennium, 2005). When talking about the Nepal, the results signify that the MDGs have been achieved prior to 2015 (The Himalayan Times, 2010, p-17; The Kathmandu Post, 2014).

Besides this, the joint estimation report stressed that the following three regions have already achieved or crossed the MDG 1 target: Latin America and the Caribbean, Central and Eastern Europe and East Asia and the Pacific regions (WHO *et al.*, 2013; UNICEF, 2014a). According to World Bank (2006b), this target is based on the belief that there exists an association between hunger and malnutrition and this association is direct in nature. It has been argued by Bryce *et al.*,

(2005) the MDG 4 is also concerned with the analysis of malnutrition and because of malnutrition, almost 50% of children under the age group of five die every year. Goal one, four and five are related to this study. MDGs are given in Textbox 2.1.

Textbox 2.1: Millennium Development Goals

Goal 1: Eradicate Extreme Poverty and Hunger.

Goal 2: Achieve Universal Primary Education.

Goal 3: Promote Gender Equality and Empower Women.

Goal 4: Reduce Child Mortality.

Goal 5: Improve Maternal Health.

Goal 6: Combat HIV/AIDS, Malaria, and Other Diseases.

Goal 7: Ensure Environmental Sustainability.

Goal 8: Develop a Global Partnership for Development.

Source: UN, 2005

According to UNICEF (2009), the second target of MDG is to diminish the ratio of people who are suffering from starvation to 50% during the time period of 1990 and 2015. The major indicator used for the purpose of measuring the MDG is the prevalence of underweight conditions especially in the children under five. UNICEF (2009) estimates for underweight prevalence are based on the most recent data available to UNICEF for the years between 1996 and 2005 from 110 countries, covering 98% of the developing world's under-five population.

Morrison and colleagues (2005; 2008) believed that as a result of the introduction of MDGs 1, 4 and 5 (see Textbox 2.1), more efforts have been made to eradicate poverty and hunger and reduce child mortality; however, mortality rates have not decreased in the world's poorest populations. For example, maternal mortality in Nepal is as high as 170 per 100,000 live births (CIA, 2013), although this is slowly decreasing. Furthermore, United Nation (2015) and Kumar *et al.*, (2016) has announced that the MDG concept has been closed in the year 2015 and a new agenda knew as 'SDGs: 2016-2030' was launched by the United Nations for the fulfilment of unachieved targets of the MDG. The below sub-section solely describes global development plan.

2.7.2 Global targets 2025

de Onis *et al.*, (2013) have reported that the Assembly of WHO in 2014 resolved to scale up global action to address the underlying causes of the problem of malnutrition. Its key concept is to improve infant and young child, and maternal nutrition (WHO, 2015). The WHO aims to reduce all the form of nutritional problems (Anaemia Policy Brief, 2015). The WHO has also decided to set six global nutrition targets to accomplish the following goals by the year 2025 (UNSCN, 2010; Global Targets, 2014; UNICEF, 2014). In 2014, MoHP of Nepal declared that, as a member of the UN, Nepal is also a part of all the global agendas. The MoHP (2014) added that Nepal has achieved the target of MDGs (UN, 2005) and might accomplish Global Nutrition Targets 2025 as well. This global initiative will help to improve undernutrition problems among the Nepalese population. Textbox 2.2 highlights a set of six global agendas.

Textbox 2.2 Global Nutrition Targets: 2025

Target 1: Reduce by 40% the number of children under five who are stunted.

Target 2: Achieve a 50% reduction in the rate of anaemia in women of reproductive age.

Target 3: Achieve a 30% reduction in the rate of infants born with low birth weight.

Target 4: Ensure that there is no increase in the rate of children who are overweight.

Target 5: Increase to at least 50% the rate of exclusive breastfeeding in the first six months.

Target 6: Reduce and maintain childhood wasting to less than 5%.

Source: Global Targets, 2014

2.7.3 SUN movement

The formation of Scaling Up Nutrition (SUN) in 2010 an initiative of more than 12 countries (SUN Movement, 2012), is a global movement whose major aim is to progress well-being through evidence-based nutrition interventions. It calls attention to, align and proliferate the resources by building up strong partnerships (SUN, 2014). SUN moment has set out the following themes: Engage, Inspire, Invest (SUN, 2010).

SUN calls for greater multi-sectorial action on nutrition during the first critical 1000 days of a child's life, from conception to two years of age (SUN, 2014; 2015). The Government of Nepal has made nutrition a priority with the adoption of the Multi-Sectorial Nutrition Plan (MSNP). Nepal is also one of the active members of the SUN moment (SUN, 2010). SUN Movement Nepal (2012) reported that external partners were also channelling important funds to improve the nutritional status of the children and women of Nepal. Besides this, the next section focuses on undernutrition as an issue in the regional context.

2.8 Undernutrition as an issue in the regional context

UNICEF (2008) shows that by focusing on maternal and child health, including undernutrition, the rate of child stunting has been reduced by 38% in developing countries within 18 years (1990 to 2008) due to the efforts of public health professionals (UNICEF, 2008). Similarly, UNICEF (2008) states that the rate of child stunting reduction is not the same in all regions'; however, the reduction rate in children underweight in the African and Asian regions was 17% and 7% respectively in the same period (ibid). The World Bank (2001) has found that the prevalence of undernutrition in children under five years is very high in the South Asian region at 46% compared with the Sub-Saharan African region which is 26% (World Bank, 2000). A study conducted by Victoria *et al.*, (2013) states that in the South East Asian region, the mean height for children between one and fifty-eight months is significantly poor among all five global parts and this region was popular for having poor nutritional sectors (Victoria *et al.*, 2013). Sub-Saharan African and South East Asian region have a reliably accomplished improvement for all age groups compared with other regions (ibid).

de Onis *et al.*, (2010) has estimated that worldwide 171 million children were stunted, of whom 167 million were from developing countries. Similarly, in 1990, overall childhood stunting was 39.7% declining by 26.7% in 2010. The overall reduction was only 13% within 20 years. de Onis *et al.*, (2010) has expressed in his study that this tendency is predicted to reach 142 million children (21.8%) stunted globally in 2020. The same study shows that in Asia it has dramatically

declined from 49% in 1990 to about 28% in 2010 (de Onis *et al.*, 2010; WHO *et al.*, 2013). Similarly, the rate of stunting has stagnated in African region since 1990 at about 40% and has hardly progressed. The study team found in 2010 that the stunting rate in Latin America is low, at 7 million (14%) in 2010 (de Onis *et al.*, 2010). In the last twenty years, progress has been achieved and these findings also help in less progressed regions needing effective interventions (WHO *et al.*, 2013; UNICEF, 2014a). A separate study conducted in the South Asian region by UNICEF (2007) and The World Bank (2006) highlighted that at the global level, the malnutrition ratio varies greatly in the South Asian region. Similarly, the same study reported that in Sri Lanka 18% of children under five years were suffering from stunting in the year 2006 (MoFP, 2008) while in Nepal it was 43% and in Afghanistan 54%. The literature agrees that, with the existing degree of achievement of malnutrition, it will be difficult to fulfil the MDG goal focusing on child nutrition, i.e. to half the number of hunger sufferers as measured by the percentage of children under-five with underweight between 1990 and 2015 (World Bank, 2006; UNICEF, 2007; Hatlebakk, 2015). Hence, the literature suggests that there is the existence of a gap in the available knowledge regarding issues of food and health-seeking behaviours and some of the key problems faced by the South Asian and the African population. In other words, this suggests that there is a need for further evaluation focusing on the key reason for undernutrition in the South Asian region particularly in Nepal, India, Sri Lanka and Afghanistan. This literature review focuses on undernutrition in the context of Nepal in the next section.

2.9 Undernutrition in the context of Nepal

This section focuses on providing detailed and comprehensive information regarding undernutrition in the context of Nepal. Further sections 2.9.1-16 literally, discuss the possible risk factors of undernutrition of Nepal. This thesis has already given background information on the possible risk factors in chapter one.

UNICEF (2009) expressed that undernutrition is particularly prevalent in the age group from six to 36 months in Nepal and a widespread problem in the nation. Based on a UNICEF report

(2009), globally, Nepal is one of the top ten nations with the highest prevalence rate of stunting and in the top twenty nations by the number of stunted under-five-year-old children. The NDHS (2001) reported that about 57% of children under five years were affected by stunting (short for their age), which can be a sign of early chronic undernutrition. In 2006, this figure reduced to about 49%, and in 2011, it was 41%. Moreover, the survey also found that in 2001 43% of children were underweight, dropping to 39% in 2006 and 29% in 2011. The survey data also indicated that rural children under five years are at greater risk than urban children (see Appendix 19).

But the recently conducted NDHS in 2011 and 2017 reported that it has been progressing. The regional assessment of the United Nations Standing Committee on Nutrition (UNSCN) (2010) revealed that the condition of stunting (32%) and underweight (40%) in Nepal exceeded the average prevalence rate in South Central Asia. In Nepal, maternal undernutrition is also an alarming cause. The report of NDHS (2011) presented that one-fifth of women aged 15–49 years were underweight (BMI less than 18.5 kg/m²). However, this has been progressing to a lesser degree. Similarly, NDHS (2011) reported that the prevalence rate of anaemia in children (46%) and women (35%) was a major health problem in Nepal. However, most importantly child and maternal undernutrition are serious concerns that urgently require targeting a defective intervention.

The NDHS (2001) reported that about 57% of children under five years were affected by stunting (short for their age), which can be a sign of early chronic undernutrition. In 2006, the figure was about 49%, and in 2011, it was 41%. The survey also found that in 2001 43% of children were underweight, dropping to 39% in 2006 and 29% in 2011. The survey data also indicated that rural children under five years are at greater risk than urban children (see Appendix 19).

The results from CBS *et al.*, (2011) reports show that there is the difference in the data for the years of 1996, 2001, 2006, and 2011 in terms of child stunting in different regions. The lowest rate of malnutrition was found in the district of Kathmandu (31%) on the other Humla district which is located in the extreme western region of Nepal has the highest rate of child stunting, to

be precise, it was 72% (CBS *et al.*, 2006). An even bigger disparity was noted between the Ilakas (one Ilaka consists of four to six VDCs). The CBS *et al.*, (2006) report failed to find out the reasons which were associated with the variations. Similar to this report Shrestha and Findeis (2007) explored and analysed the variance of stunting at a regional level with the help of NDHS data for 2001. The results of the study conducted by Shrestha and Findeis (2007) found that on a multi-level analysis that there is a spill-over effect on the community level of education of mothers on child nutrition, these also included children of uneducated mothers. It was found by the CBS report that the education level of a mother and her nutritional status has a significant impact on the nutritional value of her child (CBS *et al.*, 2006; Shrestha and Findeis, 2007). These studies showed that as compared to the Eastern region the women of the central and western region had a stronger community externality of maternal education (NPAN, 2007). This study is considered to be first of this kind specifically in the region of Nepal and it greatly contributes to the dimensions of CBS *et al.*, (2006) because it is focused on finding potential factors for producing differences in malnutrition.

A study conducted by Bishwakarma (2009) in the eastern Terai region of Nepal showed the malnutrition rate is 22% compared with 59% in the mountainous area of a western part of Nepal (Bishwakarma, 2009). Several researchers (i.e., Krugman, 1991; Kanbur and Veneables, 2005; Drewnowski, 2009; Pokharel *et al.*, 2013) have highlighted the high and often growing socio-economic difference between various geographical sectors (globally, regionally, or within-country level), regional gaps are increasingly attracting researchers' interest. Even though the focus is mostly on economic difference, research done by McNay *et al.*, (2003) has also investigated other health-related subjects, such as maternal mortality, child mortality, maternal contraceptive use and so on (Kravdal, 2004).

Similarly, the FAO (2014a) analytical report on the undernutrition situation of Nepal is deserved as best evidence (Table 2.1). This shows anthropometry values and nutritional deficiencies of Nepal at three different dates – 1992, 2002, and 2014. All the indicators presented in Table 2.1 explain anthropometric and nutritional deficiencies of under-five year old children of Nepal

between 1992, 2002 and 2014. In regards to the percentage of low birth weight babies, there is no difference between 2002 and 2014 but the percentage of wasting, stunting and underweight conditions of under-five years old children amongst males and females have slightly decreased. However, anaemia in children aged under-five was reduced to 62.6% from 71.9% between 1992 and 2002 and 57.7% in 2014 respectively. Underweight conditions of fewer than five years old children (male/female ratio) also slightly progressed to 37.7/39.8 from 43.3/42.5 between 2002 and 2014.

Table 2.1 Nepal: Indicators of undernutrition

Themes	1992	2002	2014
Anthropometry			
Low birth weight babies (% of births)	na	21.0	21.2
Wasting, children under 5 (M/F, %)	na	15.9/14.2	13/12.4
Severe wasting, children under 5 (M/F, %)	na	4.5/3.7	3.1/2.2
Stunting, children under 5 (M/F, %)	na	56.8/56.4	49.1/49.6
Underweight, children under 5 (M/F, %)	na	43.3/42.5	37.7/39.8
Underweight, adults (%)	na	Na	Na
Overweight, children (M/F, %)	na	1.3/0.7	0.6/0.6
Overweight and obesity, adults (M/F, %)	na	na	9.3/8.9
Prevalence of food over-acquisition (%)	16.1	18.8	25.2
Nutritional deficiencies			
Anaemia, women (pregnant/non-pregnant, %)	58.9/56.9	53.7/44.4	48.8/39.6
Anaemia, children under 5 (%)	71.9	62.6	57.7
Vitamin A deficiency, total pop. (%)	Na	32.3	Na
Iodine deficiency, children (%)	Na	27.4	27.4
Prevalence of undernourishment (%)	22.6	22.1	13.0
Number of people undernourished (mln)	4.2	5.2	3.6
Depth of food deficit (kcal/cap/day)	148	150	87
Source: FAO, 2014a			

National Planning Commission (NPC) (2003) and New Era (2007) reported that since 1980, the Nepalese government has been putting great efforts into addressing health and nutritional issues and some of the programmes have been very successful. According to the NDHS (2006 and 2011), infant mortality had declined from 79 per 1000 births in 1991 to 48 in 2006 and 46 in 2011. Similarly, the mortality of under-five children decreased from 91 to 54 per 1000 live births during the same period, a total decline of 37% was recorded. Some of the public health

programmes which support nutrition are also highly successful, in that nearly 90% of children (6 months to 59 months) received high-dose vitamin A capsules and deworming tablets twice annually. Likewise, the MoHP (2007) and the World Bank (2010) reports have concluded that the distribution of folic acid and iron tablets had increased from 23% in 2001 to 60% in 2006. With these remarkable outcomes, Nepal was commended by the United Nations for attaining this victory in decreasing child and maternal mortality (The Himalayan Times 2010, p. 17). However, children's nutrition has not made the same significant improvement. For example, the 2006 NDHS report showed only an 8% decline in overall stunting from 2001 and 2006 respectively. Wasting remained similar in 2001 and 2011 but it increased by 2% (from 11% to 13%) in 2011 (MoHP 2007; NDHS 2011). Similarly, according to an NDHS report carried out in three different phases (2001; 2006; 2011) underweight conditions overall reduced by 14% in 2011 from 2001, and projected to be 39% in 2006 and 29% in 2011. At the same time, the country was on the way to accomplishing MDG 4 and 5 (UNICEF, 2009). However, the actual statistics on child undernutrition of developing countries are still not known (WHO *et al.*, 2013). Regarding the undernutrition of Nepal, numerous sources of literature (e.g. CBS *et al.*, 2006; UNICEF, 2009; NDHS, 2001; 2006; 2011; NPC, 2003; Bishwakarma, 2009; New Era, 2007) have been reviewed in this chapter. This literature shows that the high prevalence rate of undernutrition still exists in Nepal (NDHS, 2017). However, this suggests that there is a need to identify further inquiry focusing on major risk factors. The following discussion moves to look at the existing literature on the major risk factors of undernutrition in the context of Nepal.

2.9.1 Major determinants of undernutrition in Nepal

This section highlights major determinants of child undernutrition in Nepal. In order to understand the key determinants of undernutrition in the context of Nepal, by outlining some of the food and health-seeking issues concerning high prevalence rate of undernutrition in Nepal (NDHS, 2011; 2017). It is necessary to understand some of the key issues related to undernutrition, especially beliefs, knowledge, attitudes about healthy diet including social and

religious norms and values which effect on food and health-seeking behaviours of the mothers.

Below given sections and sub-sections briefly, discuss these issues.

Acharya (1981) reported the major nutritional barriers such as a lack of knowledge about nutritious food and poverty which are associated with food security, food prices and income source of households (Jolly, 2010; Anamol, 2016). Similarly, Deolalikar (2005), and Upreti and Müller-Böker (2010) have reported on the major nutritional barriers of Nepal such as the magnitude of poverty, caste factors, gender and social disparities, and conflicts are considered as secondary barriers to solving the problems of undernutrition. The child undernutrition was incorporated as an important health agenda on the five-year development plan (1980-1985) (Adhikari and Maskay, 2004). The evaluation of the maternal knowledge and attitudes focusing on child undernutrition, however, seems to be fairly limited in Nepal. While, these studies highlight major determinants of undernutrition of Nepal which put children's whole life at the risk of overall development, including cognitive skills (Adhikari and Maskay, 2004), this thesis has not investigated any clinical and pathological experiments, because this thesis was completely focused to evaluate public health issues. Therefore, the literature review reveals that there are a wider variety of controversial issues in this context. Moreover, this section did not examine detailed information about the existing trend of cultural, religious norms and values which associated with food and health-seeking behaviours (Storer, 1976; Subedi, 1999; 2002; 2010). It is, therefore, important to consider briefly the riskier factors of food and health-seeking behaviours within this society. In Nepal, there was a limited study conducted using a mixed-method approach on the above-mentioned issues. The next section precisely highlights on hunger scenario of Nepal.

2.9.2 Nepal: hunger scenario

A 7.8 magnitude earthquake hit Nepal, mainly in hilly areas including the capital city, at 11.56 am local time on 25 April 2015. World Food Programme (2015) reported that thirty-nine of 75 districts of the country were affected by this devastating earthquake. This devastating destruction has badly impacted on Nepal's economy and development. It also has increased the hunger

situation in the country which literally, increased the undernutrition situation in Nepal. Furthermore, Nepal's vulnerability to high food prices, mainly in rural areas, drives hunger situation. Average food costs in the rural mountain and hill regions are 100% higher than in the Terai region (World Food Programme, 2015). These reports further highlight that approximately 5 million people in Nepal are undernourished, 29% of children under the age of five are underweight and 41% are stunted.

In Nepal, man-made disasters such as strikes, violence, conflicts and etc. are normal (Basnett, 2009). Low SES people are mostly affected by these disasters which consequently increased hunger situation. For example, Nepal's south ethnic groups have blocked the main supply routes from India since September 2015, just after the earthquake, in a bid to win amendments to a new constitution they argue disadvantages them through changes to political representation and citizenship rules and electoral boundaries (Bennett, 2015). These disasters have provoked a critical shortage of life-saving medicines and fuel, threatening at least 3 million children could be at risk of illness including undernourishment (Devkota and van Teijlingen, 2010; Bennett, 2015). Devkota and van Teijlingen (2010) also revealed the similar notion that the ten-year-long conflict in Nepal gradually centralised all systems, including health services, and unsettled the development of rural areas, where health services were badly affected and the urban population increased due to rural communities shifting to more secure places during the conflict (IRIN, 2007; MoFP, 2008; IFAD, 2013). Key research literature in these studies also demonstrated similar factors of undernutrition in Nepal.

von-Grember and colleagues (2013) reported that GHI ranks nations on a 100-point scale with 0 being the best score, indicating that there is no hunger, and 100 points being the worst. von-Grember *et al.*, (2013) explains that less than 5.0 points reflect low hunger, between 5.0 and 9.9 reflects moderate hunger. GHI between 10.0 and 19.9 points indicates a serious problem; values between 20.0 and 29.9 are an alarming condition of the hunger and values 30.0 or higher are extremely alarming (von-Grember *et al.*, 2013). Furthermore, it states that in 1990 Nepal had a GHI of 28.0, which indicates an alarming condition of hunger while in 2013 it, scored 17.3 which

indicates that there is a serious problem. The poor GHI is also significantly associated with undernutrition in Nepal and it is also one of the strong determinants of undernutrition (von-Grebmer *et al.*, 2013).

The GHI is calculated based on a multidimensional approach to measuring and tracking hunger. It combines the following three equally weighted indicators (von-Grebmer *et al.*, 2013).

- The prevalence of underweight in children under five years of age (proportion of children suffering from low weight for their age).
- The proportion of undernourished children as a percentage of the population (link with the share of the population with inadequate dietary energy intake).
- The mortality rate of children under five (associating with the fatal synergy between poor dietary intake and harmful environments).

Table 2.2 shows Nepal's GHI, the prevalence of undernourishment including underweight conditions and mortality rates of children under five between 1990, 1995, 2000, 2005 and 2013. Nepal's GHI dropped to 17.3% from 28.0% between 1990 and 2013. The prevalence of undernourishment in the whole population has increased to 27.1% from 25.9% (in 1994-96 from 1990-92) and slowly decreased to 18% in 2010-12. Under-five-year-old mortality rates have drastically reduced from 13.5% to 4.8% between 1990 and 2011 but the prevalence of underweight conditions in children-under-five still remains severe but dropped from 44.6% to 29.1% between 1988-92 and 2008-12.

Table 2.2 Nepal: GHI, prevalence of undernourishment and mortality rate

Years	1990	1995	2000	2005	2013
Nepal's Global Hunger Index	28.0	27.3	25.3	22.3	17.3
Years	1990–92	1994–96	1999–2001	2004–06	2010–12
Prevalence of undernourishment in the population (%)	25.9	27.1	24.5	21.7	18.0
Years	1988–92	1993–97	1998–2002	2003–07	2008–12
Prevalence of underweight in children under five years (%)	44.6	44.1	43.0	38.8	29.1
Years	1990	1995	2000	2005	2011
Under-five mortality rate (%)	13.5	10.6	8.3	6.5	4.8
Source: von-Grebmer <i>et al.</i>, 2013					

On the one hand, man-made disasters and global hunger index were found very critical (von-Grember *et al.*, 2013) which are considered to be the strongest evidence of a severe hunger condition in Nepal. It indicates that there is a severe undernourishment condition which is increased due to the shortage of basic food and other necessities. On the other hand, Nepal is a disaster-prone country where low SES people are being affected by food shortage (WFP, 2009; 2015). Thus, this literature review indicates that there is an urgent need for further inquiry on undernutrition focusing on issues around man-made disasters and GHI. Furthermore, the next sub-section focuses on the socio-cultural situation of Nepal.

2.9.3 Socio-cultural situation in Nepal

The socio-cultural situation of Nepal is one of the complex key issues which revolves around food and health-seeking behaviours amongst rural and urban mothers (Bennett *et al.*, 2008). Bhattachan *et al.*, (2009) analysed and cited that the country has a diverse landscape which forms various socio-cultural aspects such as culture, religion, caste /ethnicity, and language. The WHO Country Cooperation Strategy 2006-2011 published that in Nepal there are more than 103 different casts (ethnic groups). Bennett *et al.*, (2008) added that these ethnic groups have a strongly embedded caste system which describes the social stratification by ethnicity. Even though it is officially eliminated, caste differences still exist in the Nepalese society (Bandura 1986; Bennett *et al.*, 2008; Drewnowski, 2009).

According to Gurung (2001; 2005), it has been stated that the culture of Nepal is rich and wealthiest as compared to other cultures. Nepal is known as ‘the way of life for an entire society’ which depicts the culture of the Nepalese society (Subedi, 2002; Adhikari, 2012; Fouch, 2014). According to this statement, Nepal is the country where every aspect of life, food, clothing and even occupations are guided by culture (Culture of Nepal, 1994; Hinduism, 1999). Adhikari (2012) and Shrestha (2015) further explain about cultural influences in Nepalese society which include codes of manners, dress, language, rituals, and norms of behaviours and systems beliefs. Nepal is a country highly dominated by its socio-cultural norms and values. Within Nepalese

society there exist large numbers of socio-cultural elements (Culture of Nepal, 1994; Hinduism, 1999; Craig, 2011; Fouch, 2014).

Fouch (2014) citing the paper entitled 'Journey Through the Eastern Hemisphere', states that in Nepal there are various sets of customs, practices, religions, festivals, beliefs, attitudes and values. These elements are responsible for following and driving religious and cultural norms and values. People of Nepal have high faith in their culture and religion. Hence, Nepal is very popular in terms of its socio-cultural system. Variety of languages in Nepal and variety of castes are most fascinating factors (Craig, 2011; Fouch, 2014). Everyone provides respect to other languages, for example, Maithili, Bhojpuri, Magar, Tamang, Thakali and Newari (Culture of Nepal, 1994; Gurung, 2005; Fouch, 2014). Nepalese citizens celebrate several festivals every year. These festival celebrations are different according to culture and place. On the one hand, these different cultures have also some socio-cultural issues which have been burdensome to development processes such as child feeding practices, beliefs on nutritional food, feeding of colostrum and many more other activities (Culture of Nepal, 1994; Adhikari, 2012; Fouch, 2014). On the other hand, Culture of Nepal (1994) briefed on both parts, i.e. positive and negative impacts of these cultural influences and mentioned that, with the increasing level of awareness, education, migration, and globalization the negative issues which are associated with cultural norms and values are being examined and ameliorated only slowly (Gurung, 2001; Adhikari, 2012; Fouch, 2014). Many places have become famous due to culture and geographical-scenic beauty and have been attracting many tourists. Such factors positively affect the socio-economic status of the local community (Culture of Nepal, 1994). A few numbers of researchers have focused on the socio-cultural situation of Nepal and it is a key factor which influenced food recommendation. The literature review demonstrated that Nepal's socio-cultural construction seems very confusing and complex which is also strongly linked with religious norms and values. The culture and religion are strongly linked to Nepalese society (Cultural of Nepal, 1994; Gurung, 2001; Adhikari, 2012; Fouch, 2014). Above reviewed literature seems not enough exploring the key issues associated

with food and health-seeking behaviours. Next section talks about socio-cultural influences on child nutrition.

2.9.4 Socio-cultural influences in child nutrition

Biza-Zepro (2015) highlighted that food consumption remains influenced by the existing socio-cultural factors that affect food behaviour along with customary systems of food sharing within households, cultural attitudes towards various foods, methods of food preparation and child-rearing practices (Maschinot, 2008). Mostly in developing countries, several international organizations i.e. UNICEF, HKI, Save the Children, HKI, Feed the Future have been contributing tremendously towards changing the behaviour, diet and child feeding practices of the people of Nepal, particularly in the remote parts, against traditional and cultural practices (HKI, 2003; GHFSI, 2013; HKI, 2014; UNICEF, 2014). For example, children are mostly fed by hand. Children mostly eat in communal groups depending on sex and age; this is more common in the southern belt (plains area) of Nepal. The Linkages programme (GHS, 2004), an NGO sponsored by USAID, has over the years contributed very much to change the behaviour of the public against cultural and traditional practices that are contrary to the appropriate complementary feeding of infants. Maschinot (2008) has found that the family head and earning members of the family receive preference in sharing goods and take the best part of the food available. Furthermore, Maschinot (2008) revealed that in some conservative cultures, such as in Ghana, it is commonplace for the youngest and weakest children to be at an additional disadvantage in family food sharing. Subba *et al.*, (2007) and Sah (2011) have discussed the feeding culture of Nepalese mothers who are generally of the opinion that children should be fed as often as the child wishes to eat whereas others hold that it should be four times a day (GSCP, 2006).

NPHC (2012) reported, in Nepal, the employment ratio is also very poor and accounts for only 24% of the total population (Global Finance Report, 2015). Nearly 76% of the population is engaged in agriculture. Bista (1982; 1991) has described the culture and agricultural trend in Nepal in his books (*The process of Nepalization and Fatalism and Development*) published in 1982 and 1991. Further, he explained that the farmers are still practising old methods of farming,

principally subsistence farming. He further added that the landholding system of Nepal is highly varied. The National Planning Commission (2003) reported that the landholding per family is about 0.7 hectares (1 hectare = 10,000 m²) and more than 75% of landholders have less than 1 hectare of land. Additionally, the land in Nepal is inherited over generations, leading to an additional breakup of landholding (Niraula, 1994; 1995; WHO, 2008; Al-Omar and Al-Ghanim, 2010).

Family size is also another barrier which deprives sufficient food of the family. NPHC (2012) reported that the average family size is 4.88 people per household which is a fairly big family. Due to the large family size and unequal distribution of land, the life of farmers is very hard and it is very difficult for them to maintain their basic needs from the agricultural existence (Devkota, 1994).

Raheela (1994) and Nazni *et al.*, (2010) described that socio-cultural practices such as less consideration for feeding children (supplementary), late weaning and poverty are major underlying issues of undernutrition among preschool-aged children. Similarly, child health nutritional indicators are used to evaluate the quality of existing health services as well as the general health condition of the whole community. On the other hand, the culture is affecting the food behaviours of people of Nepal which contributes to the undernutrition problems (HKI, 2003; Sreeramareddy *et al.*, 2006). Many papers discuss the impact of socioeconomic influences on child nutrition but this thesis particularly focused on the specific area where socioeconomic culture seems to be highly diversified. Hence to analyse the actual impact of sociocultural influences on child nutrition has become the foremost concern of the researchers nowadays. Subsequently, the health situation/facilities are also closely linked with undernutrition. The next sub-section deals specifically with existing health management and healthcare facilities in Nepal.

2.9.5 Health situation/facilities of Nepal

MoHP (2014) stated that the key major health issues in Nepal are infectious diseases, malnutrition, poor knowledge and limited health care services. The Nepal Living Standards Survey (2011) found 12% of the population to be suffering from chronic illnesses along with

gastrointestinal ailments, abnormal blood pressure, asthma and rheumatoid related diseases and about 20% of the population are suffering from acute illnesses and traumas such as sickness with fevers and colds, and diarrhoea.

Many investigators e.g. Devkota and van Teijlingen (2009), German Technical Cooperation (2009), Karkee and Jha (2010), Devkota *et al.*, (2012) and Ghimire *et al.*, (2013), have commented that the health system of Nepal is chronically weak because of several issues including poor funding, weak management and supervision systems and endemic corruption (Levesque *et al.*, 2013). Supply systems and access are difficult due to the mountainous terrain and lack of roads (Justice, 1989; ESDSoton, 2012).

Furthermore, Rai *et al.*, (2001) expressed that the healthcare facilities in Nepal are delivered by both the private and public sectors (MoHP, 1997; Rai *et al.*, 2001; Levesque *et al.*, 2013). The health (public) care service is mainly concentrated on primary health care. On the other hand, the MoHP (2014) allocated only less than 6% of the national budget on health care services which is insufficient to deliver health services efficiently and effectively (MoHP, 1997). German Technical Cooperation (2009), Karkee and Jha (2010) and Gautam (2011) have noted that the government health care services are not equally distributed across the country (Kandel, 2007). Most of the advanced health facilities are available in urban areas (Kandel, 2007). For example, the tertiary level health service providers (hospitals) are in the major cities of Nepal (Justice, 1989). Every region has a number of regional level hospitals and each district has a district level hospital with no specialist facilities but staffed with some medical doctors (Kolehmainen-Aitken and Shrestha, 2009; MoHP/RTI, 2009). Most researchers and donors such as Rai *et al.*, (2001), the German Technical Cooperation (2009), Karkee and Jha (2010) and DFID (2013) have observed that government health services based in remote areas, very often run with inadequate staff due to lack of funds (Rai *et al.*, 2001; Karkee and Jha, 2010). Some of these district hospitals are staffed by medical assistants instead of fully-qualified medical doctors. Karkee and Jha (2010) further commented that if medical doctors are posted to the rural district hospitals most of the time they

disappear on leave or on study leave/training. In Nepal health facilities are not free, patients are required to pay for their hospital stay, investigations, and drugs.

Rai *et al.*, (2001) mentioned that recently there has been a growth of private health organisations including hospitals and nursing homes offering specialised and quality health services in urban areas. Further, WHO (2007) has reported that in rural parts of Nepal normally public health services are widely spread and there are not any specialized health services. These public health service centres in the rural part, are generally run by medical assistants including auxiliary health workers (MoHP, 2014). This is partly through the development of private pharmacies, where seemingly ‘trained’ pharmacists act as general medical counsellors/advisors (Harper and Jeffery, 2009; Subedi, 2009; Harper *et al.*, 2011; MoHP and WHO, 2011).

Harper and Jeffery (2009), Subedi (2009), and Harper *et al.*, (2011) have commented on health care services of Nepal which are often of low quality, lacking proper standards of service due to poor staffing and medical supply and also sometimes, mostly in rural parts, the service is rendered by low-level staff in the absence of trained or skilled health workers (MoHP, 2011; MoHP, 2014a). Furthermore, Maru *et al.*, (2013) analysed hospitals and clinics in Western Nepal in their study and found that the poor marginalised and some ethnic groups have limited access to basic health care services. Some authors such as Niraula (1994; 1995), Acharya (2000) and Al-Omar and Al-Ghanim (2010) said that limited accessibility to the resources in remote locations of Nepal and high cost of medical and other facilities are some of the major factors which resulted in less efficient services and poor utilisation of them in remote areas. This scenario is frequently observed in rural areas where individuals have to walk for several hours in continuity to have the access to the services and resources. Moreover, as per MoHP and WHO (2011) and ESDSoton (2012), people in Nepal are also deprived off their social security and capital. It has also been reported by WHO (2007) that the lack of health awareness amongst the people also results in difficulties for the people to access the health services for the public.

Hamal *et al.*, (2012), Baral *et al.*, (2013) and Maru *et al.*, (2013) showed that there is a lack of trained health staffs, especially in rural areas of Nepal, to provide a quality health services. Regmi

et al., (2004) discussed that the main challenges for health services in Nepal are: lack of sufficient skilled professionals, limited access to facilities across the country, poor public awareness and the lack of an adequate health policy, including poor infrastructural development and geographical diversity with poor transportation (Acharya, 2000; SOLID Nepal and Merlin Nepal, 2012; MoHP, 2014b). Sharma and Ross (1990) further highlighted national health policy with regard to government policy for an effective and efficient healthcare system including its workforce and suggested that there is a need to review, revise and develop.

Regmi *et al.*, (2004) stated that the health infrastructure of Nepal is very poor due to lack of funds. Devkota and van Teijlingen (2009) further added that 10 years of conflict have disrupted the health infrastructures in Nepal. The limited health services and poor health infrastructure of Nepal is one of the main reasons for the high prevalence of undernutrition (NDHS, 2017) in Nepal and it is because of poor health management. For example, the health professionals wanted more facilities in rural areas and health centres to be improved (Germany Technical Cooperation, 2009; Gautam, 2011). The health facilities of Nepal are fairly affected by the deficit of fund. The limited health facilities, poor management, and infrastructure of Nepal are one of the main reasons for the high prevalence rate of undernutrition (NDHS, 2017). Thus, it is also an important research issue in order to overcome on undernutrition. The next section deals specifically with mothers' health status.

2.9.6 Health status of mothers

The maternal health issues that can have a lifelong effect on child health; particularly nutrition, parental care, and care of new-born are often ignored. This section attempts to make clear connections between the mother's health status and undernutrition in the context of Nepal and identify the key gaps in the literature. Generally, a healthy mother is a child's first line of defence against disease, malnutrition, and death (Sethi, 2003; Saaka, 2014).

In 2013/14, a study conducted by the ministry of health and population of Nepal shows that the rate of low birth weight varies from 8% to 34% in Nepal (MoHP, 2014). The NDHS (2011) found the rate of low birth weight was 12%, which is possibly an underestimate and it revealed that 18%

of non-pregnant women are undernourished or chronically energy deficient (BMI<18.5 kg/m²) and 14% are overweight or obese, compared with 9% in 2006. The prevalence of both underweight and overweight conditions among women is suggestive of a likely double burden of malnutrition in the country (see Appendix 19) (Acharya and Bennett, 1981). Furthermore, the MoHP (2014) found that girls aged between 15 and 19 years are at particular risk for chronic energy deficiency. In Nepal, nearly 12% of the mothers in Nepal are with short height (<145 cm) (NDHS, 2011). Risk factors for short height include living in a rural area, having limited schooling and coming from the lowest wealth quintiles (Sethi, 2003; Nair, 2007; NDHS, 2011). In terms of aetiology, short stature is a possible result of the high prevalence of stunting in childhood. Due to the unhealthy status of mothers, children who develop poorly and become stunted are likely to continue being stunted, thus continuing the intergenerational cycle of undernutrition in the population (NDHS, 2011; 2017). Additionally, a health survey highlighted that adolescent girls in Nepal face the worse of this as 25.8% of them have a low body mass index (less than 18.5 kg/m²) compared with 18.2% of women of reproductive age (NDH, 2011; Acharya *et al.*, 2016). Low nutritional status of mothers has an indirect and direct consequence on their own health and that of their children. Mothers are naturally the main caretakers of the children with undernutrition, and a load of caring responsibilities may impact their health status. Few studies have before explored issues associated with the health status of mothers with children suffering from undernutrition. Generally, mothers who have faced lack of access to proper nutrients, their children are malnourished and those children face greater challenges in their ability to learn and thrive. These children are more susceptible to illness and disease (Acharya *et al.*, 2016). Thus, mother's good health status plays a significant role in child's well-being and good health.

In the context of Nepal including South Asian, mothers' health status is compounded by various socio-economic boundaries such as beliefs, empowerments etc. which are highly complex and debatable due to strong association with existing cultural practices (Adhikari, 2010; Acharya *et*

al., 2016). These issues are not clear as described in the literature. Additionally, next sub-section outlines on poverty which has a strong impact on child nutrition.

2.9.7 Poverty

Undernutrition and poverty have a direct association where poverty remains the key and principal reason of undernutrition. In addition to poverty, the other key causes of undernutrition are harmful economic systems, war, and conflict including change of climate in the region (Gordon, 2005). On the other hand, the lowest economic nations have the highest rates of undernutrition. As per the reports of the World Bank (2011), poverty has been a major problem in most parts of the world specifically the least developed and developing countries. Poverty and malnutrition are directly linked to each other. Poverty is further classified into absolute and relative poverty. Absolute poverty is focused in this research which refers to the deprivation of basic needs of humans including food, shelter, water, clothing, education, and hygiene needs (Weiss *et al.*, 1991; IFAD, 2013; IMU and RCHCO, 2013). The definition states that poverty is also related to deprivation of basic human necessities and has different dimensions which also include the low income and the inability to afford basic needs that are necessary for the survival of humans (IFAD, 2013). The DFID (2013) states the definition of absolute poverty is related to low level of education access and limited access to free water and sanitation, limited access to health services and lack of opportunity for a better lifestyle (ISF and UTS, 2011).

UNICEF (2008) reported that undernutrition and poverty do not appear to transformation at the similar ratio at the world level, although the trends of poverty and malnutrition appear to follow each other at the global level. This means that even though the problem of malnutrition and poverty exist globally, the trend in each country is different depending upon the development of that country economically. For instance, the South Asian region had the highest poverty ratio (46%), followed by the Middle East/Eastern African region (25%) and Sub-Saharan Africa (38%), parallel to their malnutrition status because people suffering from malnutrition problems are much lesser than the poverty ratio prevailing in these regions (UNICEF 2008). Overall, the overall

headcount of poverty worldwide reduced from 42% (1990) to 25.19% (2005) with a total reduction of 17% in the aforementioned time period (World Bank 2015a).

The UN Human Development Index (HDI) reported the poverty conditions of Nepal in July 2014. This report includes a multidimensional poverty index (MPI), gender inequality development index (GIDI), human development index (HDI) and inequality-adjusted human development index (IHD). The results for Nepal are given below in Table 2.3.

Table 2.3: Poverty in Nepal

Multi-dimensional poverty index	0.2
Population in multidimensional poverty (%)	41.44
Intensity of multidimensional poverty (%)	47.42
Population near multidimensional poverty (%)	18.13
Population in sever multidimensional poverty (%)	18.56
Population living below \$1.25 a day (%)	24.82
Share of working poor, below \$2 a day (%)	74.1

Source: UN Human Development Report, 2014

The MPI (Multidimensional Poverty Index) complements income-based poverty measures, as it measures several scarcities directly. The World Bank (2011) estimated that in 2008 that there were about 1.35 million poor people in developing countries who live on \$ 1.25 a day or less. In the practical world, there exists a relationship between MPI and standard income. Here, standard income is \$1.25 per day in poverty line but the standard income differs in the countries including Nepal because of the gap in income between rural and urban areas.

Thus, poverty in Nepal is one of the major determinants of high prevalence rates of undernutrition (IFAD, 2013; NDHS, 2017). In Nepal, while the poverty declined from 42% in 1995 to 31% in 2003, the extent of stunting was stable at 57% in 1996 and 2001, and then declined to 49% in 2006 (CBS, 2005; NDHS, 2006). As stunting is assessed for under five years aged children, and the first year is possibly the most crucial, the decline from 2001 to 2006 will reflect the economic situation from 1996 to 2001. Thus, the decline in stunting may reflect the improved economic conditions as reflected in the decline in poverty from 1995-2003. In addition to poverty, the other key reasons for undernutrition are conflict, war, climate change and

damaging economic systems which are existed in Nepal (Atkinson, 1987; IFAD, 2013). Poverty is the major determinants of the high child mortality and morbidity rate in Nepal (CBS, 2011). This thesis does not measure poverty status of the participants but is aimed to investigate key barriers on food recommendation which is identified as one of the literature gaps to explore on this issue particularly focusing on rural and urban areas. Subsequently, the following sub-section highlights on diseases and infections.

2.9.8 Diseases and infections

Diseases and infections increase the risk of undernutrition because children tend to consume less food when feeling ill and sick (Devkota *et al.*, 2012). Moreover, when children are sick, they tend to absorb fewer nutrients, lose nutrients during diarrhoea and have an increased need for nutrients in fever (Antony and Laxmaiah, 2008). On the other hand, undernutrition problems make infections worse because the body lacks anti-oxidants and the nutrients required to maintain immunity in the body (Ulijaszek, 1996).

Antony and Laxmaiah (2008) reported that undernourished children in India are physically and mentally deprived and they often come from poorer families, with poor hygiene/sanitation and crowded homes, so they are already very vulnerable to infectious diseases. Ulijaszek (1996) found that various infections are more likely to affect children more than adults. The immune system is weaker in an undernourished child than in a healthy child. Similarly, Horta and Victora (2013) revealed that exclusive breastfeeding helps protect against many ailments, including urinary tract infections, mild upper respiratory tract infections, bone and joint infections, inflammation of the middle ear and diarrheal disease. They also further highlighted that malnutrition is a disorder which includes immunity impairment, the physical development constraints and the mortality rate decreases (Horta and Victora, 2013). Malnutrition leads to certain disastrous outcomes such as illness, malnourishment of children which ultimately exposes them to certain diseases (Antony and Laxmaiah, 2008; Horta and Victora, 2013). Undernutrition worsens the outcome of illness. Malnourished children are susceptible to diseases and more apathetic (Antony and Laxmaiah, 2008). The study conducted by Levitsky and Strupp (1995) discussed that the effect of

undernutrition is speedily reversed with appropriate feeding but prolonged undernutrition can cause some enduring damage to brain development. In 2013, WHO published figures of infants and young children who were still poorly nourished and whose nutritional status, growth, and progress, health and survival, were thereby compromised. It showed that globally, diarrhoea kills 760,000 children under-five and it remains the leading cause of malnutrition and the second leading cause of child death in children under five years of age. But diarrhoea is preventable and treatable and may be the result of inappropriate feeding practices (Care Nepal, 2010; WHO, 2013).

Richards (2011) reported a loss of appetite in children during sicknesses such as malaria, measles, and diarrhoea. Therefore, inadequate food intake due to loss of appetite and poor absorption of food are among the reasons why children who fall sick often do not get well (Sreeramareddy *et al.*, 2006; Richards, 2011). UNICEF (2006) reported that the immunity to diseases in the malnourished children is high. For this purpose, a comparative study was conducted by Richards (2011) that conducted educational programmes in India for educating mothers on the feeding children practices even in families that are in rural areas. The children in these countries mostly have lower mortality rate due to common diseases among children such as diarrhoea and respiratory problems and those that survive this ailment, the frequent illness affects their nutritional status and diet adversely leading to difficulties in physical and cognitive development. More importantly, three-quarters of the children who die from causes related to undernutrition were only mildly or moderately undernourished, showing no outward sign of their vulnerability (Bryce *et al.*, 2005; UNICEF, 2006; Black *et al.*, 2008). The diseases and infections seem to be one of the key causes of undernutrition in the study population (Devkota *et al.*, 2012). Several kinds of literature have talked on this issue but this thesis did not focus on clinical and pathological investigation relating to child nutrition. The literature above described that disease and infection issues are highly complex within this highly diversified society (Devkota *et al.*, 2012). The previous literature suggests that there is a knowledge gap between undernutrition and other diseases either communicable or non-communicable (Devkota *et al.*, 2012; Horta and

Victora, 2013). Malnutrition is not considered as a serious disease by available literature and thus, did not focus on definite issues. Subsequently, the assessment of maternal knowledge gaps on the impact of diseases and infection on child life cycle is also being assessed in this literature. The next section explains about knowledge, attitudes, and beliefs about the healthy food.

2.9.9 Knowledge, attitudes, and beliefs about healthy food

Richards (2011) showed that females were discriminated by a group of mothers on feeding practices due to poor awareness and education regarding healthy food. Furthermore, Richards (2011) also discussed that malnutrition was associated with unavailability of resources such as clean water and stable diet (Weiss *et al.*, 1991; IFS and UTS, 2011).

Sanjay (2002) reported that traditional food made by Nepalese mothers has been shown through research to be very nutritious. The mixture, known as super flour is a porridge (*lito*) made from a finely ground flour of roasted cereal grains and pulses and is highly recommended for use in severely undernourished children (IRIN, 2013; Acharya *et al.*, 2016).

In Nigeria, Ojofeitimi *et al.*, (2008) showed that two types of protein-energy malnutrition (PEM) that are prevalent in the community are stunting and wasting. The results confirmed that a mother's educational level, age, and parity, type of family and child's immunisation status and age are some of the key causes of poor nutritional status in children under-fives (Weiss *et al.*, 1991; Ojofeitimi *et al.*, 2008). The intensification of exclusive breastfeeding, female education, compulsory food demonstration units in all health centres, use of complementary feeds from seven months onwards, growth monitoring and promotion are some of the strategies to reduce the high prevalence of PEM in both rural and urban areas of developing countries (Weiss *et al.*, 1991; Ojofeitimi *et al.*, 2008; UK Census Report, 2013).

A body of research agrees with Pokharel *et al.*, (2009) on behavioural aspects, such as child feeding behaviour, as important for good childhood nutrition (Black *et al.*, 2008). What is interesting, however, is that most of the research does not critically examine why such defective forms of behaviour are present in the communities studied. Onta (2003) highlighted lack of knowledge about well-being and health safety along with nutritious food and uptake of health

services in Nepal as key factors. It may be attributed partly to traditional/spiritual supporters and their status in the society (Mishra and Retherford, 2000; Lobstein and Davies, 2008). The misbeliefs are strongly embedded in the poor and underserved rural communities as well as in some urban areas because of migration there from rural areas (Miller, 1979; Meyer-Rochow, 2009). The spiritual and traditional supporters or advocates are usually Hindu, as is 81% of the population (Tamang and Broom, 2010; CBS, 2011). In rural parts of Nepal many traditional beliefs still exist, for example, leprosy is believed to be caused by sin in one's past life or to be a curse from God (Acharya, 2012). Poor people from rural locations strongly trust traditional/spiritual healers and their first choice is spiritual/traditional healers in the case of minor health issues (Colvilla, 2008; Adhikari, 2012). Almost the whole of Nepalese society uses traditional medicine as the first step of health care and they go to traditional or spiritual healers with any health problems (Tamang and Broom, 2010).

The religious leaders which include monks, priests, spiritual leaders and elderly people are reluctant to new knowledge and still believe about the taboos and misconceptions, regarding healthy food and health-seeking behaviours. The traditional and conventional practices are being practised regularly within the societies due to directly or indirectly influence these people, even though they are uneducated (Subedi, 1999; Kearney *et al.*, 2005; Poudyal *et al.*, 2005; Sibeko *et al.*, 2005; Shankar *et al.*, 2006).

Many studies and surveys conducted in Nepal (i.e. Subedi, 1999; Christian *et al.*, 2006; Odent, 2011; Pahari *et al.*, 2011; Devkota *et al.*, 2012; Acharya, 2013; Paudel *et al.*, 2013; Acharya *et al.*, 2016) have focused on maternal and child health and collected information on of nutrition. Subedi (1999) and Odent (2011) explored the widespread belief that pregnancy is a natural condition that does not need any particular attention. Christian *et al.*, (2006) highlighted women's eating habit during pregnancy in rural Terai, Nepal. Christian *et al.*, (2006) further cited that one commonly held belief is that if a woman eats more during pregnancy she will have a bigger baby which can cause problems during delivery (Simkhada *et al.*, 2006; Devkota *et al.*, 2012; Acharya, 2013; Acharya *et al.*, 2016). The mother's knowledge of *undernutrition* and its consequences

played a crucial role to overcome it (Dewey and Begum, 2011). However, undernutrition is still remained to be a critical development issue in the Nepalese society. The mother's knowledge, attitudes, and beliefs about healthy diet are biggest barriers to the nutritional problem in Nepal. However, undernutrition is still remained to be a critical development issue in the Nepalese society. Above literature review showed that there are several gaps in maternal knowledge in order to identify nutritious food that creates negative attitudes towards healthy food and ultimately these influenced healthy food recommendation to their children which are linked with existing beliefs. Moreover, it needs further in-depth investigation by employing different approaches such as qualitative, quantitative, and mixed research. Therefore, the combination of pragmatic evidence of reviewing the literature generally the knowledge, attitudes, and beliefs about nutritious food in different geographical locations such as Terai and mountain, justifies the research focus of this study at the Kaski district of Nepal (Christian *et al.*, 2006). Having examined the maternal knowledge, attitudes, and beliefs about healthy food in general, it is considered that additional understanding of their knowledge, beliefs, and attitude is needed. The next sub-section sketches on energy intake by children and mothers in Nepal.

2.9.10 Energy intake

This section discusses the energy intake patterns among the Nepalese community. Epidemiological studies confirm that energy intake increases with energy density and thus weight loss may be best achieved on a low energy diet (Gittelsohn *et al.*, 1997; Edris, 2007). Although the use of low-fat food items may not reduce intake during covert manipulation, it may be successful during periods of deliberated dieting, providing that food-substitutions are not counter-balanced by other high-density food items (Gittelsohn *et al.*, 1997; Gaman and Sherrington, 2013).

Gittelsohn *et al.*, (1997) and WFP (2006) stated that the statistics for dietary intake and food supply are significantly associated with undernutrition among Nepalese children. Several studies such as Gittelsohn *et al.*, (1997), WFP (2006), FAO (2015) have described energy intake amongst the Nepalese population. This basically explains dietary patterns and food supply in different

years: 1992, 2002 and 2014. The table in Appendix 18 describes, for children under six years: dietary patterns, the frequency of meals, dietary energy supply, the share of dietary energy supply and exclusive breastfeeding between 1992 and 2014.

Many people in Nepal still do not have a sufficient dietary intake to meet their physical requirements of energy intake as reported by CBS (Central Bureau of Statistics) as per the National Life Standard Survey conducted in 2003 and 2004 (WFP, 2006). The prevalence of inadequate energy intake varies from 35.2% to 39.8% adult population of Nepal. The energy required to sustain moderate activity was estimated at 2709 kcal/day. The estimates were calculated on the basis of reported expenditure on food. The prevalence of inadequate energy intake is highest for regions with the lowest food production (Ogunjuyigbe *et al.*, 2008): the Midwestern and Far Western regions have an energy intake 7% to 8% lower than the national average (NLSS, 2004; 2011).

The NLSS study (2003-4) found that there was no relationship between food availability and energy intake in urban areas: availability is higher than in many rural areas yet the prevalence of inadequate energy intake was found to be the highest for urban Kathmandu. This could be due to the methodology used, which calculates energy intake on the basis of an amount of money spent to buy food. The NLSS 2003–2004 also found that people in the wealthiest category spent almost double the amount of money per 1000 kcal (NRs 5.5 vs. NRs 11.4 per 1000 kcal). This observation calls for programmes to include educational approaches to improve budget management food expenditure. Aside from this study, a number of considerable studies (Gittelsohn *et al.*, 1997; Ohno *et al.*, 1997; Ohno and Hirai, 2005; Sudo *et al.*, 2005; WFP, 2006; GHFSI, 2013) have also signified that the amount of nutrients intake for Nepalese is insufficient which causes the problem of malnutrition and leads to different diseases. Although, one study conducted by Regmi and Adhikari (1994) reported that the energy intake is sufficient for people yet comparatively, most studies conclude that the diet and nutrition of these people is inappropriate (Ogunjuyigbe *et al.*, 2008; Acharya *et al.*, 2016).

The study conducted by Ohno *et al.*, (1997) in the south-eastern (Terai) region of Nepal among those attending an immunization clinic found that the usual daily diet consisted mainly of traditional food. The average energy intake was 2427 and 2275 kcal/d for men and women respectively (Ohno *et al.*, 1997).

Ohno and Hirai (2005) considered consumption patterns of people living in the Kathmandu valley. The study of male auto-rickshaw drivers and female carpet weavers found that these groups consumed mainly carbohydrate foods only. The researchers found that the amounts of food consumed by both genders, especially mothers, were mostly insufficient (Ohno and Hirai, 2005). Both men and women had an energy intake lower than the estimated requirements and lower than that in the Terai region. The reasons for the lower intakes were not provided (Ohno and Hirai, 2005).

The study by Sudo *et al.*, (2005) in Nawalparasi, a Terai district, investigated the dietary intakes in males and females based on the adults in Hindi community. It was revealed that average intake of energy was inadequate for both the genders (men: 2068 kcals/day, women: 1789 kcals/day). It was reported that food consumers mainly consisted of carbohydrate minerals yet meat and fish were less consumed having proteins and calcium., Comparatively, the less consumed food was eaten more by men as compared to women (Sudo *et al.*, 2005; Acharya *et al.*, 2016). This study by Sudo *et al.*, (2005) indicated that women in Hindu religion are at a disadvantage due to the vegetarian religious beliefs and do not eat food that can provide proper minerals to the body whereas men often intake all kinds of food yet micronutrients are still at a deficit for both genders. Subsequently, the assessment of maternal knowledge gaps on the impact on child life cycle and poor energy intake is a milestone in the literature. Actually, energy intake among the Nepalese population is merely described by the literature. It is varied due to the diversification of the culture, economy, religion, and social-structure in Nepal. They have a dissimilar lifestyle and food behaviours (Christian *et al.*, 2006; Adhikari, 2010). Hence, it is a further milestone to investigate energy intake culture of the society.

2.9.11 Socio-economic factors

Issues around poverty that are associated with undernutrition have been discussed in the earlier sections. In continuation, this section further discusses the socio-economic factors which impact on undernutrition in the context of Nepal. Socio-economic factors are equally responsible for the high prevalence rate of undernutrition in Nepal. NPC (2005) reported that financial underdevelopment is one of the reasons for the poor nutritional rank of the country and its regional differences (NPC, 2005). Thus, considering the geography of Nepal, the variety and dissimilar levels of financial growth, a wide variation of children's nutritional status is expected.

A study conducted by Bishwakarma in (2009) also points to financial aspects as sources of underfeeding. Gap analysis and the assessment of nutrition in a study by the World Bank are among the few to put forward that aspects like individual behaviour are also essential factors for child malnutrition in Nepal (Pokharel *et al.*, 2009; 2013).

A survey in Ghana (1987), supported by the WFP showed important associations between three indicators of undernutrition and a number of variables concerning income, environment, food supply, and social and health status. The socio-economic position of a family will decide the nutritional status of a child. The level of income was by far the greatest single cause of variability in food intake although income is not the only measure of poverty. Lipton and de-Kadt (1988) and Haddad (2000) have found that social and environmental factors might be a major factor for malnutrition that is associated with poverty within the country and because people cannot afford healthy food. These studies showed that in developing countries, income from home-produced food and payments received in kind are more significant than cash income in determining food availability in a rural family, however, food availability is determined mainly by cash income. For example, most of the households in a rural community exchange home produced food items such as fruits, vegetables, and meat and dairy products, in kind rather than cash (Lipton and de Kadt, 1988; Haddad, 2000). A study carried out in Northern Ghana by de Boer *et al.*, (2004) answered that meals in most northern communities of Ghana are known to be either monotonous with hardly any variety or are low in terms of protein and micronutrient contents. The availability of

food in the market and the purchasing power of people is two most important factors that contribute to a healthy lifestyle. Based on the above-discussed evidence, it can be concluded that there is a gap in socio-economic factors which need to be further evaluated to reach in-depth information. The following sub-section outlines on beliefs about undernutrition issue.

2.9.12 Beliefs about undernutrition in Nepal

This section considers the mothers' perception about undernutrition in the context of rural and urban areas in Nepal. There have been several studies conducted by Adhikari and Krantz (1977), Paneru (1981) Graves (1984), Singh (1998), Subedi (1999; 2000; 2010), Shakya (2006); Tamang and Broom (2010), and Upreti and Müller-Böker (2010) that have focused on Nepal and belief practices that prevail in Nepal regarding the food and health-seeking behaviours. It has been a common belief in Nepal that in illness and diseases such as fever, sore throat, wound, sore eyes, cold, tonsillitis, and even including childbirth is believed to be cured by avoidance of certain food substances or by changing behaviours avoiding things that caused the illness (Storer, 1976; Benzer-Kerr *et al.*, 2008; Adhikari, 2010; Subedi, 2010). However, a common belief of curing is through herbal medicine or the involvement of spiritual leaders for healing the patient (Adhikari and Krantz, 1977; Subedi, 2000; 2010; Shakya, 2006; Tamang and Broom, 2010). There are common features of food and health-seeking behaviours that are strongly embedded and regularly practised by the majority of the people. These behaviours generally are being practised by mainly poor and non-educated households in both rural and urban settings (Subedi, 1999; 2000; 2010; Tamang and Broom, 2010; Upreti and Müller-Böker, 2010). Adhikari and Krantz (1977); Sharma (2000); Shakya (2006) and Shankar (2006) reported that an undernourished child's cry often is called *Runche Lageko* (crying child). The general assumption of traditional communities about this condition is that it may occur due to evil spirits, or because the child is weak-hearted or frightened (*Tarsera or Sato Gayera*), or has been touched by strangers, including pregnant women, or by witchcraft (Adhikari and Krantz, 1977; Singh, 1998).

The literature about beliefs and practices regarding maternal and child nutrition, especially the perception of the community people on malnourished children, was reviewed by Singh (1998)

who explored the terms used for undernourished children such as *Runche lageko* (crying child), *Sato gayeko* (weak hearted or frightened child). Similarly, when children suffer from marasmus the term used is *Sukenas* (drying up) and *Phukenas* (swelling up) for kwashiorkor (Singh, 1998) (see Definitions 25 and 26 on pg. xxvi).

According to Adhikari and Krantz (1997) and Singh (1998) and Tamang and Broom (2010), there are many more superstitions and these vary by ethnic groups and their cultures. When a child starts whining, the parent does not normally associate it with inadequate feeding. In general, an early morning bath with cold water is one of the common practices to overcome the situation (Singh, 1998). In Nepal, this system has been practised generation after generation in almost all ethnic groups and cultures. In regards to issues around beliefs about undernutrition, it is highly complex in the study population and mothers are still confused to determine it and limited literature has focused on this issue. There are many controversial issues around undernutrition exist in this community which needs to be much clarified (Walters and Doyle 2002). The next sub-section describes beliefs which ban to recommend the healthy food.

2.9.13 Beliefs about healthy food in Nepal

Pool (1987) Barasi and Mottram (1990) and Biza-Zepro (2015) expressed that the Nepali culture has a strong impact on diet. Khare and Rao (1986) reported that food habits and practices are closely related to the typical behaviour of a particular group of people or culture (Moro *et al.*, 2015). Such behaviour follows codes of conduct in relation to food choice, methods of food preparation and eating, the number of meals eaten per day, time of eating, and the size of the portion eaten (Storer, 1977; Subedi, 2002; Kearney *et al.*, 2005; Shakya, 2006; Upreti and Müller-Böker, 2010; Acharya *et al.*, 2016).

Focus group discussions about fruit and vegetable consumption patterns were undertaken by Khadka (2000) in three villages of Nepal: two in the hills and one in a Terai village. This study found that the villagers were unaware about the importance of fruits and vegetables; they would eat them only when they were in a season without knowing any benefit related to consuming food

(Adhikari, 2010). They were taking them as part of their regular meal and also eaten to add flavour to meals (Adhikari, 2010).

Paneru (1981) stated that in Nepal poor and uneducated households often have strong traditional and cultural beliefs (Siega-Riz *et al.*, 2001). Children, pregnant and lactating women, old and sick individuals are caught up by these food beliefs (Storer, 1977; Pool, 1987; Subedi, 2002; Kearney *et al.*, 2005; Shakya, 2006; Upreti and Müller-Böker, 2010). Christian *et al.*, (2006) articulated that superior or inferior food beliefs, mostly among the poor and non-educated community, are widespread in the plain rural area of Nepal. Acharya *et al.*, (2015) explored that stinging nettles, amaranth, and garlic pear, as well as many more green vegetables, are considered inferior foods which are only consumed by the poor or beggars. When it was suggested that eating them would provide various nutrients such as vitamin A, iron, calcium, fibre and potassium, most of the community, including school students, reacted negatively (Christian *et al.*, 2006; Upreti and Müller-Böker, 2010). An exploratory study of food beliefs was conducted in the Kathmandu and Lalitpur districts of Nepal by Shakya (2006) who interviewed housewives from rural areas and teachers of a women's college. It found that the women held beliefs about pure and impure foods, hot, cold, and neutral foods; beneficial or harmful foods; and curative foods (see Appendix 14). However, there was little consensus about the nature of foods within each category through the diverse groups (Subedi, 2002; 2010; Upreti and Müller-Böker, 2010). Food beliefs appear to be maintained without any scientific reason (Acharya, 2013). This literature review concludes that food beliefs are prevalent in Nepalese societies which are one of the major factors of the high prevalence rate of malnutrition in Nepal (Siega-Riz *et al.*, 2001; Christian *et al.*, 2006). It is significant to know about these beliefs and their sources before any advice regarding their use can be offered (Acharya, 2013). The literature above described that food beliefs issues are highly complex within this highly diversified society. It has been found very different opinions on the similar issue within the households and the society due to diversified culture, religion, and ethnicity. Available literature, above discussed, was not enough to focus the definite issues because of cultural, religious and social complexity and diversification (Biza-Zepro, 2015). Based

on the above literature assessment, the food beliefs influencing food and health-seeking behaviours amongst the parents are critical issues in Nepal. The above-given statistics about food beliefs explain the need for the further research to focus on food beliefs on various issues such as food and health-seeking behaviours in Nepal (Adhikari, 2010). The next sub-section highlights on breastfeeding and its practices in Nepal.

2.9.14 Breastfeeding

This section is focused particularly on breastfeeding practices and related perceptions in the context of Nepal. Breast milk is considered to be the best for the baby because it is the most nutritious. Breast milk contains all the nutrients and vitamins needed by the baby in the first six months of life (Kramer, 1988; Horta *et al.*, 2007; Horta and Victora, 2013).

Many researchers, i.e. Paneru (1981), Roberts (1991); Kakute *et al.*, (2005), Sibeko *et al.*, (2005), Odent (2011), and Renfrew *et al.*, (2012) have articulated that breastfeeding is integral to meet the physiological and psychological needs of both mother and child. It is a highly reliable source of nutrition which provides food security for children up to the age of six months (Jernstrom *et al.*, 2004; Odent, 2011; Kramer and Kakuma, 2012; Renfrew *et al.*, 2012). The lives of eight million children aged under-five years could be saved every year with improved breastfeeding. Optimal breastfeeding and appropriate complementary and supplementary feeding could save about 220,000 children below five years of age (WHO, 2010b; 2014b).

MacCann *et al.*, (2007), Odent (2011) and Renfrew *et al.*, (2012) critiqued mothers' negative observations on breastfeeding which is prevalent, particularly in the developing world. Similarly, they remarked that there are many obstacles to breastfeeding, which could be accounted for by cultural and ethnic associations, gender issues and educational matters (Horta and Victora, 2013). Public health education is neither widely available nor accessible and mothers often rely on cultural, familial or religious traditions to dictate their own practices in several developing nations (Paneru, 1981; Meedya *et al.*, 2010; Odent, 2011; Renfrew *et al.*, 2012; Horta and Victora, 2013). Odent (2011) articulated that breastfeeding is strongly associated with a mother's educational status.

NDHS (2006) showed that only 35% of mothers in Nepal introduced breastfeeding within one hour of birth and within a day of birth nationally it increased by 85%. The introduction of breastfeeding within one hour of child delivery also varied between the Far Western Terai (63.3%) and Western Terrain (21.9%). NDHS (2006) further discussed that the education of these mothers was higher as compared to average mothers in Nepal having a secondary school education, precisely being 41% with 47.2% having a school leaving certificate (Acharya *et al.*, 2016). NDHS (2006) illustrated that with respect to breastfeeding of children, the women from the upper-class segment (41.2%) had more information as compared to lower class segment women (29.8%) showed that performance of mothers from the lowest wealth quintile was worse (29.8%) than that of mothers from the highest wealth quintile (41.2%).

In a study conducted by Marriot (2007), the author stated that for an infant child, exclusive breastfeeding from the mother or wet nurse is necessary with no other liquid to be provided for infant including water. However, some syrups and drops are recommended by doctors for the provision of certain minerals and nutrients to the infant in a form of medicine. This is the most significant stage for a newborn that must be carefully done by mothers or nurses (Marriot, 2007; Acharya *et al.*, 2016).

Odent (2011) reported that mothers who visit health institutions for the delivery of the baby are counselled to breastfeed as soon as possible and that they should not be given anything other than breast milk for the first six months. The NDHS (2011) described that more than 35% of mothers gave pre-lacteal feeds to babies, but geographically it varied from 75.7% in the central part of the Terai to 4.3% in the Mid-Western Hills (NDHS, 2011). In terms of education level and this behaviour, there was no difference, however, it was found to be almost double among mothers in the highest wealth quintile (33.2%) than the lowest (17.4%) (Bunik *et al.*, 2006; NDHS, 2011; Acharya *et al.*, 2016).

Breastfeeding practices remain controversial and vary considerably between educated and lowly educated mothers in Nepal (Armstrong and Anderson, 2015). Hence, breastfeeding practices are also a key determinant of undernutrition status of children of Nepal (Acharya *et al.*, 2016). In the

context of Nepal, the maternal knowledge, attitudes, and beliefs about breastfeeding, however, still appears traditional and strongly associated with several misconceptions which importantly need to identify.

2.9.15 Natural calamities including change of climate

Nepal is geologically vulnerable to various types of natural disasters such as earthquake, flood, landslide, fire, hailstorm, drought, avalanche, etc. Among the natural disasters that occur regularly (Ives, 2006; IRIN, 2008), floods and landslides are by far the most serious ones. They claim many human lives every year and cause other damages such as destruction and blockages of roads, losses of livestock, crops, and land (Ives, 2006; Jha, 2010). Generally, there two types of hazards that are man-made and natural are perceived in Nepal.

Dahal (2007) stated that Nepal as a country is at high risk from man-made and natural disasters and it is prone to a range of natural and manmade calamities including severe effects of climate change. The geography of the country is diverse. NDHS (2011) showed that around 83% of people residing in the rural parts live with limited facilities which are crucial for a healthy life such as access to health facilities, schooling, employment opportunities and hygiene and care practices (NDHS, 2011).

Douglas (2009), and Fisher and Slaney (2013) have analysed the agricultural situation of Nepal which was associated with global warming or climate changes. Additionally, they remarked that the comparatively stationary performance of the Nepalese agricultural sector is mostly due to poor crop harvests and post-harvest losses caused by the nation's vulnerability to natural and manmade calamities, limited resources (land or production), climate change and usages of low agricultural input (Fisher and Slaney, 2013). Furthermore, population growth has directly influenced farming production by changing health conditions and biodiversity in the nation (Douglas, 2009; Enterprise Survey, 2013; Fisher and Slaney, 2013).

Fisher and Slaney (2013) commented on outcomes of climate change which are limiting farming output in Nepal, and consist of monsoons, drought, erosion, regular earthquakes and flash floods. The changing intensity, arrival, and departure of monsoons often cause severe floods in lowland

areas and periods of drought which cause a lack of irrigation. Furthermore, erosion causes loss of land and increases the division of agricultural plots which ultimately reduce production (Douglas, 2009; IFPRI, 2010).

IRIN (2008), WFP (2009) and IFPRI (2010) further elaborated that climate change is, thus, also helping to lead to undernutrition within the Nepalese community which indirectly impacts on the economy. It has been described by WFP (2009) and IFPRI (2010) that Nepal has faced certain instability in climate due to geographical region and the topography of Nepal which causes frequent climate changes affecting food and agricultural output (Douglas, 2009). There is a big difference in altitude from the plains to the high mountains and the warm and humid sub-tropical climate in the Terai area contrasts with the mountainous area where it is extremely cold and the temperature often remains below freezing point in the winter (IRIN, 2008; Fisher and Slaney, 2013). These variations generally influence the climate of South Asia (Fisher and Slaney, 2013). Ives (2006), NDRI (2008), and WFP (2009) added that a huge percentage of Nepal's GDP is linked to farming and agriculture. Variations of climate will have large impacts on the livelihoods, well-being, and economy of the country (NFSMS, 2015). Generally, the farming sector of Nepal is led by smallholders and rain-fed production, which is typically affected by rainfall variability and extremes such as floods, droughts, landslides, snowfall, hailstones, hot winds and cold spells (Masset *et al.*, 2011; Fisher and Slaney, 2013; Muzzini *et al.*, 2013). The 7.8 magnitude earthquake that occurred on 25th April 2015 (see Sub-section 2.9.2) is an example of the natural disasters that afflict Nepal (Nepal Earthquake, 2015a; 2015b). ICIMOD (2015) further highlighted that it has critically affected communities and children. As a result of the earthquake, many children are likely to suffer from severe undernutrition and there is a high risk of increasing severe malnutrition in the country (Nepal Earthquake, 2015a; 2015b). Nepal is designated a disaster-prone country where two types of disasters occurred: rapid and slow onset (Fisher and Slaney, 2013). There are many more hazards frequently occurring within the country which is not known because of the limited number of scientific studies conducted in Nepal. For example, the devastating earthquake in 2015, badly impacted on public health, agriculture and economy of

Nepal (Nepal Earthquake, 2015a; 2015b). The next sub-section outlines on the geographical location of the study population.

2.9.16 Geographical location: Rural and Urban

This section mainly defines the rural and urban area in the context of Nepal (see Table 2.4) because this thesis is comparing maternal knowledge, attitudes, and beliefs about healthy diet between rural and urban mothers.

Nepal remains one of the least urbanised countries in the world and in South Asia (Gellner, 1986). The word 'rural' describes territory, populations, housing units located outside urban clusters, while 'urban' includes populations, land areas and housing developments located in cities and towns or urban clusters (FAO, 1986; 1996; Mohanty, 1993; Sharma, 2003; Goldstone, 2010; Cromartie and Bucholtz, 2008; HRSA, 2015). Rural locations are settled places beyond the cities and towns. They can have an agricultural character, though many rural parts are based on several natural resources such as gas, petroleum, mines and other natural properties (Gellner, 1986; Bryden, 2001; Bibby, 2005; DEFRA, 2005; HRSA, 2015). The rural parts are less modern, are poorly developed and unorganised settlements and poorer in such matters as education, health, buildings, roads, and industries that are urban locations (Gurung, 2001; Sharma, 2003; Bibby, 2005). Villagers are probably more associated with traditions, cultures, and beliefs (FAO, 1986; Cecchi, 1999; Bryden, 2001; Bibby, 2005; DEFRA, 2005; Cromartie and Bucholtz, 2011). However, an urban area is associated with an increased population density, better labour opportunities, a better economy with emerging new technologies such as communication (Ricketts, 2005; IRIN, 2007). The urban part is always developing and highly diversified in production in towns, cities or metropolis (FAO, 1986; 1996; Mohanty, 1993; Ricketts, 2005; Goldstone, 2010; HRSA, 2015; Shrestha, 2015).

Table 2.4: Rural and Urban differentiations

Available Facilities	Pokhara	Lekhnath
Population density	3848.83 Sq.km	4.76 Sq. km
Presence of urban characteristics	Present	Absent
Industry	Factory and mills	Only small domestic industry available
Tertiary level health facility	Available	Not available
Advanced communication system	Active	Poor
Transportation • Road • Airport	Linked to all the cities of Nepal (every 10 min) Present	Poorly linked to another city due to poor road accessibility (every hour to limited area) Absent
Education facility	Available	Poorly available
Water supply	Covered whole city	Limited
Market	Developed	Not developed
Farming	20%	67.21%
Living standard	High	Low
Groups	Complex multi-group society	Simple group society
Sources: Gurung, 2001; CBS, 2011; Lekhnath, 2014; Shrestha, 2015		

In the context of this thesis, urban and rural are differentiated as follows. Pokhara is populous and advanced with new facilities such as education, job opportunity, industry, transportation and communication (Gellner, 1986). On the other hand, in the Lekhnath area, which relates to a ‘Rural Area’ in this thesis, there is a significant lack of those facilities. The next sub-section leads, particularly on theoretical models.

2.9.17 Theoretical models

This section presents a review of literature relating to theories and models of belief, knowledge, culture, and behaviour. It describes the central issues of these and summaries of the theories of belief, knowledge, and behaviours.

a. UNICEF Conceptual framework

The purpose of this section is to improve theoretical insights of unintended linkages between underlying causes of undernutrition such as food behaviours, health facilities, food insecurity and poverty in 3-5 years old children from the rural and urban area of Kaski district contexts. Given that such a framework does not currently exist, an adaptation of the child malnutrition Causes Framework, first recognised by UNICEF in 1990 (UNICEF, 1990; 1998), will be carried out. Given its prospective adaptability, a number of projects elsewhere have used this model aiming at comprehensively interpreting solid expressions of malnutrition at diverse stages of complexity (Smith and Haddad, 2000).

The UNICEF model arranges factors of both a socioeconomic and a biological nature into three major levels of casualty corresponding to immediate, underlying, and basic causes. Health status and dietary intake are projected as the immediate causes of malnutrition, assumed that they affect individuals in a direct way. These reasons are influenced by an unhealthy household environment, family food insecurity, insufficient care of children, and a lack of access to health services. Poverty is the vital context for understanding the above-stated factors of the underlying level of causation. Basic factors are strong resources whose obtainability and utilization may be affected by political, economic, cultural and social determinants. The basic causes of malnutrition take place at the community, regional and or national levels (UNICEF, 1990; Ruel, 2008). For each association and components of this model relevant literature has been revised to explain definitions and concepts (Walters and Doyle, 2002).

Figure 1.1 is an adaptation of UNICEF's theoretical framework, based on the projected association between malnutrition, poverty, and food insecurity during childhood. It should be noted that the key focus of this thesis is not malnutrition in under-five children, but the factors of food and health-seeking behaviours. The basic causes of malnutrition will not be the focus of this project. However, there is complete awareness of their illustrative significance pertaining to a healthy diet.

b. Conceptual framework for monitoring food & nutrition related literacy in Kaski

This thesis mainly focuses on one level of the pyramid (see Appendix 6), the food/nutrition-related ‘literacy’ (knowledge, attitudes, and beliefs) (Marks *et al.*, 2001). The major aim of this study is to establish the knowledge (Stickney 1998) about nutritious food available to mothers of rural and urban areas of Kaski district. It will explore food recommendations by the mothers of rural and urban parts. It will also illicit beliefs about nutrition, which are strongly embedded in this society. This will also discuss how the health promotions are provided by local authorities arranging programs throughout the world helping urban and rural mothers educating them regarding the nutritional diet beneficiary for their children. Furthermore, it will collect information on the health-seeking behaviours and nutrition-related illnesses.

For changing the behaviour of humans, it is necessary to investigate that what motivates an individual to change behaviour (Nutbeam, 1996). Research conducted by Bandura (1986) has discussed that 95% of thinking in the human mind is done with the subconscious mind so the immediate research fails to provide what people are actually thinking thus causing failures (Bandura, 1986). Furthermore, a paper on behavioural economics suggests it is no longer enough simply to give people the right information, incentives, and disincentives, and expect them to act in their own best interests (Bandura, 1986). Other factors like emotion, habit, social context, the fear of loss and the behaviour of others play critical roles (Jack *et al.*, 2010). So how do they gain a deep understanding of these wider issues? The social setting affects a person’s behaviour, values and emotions demonstrated above (Craig, 2011).

The significance of theory in this context helps in the application of different concepts and shed light upon the knowledge regarding food nutrition, health behaviours and the recommendation of food from leading a healthy and active life from the mothers to children, In addition to this, it also provides recommendations to communities based in urban and rural areas of Nepal. The major barrier regarding the food recommendation to children and how mothers prepare them are also part of this study. This study tends to compare the results with the knowledge of the health and recommendation of healthy food for the rural and urban community people. Furthermore, the

study tends to discuss the gaps in nutritional practices of people in urban and rural areas. The focus is also on the problem of undernutrition being a major health problem in a developing country such as Nepal. The further section focuses on major food barriers.

2.10 Barriers to recommending healthy food

This section focuses on major food barriers to healthier food, including price, marketing, skill, and location. It then outlines existing barriers which are correlated with cultural and religious norms and values. The key barriers are related to the objective-ii (see Section 2.13.1).

The study conducted by Khatri *et al.*, (2017) stated that nutrition for children has been a major problem in Nepal with mothers playing the important role and thus, the recommendation of healthy food is necessary. However, there are certain barriers to the recommendation of healthy food such as beliefs of mothers of their conventional and traditional thinking which makes them hard to change their behaviour and perception regarding the healthy food. Moreover, another study by Acharya *et al.*, (2015) indicated that mothers are not aware and not educated being reluctant to change their diet and food behaviour which makes it difficult to recommend them food because of lack of awareness of health and nutritional food. In this context, the author of this thesis has stated that for preschool-aged children, it is important to educate mothers and create awareness among them for providing the healthy food recommendations for the purpose of eliminating the problem of malnutrition in Nepal (Rai *et al.*, 2001). A study conducted by Oli *et al.*, (2015) stated that although mothers have become aware of the healthiness of food and the requirement of proper micronutrients and nutrition for the people in Nepal to combat the problem of malnutrition, the mothers regard these foods as being unappetising and appropriate for sick people only not for normal people. Some significant barriers (i.e. taboos, culture, diversification of castes, cultures, and religions) exist in the Nepali context for recommending food to children and mothers (Christian *et al.*, 2006; Acharya, 2013). Besides this, the community has its own perceptions regarding health and food based on their cultural and religious norms and values (Stone, 1976; 1986; Storer, 1977; Sharma, 2004; Sibeko *et al.*, 2005). Thus, their experiences

have developed their own principles and beliefs, particularly regarding food and health-seeking behaviours. They merely believed in allopathic and homoeopathic medication practices (Stone, 1986). They specifically shared their experiences and perceptions when they paid visits to sick children or people. On that occasion, they collected the information of the sickness from the household members and they advised for food and further consultation based on their past experiences (Henry, 2014; Acharya *et al.*, 2017). This practice is being regularly carried out in the community. This practice, called multiple opinions, is also perceived as one of the major risk factors (Henry, 2014; Acharya *et al.*, 2017). There is a literature gap around this issue which urgently required further inquiry.

2.11 Chapter summary

The following chapter was the literature review chapter, which has focused on different aspects related to undernutrition problems in the broader global context and in Nepal as the focus of this study. The study has first provided a background of study focusing on children and mothers following the dietary behaviours and significance of health problems of undernutrition in Nepal (Sah, 2005). The detailed overview and description of undernutrition are provided with shedding light upon the problem of malnutrition and the consequences caused by it. The chapter then seeks to highlight the global context of malnutrition and the development plans of organisations working for the betterment of nutrition in the developing and underdeveloped parts of the world. The regional context is then discussed which is then followed by undernutrition in Nepal some reasons with determinants of malnutrition. It includes poverty, diseases, low income, environmental factors, geographical factors, breastfeeding, energy intake and knowledge of food and beliefs to name a few (Adhikari, 2010). This chapter furthermore discusses the theoretical model to be used in the study for the purpose of validating theory within a generalized context for attaining the study's aim. This chapter has also shed light on the aim and objectives of the study. After the literature has been done and considerable knowledge regarding concepts and understanding of the research, the next step is to outline the methodology for conducting the

research for the purpose of collecting, analysing and interpreting the data for attaining the aim of the study and answering the research questions formulated for this thesis (Sandelowski, 2000).

Hence, the available literature suggests that there is a gap in our knowledge, such as patterns of food recommendation in association with existing cultural and religious environments and some of the key problems mothers' expressions are practically well documented, there is a lack of in-depth perception (Jabs *et al.*, 2007). This suggests that the need for further focused mixed-methods research on the maternal knowledge, attitudes and beliefs about healthy food including association with religion and various ethnic groups are highly appropriate (Jabs *et al.*, 2007). In order to understand the food and health-seeking behaviours amongst the poor and rich mothers, it is necessary to understand some of the key issues related to their food and health behaviours, particularly maternal knowledge, attitudes and beliefs about healthy food in Nepal (Jabs *et al.*, 2007).

Most studies debated in this section are large and small-scale, cover a range of groups (e.g. Mothers, children, stakeholders, various ethnic groups and health care professionals) and limited in insights, information about healthy diets (Adhikari, 2010; Odent, 2011; Dahal, 2015). Also, studies are often cross-sectional surveys (i.e. offering purely quantitative information rather than additional qualitative images) and cover mostly clinical and laboratory investigations (Walters and Doyle, 2002; Black *et al.*, 2008; Beer *et al.*, 2015). However, the literature suggests that there is a gap in maternal knowledge around patterns of food and health-seeking behaviours and some of the key problems faced by mothers (de Boer, 2001; Lawrence *et al.*, 2007; Leroy *et al.*, 2007). In other words, this suggests the need for further research focusing on maternal knowledge, attitudes and beliefs, and their existing traditional food recommendation (Leroy *et al.*, 2007). The next section describes the rationales for this thesis.

2.12 Rationales for study

The major reasons for doing this thesis are: first, there have been very few studies in Nepal, applying the mixed-method approach on this topic. Hence this thesis has applied multiple methods

to address the aim, objectives and research questions (see Sections 2.13.1-2). Secondly, there has been little evaluation of the public health aspects which this thesis did not involve any clinical and pathological investigation. Thirdly, the literature review showed that there have been very few studies on nutrition and eating that target a wide range of stakeholders (e.g. spiritual healers, social workers, health professionals and policy people).

Food security and nutrition more generally, are global issues. Hence, the Government of Nepal has made it a policy priority as it recognised the malnutrition has a negative impact on both economic growth and human development index (Vaughan, 2011). The government has opted to develop a plan known as National Multi-Sector Nutrition Plan (MSNP) for the improvement of nutrition for children and mothers specifically and reducing the chronic malnutrition among them (Pokhrel *et al.*, 2009; 2013).

This thesis has aimed to investigate the reasons which are directly or indirectly associated with social construction, behaviours, views of mothers and stakeholders about the healthy diet (see Section 2.13: 2.13.1-2.13.2) (Victora *et al.*, 2008). This is the first Public Health study of its kind to apply a mixed-method study on this important topic in Nepal, one of the least developed and poorest countries in the world (Blades, 2004; Bennett *et al.*, 2008; Jolly, 2010; NLSS, 2011; Bhutta *et al.*, 2013).

The recommendations of this study on nutritional problems will be a most valuable source of knowledge, notions, concepts or guidelines (short-term, medium-term and long-term) to policymakers, planners, academics, governments and INGOs for implementation of the proper approach and strategy which might help to gain better health for the affected people (UNESCO, 2008; UNDP, 2013; 2014). The literature review shows that there are very few studies that describe the food consumption patterns of the general population and their variations according to eco-regions, districts, and communities focusing on both urban and rural areas (Walters and Doyle, 2002; Christian *et al.*, 2006). The significance of this study is that it provides knowledge and recommendations for guardians, parents, carers, families, and leaders positioned at every level

to support nutritional practice and healthcare service facility in these areas in order to eradicate the problem of undernutrition in Nepal (Pokharel *et al.*, 2009; 2013).

2.13 Aim of the study

The aim of this thesis is to compare rural and urban food knowledge, beliefs and attitudes, and behaviour of mothers related to feeding preschool-aged children.

2.13.1 Objectives

The objectives were to:

- i. assess the knowledge, attitudes, and beliefs about nutritious food amongst mothers.
- ii. identify major barriers that associated with existing cultures, religions and ethnic divisions including public opinions for recommending healthy food for preschool-aged children.
- iii. assess health-seeking behaviour for rural and urban children of low socio-economic status.
- iv. determine factors that affect the availability of food locally.
- v. measure the mothers' knowledge of and attitudes towards health promotion and food security.
- vi. evaluate the health-seeking behaviours for undernourished children and reasons why.
- vii. seek mothers' suggestions for a better nutritional environment.
- viii. evaluate the perceptions about healthy diet amongst the stakeholders such as policy people, health professionals (low level to mid-level), pharmacists and spiritual healers.

2.13.2 Research questions

Textbox 2.3 Overview of research questions, study methods and aims and objectives

Research questions	Methods	Aim and objectives
<ul style="list-style-type: none"> - What is the level of knowledge and attitudes about feeding preschool-aged children amongst rural and urban mothers? - What challenges do mothers face? - What do mothers do to provide nutritious food? 	<p>Interview questionnaire administered by the enumerators.</p>	<ul style="list-style-type: none"> • Assess the knowledge about food for children amongst mothers (rural/urban). • Assess health-seeking behaviour. • Measure the level of knowledge of and attitudes towards health promotion and food security. • Determine the challenges that exist for mothers to feed their children and how they attempt to overcome them. • Determine factors that affect the availability of food. • Find out attitudes/beliefs regarding food amongst rural and urban mothers.
<ul style="list-style-type: none"> - What are the maternal views about healthy food? - What are the mothers' food and health-seeking behaviours towards preschool aged children? - What challenges do the mothers face? - What are the major factors that affect food recommendations? - What are the main issues about nutritious food problems? - What is your opinion to address the nutritional problems in this community? 	<p>Focus group discussions.</p>	<ul style="list-style-type: none"> • Find out attitudes/beliefs regarding food amongst rural and urban mothers. • Assess health seeking behaviour of rural and urban mothers. • Determine factors that affect the availability of food. • Obtain food and health-seeking behaviours and attitudes about undernourished children among female community health workers: ANMs, FCHVs and mothers' group.

CHAPTER THREE: METHODOLOGY AND METHODS

3.1 Introduction

This mixed-method study uses both qualitative and quantitative approaches (Bryman, 2008). This chapter discusses both the methodology and methods executed in this thesis. The section starts with the case for a mixed-methods approach along with its theoretical underpinning. This chapter details the research including the research instruments used, the process of data collection, recruitment of participants, and the organisation of field management. Likewise, the sampling process, the pilot study and its implications for the main study, and ethical considerations are also incorporated. Aspects applicable to the whole study are presented before looking in more detail at the quantitative and qualitative methods used. This mixed-methods exploration offers a general picture of both mothers' and key respondents' perceptions of nutritional problems and the barriers to feeding nutritious food to their under-five year aged children.

3.2 Methodology

Mixed-methods studies purposefully integrate or combine quantitative and qualitative data to maximise the strengths of each and answer questions which are not possible to be answered by a single quantitative or qualitative design alone (MacKenzie-Bryers *et al.*, 2014). Mixed methods use different philosophical positions (e.g. pragmatic and transformative perspectives) and often draw upon one or more theoretical frameworks from the social or behavioural sciences (Greene, 2008).

Mixed-method research is important in studying health systems because it allows researchers to view problems from numerous perspectives, contextualize statistical findings, advance a more comprehensive understanding of a problem, triangulate results, quantify complex constructs, provide illustrations of context for trends, examine processes/experiences along with outcomes and capture a macro picture of a system (Creswell *et al.*, 2011). Hoffman *et al.* (2012) defined the common structures which occurred between the mixed-methods approach and systems of health.

Furthermore, according to Bryman (2008), it is beneficial to use mixed-method research to find a respondent's link to qualitative outcomes either for follow-up or to describe instruments. Bryman (2008) also claimed that qualitative investigation can deeply enrich understanding through the viewpoint of stakeholders and it deals with providing a rationale for health system while quantitative components allow researchers to identify the underlying links and understandings of how research findings are represented.

The words methods and methodology are occasionally used interchangeably, but it is very important to understand the distinction between methods and methodology in the mixed-methods approach (Bryman, 2008; Greene, 2008; Lingard *et al.*, 2008; Creswell *et al.*, 2011; Gilson *et al.*, 2011; Hoffman *et al.*, 2012). The methodology is the theory, which is often referred to as the research paradigm (Gilson *et al.*, 2011; Hoffman *et al.*, 2012).

In short, there are two different study methodologies which are known as positivism and interpretivism (Hoffman *et al.*, 2012). The positivist paradigm is based on objectivism, which takes into account the scientific method and technicalities. The positivism approach is followed in quantitative research generally (Rocco *et al.*, 2003; Creswell, 2009). For instance, survey questionnaire can be considered as a quantitative method. The quantitative investigation starts with prearranged, instrument-based questions aimed to test prior hypotheses (Gilson *et al.*, 2011; Creswell *et al.*, 2011). On contrary to this, there is the interpretivist approach which is naturalist and contextual in nature (Polit and Beck, 2004). Positivism begins from the need to assess theory and interpretivism to develop theory. This generates problems for the investigator who has a research question in an area where theory exists but which may not be suitable in specific circumstances (Hoffman *et al.*, 2012; Gilson *et al.*, 2011).

The above method received criticism from researchers which led to the establishment of a new method known as constructivism method (Polit and Beck, 2004). This method is based on societal structures and relativism and contends that authenticity is moulded by the individual and the cultural rather than being unqualified (Sandelowki, 2000; Downe, 2004; Lingard *et al.*, 2008; Gilson *et al.*, 2011). The case here would be that the researcher might want to try through a

qualitative approach to comprehend how and why a phenomenon is affected by social, behavioural, or cultural determinants. Qualitative approaches characteristically involve a naturalistic or holistic collection of data through, for example, face-to-face interviews or focus group discussions.

From the various defects and criticism of the above-mentioned techniques, scholars came up with a new kind of investigation majorly based on post-modernism. (Gage, 1989; Bryan, 2008; Hoffman *et al.*, 2012), it is said that the mixed-method is considered to be one of the most practical methods for conducting research. This method creates a link between qualitative and quantitative investigation (Tashakkori and Teddlie, 1998; 2003; Greene, 2008; Creswell *et al.*, 2011).

In this thesis, the main philosophy is to use a mixed-method approach by using a questionnaire study and focus group discussions (Tashkkori and Teddlie, 2003). The fundamental reason for using a mixed-method approach is that it provides a better understanding of the issue addressed in this Ph.D. research. Moreover, the research issue cannot be addressed in a comprehensive manner by using a quantitative method or qualitative method alone. (Creswell *et al.*, 2003; van Teijlingen and Hundley, 2005). In this thesis, the mixed-method approach was employed mainly to accomplish certain objectives. First, it leads to the increased validity of the differences in data gathering. Similarly, a mixed-methods approach (questionnaire and focus group discussion) answers the question from different of perspectives. Likewise, it ensures that there are no gaps in the gathered data or information (Tashakkori and Teddlie, 2003; van Teijlingen and Forest, 2004).

3.3 Mixed-methods

Mixed-methods focus on collecting, analysing and mixing both qualitative and quantitative information in a single study or series of studies (Sandelowski, 2000; Rocco *et al.*, 2003). Mixed-methods are a more comprehensive method as they combine both qualitative method and quantitative method (Lingard, 2008; MacKenzie-Bryers *et al.*, 2014) which is appropriate for this

research to give a complete picture (Tashakkori and Teddlie, 1998; 2003; MacKenzie-Bryers *et al.*, 2014).

In this thesis, the mixed-methods approach was employed to accomplish the following objectives. First, it increases validity through triangulation of qualitative and quantitative data. It ensures that there are fewer gaps in the information gathered (van Teijlingen and Forest, 2004; Tashakkori and Teddlie, 2003). Secondly, it reduces potential bias which may be possible when using just one method (Creswell *et al.*, 2003; Tashakkori and Teddlie, 2003). Qualitative methods are frequently used to clarify quantitative results and develop survey tools for the research. Mixed-method investigation is important in low-income countries, where there is a shortage of research aiming to understand social, economic and cultural contexts is essential to assess a health system's performance (Tashakkori and Teddlie, 1998; 2003; MacKenzie-Bryers *et al.*, 2014).

Following the study aim, objectives and research questions (see Sections 2.13.1-2.13.2), the investigation is centred on maternal knowledge, beliefs, attitudes, and behaviours about healthy foods. To examine the aforementioned variables a questionnaire was used to investigate mothers' knowledge about a healthy diet. Structured questions have various limitations such as the data only rely on given questions, can be influenced by misinterpretations and lack of depth (see Section 3.5). Similarly, it has been observed that the answers derived from the questionnaire lack detail as only close-ended questions were asked. This means the quantitative study could not help explain why a person behaves in a particular way, as questionnaires typically address 'what' questions. Moreover, questionnaires are not flexible in nature which means the administrator cannot ask unplanned or new questions. A quantitative approach is not sufficient to investigate attitudes and behavioural issues whereas, a qualitative approach can provide deeper insights from respondents particularly in cultural and religious issues as well as behavioural issues, as it generally addresses the 'why' question.

In this thesis, the quantitative method has been used for the purpose of measuring the knowledge of mothers regarding a healthy diet. Moreover, it also collected data about values of nutritious food, the importance, and implications of healthy diet, healthy food recommendations and the

major barriers in this regard. On the other hand, qualitative methods addressed more in-depth issues such as practices of mothers regarding food and health-seeking behaviours within the norms and values of the cultural and religious framework.

The FGD (Focus Group Discussion) schedule explored issues about healthy food including attitudes, beliefs, and knowledge. Thus addressing the issues not covered by the questionnaire (Reja *et al.*, 2004).

Principally, for the following reasons, this study has used a mixed-method approach (Green *et al.*, 1989; Sandelowski, 2000; Tashakkori and Teddlie, 2003; Creswell, 2009):

- Different methods of data collection lead to greater validity.
- Answers the question from a number of perspectives.
- Ensures that there are no ‘gaps’ in the information/data collected.
- Comprehensively covers all the information which is not possible in a single method.

Recently there has been growing international interest in combining qualitative and quantitative methods in a single study (O’Cathain *et al.*, 2007). Many researchers have (i.e. Green *et al.*, 1989; Sandelowski, 2000; Rocco *et al.*, 2003; Lingard *et al.*, 2008; Creswell, 2009) have mentioned different ways of mixing methods at many levels in a single study. For example, Sandelowski (2000) suggests a combination of methods at various research stages: (a) data collection: combinations include the use of instruments for fuller qualitative descriptions, for validation, as guides for purposeful sampling, and as elicitation devices in interviews; (b) data analysis: combinations include interpretively linking qualitative and quantitative data sets; and (c) sampling: combinations include criterion sampling from instrument scores, random purposeful sampling, and stratified purposeful sampling. Green *et al.* (1989) and Greene (2008) suggest five broad benefits of combining methods: (1) complimentary (seeking elaboration, enhancement, illustration, clarification of the results from one method with results from the other method); (2) triangulation (seeking convergence and corroboration of results from different methods studying the same phenomenon); (3) initiation (discovering paradoxes and contradictions that lead to the framing of the research question), (4) development (using the results from one method to help

inform the other method); and (5) expansion (seeking to expand the breadth and range of inquiry by using different methods for different inquiry components). In addition, methods are mixed to increase the scope or width of studies, (Sandelowski, 2000), comprehend or clarify the outcomes from the other approach better (Creswell, 2009). In this thesis, the FGD and interview questionnaire's results are synchronized together to conclude the research results.

3.3.1 Strengths of mixed-methods research

The overall strengths of mixed-methods research are:

- a. Strengthens research outcomes (Creswell, 2009; Denscombe, 2010): Mixed-methods research balances the disadvantages of both qualitative and quantitative methods. For example, quantitative research may be weak in understanding context because the voices of participants are not directly heard. Personal (researcher) bias may affect the quantitative results as the researcher is in the background during interpreting the results combat the human tendency towards overconfidence in research results, syntheses and critiques and the interpretations (Denscombe, 2010). Qualitative research makes up for these weaknesses. Similarly, it is difficult to generalize findings in qualitative research due to: (a) researcher bias; the personal interpretations of the researcher; and (b) small qualitative samples may not represent large populations. Hence, a combination of two approaches can balance the weaknesses of either approach.
- b. Addresses research questions in a more sophisticated way, i.e. in a way a single method is not able to. Provides a better perception of the problems investigated than any one of the approaches on its own.
- c. Is "practical": The researcher is free to use all potential techniques to address a research problem. Researchers can use words and statistics to solve research problems.

3.3.2 Limitations of mixed-methods research

Like all methods, a mixed-method approach also has weaknesses (Creswell, 2009; Denscombe, 2010), which are:

- Takes more time and resources to collect and examine both qualitative and quantitative data.
- Can be complex for a single examiner to carry out both quantitative and qualitative research, particularly if two or more approaches are used in a parallel manner. The researcher has to be trained in multiple methods and approaches in order to understand how to combine them correctly.
- Some of the details of mixed-method study remain to be worked out fully by research methodologists (e.g. problems of sample mixing, and how to interpret conflicting outcomes).

3.4 Locality

3.4.1 Definitions of urban and rural

Nepal is one of the least urbanised nations in South Asia and the world, as only 19% of the population live in urban areas (CBS, 2011). However, the rate of urbanisation in Nepal is very high (growing at 3.6% annually) which is the highest in the whole of South Asia (Goldstone, 2010). The term ‘urban’ has been defined and redefined over the years and there is evident lack of consistency in the definition (Gellner, 1986; Sharma, 2003; Bibby, 2005). There is a rich literature in the statistical and policy debate on what variables should be considered to distinguish urban and rural districts. The definition of urban and rural areas varies from country to country and with periodic reclassification it can also differ within one country over time, making direct comparisons difficult (HRSA, 2015).

In Nepal, several villages within a Village Development Committee (VDC) may be merged to form an urban municipality (Gellner, 1986; Sharma, 2003). The government of Nepal taxes municipalities as urban areas at a higher rate than rural VDCs. Therefore, some places feature village characteristics even when they are classed as a municipality. In those areas, the provision of infrastructures such as roads, transportation, education, industries and much more are still going on (Gurung, 2001; Shrestha, 2015).

In Nepal generally, 'urban' refers to 'developed' and the region where all the facilities are available, whereas 'rural' means poor facilities, less developed region, geographically located outside of towns and cities, and difficult to reach (Gurung, 2001; Ricketts, 2005; HRSA, 2015). Urban and rural areas are defined on the basis of population size and geographical location (Ricketts, 2005). For example, if a settlement of more than 5000 people having features of an urban environment such as a secondary school, college, judicial and administrative offices, bazaar, modern communication facilities, mills, or factories, develops into a city or town it is classed as urban (Gurung, 2001; HRSA, 2015) (see 2.9.16) but those places that do not meet urban conditions are deemed rural (Gurung, 2001). As the rural and urban differ substantially in terms of their economy, type of living and social attitudes, it is essential to differentiate between them. An urban settlement is characterised by distinct demographic features as well as the availability of infrastructural facilities. The urban population has been growing more rapidly than the rural. Urban centres once established, tend to influence the socio-economic conditions of the region and ultimately become highly attractive to the population (HRSA, 2015).

In this study, Pokhara is defined as an urban locality (Gurung, 2001; Shrestha, 2015). Lekhnath is officially a municipality (Lekhnath, 2014) but it does not meet the urban criteria as described above and most of the population live in rural villages (Ricketts, 2005; IRIN, 2007; HRSA, 2015).

3.4.2 Study location

The present study covers five urban and five rural places of Kaski district (see Table 3.2). The pilot study for both qualitative and quantitative research was conducted at Hemja village of the Kaski district which is in the different location to the main study to avoid contamination.

3.5 Research design

This section describes the research design, i.e. methods applied in this thesis. The mixed-method approach designed for this thesis uses both the survey approach (Bowling, 2002) and FGD (Bowling, 2002; van Teijlingen and Forrest, 2004, Hancock, 2007; Silverman, 2009; Lucas, 2012). In this study, focus groups were employed to gather information and opinions about food

and health-seeking behaviours amongst mothers from rural and urban regions. Questions were asked in an interactive session and where respondents were encouraged to discuss their thoughts freely with other participants (Bowling, 2002; Lucas, 2012). Such free and open interactions typically generate ideas. The FGD helped to gain useful insights of the respondents on particular issues such as knowledge, attitudes, and beliefs about a healthy diet (Hancock, 2007; Silverman, 2009; Lucas, 2012).

This thesis addresses different aspects of issues such as beliefs, knowledge, attitudes and major barriers to mothers regarding a healthy diet. Moreover, the study explores the level of empowerment and integration of women in households (Majupuria, 2007). The survey questionnaire reviewed the perspectives of both well-off and deprived people from two distinct geographical areas (rural and urban) about the importance of availability, affordability and proper utilisation of a healthy diet. Likewise, the FGD encouraged healthy discussions of different issues of nutritional problems. The mixing of approaches in this proposal occurred in data collection and participant selection as well as the analysis phase (Hancock, 2007; Silverman, 2009). In the analytical phase, the quantitative survey outcomes have been clarified by an analysis of the qualitative results. Both elements of the mixed-methods approach are described in detail below.

A cross-sectional study is a valuable instrument used in social sciences to collect relevant information from a population by studying a sample of that population (Creswell, 2009). A cross-sectional study can provide key information on risk factors and associations (Peat *et al.*, 2002). In addition, it is easy to conduct, can provide timely results (Peat *et al.*, 2002) and is perceived to be cost-effective (Creswell, 2009).

In this thesis, the sequential mixed-methods data collection included gathering data in an iterative process whereby the data gathered in one phase contributed to the data collected in the next phase. The survey questionnaire was the first phase which was used in the design of the qualitative phase two (Hancock, 2007; Silverman, 2009).

Quantitative results were presented in numbers and percentages whereas qualitative research outcomes were presented in textual form in the findings chapter (Hancock, 2007). The numeric

values of the quantitative data results were interpreted. All the key findings of qualitative data results including quotes were combined and explained appropriately (Tashakkori and Teddlie, 2003; Creswell and Clark, 2007).

The analytic process of combining quantitative data and qualitative data consumes researcher's time and pressures the researcher to work on a tight budget; however, this design seems to be most appropriate for this thesis (Carvalho and White, 1997). The open-ended and structured survey questionnaire responses were analysed using an analytic software package, SPSS V21.0 and focus group data were coded and were analysed with the help of thematic analysis.

A structured questionnaire including open-ended questions was used in this thesis; however, with this method, it was not possible to collect data to clearly distinguish between food and health-seeking issues. With regard to the limitations of the survey questionnaire, there were many limitations, particularly related to respondents and selected regions. The following limitations are found in the literature on questionnaires: dishonesty, lack of conscientious responses, differences in understanding and interpretation, feelings and meanings unable to be conveyed, some questions were difficult to analyse for them, respondents might have their own agenda, lack of personalization, skipped questions and accessibility issues. Most of the above-mentioned limitations existed in this study as well. For example, the study was conducted in domains of multi-cultural, multi-caste/ethnicity, multi-religious and multi-languages where those given questions on the questionnaire may misinterpret due to the difference in ethnicity, religion, culture, and language. It is worth noting that the duration of the survey in this thesis (between 40 and 90 minutes in some cases) was tedious for some participants, especially if they had one or more preschool children in their care.

Conducting focus group discussions provided sufficient and comprehensive information about the experiences of the participants (Morgan, 1993; 2006; DiCicco-Bloom and Crabtree, 2006). First, it was considered that survey questionnaire would be more realistic than conducting FGDs with mothers' group, because of several factors which make it difficult for illiterate mothers to discuss it in an open setting. These factors include attitudes, food beliefs and health seeking

behaviour of the issues including social life-styles which are associated with socio-economic status (DiCicco-Bloom and Crabtree, 2006). FGD can provide relevant, reliable, appropriate and detailed information about the knowledge and experiences of key informants (DiCicco-Bloom and Crabtree, 2006; van Teijlingen and Pitchforth, 2006; Lucas, 2012) because of the association of child and maternal health issues with existing socio-cultural beliefs, attitudes and existing traditional practices which are more difficult for Nepalese women to discuss in public places (Majupuria, 2007; Devkota, 2011; Nishi, 2013).

3.6 Methods

3.6.1 Quantitative

3.6.1.1 Survey questionnaire

Surveys have been used to investigate food habits, patterns in poor and well-off groups, shopping habits of respondents, food consumption behaviours, and attitudes, knowledge, and beliefs about healthy diet within rural and urban areas (Gellner, 1986; Shakya, 2006; Bennett *et al.*, 2008; Odent 2011; Beza-Zepro, 2015). The survey questionnaire is a flexible research method used to examine an inclusive array of topics. In this thesis, both structured and open-ended questions including a pictogram were employed in the questionnaire (Otsubo, 1988; Norman, 1990; Dovona-Ope, 2008).

A comparative study between two localities, urban and rural, using a questionnaire with 63-questions, including socio-demographic information combined structured and open-ended questions, including pictograph of common fruits and vegetables: the study used a pictogram of common and familiar fruits and vegetables. A pictogram is better than a label, and recognizing an image is easier than reading the text (Norman, 1990). It is a conventional symbolic drawing that is used to directly deliver information of a figurative nature to specify an object or to express an idea and can fulfil numerous functions (Hameen-Anttila *et al.*, 2004). A pictogram needs to capture its audience's attention (Otsubo, 1988). Pictograms are suitable when users undertake familiar or routine tasks but it may not be interpreted correctly for cultures (Triggs and Harris, 1982). The

main view of applying this method of assessment was to reach an accuracy of mothers' knowledge on identifying nutritious food (Wolff and Wogalter, 1998).

The study population comprised mothers (and some other caretakers) of children aged three to five, the majority of whom were housewives and living in a poor socio-economic environment (Cumming, 2010). With regard to literacy status (see Appendix 21), only three categories such as illiterate, literate and educated were considered. Literacy is usually agreed as the ability to read, write and use arithmetic (UNESCO, 2006).

3.6.1.2 Sampling

Sampling is the technique of selecting a subset of cases of the total population to represent the entire population in a study (Aldridge and Levine, 2001). As this thesis applied mixed methods, two different sampling actions were used. Convenience/quota sampling (de Winter, 2013) was used to recruit participants for the questionnaire survey and purposive sampling was used for the FGD (Morgan, 1993). For the survey, the enumerators went from house to house and interviewed relevant participants after obtaining their consent and assuring them that the data collected from them will only be used for the purpose of the research. If the occupant was not willing to participate in the questionnaire or was not a match for the criteria of the sample due to various reasons, the enumerator moved to the next candidate or house. Convenience/quota sampling is a method for sampling (Trochim, 2006; de Winter, 2013) whereby the researcher decides on certain key characteristics by which to stratify the sample (Section 3.6.1.6). The researcher decided to include the three-to-five-year-old children. The reason for this was that the chances of undernutrition are much high in this age group of children (Adhikari, 2010; Chandawani and Pandor, 2015). Another fundamental reason for choosing this particular age group rather than choosing the newborn group is that children ranging from 0-2 years are usually breastfed and hence, are less likely to be malnourished. A malnourished child presents certain signs and symptoms, such as not wanting to eat, frequent crying, screaming and quarrelling rough skin, and much more (Horta and Victora, 2013; NHS, 2015). However, for these age groups, the mothers would be more experienced and insightful about child health issues particularly those who meet

the criteria of study aim, objectives and research questions including food and health-seeking behaviours (Ahmed *et al.*, 2000; Ahmed, 2003; Adhikari, 2010; Chandawani and Pandor, 2015). Women whose children were not aged three to five years were excluded from the study. Mothers from other locations, or from outside the study area, and breastfeeding were also excluded.

3.6.1.3 Sampling frame

Potential participants for this thesis were approached in their homes in selected wards and villages. The selection of the respondents was based on a convenience sampling method (Trochim, 2006; de Winter, 2013). The estimated sample size for the study was generated by Survey Sample Size Calculator “FluidSurveysTM”. The sample size was calculated based on the population census of 2001 of the Kaski district, where 31% of the population were children aged 0–14 years (117,963) and 7% were aged three to five years (26,637). The estimated total sample size was 473 (Crouch and McKenzie, 2006) using a 5% margin of error with a 95% confidence level (Sub-section 3.6.1.4) (de Winter, 2013). A 95% confidence level shows the investigation is a trustworthy and valid representation and selection of the sample. The 5% margin of error allowed is associated with sampling error. This is crucial because it is difficult to know whether results of samples are identical with the true value of the population. It is common to consider a margin of error of +5 with a 95% confidence interval in the study (Machin *et al.*, 2008; de Winter, 2013).

The sample size for urban area was 339 (10% of the 3-5 years aged population) and for rural area was 134 (15% of the 3-5 years aged population) calculated from the three to five years aged population of urban (3,391) and rural area (897) (Crouch and McKenzie, 2006). The survey questionnaire included more participants (n=101) from the rural area than estimated sample size (n=134) due to less population than urban (CBS, 2001; 2002). The total sample size for the urban area was 339 and rural area was 235. A total of 574 mothers were recruited in the survey but 50 participants withdrew from the study (Crouch and McKenzie, 2006). Among the withdrawn participants 16 were from urban and 34 from a rural area (Trochim, 2006). A total of 524 mothers were included in the study. Table 3.1 shows the sampling frame.

Table 3.1: Sampling frame

Study area	Total population	Total population 0–14 yrs (31%)	Total population 3–5 yrs (7%)	Estimated sample size	Actual sample Size	Total sample size
Kaski District	380,527	117,963	26,637	473	574	524
Urban area	156,312	48,456	3,391	339 (10%)	339	323
Rural area	41,369	12,824	897	134 (15%)	235	201
Source: CBS, 2002						

The mothers who participated in the focus group discussions were from a different community than those in the survey, in order to reduce biases and avoid contamination because they were chosen for the different purposes such as one group for survey questionnaire and other for FGD (Morrison *et al.*, 2005; KC *et al.*, 2011; Pokhrel, 2015).

3.6.1.4 Sampling process

The sampling process could not be random as there was no comprehensive sampling frame e.g. of a list of individual mothers meeting the selection criteria e.g. exclusion and inclusion from which a random sample could be drawn (Babbie, 2001; Bowling, 2002). So, for the survey questionnaire, a convenience sampling approach was used to select participants (Dodge, 2003; Trochim, 2006).

3.6.1.5 Study period

The data collection period, for survey questionnaire (July 2012) and FGD (August 2012), was chosen to coincide with the festive season in Nepal when most people, especially farmers, workers and their families are done with farming and prepare to celebrate the upcoming festivals such as Dashain, Tihar, Chhat and other ethnic groups' festivals (Hinduism, 1999; Shrestha, 2015). Many are free in this period; available at home and therefore would have been more likely to participate in the study.

3.6.1.6 Research instrument (tools)

A questionnaire was used for data collection (Dovona-Ope, 2008). Open-ended and pictogram questions were also used in the questionnaire (van Teijlingen and Forrest, 2004; Walford *et al.*, 2010). Questions were developed and identified based on the aims, objectives and research questions of the study and using model questions from the Ethiopian Demographic and Health Survey (2005), the Nepal Demographic and Health Survey (NDHS) (2006), and the Jajarkot Nutrition Survey (2008) which were already validated and tested. Some new questions were developed, added and validated (Reja *et al.*, 2004). The survey questionnaire was divided into nine sections: (1) household and socio-demographic information; (2) food recommendation; (3) food scarcity; (4) knowledge; (5) cultural effects or beliefs about nutritious food; (6) barriers or difficulties to recommend nutritious food; (7) health-seeking behaviours; (8) involvement in health education or promotional activities; and (9) attitudes (see Appendix 4a).

3.6.1.7 Selection, recruitment, and training

La'Grandee International College of Pokhara provided third-year students studying for a Bachelor of Public Health (BPH) and one BPH tutor to assist in the study. A BPH tutor with qualitative research experience and ten students were appointed as a research assistant and enumerators respectively. The research assistant and enumerators were provided three days of training by the Ph.D. researcher before starting the fieldwork. This training comprised two days of theoretical and one full day of practical training in data collection techniques and research methods (see Appendix 15). The students had already completed the theoretical classes on research methodology as a part of their academic course. The tutor who was recruited as a research assistant for this study trained BPH students in the theory of a research methodology as part of their academic course (La'Grandee, 2013). All the enumerators along with the research assistant participated actively during the theoretical and practical sessions (see Appendix 15). The training focused on the specific research activities. As a practical part of the training session, a practice structured interview was organized between enumerators and a research assistant so that preliminary feedback could be gained on the suitability of the subject guide, to increase

confidence including interpersonal confidence (Hind *et al.*, 2003). The interview technique of the enumerators and research assistant, to learn how to build sufficient rapport with participants and help reduce the nervousness of the participants (Sechrest *et al.*, 1972; Larkin *et al.*, 2007; Zibah Consultants Ltd., 2009). On this occasion, academics and students raised crucial issues and provided appropriate feedback on the research methodology, survey questionnaire, guidelines and discussion points for the focus groups (van Teijlingen and Pitchforth, 2006). This forum was also very helpful for the development and review of the research documents such as questions for the questionnaire and discussion points for the FGDs including appropriate terms in the Nepali language of the questions (Sechrest *et al.*, 1972; Larkin *et al.*, 2007). On the basis of this feedback, the researcher reviewed the research tools again (see Sections 2.13.1-2.13.2).

3.6.1.8 Data collection

The data collection for survey took place at different times of day at ten different locations of the study area (see Table 3.2). There were some incidents, such as political strikes and unrests, local festivals, heavy rainfall, road accidents and sickness of research team members which hindered the planned data collection (Culture of Nepal, 1994; Upreti, 2006; Basnett, 2009). However, if the schedule could not be followed, the plan was rescheduled for the next week and circulated immediately to all concerned people (Devkota and Teijlingen, 2010).

The quantitative data was collected by the application of the structured and open-ended survey questionnaire. The one-to-one individual survey questionnaire was conducted with the chosen sample, generally in their homes, following the questions in the survey questionnaire. The survey questionnaire was administered by 10 trained enumerators. These survey forms were manually recorded by the enumerators on the specified survey questionnaire in Nepali (Sechrest *et al.*, 1972; Larkin *et al.*, 2007). No incentives such as money or any goods were offered to the participants who agreed to be involved in this thesis however, chocolates and some toys were provided for the children during the survey questionnaire.

3.6.1.10 Descriptions of data collection forms

For further field management and other support such as ethical permission at local level and proposed data collection from child care institutions, the Ph.D. researcher established contact with local authorities namely; the District Development Committee, Pokhara Metropolitan City (PMC), the District Public Health Office, Child Welfare Scheme Nepal (CWSN), Regional Health Directorate and Health Training Centre and La' Grandee College in Pokhara, Nepal, by emails and telephone calls from the UK. The contents of the data collection forms give an idea about the questionnaire with mothers and carers of children. The revised questionnaire is available in Appendix 4a.

Section 1 of the questionnaire (questions 1 to 22) was designed to collect the following information: respondent's address including ward number; respondent's gender and age were excluded from the serial numbers of the questions and socio-demographic information chiefly focused on source of income, literacy status, family size, responsibility for taking care of children, sanitation and environment, and use of fuel for cooking.

Section 2 of the questionnaire (questions 23 to 31) was designed mainly to define the frequency of healthy food being given to children. These nine questions were employed to obtain information basically on child feeding practices and frequency, the times of food surplus and food insecurity and the main causes for it.

Section 3 (question 32) mainly looked at households' experience of food shortage in the last 12 months. If the respondent had no food problem in the last 12 months, then the questions 32a and 32b were skipped. If any respondent's household experienced a food shortage in the last 12 months, then they were asked about the food shortage period (32a) and the main reason for it (32b).

Section 4 contained eleven questions (33 to 43), including four open-ended questions (33, 34, 35 and 43). Question no. 38 was mother's knowledge about child weight and is followed by questions 38a and 38b. If the child's weight is abnormal then questions 38a- b needed to be answered. If the child's weight is normal then they skipped the questions 38a-b. This section

mainly explored the mothers' knowledge about nutrition: foods with high and low nutritional value, and signs and symptoms of malnutrition with which they might be familiar. This section also measured their confidence in recognising nutritious foods from a grocery store. In this section, real fruits and vegetables including pictograms were used to assess mothers' knowledge about nutritious food. The pictograms represented locally available common green leafy vegetables and fruits (Appendix 13). Ten pictures with a combination of green leafy vegetables and fruits were shown to each of the respondents and their responses were recorded as: 'all correct' answers (ten correct out of ten), 'all wrong' (ten wrong out of ten), 'partially correct' (six correct out of ten), 'partially wrong' (six wrong out of ten). This technique was very important for illiterate mothers, especially to assess their knowledge on nutritious food. The main idea of using open-ended questions was to ascertain the factual insights, inspirations, and experiences of the mothers about nutritious foods based on different cultures and ethnicities. This section tried to evaluate the knowledge of mothers in negative and positive ways such as their knowledge of foods of low or high nutritional value.

Section 5 contained six questions (questions 44 to 49), mainly aimed at collecting crucial information from the respondents by employing five open-ended questions and one structured question. This section was primarily linked with cultural values and beliefs about nutritious food. Cultural norms and values are highly sensitive; therefore, five questions were used to collect information about attitudes to nutritious food. It also aimed to evaluate beliefs about nutritious foods and breastfeeding practices, including colostrum (MMWR, 2007; May *et al.*, 2013).

Section 6 labelled "Barriers or difficulty to recommending a healthy diet for children", had three questions, (50 to 52) designed to collect the respondents' views on the major barriers to their children's a healthy diet. Two open-ended and one structured question were employed for this purpose.

Section 7 (question 53) elicited the respondents' health-seeking behaviours. For this purpose, a single question targeted the health care use by families for malnourished children.

Section 8 addressed any involvement in health awareness activities particularly about healthy diet and also from whom the respondent received information. Two structured questions, 54 to 55, were used for this purpose.

Section 9 was designed to record attitudes of the respondents. There were four structured questions (56 to 59) to assess attitudes about nutritious food. It mainly aimed at examining mothers' food and health-seeking behaviours.

The survey questionnaire also contained two common options: 'Do not know' and 'Do not want to answer', in the answers column. These options were used when respondents were not aware of the subject matter or did not want to give an answer due to sensitive issues particularly social, religious or physical reasons and leave it blank which differentiates social status, and caste. In this society, some poor women cannot talk very fluently and also getting nervous about having conversations with a stranger or a person of a higher class. On the other hand, rural and illiterate women may believe that the research team is attached to government authorities, such as higher-level government officials (Chief District Officer, judge, lawyer) or landlords, army or police (Nepalese Army, 2011). Moreover, there were certain other situations where the respondents refrained from answering some questions, this was most common among the respondents who were not mothers of the children and rather were the caretakers and did not know about particular issues in children such as immunisation and feeding habits., In total, there were ten open-ended questions included in the questionnaire (see Appendix 4a).

3.6.1.11 Data collection process

3.6.1.11.1 Logistical considerations

The field study itinerary for the survey was set out in ten places (five urban areas and five rural) based on quota/convenience sampling (Section 3.6.1.2) (Creswell *and* Clark, 2007; Hancock, 2007). The researcher and study team had discussed appropriate places for the administering of the questionnaire and the seven FGDs at the participants' convenience.

3.6.1.11.2 Field schedule and management

The research team was allocated into three groups comprising the researcher, research assistant, and enumerators, to complete the field-work and to balance the workload and travel time among the team members. Each group was responsible for a particular area of the study site. The primary job of one group was to visit house-to-house to find participants and to obtain consent for completing the survey questionnaire and have polite conversations. The research assistant was solely responsible for supervising and monitoring the data collection activities and checking all the forms and completing them, and also for supplying the stationery. The researcher was responsible for coordinating, supervising and monitoring the field-work. Besides this, the researcher also communicated with his supervisory team about the field activities. The researcher was equipped with a laptop, memory sticks, wireless internet adapter, interview forms, study guidelines, a mobile phone with fully charged extra battery, first aid box, and gift items for children, stationery and other logistics which were required in the field. A vehicle was always kept on standby in case of an emergency occurred during the data collection. All the necessary instructions were given to rectify the errors and inconsistencies found during the data collection.

3.6.1.11.4 Data collection schedule

Table 3.2 shows the data collection schedule. The important meetings with the stakeholders and the local authorities were carried out and the pilot study conducted in the month of June. Quantitative data was collected in the month of July. The qualitative data was gathered in the month of August (see Table 3.2).

Table 3.2 Field itinerary

Steps	Activities	2012
1.	Introductory meetings with ethical approval body <ul style="list-style-type: none"> • Bournemouth University Research Team • Nepal Health Research Council (NHRC) 	June
2.	<ul style="list-style-type: none"> • Introductory meetings government health authority, local CBOs and I/NGOs including private institutions 	June
3.	Pilot study for: <ul style="list-style-type: none"> • Interview Survey (n=60) • Focus Group Discussion (n=1) 	June
4.	Data collection phases <ul style="list-style-type: none"> • Pokhara: Bagar, Lakeside, New Road, Birauta and Ram Bazar • Lekhnath: Sisuwa, Rajako Chautaro, Satmuhane, Khudi Khola and Rupatal 	July
5.	Focus Group Discussion	August
6.	Initial data checking & entry in Nepal	Sept-Oct
7.	Final data entry	Oct-Dec

3.6.1.12 Pre-testing and piloting

The pilot study was conducted to investigate the appropriateness of the research tools, to measure the viability of the survey questionnaire, whether the study design was accurate and useful, the efficiency of the sampling frame and procedure, and the size and shaping of the sample, to reassure academic institutions and donors, to explore the budgetary allocation and to train and encourage the research team (van Teijlingen and Hundley, 2001).

Pre-testing or piloting studies plays an essential role in the preparation of large-scale investigations (Lancaster *et al.*, 2004). Additionally, a pilot study enables the researcher to refine methods, test ideas, evaluate and assess difficulties and advantages for participants and researchers, clarify project timelines and recognize unexpected problems or benefits at low cost compared with large-scale studies (Fox and Ventura, 1983; van Teijlingen *et al.*, 2001; Carfoot *et al.*, 2004). In the social sciences, researchers mainly use pilot studies in the two different ways: for a small-scale feasibility study and for meticulous pre-testing of study instruments (van Teijlingen and Hundley, 2002). This pilot study pre-tested the feasibility of the survey questionnaire for the final research. The pilot testing was significant to establish the content

validity of the instrument and to improve the survey format and questions (Creswell, 2009). A further advantage of carrying out a pilot study is that it may provide advance warning of where the core study plan could fail, where study etiquettes may not be observed, or whether proposed techniques or tools are unsuitable or too complicated (van Teijlingen and Hundley, 2002). This pilot study was conducted to test the structured survey questionnaire (Fox and Venture, 1983; Carfoot *et al.*, 2004).

3.6.1.12.1 Pre-testing/piloting of survey questionnaire & FGD schedule

The basis of the survey questionnaire was the NDHS (2006), the Jajarkot Nutrition Survey (2008) and the Ethiopian Demographic and Health Survey (2005). Most of the questions were adapted from these studies, which were previously validated individually. The research questions were pre-tested twice, in the UK and Nepal.

The survey questionnaire was sent by email to six registered nurses from the UK and Nepal (based in the UK), consultant paediatricians in Nepal and Belgium, a research and health training officer of CWSN, a public health officer of Nepal (Regional Health Training Centre), and staff at Sight and Life (an INGO based in Switzerland, see <http://www.sightandlife.org/home.html>) between March and April 2012 to pre-test (Oksenberg, 1991; Forsyth, 2004) the external and internal validity of the different instruments selected for this thesis. All participants involved in the pilot study were familiar with Nepal's nutrition problems. After valuable feedback questions were reviewed, omitted, added and modified. Besides this, there was provision for supervision from the NHRC (Nepal Health Research Council) as well as from local government health authorities. The final version of the questionnaire was used for the main study.

The survey questionnaire was also piloted (van Teijlingen *et al.*, 2001; 2002; van Teijlingen and Hundley, 2005) in Nepal. Before the pre-testing, the Ph.D. researcher consulted health professionals, researchers and local government authority officers who provided valuable input, and after this, the whole instrument was translated into Nepali (Sechrest *et al.*, 1972; Larkin *et al.*, 2007).

Likewise, the researcher piloted the research tools with a similar population in the Hemja district of Nepal before the main study. In the meantime, verbal and written consent was obtained from the respondents as well as enumerators. On this occasion, carers and parents of three-to-five-year-old children, mothers, social workers, spiritual healers, the executive body of a local club, landlords, mothers' group and health service providers were invited from the area for the pilot; 60 people for the survey questionnaire and nine people for one FGD were recruited for the pilot study. The questionnaire and focus group discussion points were modified as appropriate on the basis of the findings (van Teijlingen and Hundley, 2005). Additionally, Sight and Life, enumerators and participants were also requested to give their feedback. They commented on any unclear terminology or ambiguous questions; whether variations would be essential to confine the truth and flow of the survey questionnaire; or whether the questions missed out important points or were too broad; whether the survey questionnaire was of acceptable length and whether directions to skip certain questions were required for particular respondents (Sechrest *et al.*, 1972; Larkin *et al.*, 2007).

The FGD points were also reviewed and revised based on the results of the pilot study. During the FGDs, audio recording and photography of the event were strongly opposed by the participants (particularly by low-mid-level health workers).

3.6.1.12.2 Recruitment for pilot study for survey questionnaire and FGD

A social motivator, the Public Health Office, and a leading NGO, namely NEPAN (Nepal Participatory Action Network) working on the Older Citizen Monitoring Project, was requested to arrange a public gathering in a public resource centre in Hemja village which is a different venue from the main study area. The exercise started with a large gathering of mothers (n=60) of three–five-year-old children in the public resource centre. Twenty mothers were recruited for survey questionnaire and nine people for one focus group discussion. The research team had struggled to gather the people for the pilot study. However, it was not an appropriate time to gather people for research purposes because the villagers were busy with farm work mostly in June and July.

During the pilot study, the researcher carefully monitored the process of survey administration and FGD that were executed by enumerators and research assistant.

3.6.1.12.3 Findings of the pilot study

The pilot study found some mistakes in the questionnaire. Some of the questions were repeated, were subject to dual interpretations, were found to be difficult for respondents to respond to, or created confusion for enumerator and/or participant. As per the feedback from participants and enumerators, some questions were deleted; those presenting dual meanings or were too direct, impolite and/or extraneous to the subject. No major changes were made in the structure of the questionnaire, but a few questions were modified and a few new questions were added. This pilot study also found some errors in the Nepali translation which rendered the wording of some questions too direct and impolite. The chief executive of Sight and Life recommended adding some questions on food security and child feeding habit patterns. Outcomes of the pre-test and piloting are given in Appendix 17.

3.6.1.12.4 Outcomes of FGD pilot

Before conducting the pilot study for the FGDs, the researcher provided draft discussion points to the supervisory team and received invaluable feedback from them (Keen and Todres, 2007). Piloting of the discussion points of FGD was done in the surrounding community (van Teijlingen and Hundley, 2005). Carers, members of a mothers' group, social workers, spiritual healers, teachers, service providers and policymakers from the local government bodies and club executives were actively involved in the discussion. The FGD points were reviewed and modified based on the participants' communication (Keen and Todres, 2007).

The pilot study discovered various relevant and crucial issues (see Appendix 17). According to the pilot study's outcomes, the FGD schedule items were refined, re-tuned and corrected before the final study. Finally, 15 items were set out for the discussion (Fox and Ventura, 1983; van Teijlingen and Hundley, 2002; 2005; Carfoot *et al.*, 2004; van Teijlingen and Hundley, 2005).

Textbox 3.1: Outcomes of FGD pilot study

Pilot study outcomes of FGD agendas

- The heading of discussion points was changed (deleted address of Bournemouth University and location of the study area).
- Revised Nepali translated version because some of the points were presenting dual meanings, too straight or direct, used Nepalese words that were difficult to understand by respondents, and/or confusing.
- Some questions of the points were time-consuming due to poor practice of conducting FGDs.

van Teijlingen and Hundley, 2005; Keen and Todres, 2007

3.6.1.12.6 Conclusion of pilot study

The participants' responses and feedback were examined in order to retune the research tool for the main study. The sample size of the pilot study (van Teijlingen and Hundley, 2002) was small due to political unrest or conflict and the busy schedule of respondents. It should be noted that it is not used to present any analysis of results in the study. This pilot study empowered the researcher with more accurate insight about the instruments (Keen and Todres, 2007), helped reveal errors in the FGD points and questionnaire, helped to revise and retune the questions and hereby to improve the study instruments (van Teijlingen and Hundley, 2005). In summary, the pre-testing and piloting had provided significant criticism for timely reconsideration, developments and corrections of the study tools, while it did not specify a need to modify the study plan greatly prior to the operation of the full-scale research. This approach helped to confirm the internal validity of the survey (van Teijlingen and Hundley, 2005). The pilot study also revealed some negatives outcomes. From a research management perspective, it was quite difficult to gather people voluntarily especially in a remote and poor community and it was a very lengthy process. The participants asked for money and similar benefits, and it proved expensive, time-consuming and associated with risks of debates meaning that the researcher should have special skills to tackle these problems (van Teijlingen and Hundley, 2001). To minimise the associated risks, the researcher provided tea and snacks to the participants and chocolates for their children.

3.6.1.13 Quantitative data analysis

3.6.1.13.1 Data analysis processes

Most of the survey questionnaires were administered by the enumerators, and they completed the questionnaire forms and incomplete returns were excluded. During data collection, 30–50 questionnaires per day were completed by 10 enumerators. The researcher checked the completed questionnaire data every day, to reduce mistakes or incomplete information. Data were regularly and routinely screened for errors or missing data ahead of the initial data analysis by reviewing the questionnaire one by one. All data were transcribed into English from Nepali by the researcher with the help of a research officer of CWSN (The UK registered charity supported project) and a lecturer in sociology in Pokhara campus. Before data analysis the researcher and research assistant carefully re-checked data entry to help reduce duplication (Gibson *et al.*, 1994). The rate of recurrences was tracked for all the variables and where any uncommon records were found, data entry was rechecked with the original records. Besides this, in Bournemouth, the researcher rechecked all the entries back under the guidance of his supervisory team. The study data were double-entered by a professional statistician in Nepal, the researcher in the UK, and validated (Gibson *et al.*, 1994; Whitney *et al.*, 1998). Double entries and single validation processes were carried out (Gibson *et al.*, 1994). In regard to open-ended questions, all categories were organised and re-coded before data entry. More than 10 variables obtained from open-ended questions were re-categorized and coded, with the support of the statistical and supervisory team. After these descriptive statistics were generated using a combination of cross-tabulation and comparison of frequencies. The majority of the structured questions for the quantitative study had multiple-choice responses (Douglas *et al.*, 2005). Cross-tabulations were generated between various explanatory characteristics. A statistician initially ran the analysis then the researcher created a syntax for cross-tabulations in SPSS independently. The results were cross-checked and the P-value was calculated. Cross-tabulation with Chi-square tests with continuity amendment was applied to investigate the association between variables in 2 by 2 tables and the Pearson Chi-square test was applied to larger tables (e.g. 3 by 2) (Field, 2005). A Chi-square test for trends was

applied to investigate the association between ordinal and categorical variables or binary outcome variables (Field, 2005). A significance level of 95% CI was selected and then results were reported as significant if $P < 0.05$. Results of $P < 0.05$ and $P < 0.001$ were described as significant. All the results are normally given in the table format with frequency (number) and percentage (%). The valid percentages were used and the number of missing values also recorded. All responses that indicated similar meanings were summarized and categorized. All the similar or synonymous answers to each question were merged into relevant categories. These categories were operationalised as quantitative data and were analysed in a comprehensive manner. In some of their answers respondents provided multiple answers which generated many categories. Amongst those categories which presented similar results, they were merged into analogous variables. After consultation with the supervisory team, it was decided to merge into common and similar meaning presented categories. So, multiple categories which presented 5% results were merged, or they were fitted into overarching themes from similar categories into a single category.

3.6.1.13.2 Validity and reliability

“Reliability and validity are tools of an essentially positivist epistemology” (Golafshani, 2003, p. 24). Reliability is the extent to which an assessment explores consistent results, whereas validity is dependent on the assessment measuring what it was designed to measure (McColl *et al.*, 2001). Validity identifies the degree of correlation between the test and the criterion of the study. Reliability is the overall consistency of a test. A test is said to have a high reliability if it produces the same results under consistent situations.

In this thesis, to ensure the content and face validity (Nevo, 1985), the questionnaire was reviewed and refined based on the aims, objectives and research question. It was then modified and reviewed based on the existing literature and suggestions of the supervisory team in the UK and concerned health personnel in Pokhara who had prior experience in the field of public health research (Sackett, 1979; McColl *et al.*, 2001). For example, the chief of the regional health training centre and chief public health officer, a government institution in Nepal, were actively involved in refining and re-tuning both the interviews and FGD.

Reliability is the extent to which outcomes are reliable over time and an accurate representation of the total population under study is referred to as reliability. In other words, if the research outcomes of a study can be reproduced under a similar approach then the study tools are considered to be consistent (Golafshani, 2003).

3.6.1.13.3 Potential bias

To reduce potential biases throughout the study and data collection process, the researcher strictly followed the rules and regulations of the NHRC and Bournemouth University research protocols (NHRC, 2013). There are two main types of bias in social sciences research: selection bias and information bias (Sackett, 1979; Bourdieu, 1986; Larking *et al.*, 2007). Several classification systems exist with regard to bias (Bourdieu, 1986; Larking *et al.*, 2007), although they are often grouped into three categories: information, selection and confounding (Sackett, 1979; Kroeger, 1983; Grimes, 2002; Larking *et al.*, 2007). For this study, selection and information biases are most relevant.

Information bias describes a systematic or random error in the measurement of the results (Sackett, 1979; Kroeger, 1983; Gable, 1994). Selection bias is more freely identified in one group than another group, is an example of the bias that has been reported as a frequent problem in the literature relating to breastfeeding and infant infection (Kramer, 1988; Kramer and Kakuma, 2012). In regard to quality control and reducing the biases, the supervisory team has supported the setting out of appropriate sample size, selection of stakeholders and the data collection and management for FGD data.

3.6.2 Qualitative approach

3.6.2.1 Introduction

Detailed qualitative research (focus group) to gather further insight is essential because it can provide relevant, reliable, appropriate and detailed information about the knowledge and experiences of contributors (DiCicco-Bloom and Crabtree, 2006). Qualitative research (FGD) mainly examines public opinions and actions in narrative or descriptive ways more closely

representing the situation as experienced by the participants (Gorstein *et al.*, 1994). This approach is most suitable when the subject matter of the research is unfamiliar and when meanings rather than frequencies are sought. It is also invaluable for relating particular aspects of behaviour to the wider context (Keen and Todres, 2007). The qualitative approach was chosen because of the nature of the research problem in this thesis (Gorstein *et al.*, 1994). All the stakeholders were familiar with child health care and they mostly contributed to the maternal and child health (MCH) programme (Stone, 1986; Niraula, 1994; Subedi, 1999; Harper and Roger, 2009; Subedi, 2009; KC *et al.*, 2011; Pandey *et al.*, 2013). Pharmacists, spiritual healers, and social workers (Stone, 1976; Poudyal *et al.*, 2005; Harper and Roger, 2009) were directly involved in child care activities whereas auxiliary nurse midwives, health workers, mothers group, and policy people were involved through the local government body (Niraula, 1994; Pandey *et al.*, 2013). Thus, the stakeholders in the FGD helped the researcher in gathering potential information about food and health-seeking behaviours including beliefs and major barriers employed these groups (Keen and Todres, 2007). Major characteristics of the stakeholders are:

- Social workers and mothers' group were mainly working as mediators between the communities and health authorities. These groups were particularly responsible for creating awareness about food and health-seeking behaviours and providing appropriate advice to the needy (KC *et al.*, 2011; Pandey *et al.*, 2013).
- The policy people were mainly responsible for policy implementation, capacity building of the health professionals and evaluating whole health programmes (Nepal Health Act, 1997; Solid Nepal and Merlin Nepal, 2012).

3.6.2.2 Focus group sampling method and sample size

This thesis used a purposive sampling method to select the focus group participants. The purposive sampling method is a common and simplest method (Gorstein *et al.*, 1994). The focus groups were formed such that information regarding maternal and infant management was

discussed. Therefore; the study has selected seven different groups (Newson *et al.*, 2013; Nishi, 2013) (see Table 5.2).

3.6.2.3 Data collection process (qualitative)

The focus group discussions were scheduled after completion of the survey (Table 3.2). The FGD was completed over a seven-day period; however, the management of the focus group took nearly two months including pre-management meeting and ethical processes from the local health authorities including pre-selected groups. The researcher made telephone contact with concerned groups and made appointments with them for the introductory meeting and acquired consent from each group (Regmi *et al.*, 2016). During the introductory session, the researcher presented the main aim and purpose of the study. Informed consent forms and discussion points were circulated to participants (see Appendices 2; 3; 4b). Besides this, the focus group discussion guides and interview rules were also explained (Appendix 3). The discussion points were fifteen in total (Appendix 4b), mainly to obtain experiences, feelings, opinions, and actions about healthy diet including nutritional problems. The FGDs were run by an experienced and trained facilitator, supported by an observer and the researcher.

Generally, one group session was conducted per day and lasted between one and two hours (van Teijlingen and Pitchforth, 2006). But a couple of FGD were conducted on the same day; one session in the morning and other in the evening, due to the time constraints of the participants or requested by the participants.

The FGD guide had three main sections: background of study, which focused on respondents' backgrounds, including socio-economic demography, the next section centred on study subjects and explored in-depth knowledge, attitudes and beliefs about nutritious foods and health-seeking behaviours and difficulties of food recommendation and the last section was a summary of the discussion and also at very end the respondents were invited to ask if they would clarify anything about the study (van Teijlingen and Pitchforth, 2006). The summary of the conversation was followed by tea and snacks. The respondents working in the rehabilitation centres and district development committee offices did not participate due to their busy schedules.

The focus groups were conducted mostly at the seminar/training or meeting rooms of the government office and one at the seminar room of a hotel which was very quiet and avoided interaction with other people or groups. The FGDs were conducted between 9:00 am and 4:00 pm, at a time suitable for each participant of the groups. A few participants of the FGD, from the group of health workers, policy people, auxiliary nurse midwives including pharmacists, did not give consent to use audio or video recorders and hence not all FGDs were recorded (van Teijlingen and Pitchforth, 2006) (see 3.6.2.3). This was because they were concerned that the record of their voices might be evidence of their views on sensitive matters of health policy, criticism of government people and religious issues (Newson *et al.*, 2013; Regmi *et al.*, 2016).

The focus group discussions were conducted in Nepali and English languages where appropriate and also recorded in both languages for the respondents who gave their consent to be recorded (Appendix 11). The discussion points were translated into Nepali by the researcher of this thesis and were delivered by the research assistant mainly for illiterate groups or those who had difficulty understanding English. The next section discusses qualitative data record system.

3.6.2.4 Qualitative data record

All the qualitative data from the FGD were manually recorded by a note keeper and the researcher by and maintaining the focus group data recording log book (Appendix 11). The noting of information in FGD was done by three report keepers, in English and Nepali during the discussion. The record keepers were trained in terms of manual report keeping.

All information given by informants was recorded manually in a log book (Appendix 11). Name, age, gender, occupation, organisation, literacy status, and religion of the all the participants were recorded. In the given format, rows were used for discussion topics and columns were used for participants. According to the format, each row was used as a discussion point and each column for each participant. For example, discussion point '01' as discussed by participant one, two, three and so on. If participant number five did not answer agenda '01' then column five was left blank and so on. All the common categories from each discussion point were recorded in the summary column. The record table (Appendix 11) enables the researcher to record the responses according

to selected topics of interest. All the responses in the discussions were manually recorded by three record keepers separately, including the research assistant and researcher. The record keepers were allocated certain discussion points throughout the session so that the first record keeper was responsible for recording responses on points 1 to 5, the second one was responsible for points 6 to 10 and the third for 11 to 15. For recording FGD responses three big registers were used separately. At the left-hand side of the page was a column for the discussion point and at the top, it was participant number. This means that each column of the record book (see Appendix 11) represented a discussion point and participant separately. All verbal information was noted in the record book. Roundtable sitting arrangements were used for the sessions. The next sub-subsection describes data handling process.

3.6.2.5 Data handling

The FGD reported both positive and negative perceptions on the issues specified in this thesis. The same interpreter who translated the questionnaire also translated the FDG reports, which were noted down on the register/notebook by three report keepers, from Nepali to English. Meanwhile, another interpreter, who was fluent in English and belonged to the UK, translated and transcribed all the FGD results from the register/notebook which were randomly sampled to check accuracy and validity by the researcher “back-translation” (Sechrest *et al.*, 1972). The researcher of this thesis was the first translator, who is bilingual. In order to overcome the rigidity of language barriers, the data was translated so that the researcher could gain useful insights regarding the aim and objectives of the research. A second translator was a bilingual Nepalese Ph.D. scholar with a similar research background in public health and translated some of the translated transcripts back into Nepali for quality control purpose, to ensure the accuracy of the translation. To generate the key themes, transcripts and FGD notes were read several times in order to make relevant themes for thematic analysis (Poland, 1995; Bowling, 2002).

These data were transcribed word-for-word, interpreted into English and each question was coded according to the reactions of the participants (Poland, 1995; Creswell, 2009). The interpreter is a bilingual Ph.D. scholar from another UK university, to strengthen the rigour of language-based

inquiry and to convey the true meaning of the participants' experience (Larkin *et al.*, 2007). Key themes and concepts were identified in order to carry out a thematic analysis in a comprehensive manner (Forrest Keenan *et al.*, 2005; Barun and Clarke, 2006; Bradley *et al.*, 2007; Creswell 2009). For the thematic analysis, the researcher has made use of the elements of conceptual framework approach to generate (Samik-Ibrahim, 2008) and to explore the information collected from the FGD (Bowling 2002). Most of the selected themes were correlated with research questions and study objectives (see Sections 2.13.1-2) (Holiday, 2002). All the gathered themes were rearranged and refined, and some themes were merged into main or similar themes followed by a data generating cycle (Appendix 7). The below-given sub-section describes the data analysis.

3.6.2.6 Data analysis

All the FGD data, which were manually recorded on a register, were translated verbatim, transcribed into English and coded to each question according to the responses of the participants (Creswell, 2009). The translator was the bi-lingual researcher in order to strengthen the rigour of language-based inquiry (Larking *et al.*, 2007). This effort aimed to convey the true meaning of the participants' experiences. The thematic analysis s (Broun & Clarke, 2006) was used due to its flexibility and accessibility to researchers with litter or no experience of qualitative research. Thematic analysis was also considered an appropriate tool as it summarises key features of large bodies of the qualitative data (Attride-Stirling, 2001).

The following paragraph focuses on qualitative data analysis process. The responses of the FGD were coded. At the end, approaching the analysis this way has enabled the researcher to find out how many times an issue was discussed during the focus group discussion, as well as how many times a response was given by the participants. The approach was very useful when combining the results from different groups on the same topic (see Appendices 7; 8; 11; 20). This allowed the researcher to focus on the issues that emerged as most relevant to participants; in contrast to applying an encoded framework to their accounts (Samik-Ibrahim, 2008).

First, the transcribed data were put into the table given in Appendix 20, followed by discussion agenda. Then, the summary of similar categories was developed and common themes were put

into one column. Then these initial themes were refined and finalised. Final themes were generated and put into a final themes column. This research has adopted the approach which is used by Creswell and Clark (2007). Appendices 11 and 20 show the record of FGDs data identified by numbers e.g. 'FGD 3', a serial number of discussion points in rows and the columns represents participants based on seating arrangement. For example, 01 indicates participant one and 02 represents participant two.

While carrying out the analysis for this study, at the end a different format was used this is mentioned in Appendices 7 and 8. The format basically includes different rows and columns, rows were used for issues and columns for the discussion. On the left side of the table, the discussion was done in the rows. On the right side of the table, common themes are noted in the find which is abstracted from each issue. Examples of the data recording and analysis are projected in Appendices 11 and 20. The process of FGD analysis has been described in six stages (Braun and Clarke, 2006; Creswell, 2009).

Stage 1. Familiarization

Familiarization with the data was undertaken in four steps. First, the researcher made himself familiar with the depth and span of the content as he gathered all FGD data initially (Braun and Clarke, 2006). Secondly, the researcher familiarized himself with the data while writing down and interpreting all the data (Creswell, 2009). Thirdly, all the transcripts and manually recorded data were checked against original notes for accuracy (Braun and Clarke, 2006). At the final stage, further knowledge of the transcribed data was gained through frequent reading (Creswell, 2009) to create initial codes and to develop possible themes (Forrest Keenan *et al.*, 2005; Braun and Clarke, 2006).

Stage 2. Creating initial codes

The process of creating codes is part of the thematic analysis (Miles and Huberman, 1994; Forrest Keenan *et al.*, 2005). Usually, codes recognize a characteristic of the data that emerges interesting to the analyst (Braun and Clarke, 2006). Hence, the researcher read and re-read the whole recorded manuscript to create codes (Forrest Keenan *et al.*, 2005). At this stage, inventories of

thoughts or sections of the transcript were created manually to develop initial codes (Creswell 2009). After that, common codes were developed from the list of these ideas. The codes developed by the researcher were then examined by the supervisory team to check their appropriateness and validity (Appendices 7- 9).

Stage 3. Searching for themes

At this stage, the researcher sorted the different codes, that is, the inventory of code developed in step two, to generate potential themes (Creswell, 2009) or basic themes (Attride-Stirling, 2001). Different coloured highlighter pencils and pens were used to underline or highlight different themes (Forrest Keenan *et al.*, 2005). A thematic diagram was built after reviewing themes within which the themes were filtered and sorted (Forrest Keenan *et al.*, 2005; Braun and Clarke, 2006) (see Appendices 7-8).

Stage 4. Reviewing themes

Stage four mainly involved refining and reviewing the themes. The researcher continued to repeat the themes that were developed in step three and checked whether the extracted data completely supported these themes or not and produced new themes if required. Attride-Stirling (2001, p. 395) referred to this step as “organizing themes” in order to disclose more of what was going on in the textual data. For this step, the researcher read all the gathered extracts for each theme and also read the relevant literature in this regard. Lastly, significant themes were developed in this step (see Appendices 7-8). Regular advice and support from the supervisory team also helped to refine the themes in this step.

Stage 5. Defining and naming themes

The researcher started to draw out data and themes developed in step four and prepare them into a rational and internally reliable account with accompanying description (Braun and Clarke, 2006). These are macro themes, called ‘global themes’ by Attride-Stirling (2001). These global themes are a synopsis of the main themes of step four and an illuminating interpretation of the texts. In this process, the researcher recognized the six main themes arising out of the data (see Appendices 7-9).

Stage 6. Generating the report

Stage six is the final step of data analysis where the researcher translates the data. At this point, when all the data has been separated and charted with key themes, a description of the data is created and the data set as a whole is translated (Braun and Clarke, 2006; Creswell, 2009). Hence, familiarization with the data, development of codes and themes, the structure of a thematic chart, and construction of the final description was finished in this thematic analysis (Forrest Keenan *et al.*, 2005; Braun and Clarke, 2006; Bradley *et al.*, 2007).

3.6.2.7 Generalizability and transferability

In qualitative research, transferability is another data quality assurance tool. Transferability is the conversion of the outcomes of qualitative research from one context to another. As recommended by Lincoln and Guba (1985, p. 316), the Ph.D. researcher has used methods to completely define all the contextual information about the fieldwork sites in order to ensure transferability. His previous research and data collection experience was an important factor which has helped the researcher to ensure high-quality data gathering. Furthermore, the manual note taking by the researcher and research assistants helped in clarifying the content of the data gathered. The manual note taking allowed for transcription and this helped in terms of establishment of a correct record for each group. Besides this, the data gathering techniques, number, and length of the data collection periods and data collection time have also been detailed in this report.

The issue of how to assess quality is an important issue in the field of qualitative research (Patton 2002; Flick and Flick 2014). In this investigation, the researcher applied the following data quality assurance tools.

3.6.2.8 Conformability

According to Flick and Flick (2014), objectivity or conformability is regarded as the reliability of meaning when two or more independent researchers analyse the same data and arrive at the same outcomes. In this study, the translation of the record into Nepali was carried out by a second bilingual Nepalese person with a background in health research and some were back-translated by

the researcher for quality control to ensure the accuracy of the translation (Section 3.6.2.5). The translator came up with very similar outcomes that verified the translations and gave assurance of the quality of the original translation.

3.6.2.9 Credibility

Regarding credibility, the researcher has used the following two main procedures: an examination of previous research results and credibility of the researcher (Lincoln and Guba, 1985; Silverman, 2000; Patton, 2002). Similarly, Lincoln and Guba (1985) stated that credibility is an evaluation of whether or not the research findings represent a “credible” interpretation of the data from the participants’ original data. Lincoln and Guba (1985), Silverman (2000), Patton (2002), Flick and Flick (2014), and Denscombe (2010) used a number of techniques to ensure credibility in qualitative research. Likewise, according to Silverman, the capacity of a researcher to calculate her or his outcomes likened to existing studies is an important principle to examine credibility.

With respect to the examination of previous research results, the researcher compared the results of this thesis with the results of previous similar studies to ensure the credibility of the qualitative study. As Silverman (2000) suggested, the ability of the researcher to describe the results of the study alongside existing research is an additional vital criterion for appraising qualitative studies (Kitzinger, 1995).

To ensure the credibility of the research, the researcher, and his supervisors have compared and debated variances between coding and then elucidated consequent codes. The supervisory team has also examined the research tools and reviewed analytical progress.

3.6.2.10 Dependability

A comprehensive report about the procedure of this study with in-depth methodological explanations to boost dependability has been given in this thesis. Similarly, Flick and Flick (2014) suggested that dependability in a qualitative study is tested through a method of auditing that comprises data gathering, data collection and recording, raw data, data reduction and a summary

of outcomes. In this thesis, the researcher has ensured dependability with careful dictation and analysis of the raw data.

3.7 Ethical considerations

In terms of ethical consideration, the researcher should deal with the following ethical protections: voluntary participation, informed consent, no risk of harm to anybody, confidentiality, and anonymity (Bryman, 2013; Regmi *et al.*, 2016). These help to protect participants and researchers from being exploited and experimented on. The NHRC and the Bournemouth University Research Ethical Committee (BUREC) both approved this study (see Appendices 1a *and* 1b) (NHRC, 2013). BUREC has provided a recommendation letter to NHRC for final approval (see Appendix 1b). Furthermore, written and verbal consent was obtained from the Pokhara Sub-Metropolitan City, Child Welfare Scheme Nepal and the District Public Health Office of Kaski (Regmi *et al.*, 2016). None of the activities or procedures carried out in this study caused distress or discomfort to participants and key informants or any other members of their households. For example, the enumerators withdrew the participants who did not complete or wish to withdraw their name from the study.

Respondent confidentiality was assured through the coding of participant mothers with individual identification numbers and hence data was recorded anonymously. Also, all the respondents were informed about the freedom to withdraw, non-discrimination and willingness to participate in the survey and FGD (Regmi *et al.*, 2016).

Some points were taken into account concerning the degree of confidentiality maintained with respect to the data collected. Responding to questions on family income or expenditure patterns or other issues related to poverty and living conditions are usually embarrassing for respondents (INE 2009; DFID 2013; IFAD 2013), especially in well-off families. Hence, the face-to-face questionnaires were asked in a private setting at the respondents' request. Regarding knowledge of signs and symptoms of malnutrition, feeding practices and frequencies, beliefs and cultural influences were also embarrassing issues, as noted by the enumerators and researcher. For all

these reasons, no names were given to anyone involved in the use of the database, no questionnaire, and no family-level information was shared or provided to anyone (IRIN, 2013). All the manually recorded forms, registered and relevant documents were held in a secure and safe place. The further section presents the conclusion of the chapter.

3.8 Chapter summary

In this chapter, the major reason for adopting a mixed-methods approach has been presented. The mixed-methods technique provided quantitative data to help assess the size of the problem, whilst at the same time offering further detailed insight into the problem through FGD with a sub-sample for the stakeholders. A survey questionnaire comprises structure and open-ended questions, and pictograph has been executed to investigate the maternal views of nutritional attitudes and beliefs about a healthy diet for rural and urban preschool-aged children of the study population. Furthermore, the mothers' food and health-seeking behaviours including knowledge, attitudes, and existing cultural beliefs have been assessed using FGDs. The process of selecting study participants has been outlined. The target population for this thesis was three to five years old children's mothers and stakeholders who have been living in the rural and urban location of the Kaski district. Furthermore, the sample selection criteria for survey questionnaire, the design of the study, the underpinning of the research philosophy, data analyses process, pilot study and its outcomes, and ethical consideration have also been focused. The analysis of the survey questionnaire is described. Similarly, the section has described how the quantitative and qualitative information has been examined. The main outcomes of this thesis are being discussed in the Chapter Four for survey questionnaire and Five for the FGD.

CHAPTER FOUR: QUANTITATIVE RESULTS

4.1. Introduction

The mixed-methods approach generated both quantitative and qualitative data and in this chapter the quantitative results are presented. This chapter is divided into two parts: overall results, and comparative results between urban and rural areas. The first part presents the socio-demographic information of respondents, socio-economic characteristics, child care, and feeding responsibilities, knowledge about nutritious food, sign, and symptom of malnutrition, beliefs about healthy diets, breastfeeding and colostrum, barriers to recommending the food, and mothers' views or feedback to overcome nutritional problems.

The overall research outcomes are presented in Tables 1 to 10 and the comparative results, between rural and urban mothers, are presented in Tables 11 to 23. All the results of the interview questions (part one) are presented as frequency (n), sample size value (n=), and percentage (%) in the tables. Subsequently, comparative results (part two) are presented as variables, frequency (n), sample size value (n=), location, positive and negative responses (%) and P-values (Schuman and Presser, 1979). Furthermore, Table 4.9 shows the key barriers to providing a healthy diet to children. Similarly, the second section, 4.3 onwards, shows the comparative analysis between rural and urban mothers. Nearly 3% of participants filled in the survey form by themselves. All the results presented in the tables are statistically significant.

4.2. Overall outcomes of quantitative method

The survey questionnaire comprised nine different sections including structured and open-ended questions (Schuman and Presser, 1979). The majority of the respondents in the survey questionnaire were mothers were both from urban and rural localities.

4.2.1. Socio-demographic information of respondents (mothers)

The study initially targeted mothers but some of the children were found with other carers at home and therefore, these carers (n=8) were also included. They were mainly the child's father, grandparents or other relatives including siblings aged over 16. In addition, the demographic information is listed in table 4.1. Around 81% of the females participated in the research study where the male respondents were one-fifth of the total respondents. In terms of relationship to a child, 67% were mothers, 13% fathers, 12% grandparents and 8% had other relationships with the child in their care. The majority 84% of the respondents were Hindu by religion and 31% were Brahmin/Janajati by caste.

The majority had one child aged between three to five years (83%), whereas, 57% of the respondents had a larger family size with more than six family members in their household. Children involved in the study, 32% were aged between 36 and 40 months, 30% were aged between 56, and 60 months and 22% were aged between 46 and 50 months. Similarly, 9% were aged between 41 and 45 months, and 8% were aged between 51 and 55. Most of the mothers were aged between 31 and 45 years. Moreover, the minimum age of respondents including mothers, carers, siblings, relatives, and neighbours were 16 years and the maximum was over 61. More than 50% of respondents were the head of their families.

Table 4.1: Socio-demographic information of respondents

Characteristic	Frequency (n=524)	%
Study location		
Urban: Pokhara	296	57
Rural: Lekhnath	228	43
Respondents with gender		
Male	99	19
Female	425	81
Children (3–5 years of age)		
Male	271	52
Female	253	48
Age of respondents (years)		
16–30	173	33
31–45	256	49
46–60	44	8
61+	51	10
Age of child (months)		
36–40	165	32
41–45	48	9
46–50	115	22
51–55	41	8
56–60	155	30
Caste/Ethnicity		
Brahman	165	31
Chhetry	71	14
Janajati	164	31
Others: Dalit/Madhese	124	24
Religion		
Hindu	438	84
Buddhist	31	6
Christian & other religions	55	10
Family size of respondents		
Two to four	41	8
Five to six	185	35
Six plus	298	57
Number of children aged 3–5 years per household		
One child	435	83
Two to three children	41	8
Four plus children	48	9
Relationship to children		
Mother	350	67
Father	69	13
Grandparents	65	12
Others	40	8
Status of respondents		
Head of the family	264	51
Another member of the family	260	49

4.2.2 Socio-economic status of respondents

The socio-economic issues which were explored in this research include occupation, education, construction materials of the house, the source of income, property, and types of cooking fuel consumption by the respondents and their family members. The present study is intended towards gaining accurate information on the socio-economic status of the respondents' households. Table 4.2 explains the socio-economic status and hygienic environment of the respondents' homes which are included in this research study. As presented in Table 4.2, the majority of the respondents owned some land, but no livestock or animals; their main income source was business/service and cash crop farming. The majority of respondents were housewives/farmers by occupation (Jansen, 2006).

Most of the respondents' literacy status was found to be educated, whereas, a large number of respondents were those who never read a newspaper. The educated and literate respondents were of equal proportions. However, a large number of respondents were heads of their family, which accounted for around 51%. Regarding sources of income, 14% were getting financial support from remittances and 11% earned money from casual labouring work. For cooking fuels, 30% were using LP and biogas, 30% timber, cow-dung, shrubs and grass/straw and 26% kerosene, whereas use of electricity was low (14%) due to its high price and unavailability. Regarding sanitation, the majority of the households were using a closed latrine (44%) located outside the house but a countable number of people in the community (8%) were still using open toilets. But 6% of mothers did not answer about the use of toilets. In terms of source of drinking water, private taps (38%) were still less used than the public tap (56%) and a minority were still obtaining their drinking water from wells, lakes, and streams (6%), and nearly one-third (29%) of the total respondents were drinking water without purifying (IMU and RCHCO, 2013; RSS, 2013).

Table 4.2: Socio-economic and health and hygiene status of respondents

Economic status	Frequency (n=524)	%
Occupation of respondent		
Housewife/Farming	299	57%
Business	121	23%
Service	52	10%
Others: Labourer/Unemployed	52	10%
Literacy Status		
Illiterate	141	27%
Literate	189	36%
Educated	194	37%
Reading newspapers		
Every day	132	25
Infrequently in a week	165	32
Never	227	43
Land ownership of respondents		
Land ownership	314	60
No land	210	40
Livestock, poultry, sheep. and animal		
Livestock	181	34
No livestock	343	66
Construction materials of roof		
Soil, mud, thatched, bamboo	52	10
Slate or local tiles	39	8
GCI sheet	229	43
Concrete	204	39
Principal source of income of family		
Crop farming	150	29
Livestock & poultry farming	30	6
Casual wage labour	59	11
Work abroad/ remittance	75	14
Own business or in service	165	31
Others: selling firewood, fishing etc.	45	9
Household cooking fuels		
Electricity	74	14
LP gas or biogas	157	30
Kerosene	138	26
Others: timber/ <i>guitha</i> /charcoal/shrubs/grass/ straw, etc.	155	30
Health & Environment		
Sanitation by household		
Closed latrine inside own house	220	42
Closed latrine outside house	230	44
Open latrine or toilet	41	8
Do not want to answer	33	6
Source of drinking water		
Public tap	294	56
Private tap	198	38
Others: well, stream, lake etc.	32	6
Purification of drinking water		
Purifying	373	71
Not purifying	151	29

4.2.3. Responsibility for taking care and feeding of the child

Table 4.3 presents the data on responsibility for feeding and caring for children aged between three-five years. In most cases, mothers were solely involved in caring for (65%) and feeding (66%) the child. Fathers' involvement was meagre in both activities including caring and feeding the child at 6% and 5% respectively. Moreover, the grandparents' involvement was found to be more in feeding activities (18%) rather than caring (14%) for the children. The study also found that the age of supplementation of the diet of the children was between three to six months (78%). Most of the children were being fed three to four times a day (79%) but 1 out of 10 children had no fixed feeding schedule. As per the respondents' information on meals given to children the previous night, 40% provided rice, bread with dal, legumes or vegetable soup with fruits and green leafy vegetables and 27% porridge, mainly homemade dishes such as halwa, lito, dhindo, jaulo or khichadi (Christian *et al.*, 2006; Shakya, 2006; Acharya, 2013). Besides these, 22% had served ready-made or fast foods including beaten rice (Shakya, 2006).

Table 4.3: Responsibility for child care and feeding

Characteristic	Frequency (n=524)	%
Child being cared for by		
Mother	342	65
Father	29	6
Grandparents	72	14
Others: siblings, relatives, neighbours	81	15
A child is fed by:		
Mother	346	66
Father	27	5
Grandparents	95	18
Others: siblings, relatives, neighbours	56	11
Supplementation age of child		
Three to six months	411	78
Nine to twelve months	71	14
<1 month/do not know/do not want answer	42	8
Child feeding frequency (per day)		
One to two times	55	11
Three to four times	415	79
Infrequently	54	10
Dishes provided to child(ren) last night		
Rice, bread with dal/legumes/veg soup, fruits, GLVs, etc.	208	40
Rice with dairy products	142	27
Porridge: <i>haluwa, dhido, lito, jaulo, khichadi</i>	57	11
Others: fast food/ready-made food/beaten rice with sugar	117	22

4.2.4 Knowledge about nutritious foods

Table 4.4 represents the knowledge of mothers on the food items which are of high or low nutritional value. The following is study aimed to evaluate the knowledge of mothers (on both food items of high or low nutritional value) regarding locally available food items which mothers are familiar with and might have been using it regularly. According to the data given in Table 4.4, meat items, dairy products, green vegetables, and fruits were counted as highly nutritious food (81%) by most of the respondents, whereas 19% disagreed that they are highly nutritious food.

In addition, Dairy products (79%), fruits and juice (78%) and legumes, sprouts, and soups (66%) were also counted as nutritious food items. On average dry fruits (17%), fast foods (37%), and staple food (13%) were also regarded as the nutritious food items. With regard to dried fruits, 83% of respondents were in the opinion that they are not a nutritious food item, and 87% for staples, 74% for porridge, and 63% for fast foods were found to be highly nutritious by the respondents of the study.

The majority responded that the following food items are poor or non-nutritious which includes rice with dal, bhujia, beaten rice, dhindo and khichadi (70%), staples (39%), green vegetables (12%), wild fruits and vegetables (12%), dried vegetables (12%), legumes (14%), fruits and juice (9%) and fast foods (60%). In addition to the above-stated results, a large group of mothers (70%) negated with the above argument because they believed that these foods are poor or non-nutritious.

Similarly, more than one-third of respondents (34%) could not identify and select nutritious food items from a grocery store. Moreover, the pictogram assessment also found the comparatively poor knowledge on choosing nutritious food items. Nearly 7% of the group of mothers could not recognise nutritious foods from the pictures (see Appendix 13) they were shown despite being generally familiar with these food items.

Table 4.4: Knowledge of nutritious and non-nutritious food items

List of highly nutritious food items	Yes (%) (n=524)	No/ Do not know (%)
Meat items, fish, eggs, liver, <i>momo</i> etc.	81	19
Dairy products including rice pudding	79	21
Green leafy vegetables	54	46
Fruits and juice	78	22
Dry fruits	17	83
Legumes, sprouts, and soups	66	34
Staples: rice, maize, potato, bread, wheat, lentil, millet etc.	13	87
Porridge: <i>haluwa, litto, dhindho, jaulo, khichadi</i>	26	74
Readymade or fast foods:	37	63
List of low or non-nutritious food items	Yes (%) (n=524)	No/Do not know (%)
Rice with dal, bread, beaten rice, <i>bhuja & dhindo, khichadi</i> .	70	30
Potato pumpkin, bottle guards, bitter & snack guards, yam etc	40	60
Readymade or fast foods and junk foods	60	40
Legumes, bean, peanuts, and sprouts	14	86
Fruits, juice and dry fruits	9	91
Meat items & dairy products	6	94
Green leafy vegetables	12	88
Wild fruits and vegetables	13	87
Dried vegetables: <i>gundruk, masyeura, gava</i> , radish etc.	12	88
Crops/staples: millet, maize, rice, wheat, <i>buckwheat</i> etc.	39	61
Mothers' skill to select nutritious food items from grocery stores	66	34
Pictogram result (ten different types of green leafy vegetables and fruits are shown to mothers)	Yes (Frequency)	No/Do not know (%)

Table 4.4: Continued.

Right (all (ten correct answers were given)	231	44
Wrong (all (ten wrong answers were given)	34	7
Partially right (six correct answers were given)	206	39
Partially wrong (six wrong answers were given)	53	10

4.2.5 Respondent's views on child weight

Table 4.5 reports respondents' knowledge of child weight, whether it is normal or low, and key causes for normal or low weight. Most of the respondents who were mothers thought that their children were of normal weight. The main reason for this perception of normal weight is due to medicines and taking good care of the child (34%). Only 21% of the group replied that it was due to nutritious food which is consumed by children and 12% remained neutral to the question statement. On the other hand, with regard to the low weight of a child, the 12% of the group pointed out that the main factors of low weight were lack of nutritious food (19%), poverty (11%), poor care of children (8%) but surprisingly 62% of the mothers were not familiar with the causes of the low weight of the child or they remained neutral to the question stated.

Table 4.5: Knowledge of child's weight, including reason

Characteristic	Frequency (n=524)	%
Weight of your child		
Normal for age and gender for social class	379	72
Low	68	13
Do not know/do not want to answer	77	15
Main reason for normal weight		
Due to nutritious food	111	21
Due to medicines that are given by doctor/healers	179	34
Due to good care of child	170	33
No knowledge/do not want to answer	64	12
Main reason for low weight of child		
Due to poverty	56	11
Due to lack of nutritious food	101	19
Due to poor care of child	43	8
Do not know/do not want to answer	324	62

4.2.6 Signs and symptoms of malnutrition

Table 4.6 relates to mothers' and carers' ability to recognise the signs and symptoms of malnutrition. This study aimed to measure the mother's ability to recognise the signs and symptoms of malnutrition (see Appendix 16).

The data below show that the majority of the mothers/carers could not recognise malnutrition from the described signs and symptoms. In addition, the majority of mothers were found to be unaware of the signs and symptoms of malnutrition among the rest of the respondents. Almost half were able to recognise low weight, being lean and thin, as a sign and a symptom of malnutrition. Likewise, 35% responded that the changing behaviour of a child is also one of the signs and symptoms of malnutrition. Most of the mothers scored 26% on the signs and symptoms of malnutrition.

Table 4.6: Knowledge about signs and symptoms of malnutrition

Mothers'/carers' ability to recognize malnutrition by signs and symptoms	Yes (%) (n=524)	No/do not know (%)
Crying, angry, not sleeping, quarrelling	35	65
Diarrhoea & vomiting	11	89
Low weight/lean and thin	49	51
Short in height and slow in growth	15	85
Rough/dry skinny/swollen/big belly/loss of hair/shrunken eyes, etc.	17	83
Slow minded/slow in response/poor in speaking	22	88
Poor/loss of appetite/dislike foods/stomach ache	21	79
Always looking weak/ill health/difficulty in walking	26	74

4.2.7 Beliefs about nutritious foods associated with culture

Table 4.7 describes the main existing cultural beliefs about nutritious food. A large number of mothers'/carers' beliefs were found to be highly positive towards a healthy diet. Nearly 76% replied that healthy foods are essential to child and mother, and the remaining 71% agreed that colostrum is good for new-born babies, and less than 24% out of 76% and 29% out of 71% did not agree. In general, the majority of the mothers either were not familiar with the question statement asked the respondents or did not contribute to certain traditional beliefs. However, only 9% of the respondents were in the favour of breastfeeding new-born babies and providing healthy food in front of strangers.

Table 4.7: Beliefs about nutritious food associated with culture

Major existing cultural beliefs or mis-beliefs about nutritious food	Yes (%) (n=524)	No/do not know (%)
Animal products, legumes and honey consumed at same time cause diarrhoea, dysentery and constipation	22	78
Animal products and fruits are high-calorie items which are not given to persons in weak health especially not during sickness	17	83
Yogurt, ice-cream, GLVs, fruits are believed to be cold items	31	69
Colostrum is harmful to the child, form of pus, toxic, dirty and smelly, squeeze out and clean it before feeding	24	76
Mango, jackfruit, legumes, meat items are hot/highly nutritious	15	85
cause diarrhoea, vomiting, blisters if consumed at the same time		
Colostrum is good for child health because it's like a pious and is highly nutritious and compulsorily need to feed to newborn	71	29
Nutritious foods, breastfeeding should be avoided in front of strangers, it is believed that the child will fall ill	9	91
Excessive intake of nutritious foods causes indigestion, risk of developing obesity, high blood pressure, and diabetes	29	71
GLVs are only consumed by poor people & beggars	17	83
Meat items avoid child on the day of deworming medication	15	85
Excessive sugary items consumed by children caused worms, affect teeth, and cough	22	88
Milk and fish not consume same time, avoid mix of salt and milk as it may cause leprosy	10	90
Avoid feeding fast foods, oily and stale or rotted foods to child/mother, affect health due to mixture of chemicals and colours	20	80
Pregnant women avoid consuming excessive nutritious foods because inside the baby gets bigger, risk to deliver baby	22	78
Brahmins not allowed to eat chicken, pork, beef or meat of buffalo, alcohol, lose their caste/degraded to a lower caste	11	89
Mothers become weak, ugly, aged, shrunken breasts and may develop breast cancer by regular/excessive breastfeeding	15	85
Healthy foods are essential for child and mother	76	24

4.2.8. Cultural beliefs about breastfeeding and colostrum

Table 4.8 describes existing cultural beliefs about breastfeeding and the feeding of colostrum. Table 4.8 also informs the characteristics of attitudes on food and health-seeking behaviours of the respondents (MMWR, 2007). More than one-quarter of respondents still believed that colostrum is a form of pus, a toxic and dirty substance and the contrary side, 71% of the same community believed that colostrum is a highly nutritional substance which is essential for the new-born, but 29% were still not aware of this. In comparison to the previous statement, nearly one-quarter (24%) had slightly positive perceptions towards the feeding of colostrum, but they believed it should be expressed and strained before feeding. In general, the majority disagreed

with traditional beliefs about colostrum feeding. On long-term breastfeeding, 15% believed that mothers become weak, ugly, and older at an early age, breasts can shrink and they may develop cancer from excessive and regular breastfeeding but 85% disagreed with this traditional belief. In regards to health-seeking behaviours, 52% of mothers visit doctors' clinics or private health institutes for the treatment of a malnourished child, whereas 6% keep the child at home. 19% of mothers' perception is negative towards providing GLVs during child sickness. In addition to the above statement, 16% of mothers visited a healer's clinics multiple times, whereas, 27% never visited clinics. Similarly, only 25% of mothers access government health services.

Table 4.8: Cultural beliefs about breastfeeding and colostrum and attitudes

Major existing cultural beliefs/mis-beliefs about long-term breastfeeding and colostrum	Yes (%) (n=524)	No/do not know (%)
Beliefs on feeding of colostrum		
Form of pus/toxic or dirty/causes diarrhoea, vomiting, & constipation	27	73
Highly nutritious,/good for health/fast growth/increases immunity	71	29
Good for health but needs to be squeezed out and cleaned before feeding	24	76
Never feed to new-born/baby become weak health in later life	12	88
Lots of fears and tensions /existing beliefs/rumours	15	85
Everyone says good for health and encouraged it but practically no one feeds it to own children, even health workers, and educated families	15	85
Senior family members and spiritual healers discouraged feeding of colostrum, with the exception of health workers	19	81
Beliefs on long-term breastfeeding		
Mother becomes weak, ugly, older at an early age, shrunken breasts and may develop breast cancer by regular or excessive breastfeeding	15	85
Attitudes about food and health-seeking behaviours		%
Frequency of child visited spiritual healer		Frequency (n=524)
One – two times	299	57
Several times	84	16
Never	141	27
Health seeking behaviours of the mothers		
Doctors' clinic and private health institutions	271	52
Spiritual/traditional healer/temple/Church	90	17
Asha clinic/GONESA/SHP/HP/Ward Office/ WRH	129	25
No where	34	6
Mothers' perceptions of feeding of healthy diet		
Survive	50	9
Fill the stomach	57	11
Keep healthy and increase immunity power	350	67
Grow child fast	67	13
Perceptions on providing GLVs & fruits during sick		
Bad for child health	101	19
Good for child health	368	70
No knowledge/do not want to answer	55	11
Perceptions on giving GLVs & fruits regularly		
Keep child healthy	366	70
Make child sick	41	8
Protect child from devils'/evils' eyes	39	7
Know knowledge/do not want to answer	78	15

4.2.9 Major barriers to providing nutritious foods

Table 4.9 shows the result of two different variables (key barriers to get healthy food and main reasons not providing healthy food): first the main barriers to obtaining nutritious food and second the reasons for not providing a healthy diet to children. In the first variable, the major barriers were; poverty (45%), poor or no education about healthy foods (43%), processed or fast foods used (28%), scarcity of food (29%), food not grown in the kitchen garden (22%), and lack of time (15%), no need felt to provide healthy food or ignorance or poor knowledge on infant young child feeding and childcare (21%). Other barriers include lack of empowerment of women (14%), existing beliefs/ misbeliefs (13%), and no mother or carer (12%). Overall, 35% of respondents reported that there were no problems with providing nutritious food to their children regularly.

The second variable gives the main reasons that mothers/carers do not feed healthy food to their children. The most common reasons were: 40% responded that the child dislikes homemade food due to its monotonous taste and the child gets sick after feeding the homemade food. Similarly, 36% said it is difficult to prepare healthy food at homes because they do not have time to prepare and feed it to the child; 24% had no or poor knowledge about preparation; 21% referred to family pressure, large family size and difficulty of food distribution; 20% followed the advice of spiritual healers and 16% health workers; 19% referred to fear and tension, and not having appropriate foods available at home; 18% referred to the practice or fashion of consuming processed foods. Overall, 35% had no any difficulty or problem in feeding their children nutritious foods.

Table 4.9: Major barriers to provide nutritious foods

Major barriers to getting nutritious food	Yes (%) (n=524)	No, /do not know (%)	No problems (%)
Poverty, expensive, market price, no money	45	19	35
No time/distance	21	44	35
Poor or no knowledge about nutritious foods	43	22	35
Food scarce, high demand, seasonal variation	29	35	35
Poor or no purchasing power for women	14	51	35
Poor knowledge, ignorance about child care and IYCF practices, save money, no need felt	21	44	35
Not grown/available in the kitchen garden or homestead	22	43	35
Existing beliefs and impact of socio-cultural influence	13	52	35
Family pressure, conflict and big family structure	19	47	34
Processed food with various chemicals and colourings	28	37	35
No mother or no one to care for child's diet	12	53	35
Main reasons for not providing nutritious foods			
Poor or no knowledge about food preparation	24	42	34
Child dislikes homemade food, gets sick after feeding	40	25	35
Family pressure, big family, difficult in sharing, conflict, no money to buy food	21	44	35
Not available at home, poor availability in the market	19	46	35
No time /difficult to prepare and feed at home	36	29	35
As per advice of doctors and health workers	16	49	35
Fear, tensions, sick child cannot digest gets worse	19	46	35
No eating habits and feeding as per child's mood	15	50	35
As per advice of spiritual/traditional healer	20	45	35
Fashion for processed foods, chemical colourings	18	47	35
Poverty/expensive/affordable, save money	20	45	35
Cultural beliefs, traditional food habits and attitudes	23	42	35

4.2.10 Mothers' opinions

Table 4.10 presents mothers'/carers' view on how to control the conditions of poor nutrition. These views were obtained from open-ended questions. The themes identified from the various responses included: feeding of nutritious food, reviewing the appropriate policy of free health services to mothers and children, immunisation, family planning, research and dissemination, and capacity building and education. Table 4.10 shows that 60% of the mother's emphasised regular feeding of fresh and healthy foods for child and mother; 54% emphasized free health care, immunisation, deworming and family planning; 56% indicated awareness, capacity building, and research; and 51% focused on nutrition policy. Measures that were raised but less frequently were: improvement of IYCF practices and change of attitudes (31%), maintaining a healthy environment (24%), a programme for supplementation of diet with healthy snacks (14%) and development of agriculture (26%). 33% of the group of mothers received nutritional information

from doctors and other health professionals, 39% of pharmacists, healers, and teachers, whereas only 10% from health institutions, temple, and church.

Table 4.10: Measures to control malnutrition

Respondents views on how to control malnutrition	Yes (%) (n=524)	No/do not know (%)
Providing fresh, healthy foods to children/mothers regularly	60	40
Free health services to child/mother immunization/family planning	54	46
Awareness, mass education, training, research, workshop, seminar	56	44
Focus on child care, change child feeding practices/attitudes/behaviours /avoid mis-beliefs and cultural practices	31	69
Review and revise the existing policies	51	49
Create and maintain healthy and hygienic environment	24	76
Introduce supplementation, ORS, snacks programme at daycare centres, schools, and community	14	86
Long-term breastfeeding /encourage colostrum feeding/monitoring	57	43
Scientific/modern agriculture system/food security and safety	26	74
Sources of nutritional information	Frequency (n=524)	%
Doctors/HWs/FCHVs/mothers' groups	171	33
Health organizations/Temples/Churches	54	10
Pharmacists/Spiritual-traditional Healers/Teachers	203	39
Radio/TV/newspaper/magazine/books/news bulletin	96	18

4.3 Comparative results

The study aimed to compare mother's knowledge, attitudes, and beliefs about a healthy diet between rural and urban areas. To compare between rural and urban mothers, the variables were selected based on study title, aim, objectives, and research questions.

4.3.1 Knowledge about nutritious food

Table 4.11 shows the comparative breakdown between rural and urban mothers about the knowledge on nutritious foods. This information was obtained from open-ended questions. The data indicated that there is no any difference between rural and urban mothers to determine a healthy food. In regard to meat items, urban and rural mothers' responses were no any difference (42.9: 38.2). However, the perception on dairy products, urban and rural mothers have the same opinion (39.5:39.3), fruits and juice (40.1: 38.0), and rice with lentil soup, potato, and staple (7.1: 5.7). These variables are statistically not significant (ns). But there are some variations were observed between rural and urban mothers, especially about green vegetables (36.1%: 17.7%), dry

fruits (15.3%: 2.1%), and porridge (haluwa) (3.1%: 22.7%) which were statistically significant ($p < .001$; $p < .05$).

Table 4.11: Mothers' knowledge about healthy diet

Knowledge about nutritious food (poshilo or tagatilo khana) items	Frequency (%)		
	Urban (n=296)	Rural (n=228)	P=Value
Meat items (meat, fish, egg, liver, <i>momo</i>)	42.9%	38.2%	n s
Dairy products, rice pudding	39.5%	39.3%	n s
Green leafy vegetables	36.1%	17.7%	<.001
Fruits and juice	40.1%	38.0%	n s
Dry fruits	15.3%	2.1%	<.001
Rice with lentil soup, potato, bread, pasta, <i>Jaulo</i> , and staples	7.1%	5.7%	n s
Legumes, sprouts and soup	35.5%	30.5%	n s
Porridge (litto, haluwa, dhindo)	3.1%	22.7%	<.001
Ready-made /fast foods: Chocolate/sweets, lays/crisps, Boumviita, Horlicks, cereals, <i>chyawanpras</i> , honey etc.	14.5%	22.5%	<.001

4.3.2 Knowledge of selection of nutritious foods

Table 4.12 shows the breakdown of identification by respondents of nutritious food items from a grocery store and pictogram assessment. It measures the capabilities of mothers for the selection of healthy items from the store. Similarly, the pictogram comprises of ten different types of vegetables and fruits which were shown to participants (see Appendix 13). These fruits and vegetables were commonly available in the local market and the mothers were also familiar with them. Urban mothers have the distinctly better knowledge to identify nutritious food from the grocery store than rural mothers (38.2:27.9). However, pictograph assessment showed that urban mothers have better knowledge and rural (27.5: 16.6). These both variables are statistically significant ($p < .05$). But the pictograph assessment data are statistically not significant (ns).

Table 4.12: Knowledge of familiar fruits and green vegetables

Knowledge of mothers on selection of nutritious food items	Frequency (%)		
	Urban (n=296)	Rural (n=228)	P=Value
Mothers' ability to select nutritious food from the grocery store	38.2%	27.9%	<.05
Pictograph assessment of common nutritious food items			
All correct (all (ten) correct answers given)	27.5%	16.6%	<.05
All wrong (all (ten) wrong answers given)	2.5%	4.0%	ns
Partially correct (six correct answers were given)	21.4%	17.9%	ns
Partially wrong (six wrong answers were given)	5.2%	5.0%	ns

4.3.3 Views about poor or non-nutritious food

Table 4.13 shows two different results for the same outcomes. The study uses two distinct models of questions (open-ended and structured questions). In the first part of the table, results are derived from open-ended questions and the following one from structured questions. Table 4.13 shows the breakdown of findings on the respondents' level of knowledge about non-nutritious foods by urban and rural locations with a similar proportion of urban and rural mothers having shown equal knowledge. The structured questions also presented similar knowledge on non-nutritious food items. Large proportions of respondents from both urban and rural locations for both variables believe rice, potato, beaten rice and bread are non-nutritious food items. In addition, chi-square tests for both variables presented similar outcomes ($p < .05$; $p < .001$) and were statistically significant but some results were reported as not significant (ns).

Table 4.13: Perceptions about poor or non-nutritious foods

Mothers' views about poor or non-nutritious food items (open-ended questions)	Frequency (%)		
	Urban (n=296)	Rural (n=228)	P=Value
Rice with dal/bread, beaten rice, <i>bhuja</i> , porridge (<i>haluwa, lito, khichadi, dhindo</i>)	40.6%	29.0%	<.05
Potato/pumpkin/aubergine/gourds/ <i>pindalu</i> , yam etc.	27.3%	13.0%	<.001
Fast ready-made foods: biscuits/noodles/puffs, lays, crisps, sweets, chocolates, ice cream etc.	30.0%	30.2%	ns
Legumes, sprouts and soups	8.6%	5.3%	ns
Fruits, juice and dry fruits	3.4%	5.7%	ns
Meat items and dairy products	4.6%	1.1%	ns
Green leafy vegetables	7.6%	4.2%	n s
Crops/staples: millet, maize, wheat, <i>fafar</i> , barley	14.3%	25.0%	<.001
Dried (fermented) vegetables: <i>gundruk, gava,</i> <i>masyeura</i> , potato, radish, bamboo and etc.	5.7%	6.3%	ns
Wild fruits and vegetables: <i>tarul, githa</i> , mushroom, stinging nettles, <i>latte, kurilo, niuro, jibre</i> etc.	5.7%	7.1%	ns
Knowledge of poor or non-nutritious food items (structured questions)			
Meat items/dairy products/GLVs/fruits/mixed of grains	2.5%	3.1%	ns
Rice, potato and beaten rice	44.7%	32.6%	<.05

4.3.4 Knowledge about children's weight

Table 4.14 shows the breakdown of findings on the respondents' level of knowledge on children's normal (38.4%: 34%) or low weight (9%:4%), with the most frequent explanations, by urban and rural locations. The statistics show there are no significant variances on the level of knowledge on

children's normal weight (38.4%: 34%) between urban and rural mothers. The data shows poverty (5.3%:5.3%), lack of nutritious food (9.5%:9.7%) and poor care of a child (5.7%:2.5%) are the major reasons for low weight among children. Mothers' responses toward normal weight and nutritious food were statistically not significant (12.2%: 9%). Urban and rural mothers' responses about the abnormal weight are low from both areas and these differences are statistically not significant. Based on mothers' responses, the weight of children is not associated with a healthy diet. In regard to mother's response to child weight, the majority of the mothers' responses are statistically not significant (ns).

Table 4.14: Knowledge about children's weight

Knowledge of mothers on children weight	Frequency (%)		
	Urban (n=296)	Rural (n=228)	P=Value
Mothers' response to weight of children			
Normal for age and gender for social class	38.4%	34.0%	ns
Low	9.0%	4.0%	<.05
Mothers' response to normal weight			
Due to nutritious food	12.2%	9.0%	<.05
Due to medicines are given by the doctor/spiritual healer	20.8%	13.4%	<.05
Due to taking good care	15.5%	17.0%	ns
Mothers' response to low weight			
Poverty	5.3%	5.3%	ns
Lack of or poor nutritious food	9.5%	9.7%	ns
Lack of taking good care of the child	5.7%	2.5%	<.05

4.3.5 Knowledge of signs and symptoms of malnutrition

Table 4.15 shows the breakdown of findings on the mothers' level of knowledge about signs and symptoms of malnutrition by urban and rural locations. From the results, it was found that a higher proportion of urban mothers have better knowledge as compared to the rural mothers on children's diseases which mainly occurred due to malnutrition and these variables are statistically significant ($p < .05$ and $p < .001$). There was some dissimilarity found between rural and urban mothers especially about the weight of the child (32.6%: 17.2%). This difference was statistically significant ($p < .05$). These results have been derived from open-ended questions. However, some of the responses are statistically not significant (ns).

Table 4.15: Knowledge about signs and symptoms of malnutrition

Mothers' knowledge of signs and symptoms of malnutrition (open-ended question)	Frequency (%)		
	Urban (n=296)	Rural (n=228)	P=Value
Crying, angry, quarrelling, not sleeping	25.2%	10.3%	<.001
Diarrhoea & vomiting	9.4%	2.1%	<.001
Low weight, lean & thin	32.6%	17.2%	<.001
Short in height and slow in growth	9.7%	5.2%	<.05
Poor appetite, do not want to eat, stomach-ache	14.1%	6.5%	<.05
Rough/dry skin, big belly, yellow & shrunken eyes, hair loss, prolonged wound, poor breathing, swollen	10.1%	7.1%	ns
Always unhealthy, weak, inconsistent with movement	20.2%	6.1%	<.001
Mentally retarded, no speech or poor in speaking, slow minded or slow in response	9.7%	12.4%	ns

4.3.6 Attitudes to providing nutritious food to children

Table 4.16 shows the outcomes of mothers' attitudes, by urban and rural location, on providing various healthy diets to children regularly. Overall, both urban and rural mothers' attitudes are positive towards the healthy diet. Regarding green vegetables, rural mothers' attitude is more negative than urban mothers (bad for child health 12.8%: 6.5%). Mothers from both locations are equally compliant with the advice of health workers and spiritual healers and also reliant on existing beliefs about nutritious foods. A large number of mothers from urban locations are keen to provide soft and liquid foods to children than rural mothers (19.5%: 3.2%). This difference is statistically significant ($p < .05$). But some of the variables are not statistically significant (ns).

Table 4.16: Attitudes towards healthy diet

Attitudes to provide nutritious food to children	Frequency (%)		
	Urban (n=296)	Rural (n=228)	P=Value
Mothers' attitudes towards a healthy diet			
To survive	6.1%	3.4%	<.05
To fill the stomach	6.5%	4.4%	ns
To keep healthy/ get immunity power	34.4%	32.4%	ns
To grow faster	9.5%	3.2%	<.05
Providing green leafy vegetables during illness			
Bad for child health	6.5%	12.8%	<.001
Good for child health	47.3%	22.9%	<.001
The importance of providing GVLs & Fruits			
To keep child healthy	38.9%	30.9%	<.05
To make child sick	5.3%	2.5%	<.05
To protect child from devil eyes	5.0%	2.5%	<.05
Feeding of dairy products and meat items together to children	5.9%	3.2%	ns
Mothers' believed that providing healthy food will help keep children healthy	48.3%	34.7%	<.05
Not providing anything to eat to child during illness, because of:			
Poor knowledge of mothers/carers	5.9%	2.9%	ns
Not available at home/no money/food scarce	8.6%	5.9%	ns
Advised by healers/health workers	12.2%	17.7%	<.05
As per belief of society not to feed during illness	14.3%	4.6%	<.05
Tension and fear	5.0%	4.0%	ns
Child does not like to eat	10.5%	8.4%	ns
Foods to provide regularly to children			
Readymade and fashionable foods	12.8%	20.8%	<.05
Rice with pulse and various types of vegetables	9.5%	10.3%	ns
Soft foods and liquids: <i>Lito, Jaulo, Dhindo</i> etc.	19.5%	3.2%	<.001
Rice with dairy products and meat items	14.7%	9.2%	<.05

4.3.7 Beliefs on various healthy foods

Table 4.17 shows mixed results amongst urban and rural mothers regarding existing beliefs about nutritious food including feeding of colostrum. These results were obtained by using open-ended questions. Some beliefs exist in urban locations which are less prevalent in rural areas and vice versa. Proportionately a large group of mothers was against the existing beliefs about nutritious food. The result shows that nearly 49.4% of urban mothers believed that nutritious food is essential for children's health and needs to be provided regularly, whereas just 28.8% of rural mothers believed this ($p < .001$). Similarly, rural mothers were more likely (14.7%) than urban mothers (7.1%) to believe that excessive consumption of nutritious foods by pregnant women causes difficulty in delivering the (larger) baby. This difference is statistically significant ($p < .001$). Some outcomes, under this variable, are statistically not significant (ns).

Table 4.17: Beliefs on various healthy foods

Beliefs on feeding dairy products and meat items	Frequency (%)		
	Urban (n=296)	Rural (n=228)	P=Value
Child becomes healthy/strong/active/ intelligent/brainy/smart/happy/ lives long	49.4%	28.8%	<.001
Gain weight and height	14.9%	10.7%	<.05
To increase immunity power/fight against diseases	19.8%	4.6%	<.001
To promote good health and create a healthy community	31.1%	17.0%	<.001
Major existing cultural beliefs about nutritious food			
Animal products, legumes, honey not consumed same time, causes diarrhoea, dysentery, and constipation	15.1%	6.5%	<.05
Animal products/fruits are high-calorie foods/not given to the ill health person or during sickness	7.8%	9.0%	ns
Yogurt, ice-creams, GLVs, fruits are cold items/cause cold/ avoided in winter	21.6%	9.7%	<.001
Colostrum harmful to children/form of pus, toxin, dirty, smelly, squeeze & clean before feeding	14.1%	10.1%	<.05
Colostrum good for child's health/pious and highly nutritious, compulsorily need to feed	40.8%	30.0%	<.05
Mango, jackfruit, legumes, meat/fish/hot/highly nutritious, cause diarrhoea, vomiting, blisters	9.4%	5.7%	<.05
Ghee/milk makes mothers healthy/prevents from cold	9.5%	4.4%	<.05
Never breastfeed/give nutritious foods in front of strangers, child gets ill/spits up on nipples before it	2.7%	6.7%	<.05
Excessive nutritious food develops ill health: undigested/high blood pressure/diabetes	18.3%	10.5%	<.05
GLVs consumed by the poor & beggars, well-off community hesitate to feed and eat	5.7%	11.3%	<.05
Meat avoided on the day of deworming medication	11.3%	3.8%	<.001
Milk/fish do not consume at the same time, it causes leprosy/stinging nettle not cooked in the kitchen	6.5%	3.8%	ns
Consuming sweets, ice-cream/may get worms/affects teeth/cough and toothache.	11.6%	10.5%	ns
Avoid oily, stale, dirty, rotted, readymade, & junk foods/ child, mother affects by chemicals and colours	13.0%	7.4%	<.05
Pregnant women ban nutritious foods/inside baby gets bigger/causes problems /high risk in delivery	7.1%	14.7%	<.001
Brahmins prohibited chicken, pork, egg, beef, buffalo alcohols/lose their caste	7.6%	3.2%	<.05
Regular/excessive breastfeeding cause weak, ugly, breast shrinkage, looking aged/develop breast cancer	10.1%	5.2%	<.05
Nutritious food essential/provide it regularly	46.8%	29.2%	<.001

4.3.8 Beliefs about feeding of colostrum

Table 4.18 shows that urban mothers have both positive and negative experiences about the feeding of colostrum, more so than rural mothers. These results were obtained through open-ended questions. Respondents from both localities (43.3% and 27.7%) have strong beliefs about the feeding of colostrum and that it is essential for the new-born babies. Overall, the results are statistically significant ($p < .001$). A similar proportion (11.6%:12.6%) of the group of mothers

from urban and rural feeding colostrum to newborns after squeezing out and cleaning the yellow and thick substances which they believed it is a kind of pus, toxic or dirty material. This result is not statistically significant (ns).

Table 4.18: Existing beliefs about feeding colostrum

Existing beliefs about feeding colostrum	Frequency (%)		
	Urban (n=296)	Rural (n=228)	P=Value
Dirty, form of pus, toxic/squeeze out & clean before feeding/causes diarrhoea, vomiting, and constipation	16.8%	10.1%	<.05
Highly nutritious /good/growth/ immunity power	43.3%	27.7%	<.001
Good for child health /squeeze/cleaned before feeding	11.6%	12.6%	n s
Never feed to new-born: unhealthy/weak in later life	7.4%	4.2%	<.05
Lot of fears/tensions /existing mis-beliefs/rumours	7.4%	7.8%	n s
Saying good for children but due to poor in practice within own family: health workers /educated families of the society	11.1%	4.6%	<.05
Old people/healers /some health workers discourage	12.0%	7.3%	<.05

4.3.9 Food recommendations patterns to children

Table 4.19 shows the results of two variables; the local trend of the recommendation of food to children, and the food those children most like or demand. These outcomes were achieved by using open-ended questions. The trend of fast food or ready-made food is increasing in both communities, however, urban mothers provide fast food more than twice as much as the rural mothers (35.1%:16.8%). Likewise, rice with dal, bread, and porridge are equally recommended by both communities (40.8%: 34.5%). Recommendations for meat and dairy products are nearly double in urban communities as compared with rural (25.2%: 16.2%). On the other hand, children from both localities preferred ready-made food items on homemade foods; just 11.1% of children from urban areas and 3.2% of rural children demand home-made foods. Beaten rice and sugar were demanded by nearly 10% of urban children, whereas the rural children demanded 0.6% only. This result is statistically significant ($p<.001$). Some results under this variable are found statistically not significant (ns).

Table 4.19: Food recommendation by parents and food demand by children

Food items regularly recommended to the child	Frequency (%)		
	Urban (n=296)	Rural (n=228)	P=Value
Fast/readymade /junk foods: noodles, biscuits, lays, crisps, ice-cream, bourn vita, Horlicks, <i>chyawanpras</i> etc.	35.1%	16.8%	<.001
Rice with dal/bread/potato/maize/popcorn/fried bean, porridge (<i>Haluwa, Jaulo, Dhindo, Khichadi, Lito</i>)	40.8%	34.5%	<.05
Rice with soup of legumes or vegetables and sprouts	21.0%	9.0%	<.001
Rice with dairy products	25.2%	16.2%	<.05
Rice with meat items	25.8%	16.0%	<.05
Food items that child demanded or most liked (food demand)			
Fast or ready-made food items	26.7%	30.7%	<.05
Rice with pulse /vegetables/animal products/fruits	11.1%	3.2%	<.05
Beaten rice with sugar	9.9%	0.6%	<.001
Nothing	8.8%	9.0%	ns

4.3.10 Major barriers to providing nutritious food

Table 4.20 shows the major barriers to providing nutritious food among the urban and rural mothers. Lack of knowledge, affordability or availability, beliefs and time constraints were found to be the major barriers in both localities. The result also shows that urban mothers have more problems than rural mothers. Knowledge about nutritious food is an equal barrier for urban and rural mothers (10.3%: 8.2%) which is not statistically significant. Poverty, food scarcity, and beliefs are the major barriers for urban mothers, more than rural, due to their busy lives, populous environment, and people depending on markets. This result is statistically significant ($p<.05$) but variables are statistically not significant (ns).

Table 4.20: Major barriers to providing nutritious foods

Main food barriers	Frequency (%)		
	Urban (n=296)	Rural (n=228)	P=Value
Lack of knowledge about nutritious food	10.3%	8.2%	ns
Affordability: Poverty / Expensive / No money	14.1%	6.9%	<.05
Availability: Food scarce/ shortage in market	7.1%	0.4%	<.05
Mis-beliefs about nutritious food	4.4%	2.9%	ns
No time	6.3%	7.6%	ns

4.3.11 Major barriers to obtaining nutritious food

Table 4.21 shows the major barriers respondents encountered in obtaining nutritious foods for their preschool children. This result reflects main difficulties overall in the urban and rural areas.

The most frequently cited reasons were poverty and market price, especially in urban areas (28.8%: 16.6%). Likewise, the frequencies of citing poor or no knowledge about nutritious food in the urban area was almost double that in rural areas. With regard to urban mothers' knowledge about nutritious food, it mainly relates to the in-depth knowledge concerning nutrients such as balanced diet. All the results presented in the table are statistically significant ($p < .05$; $p < .001$).

Table 4.21: Main barriers to obtaining nutritious foods

Major barriers to getting nutritious foods	Frequency (%)		
	Urban (n=296)	Rural (n=228)	P=Value
Poverty/expensive/little or no money	28.8%	16.6%	<.001
No time/distance	19.1%	1.5%	<.001
Poor/no knowledge about nutritious food	28.1%	14.5%	<.001
Food scarce/high demand/fresh, organic foods not available/seasonal variation of GLVs and fruits	18.5%	10.9%	<.05
No purchasing power is given to mother/woman	10.9%	3.4%	<.05
Poor knowledge/negligence on child care, IYCF/ saving money/ no need felt to provide healthy diets	15.5%	5.2%	<.001
Not grown or available in the kitchen garden	17.6%	4.0%	<.001
Existing beliefs/socio-culture impact	9.0%	4.0%	<.05
Big family/Pressure/Conflict	12.4%	6.9%	<.05
Reliance on processed foods /chemicals/colourings	24.6%	3.4%	<.001
No mother or no one to take care of a child's diet	7.8%	4.2%	<.05

4.3.12 Health seeking behaviours

Table 4.22 shows health-seeking behaviours, mainly of mothers for their sick children, between urban and rural areas. The data show that many mothers from urban areas visit doctors' clinics and private hospitals (38.5%) whereas, just 13.2% of rural mothers visit clinics and health institutions. However, 16% of rural mothers attend spiritual healers' clinics in contrast with a meagre proportion (1.1%) of mothers from urban areas. In rural areas, 6.1% of children stay at home during sickness, whereas, only 0.4% of urban children remain at home during sickness. In regard to getting information about nutritious food and a healthy diet, a large proportion of mothers in urban areas (25.6%) obtained advice from pharmacists and teachers, including spiritual healers, compared with just 13.2% of rural mothers. The role of health institutions for health promotion was greater in urban areas than rural areas (9.2%:1.1%); 18.9% of mothers from urban

areas attended awareness campaigns, whereas 15.1% mothers from rural areas did. These results are statistically significant ($p < .05$; $p < .001$).

Table 4.22: Health seeking behaviours

Health seeking behaviours for sick children	Frequency (%)		
	Urban (n=296)	Rural (n=228)	P=Value
Doctors' clinics/private health institutions	38.5%	13.2%	<.001
Spiritual, traditional healer/temple/church	1.1%	16.0%	
Asha Clinic/GONESA/Hospital /HP/SHP/Ward office	16.4%	8.2%	
Nowhere	0.4%	6.1%	
Mothers' source of information about nutritious food or healthy diet			
Doctors / Health workers / FCHV / Mothers' Groups	21.8%	29.2%	<.05
Health institutions, ward office, Hindu temple, Church	9.2%	1.1%	<.001
Pharmacist, Healer, Teacher & Others	25.6%	13.2%	<.001
Mother attended awareness campaign	18.9%	15.1%	<.05

4.3.13 Mothers' views

Table 4.23 shows the opinions offered by respondents from both localities on reducing the problems of undernutrition in the community. These results were obtained by open-ended questions. The respondents covered the major essential subjects which related to undernutrition. The results show that urban mothers are more proactive than rural mothers. Most of the mothers gave similar opinions on matters such as policy issues, food supplementation, child care and feeding practices. Most of the results are statistically significant ($p < .05$). But some of the mothers' views are statistically not significant (ns).

Table 4.23: Opinions on overcoming Undernutrition

Mothers' ideas to solve undernutrition problems in the community	Frequency (%)		
	Urban (n=296)	Rural (n=228)	P=Value
Provide fresh healthy foods to children/mothers regularly	35.9%	24.4%	<.05
Free health services to children/mothers	28.8%	25.4%	ns
Awareness/education/training/research/workshop/seminar	30.5%	20.2%	<.05
Focus on child care/improve IYCF/change attitudes, behaviours /avoid mis-beliefs/cultural practices	13.2%	12.2%	ns
Review/revise policies	22.3%	21.4%	ns
Create/maintain a healthy and hygienic environment	33.0%	25.6%	<.05
Introduce supplementation ORS, healthy snack programme in the school and community	28.4%	30.3%	ns
Long-term breastfeeding/encourage to feed colostrum/proper and regular monitor	28.6%	23.9%	<.05
Adoption of scientific or modern agriculture system focusing on food security and safety	35.7%	26.7%	<.05

4.4 Chapter summary

This chapter begins with an introduction and descriptions of quantitative results which also facilitated subheadings for clear understanding to the readers. Primarily, this chapter highlights rural and urban mother's knowledge, attitudes, beliefs about a healthy diet and food recommending barriers including mothers' opinions. The quantitative results are arranged in two forms such as overall (table 4.1 to 4.10) and comparative (table 4.11 to 4.23). In regards to major barriers to providing nutritious food, 35% of total respondents have said they do not have any problem to provide healthy food to their children (Table 4.9). In regards to mothers' knowledge on highly nutritious food, there are not any differences found between rural and urban mothers (Table 4.11). The pictogram assessment shows that rural mothers are found to be poor (2.5%:4.0%) on identifying healthy foods compared to urban mothers. In general, rural mothers' perceptions about poor or non-nutritious food items were found weaker than urban (Table 4.13). In the issues around malnutrition signs and symptoms, the rural mothers are seen poor (Table 4.15). In regards to attitudes towards healthy diet, there are significant differences observed (9.5%:3.2%) between rural and urban mothers (Table 4.16). Rural mothers are seen negative in regard to green leafy vegetables compared to urban (6.5%:12.8%). Some of the results of a quantitative investigation, which are not strongly associated with the study aim, objectives, and research questions, are excluded in this section. Food beliefs are more strongly embedded with rural mothers than urban (Table 4.17). However, rural mothers are also strongly associated with beliefs on the feeding of colostrum than the urban (Table 4.18). Urban mothers are broader to recommend ready-made food than the rural (Table 4.19). Concerning issues around major food access barriers, affordability occurred by 14.1%: 6.9% between urban and rural mothers whereas availability accounts 7.1%: 0.4%, but in regards to key barriers there are no significant differences seen between 'misbeliefs about what is nutritious; and 'no time' within two locations (Table 4.20). Urban mothers have found broader knowledge in regards to tackling the problems within their community rather than rural (Table 4.23) where 35.7% of mothers highlighted about the adaptation of scientific or modern agriculture systems. In regards to issues around health policy,

long-term breastfeeding practice, the introduction of supplementation, improvement of child care and feeding practices, and free health facilities, there is no difference observed between rural and urban groups (Table 4.23). After explaining quantitative outcomes, the following chapter describes on qualitative results.

CHAPTER FIVE: QUALITATIVE RESULTS

5.1. Introduction to qualitative findings

Participants in the focus group discussions (FGDs) were keen to discuss how nutritional status is maintained in the context of this society, which type of food needs to be provided regularly that is primarily related with income of the household. Each of the seven focus groups had different viewpoints on poverty and healthy diets. In Nepal, the main causes of child and maternal undernutrition include poverty, poor maternal education, and food security (Odent, 2011; Acharya *et al.*, 2016). The mothers' group for FGD is a completely different population from the mothers who involved in the survey questionnaire (see Chapter 3, sub-section 3.6.1.3). This chapter outlines the FGD results in two sections. The first section presents the socio-demographic characteristics, list of groups and length of discussion, and literacy status of the stakeholders and section second focuses on the key themes generated from a thematic analysis of the focus group discussion data. The following section summarises with demographic characteristics of the participants.

5.2. Demographics of focus group participants

This section is intended towards providing demographic detail of the FGD participants (Table 5.1) before outlining the key qualitative findings in textbox 5.1. There were 50 participants (male 33/female 17) actively participated in the focus group discussion. Majority of the participants were belonging to Hindu and aged between 36 and 45 years. Health workers' group was largest and spiritual healers' group was smallest.

Table 5.1: Demographic of FGD participants

Group identity (no. of participants)	Gender		Age Group Ratio				Religions	
	Male	Female	25-35	36-45	46-55	56-65+	Hindu	Buddh/Christ.
Pharmacists	4	0	1	3	0	0	4	0
Auxiliary Nurse Midwives (ANMs)	0	7	4	2	1	0	5	2
Spiritual Healers	5	0	0	0	0	5	5	0
Mothers' Group	0	7	2	3	1	1	3	4
Health Workers	10	1	3	5	3	0	10	1
Social Workers	9	0	3	2	3	1	9	0
Policy People	5	2	3	3	1	0	7	0
Total (50)	33	17	16	18	9	7	43	7

For the FGD, the researcher composed seven groups of individuals who have been extensively associated with child health care activities within the study area (Kaski district) and are also among the most crucial resources in terms of service provision. All those involved in the FGD were fairly familiar with the existing resources within the study area and particularly well placed to explore the major understandings of nutritional problems in the Kaski district, where all seven FGD were conducted. There were 15 discussion points mainly relating to undernutrition (see Appendix 4b). Table 5.2 shows information on the group of stakeholders, number of participants and the time length of discussion.

Table 5.2: Focus group discussion participants and length of discussion (August 2012)

Name of the groups	Number of participants	Length
Pharmacists	4	1½ hours
Auxiliary Nurse Midwives	7	1½ hours
Spiritual Healers	5	1 hr & 15 mins
Health Workers	11	1½ hours
Mothers Group	7	1 hr & five mins
Social Workers	9	1 hr & ten mins
Policy People	7	1 hr & ten mins

Table 5.3 shows the literacy status of focus group participants.

Table 5.3: Focus group participant's literacy status

Literacy status	Per cent (%) (n=50)
Illiterate	8%
Literate	26%
Educated	66%

Table 5.3 highlights the literacy percentage of the focus group participants, which elucidates that around 8% of the participants were illiterate, where 26% were found to be literate and a majority of the participants were educated which is 66% (see Appendix 21). A few participants from the group of spiritual healers and mothers group were illiterate.

All the FDG participants are directly or indirectly involved in the field of child health. For instance, most of the pharmacists have been running their own business for more than 10 years and supporting those who come to them, with or without prescriptions, for help (Harper *et al.*, 2011). Similarly, the mothers' group, ANMs, social workers, and spiritual healers serve the community, especially children and mothers. Likewise, health workers and policymakers are involved directly or indirectly in monitoring and supervising health programmes including nutrition. The group of policy people was made up of representatives from the Regional Health Directorate, the Regional Health Training Centre, the District Public Health Office, the Sub-metropolitan city, the SUAHARA (*Saddha Santulit Aahar, Hamro Jeevan Rakchhya ko Baliyo Aadhaar*) Project (USAID/Save the Children), NHSSP (Nepal Health Sector Support Programme; supported by the UK DFID) and the vaccine surveillance office of WHO. The mothers, spiritual healers, and ANMs were of low social status with low-level educational background and financial position (middle and low status). In contrast, the pharmacists, health workers, social workers, and policymakers were of high status and strong in educational qualifications and financial position (well-off group). The key findings of the FGD were categorised into six themes (Textbox 5.1). Under each theme or heading the findings are presented. The analysis of the focus group discussions revealed several sub-themes which are discussed below under six broad headings:

Textbox 5.1: Key findings from FGD

Themes
★ Financial issues/poverty
★ Knowledge/education
★ Resources:
• Availability
• Accessibility
• Affordability
★ Policy/strategy
★ Environment/time/situation
★ Beliefs and cultural influences

5.3. Financial issues and poverty

Poverty was the principal theme regarding the maintenance of the nutritional status of households as well as their children. Financial issues or poverty are also significant barriers to a healthy diet which is particularly difficult for low-income households to overcome. Almost all the FGD respondents were agreed on this issue. In addition to this, poor households cannot buy any healthy foods and they neither consume it by themselves nor provide into their children. The general agreement on this issue was that there is no undernutrition among rich households compared with those who live below the poverty line. In this essence, numerous responses regarding financial issues could be quoted, but most of them explored are common and similar ideas.

Policy makers had somewhat different opinions regarding the costs associated with existing health facilities in the area. The Government of Nepal provides free health care services, especially for children and senior citizens. They explored this during the discussion. One participant explained that:

“Hardly any poor people reach this facility because they do not trust government health services due to poor tadak-vadak (decoration) compared with private ones. So, the poor people are being attracted by private facilities. Most of the rural community rarely reach services because of their poor finances. On the other hand, they are habitually involved in traditional and spiritual regimes.” (FDG: Policy People - 1).

The focus groups also agreed that a poor health environment, particularly in rural communities is a significant cause of undernutrition. Rural communities are often deprived of pure drinking water and good quality health services and they suffer poor health and hygiene (RSS, 2014). Diarrhoea is equally prevalent in rural and urban locations. Besides these, rural households are nearly always in a financial crisis so they cannot voluntarily create a healthy environment in their locations.

The social workers stressed that a focus on rural areas was likely to be a more positive way of controlling health and environments including malnutrition. One of the participants from this group argued that:

“The government should focus on rural parts rather than urban. I was surprised to learn about the Urban Health Policy which has recently been launched in urban areas. It is absolutely unfair to poor rural communities. Rural people cannot access quality health services or good food either mainly due to financial constraints along with other factors. There is no policy of social capital from which poor people may get the benefit. Even it should be subsidised and an effective policy on health care and food supply focusing on underprivileged groups in the community, but honestly, most of them are unaware of it. On the other hand, the poor are always left out to get free health facilities.” (FGD: Social Worker - 2).

Poor households from rural communities also cannot afford to use existing health care services to treat their children in case of undernutrition or any other diseases. Moreover, the healthcare services generally are also very expensive for the poor community. Financial issues are also significantly associated with nutrition and prosperity of the people. Most of the FGD participants expressed similar views on financial issues within the community. One of the mothers from the group stated that:

“I remember those difficult days which I passed nearly a decade ago when I was not able to provide healthy diets to all my children due to extreme financial problems. They were crying, quarrelling, and demanding the luxurious food items. Now I have already passed the bad days for my children which hardly afford the health services due to financial problems. Honestly speaking, people have no money to fill up their stomachs and no time to think about a healthy diet for children.” (FGD: Mothers’ Group - 3).

Rural communities have always been subject to multidimensional poverty. In this setting, a person or household is frail against insufficient food supply, including lack of nutritious food, as well as being prone to shortages of other services and goods such as clothing, accommodation, transportation, and medical requirements. In general, this has direct effects on human happiness and health. There is always a scarcity of job opportunities and also low pay in rural locations. Rural people face a double burden of poor health and a weak economy.

Most of the FGD participants agreed that undernutrition is prevalent in rural areas. Dissent was expressed by one participant of the pharmacist group, who opined that:

“In my observation, generally rural people seem stronger and healthier than urban people because they always consume fresh and organic food which is hardly possible in urban locations. Urban communities are always affected by food scarcity and are influenced by (availability of) processed food items. Urban areas are equipped with advanced facilities but they are populous and (people are) always struggling to escape from unhealthy environments, such as pollution and unhealthy food. I have found the lifestyle in urban areas is relatively more costly than rural. The poor or disadvantaged groups move into urban areas due to various job opportunities.” (FGD: Pharmacist - 4).

The ANM group shared their own experiences on the financial burden. One participant hesitantly shared her personal experience. She stated that:

“There are eleven members of my family including seven children. So, we hardly eat meat and other highly luxurious food items because we need large quantity which is very difficult to manage in terms of food distribution and money in such a large family size which creates an unhealthy environment including conflicts within the family members. I also could not choose healthy food for my children because of lack of money. Poor people have no money to fill up their stomachs.” (FGD: ANM - 5).

The health workers discussed how financial issues are major constraints in Nepalese society. They all agreed on this issue. One of the group members said:

“I remember that household leader who was regularly involved in Taas (a card or dice games) or juwa and paid out big amounts of money. He tried to cover up the lost money by spending little on food and health for his family. This is one cause of food deficit within the household. Most of the (heads of) households are also very much like misers who mostly hesitate to spend money on food and health care of household members. This could be one of the strongest reasons for undernutrition within the households.” (FGD: Health Worker - 6).

Regarding economic issues, one of the experienced mothers from the mothers' group said:

“I think the main barrier is poverty especially, to treat children who are suffering from hunger or poor diet. The Government of Nepal has no dedicated aid fund mainly for the poor and disadvantaged groups; therefore, there are many people in the community who do visit spiritual/traditional healers. Households are earning mainly for food, shelter, education for children and health care. All these costs a lot, which is a big problem for the low-income groups. This group invests only in the shelter,

food, and health of the family. Poor people find it very difficult to cover their body and fill up their stomachs.” (FGD: Mothers’ Group - 7).

Spiritual healers are often consulted amongst the middle and low-income families. They are trusted by the community and ready to negotiate for their services. They accept goods or money and will barter with staples like rice, rice-paddy, mustard, millet, buckwheat, wheat, and maize. All FGD participants were agreed on this point and one of the policy people said that:

“It is the strongest reason that spiritual healer is trusted by the community and also they are familiar and active day by day due to their low cost rather than private and public health institutions. They also readily accept goods and barter for their service with crops. We have monitored the distribution of free quota which is still poorly understood by the community and they come to the service hub through the wrong system which they unsuccessful and they spread the negative message in the community. It is known that people are still highly trusting of healers rather than doctors. Slum communities have a great scarcity of money to cover their basic needs.” (FGD: Policy People - 8).

A health worker also stated a few words about this issue:

“I have found many disadvantaged groups of mothers from remote areas take their child to the spiritual healer’s clinic for treatment because they either do not trust or cannot afford the cost of treatment at hospitals and clinics. It is also noticed that the healers are so kind to poor and disadvantaged groups. In regards to a healthy diet, poor people have a difficult hand-to-mouth (existence), so, seriously they think to fill up their stomachs rather than to choose a healthy diet.” (FGD: Health Worker - 9).

Another health worker observed the high cost of medical treatment:

“I have observed several times, mostly Dalits and low-income households; they first go to a pharmacy and then to government health facilities and request free treatment. If they do not get free services in those facilities then lastly, they visit the healers. It is a kind of common routine mostly of low-income groups. Some pharmacists are so kind and they provide them free medicines based on the patient’s history and condition.” (FGD: Health Worker - 10).

Highlighting the government’s programmes to support maternal and child nutrition, the policy people expressed that:

“Poverty is the main constraint for this society as well as this country. More than 25% of people live in poverty and reside in remote areas. Transportation is a serious problem for the poor patients here. They also do not have confidence in health care because money is not the only matter. The government has announced free health services for these people and circulated (information) to (those) concerned. Mostly they are found (to stay) away from this system.” (FGD: Policy People - 11).

Adding more issues on finance, a social worker pronounced that:

“Poverty is the main root cause of undernutrition and various diseases in our community. People cannot afford the cost of treatment, cannot get a proper education and are always under pressure. Underprivileged cohorts are generally economically, socially, physically, as well as mentally deprived. I have taken a few sick persons who were eligible to get free health care services from the regional hospital but there was no free quota left for them to be admitted into the system. They mostly could not pay the cost of treatment so they ran away from the hospital and accessed the service of spiritual healers” (FGD: Social Worker - 12).

The ANMs also collected information about the free service system which is being delivered by the WRH of Pokhara and one added:

“Yes, I think money is the biggest barrier to the growth of children as well as households in this community. Nowadays NGOs/INGOs are supporting the community in many aspects including financial issues. We could imagine that when INGOs/NGOs (support is) over then what will be the situation of the people of this area? How will they survive without any support? In Pokhara, most of the food items are expensive even compared to the Kathmandu, which creates food shortage mainly in disadvantaged households which are the cause of poor nutrition amongst the children.” (FGD: ANM - 13).

It can be asserted from the discussion above that, due to the structure of Nepalese society, underprivileged ethnic groups and Dalits are poor whether in urban or rural locations. In general, they are of low socioeconomic status and susceptible to undernutrition. There are variations in the Human Development Index among sub-groups of both rural and urban people, particularly based on caste/ethnicity and region or ecological zone. Ethnic and geographical variation impacts on people's lifestyles such as access to safe drinking water, use of tobacco, the age of mother at first

birth, and sanitation, which can contribute to child and maternal undernutrition. These factors may be influential regarding children's and women's nutritional status.

All the FDG participants agreed that mothers of low and middle-income households could not provide nutritious foods to their children as well as better-off their families due to increasing financial constraints. They have limited money to purchase the foods their children want and it costs more to obtain them. For example, a mother/carer needs to go to the nearest market to get food, which cost her more money for transportation. Low-income households have limited money and generally, they buy basic foods with a poor nutritious value which are relatively cheaper. They also include other family members as well as children and there is no special arrangement to ensure the children receive the more nutritious food. Ultimately financial issues are major barriers to improving child health in this community. For instance, poverty can also lead to frequent infections, big size of households, regular pregnancies, and consumption of inadequate food all of which can cause child undernutrition and malnutrition.

5.4. Knowledge/education/awareness

In this section, 'knowledge/education/awareness' pertaining to the level of knowledge of mothers about undernutrition, as well as common healthy and non-healthy foods, and their availability are highlighted.

Discussion of this theme mainly aimed to explore understanding about nutritious foods that are practised in the community. What are the cultural or religious implications of beliefs or taboos that are strongly rooted in the society? Why do these frequently come into practice in very systematic behaviours and yet are also highly diversified into different platforms such as ethnic groups, castes, and religions? They are not always documented, even though they occur very frequently in society. For example, in one group, colostrum feeding is encouraged and in other groups, it is rejected. Similarly, poor households do not focus on the condition of children, whereas rich households are highly focused on them and try to tackle their condition urgently. This variation is definitely due to different levels of knowledge. The above-stated theme

‘knowledge/education/awareness’ is a better understanding amongst the educated participants rather than illiterate or literate. For example, a few participants of a mothers group, spiritual healers, and ANMs.

In general, all participants of focus groups have shared their experiences that the level of awareness about undernutrition to be fairly poor in the communities they serve. This poor level of nutritional awareness is the main factor in continuing behaviours that harm nutritional statuses such as non-exclusive breastfeeding, incorrect child-feeding practices, inadequate diet, and insufficient rest for women during pregnancy and inadequate health-seeking behaviours. Most of the participants also regarded the low level of knowledge as one of the major factors of undernutrition.

Regarding knowledge of the major factors of undernutrition, one of the participants from the ANM group, said that:

“I noticed one family who stayed next door to a sub-health post (SHP) in my working area, who had four children. The grandparents always used to recommend them ready-made foods. After a year of the time these children – three out of four – were diagnosed with undernutrition by the SHP and sadly one died. After this episode, they realised that it was due to the regular feeding of ready-made food to the children. People of this area have fairly poor knowledge on a healthy diet. It may be due to poverty and low level of education.” (FGD: ANM - 14).

Knowledge about nutritious food is highly diversified in the district. A few mothers who live in an urban area, who are educated and belong to rich households, are highly knowledgeable on food sciences but have poor knowledge on nutritious food preference, preparation, and preserving the nutritional value of foods. One of the participants in the policy people group drew on his personal experience in observing that:

“One of my neighbours who is well off and highly educated never buys green vegetables and fruits from the market because of food adulteration. He always grows them in his own garden. I have also experienced that many mothers from disadvantaged communities do not give priority to child ailments unless the condition of the child gets worse. This type of knowledge is widely practised in Nepal which is creating big problems in society.” (FGD: Policy People - 15).

All the groups were in agreement about undernutrition mainly due to mothers' negligence and low level of knowledge. They also indicated that most of the issues of undernutrition including dietary patterns were not the priority of households due to several reasons, such as poverty and poor knowledge of the nature and effect of the disease. They shared their own experiences and ideas on healthy diet and the nature of the effects of undernutrition which is caused by neglect. On this matter, one social worker suggested that:

“In regard to tackling the existing problem of Kuposhan (ku= poor, poshan= nutrition), the government must include the provision of the human rights to adequate quality of food and better health facilities in the Constitution; protect land rights, focus on agricultural development, empowerment of women, inequality, and food security. To achieve all of these goals that require a high level of political commitment including standard rules and regulations. The people do not give priority to undernutrition because of its nature of affect in the body. This community generally gives priority to high fever, unconsciousness, major injury or trauma and diseases that present with redness, high body temperature, swelling, and pain.” (FGD: Social Worker - 16).

The group of healers has shared their own experiences of knowledge of undernutrition and about child problems which were very different from the other groups. They commented:

“At present diseases are prevalent amongst children and most of the children of this community are suffering. People have problems of their own. Honestly speaking people in the community generally neglect most of the children's diseases due to the low level of knowledge. Kuposhan is not a big issue if all the people strictly follow the religious rules and regulations. Generally, people are displaced from a cultural discipline which is causing an effect on the health of children. The word Kuposhan is misleading but this condition needs an urgent visit to the hospital. For this condition, I also used to advise to keep the child's stomach full.” (FGD: Spiritual Healer - 17).

Regarding child feeding trends, one older and experienced member of mothers' group cited that:

“In regards to food recommendation, many mothers anxiously said that our children always demand only fast or junk foods such as Chau-Chau (wai-wai= instant noodles). They do not want to consume any other recipes except wai-wai. Generally, most of the children do not like to eat homemade foods

such as lito, jaulo, khichadi, halwa, khir and even dal-bhat. But they do not know junk foods are harmful to children's health.” (FGD: Mother Group - 18).

Similarly, one of the policy people stated that:

“Workforce empowerment is really highly helpful to control undernutrition. High levels of policymakers are well aware but middle and grass-root level health workers must be trained in the subject. The practical knowledge of people in the community about undernutrition would help to identify it early. Much information has been collected of poor knowledge about undernutrition. For example, people with low socioeconomic status have generally negative attitudes towards undernutrition due to the low level of knowledge.” (FGD: Policy People - 19).

Policy people group really warmed up on the issue and explored various health seeking-behaviours which pertaining to low levels of knowledge about healthy diet. One member of the group stated that:

“Serious action should be taken to the quack, traditional/spiritual healer, mal-practitioner and medicine vendor for the misleading of knowledge in the community in the name of free health services that are being provided by them. It is absolutely against human rights and illegal activities. The government has only authorised skilled and trained professionals to provide care services to needy cohorts.” (FGD: Policy People - 20).

One could argue that it is misleading for poor and honest villagers by quacks, traditional/spiritual healers, and other practitioners which cause risk to life. The sufferers generally place their full trust in treatment by those people, whose help delay, them from presenting at authorised health institutions for proper consultation and treatment.

The health workers' group highlighted education patterns of mothers, fathers, and even grandparents of children as helping to maintain health and hygiene, food preservation, and improve child feeding practices and the picture of healthy and nourished children at all levels.

During the ten-year conflict (1996-2006) many rural people migrated to safe and secure places within urban areas such as the capital or district headquarters (Basnett, 2009). Migrant communities have strong faith in their traditional beliefs which they carry to their new home. Hence cultural beliefs and food taboos exist equally in city and village areas. This low level of

nutrition education is a key factor in continuing behaviours that harm nutritional statuses, such as late and improper child feeding practices, short-term or non-exclusive breastfeeding, inadequate eating, and rest for women during pregnancy and unsatisfactory health care seeking behaviours. All the participants from FGD agreed that the level of knowledge on undernutrition and food behaviours should be focused at the community level:

“Education has a huge power to improve the knowledge and behaviours of the future generation mainly on healthy diet. Educated mothers play a crucial role in many aspects such as creating a healthy and hygienic environment in the family. Mothers should have good knowledge of child feeding, child health and caring, sanitation and hygiene and positive health-seeking behaviours. Mothers of this community are generally found to have weak knowledge on these. Mostly they follow traditional beliefs.”(FGD: Policy People - 21).

The social worker further added on the mothers’ education level which impacts on the child health status that:

“Increasing education of the mothers converts into the better nutritional status of the infant and adult. Education generally is also effective in many ways such as increasing women’s participation in decision making or women’s empowerment, improving adolescents’ nutritional status, increasing girls’ participation in school and society and reducing teenage pregnancy. The educated mothers of this society are generally employed in offices and all their children are being cared for by grandparents, carers, siblings, and/or neighbours so the children are poorly cared for by these groups due to the traditional or low level of knowledge on child caring.”(FGD: Social Worker - 22).

Regarding national policy about awareness and education focusing on healthy food, one of the policy people highlighted that:

“Lack of knowledge is a significant cause of undernutrition in this area. Women often have limited influence over how resources are spent and what foods are purchased. The response to the special needs of women and children is not adequate, especially in rural areas and in lower income households. Their knowledge of nutritious food is generally influenced by cultural and religious beliefs which affect the child health and feeding practices. Even households are still attached to traditional farming.” (FGD: Policy People - 23).

ANMs, health workers, and mothers' group participants had similar views to the policy people because they work under their guidance and supervision. Social workers and pharmacists were more critical about the government's existing health service rules and regulations than the policy people's statements.

The health workers explored community perceptions, and particularly mothers' knowledge, of undernutrition based on their experiences. These health workers mainly work at the district public health office and are responsible for monitoring and supervising all health programmes including nutrition. They all agreed that:

“Pertaining to education about undernutrition, most of the mothers, both educated and poorly educated, could not recognise it and mostly neglect it, calling it Kuposhan (lack of nutrition) ‘Runche’ (crying child) or ‘Sato Gayeko’ (frightened). And more serious conditions of malnutrition are termed as Sukenas (marasmus) and Fukenas (kwashiorkor). The undernutrition occurs mainly between six months and two years of age, and it is irreversible.” (FGD: Health Worker - 24).

All the focus group participants, except the spiritual healers, independently voiced similar opinions about mothers' knowledge and major perceptions of households on undernutrition. Spiritual healers disagreed with health workers' statements and one reacted that:

“Runche and Sato Gayeko conditions are not due to undernutrition, generally, they are due to the effect of devils' eyes and bayu (ghost). In this situation, medication does not work so the child needs to undergo a spiritual course. Particularly it is only necessary to sacrifice a Kalo Bhale (black cock) or Kalo Boka (blackbuck) which helps to extract devils or ghost from the child's body. In the meantime, the child also needs to eat garist bhojan (healthy food items) such as animal products, dried fruits, and fruits.” (FGD: Spiritual Healer - 25).

Interestingly, the spiritual healer also believed that an ill child needs nutritious food which helps control undernutrition and will help the child get better. The health workers, policy people, ANMs and mothers' group emphasised the poor caring systems which still exist in both urban and rural households which often adhere to traditional, cultural and religious influences.

All were concerned that traditional care-seeking behaviour during common childhood illnesses is a significant factor of undernutrition status and this behaviour is still widely practised in the community (Sreeramareddy *et al.*, 2006):

“Due to poor knowledge of mothers on child care, lack of funds and human resources the undernutrition situation has been emerging in our society which is hindering efforts to enhance national, social and economic development. It is very difficult to tackle the problem in Nepal. However, lack of variety in the diet is a severe problem throughout much of the country. Awareness about healthy diet amongst the mothers would help to overcome it.” (FGD: Pharmacist - 26).

Similarly, social workers also anxiously argued about the need for education of the mothers, including wealthy people:

“Knowledge about child health including disadvantages of undernutrition is the crucial components of the community-based programme dealing with the ill health of children. There is a massive lack of knowledge among mothers and grassroots level health workers mainly about healthy diet, child feeding practices, and child care. They are also strongly influenced by existing cultural beliefs or taboos which lack in making right decisions.” (FGD: Social Worker - 27)

A spiritual healer said that:

“I have heard that nearly 50 per cent of children in Nepal is suffering from Kuposhan. But I doubt this (figure) because more than 80 per cent of children who visit my clinic for treatment and advice, mostly they look very lean and thin, I mean they are Kuposhit (undernourished). Many children from poor and disadvantaged groups are suffering from these conditions. In my knowledge, it is due to lack of education including poor dietary habits.” (FGD: Spiritual Healer - 28).

Similarly, one participant from the group of policy people raised the point that:

“Educated households are also found to have low levels of knowledge about healthy diet. Generally, they could not balance a healthy diet in their daily meals, such as fat, protein, calcium, iron, carbohydrate, and vitamins. Thus, their children do not get enough nutrition. Some of the educated and rich households are also very miserly and do not spend on healthy food such as meat, eggs, fruits and green vegetables.” (FGD: Policy People - 29).

One pharmacist expressed that:

“I think there is a big gap of understanding of undernutrition and a healthy diet. It is not a disease or a big burden, if we feed our children properly as per the recommendations and by avoiding all the existing beliefs and misbeliefs about nutritious food and keep the child in a healthy environment. So, it will help to overcome on undernutrition from this society.” (FGD: Pharmacist - 30).

Health workers urged awareness or education, including on health-seeking behaviours, among rich and educated people:

“Most of the rich people of this area, mainly villagers, thought that the government should provide all the health facilities for children and mothers which would help to eliminate all forms of malnutrition including other health problems. So, this action helps to build up a healthy society. They should be aware that the government cannot do everything.” (FGD: Health Worker - 31).

The oldest participant from the ANM group volunteered that:

“I have been feeding plenty of fruits and vegetables to my daughter without knowing any nutritional values. When she gets diarrhoea, and vomiting after feeding the so-called healthy diets, in reality, it makes me anxious and creates a lot of doubts about nutritional value which may be due to poor education. Therefore, most of the mothers of this community, barely offer poshilo khana (healthy diet) to children. Consumption of healthy food regularly by children of this area (makes them) become sick.” (FGD: ANM - 32).

Another group of FGD participants, the spiritual healers, criticised the nutritional value of foods available in the market:

“As per my knowledge, I do not allow my family to eat vegetables and fruits which are purchased from the market because these items are nutritionally poor due to the use of various colours and chemicals for their benefit. I am very much conscious about it and never buy anything from the Bazaar.” (FGD: Spiritual Healer - 33).

Likewise, one of the participants from the group of health workers from the DPHO explained that:

“I have better knowledge on choosing the nutritional foods from the market. I always shared it with my wife as she is not confident in selecting healthy food items from the stores or shops. She also makes

me confused because her knowledge is strongly influenced by religious matter and existing beliefs or taboos.” (FGD: Health Worker - 34).

Whether, educated, uneducated, or illiterate, people in the district have questionable knowledge of undernutrition, food consumption, and child health. Knowledge about a healthy diet and child health is moderately shaded by or associated with existing cultural beliefs and taboos. It is also noted that ethnic cultures and perception-based evidence are creating wrong information about food and health. For example, in some communities, if a new-born baby suffered from constipation or diarrhoea and vomiting and died soon after being breastfed with colostrum then this becomes a sort of rumour and spreads very quickly in the community. After this, no one will suggest and encourage mothers to offer colostrum to new-born babies. Such types of incidents become important information for the ethnic group or community which spreads widely and produces negative thoughts about nutritious food. Thus, mothers are compelled to think seriously before offering colostrum to their new-born. Generally, there are several food beliefs which are active in every society and particularly present negative impacts on child health and diet. These rumours which exist after the occurrences may be true or false but they become evidence-based perceptions passed from generation to generation under the aegis of mothers, grandmothers, and mothers-in-law. These messages or rumours differ between religious clusters and ethnic groups or castes. In Nepal, there is no authentic documentation available about the existing food beliefs and rumours. It has also not been noticed that almost all the old people of these communities possess such types of rumours and information which came to them through their previous generations as anecdotes. Education plays a vital role in overcoming such kinds of belief. Another unlikely example, which is very common in the Nepalese community, is not providing dairy products and meat items together at the same time to children or even any family member. This belief is still so strongly rooted that dishes with dairy products and meat items are barely given to children, pregnant or lactating women, and sick people. The majority of people still believe that consuming dairy products and meat items at the same time causes harm because no one can digest these items due to their high nutritional value. Consumption of dairy products and meat items causes of

diarrhoea, dysentery, constipation and vomiting, even loss of life. Unfortunately, there is no literature available about these rumours and beliefs. Hence this study suggests future action research mainly focusing on the occurrence of perception-based evidence.

5.5. Resources (availability/accessibility/affordability)

During the FGDs all the participants devoted their attention to existing health care services and whether they are basically equally available, accessible, and affordable or not. The FGD also concentrated on other factors directly or indirectly associated with healthy food and child care issues. There were several quotes evolved under this theme but only the major and most relevant quotes are presented in this section.

Under this theme, the spiritual healers, ANMs, social workers and mothers' group explorations were found highly relevant and practical rather than any of other groups. This is because these groups play dual roles as service providers and consumers generally due to living behind the poverty line (NLSS, 2011).

The policy people expressed their views on health resources which emphasised the legacy of the ten-year conflict within the country (Devkota and van Teijlingen, 2010). This condition is also one of the major factors responsible for the increased nutritional problem. A typical remark was:

"I have observed that this so-called civil war generally disturbed the rural health care services and they were compelled to restrict themselves to safe places for the security of the staff. Additionally, Kaski district is a highly fertile and higher rainfall area of Nepal. (The conflict) rarely caused food shortage in this district compared with other districts of Nepal. Within the last five years, I have not heard about a food deficit in this area. But this area is a bit expensive due to the tourist-focused part."

(FGD: Policy People - 35).

Members of the group of social workers were seen to be highly excited while discussing issues of availability, accessibility, and affordability of the resources. They drew on bitter experiences these issues whilst serving real clients. Thus, this group was highly familiar with the existing resources, particular issues of food deficit, health care, and other relevant subjects. One of the group members commented that:

“Privatisation of the health care system is highly responsive for influencing the resources because it is outside of government authority and a strong monopoly exists in terms of cost of services which poor people cannot access and afford. The public health services have faced huge barriers which are influenced by a shortage of funds, health workers, and remote setup.” (FGD: Social Worker - 36).

The group of pharmacists was involved quite excitedly in the discussion over resources pertaining to health and food. Moreover, their discussion was very direct and aggressive as compared to the groups of policymakers, health workers, ANMs and the mothers’ group. They shared their practical experiences with the health infrastructure mainly for rural locations which is important to improve life expectancies. One of the pharmacists shared his view that:

“Mainly in rural areas of Nepal, there are numerous children and adults still dying from seasonal diseases such as ARI, diarrhoea, fever and the common cold due to poor health (care) set-up. Knowing these consequences, we are still turning a blind eye which is a real disappointment. The government is still facing huge problems of resources even to provide basic health, shelter, education, and food to people.” (FGD: Pharmacist - 37).

It was generally observed that underprivileged communities and low-income groups generally have poor access to better facilities such as health, education, and food. Therefore, these groups rely on the traditional and religious customs passed down from generation to generation. This may be due to limited and urban-focused resources, familiarity with old traditions, cost-effectiveness and their wide acceptance by the majority of the people. The health infrastructure of Nepal is inadequate particularly in remote parts. In the town and city areas, there are lots of private health institutions providing quality care but they are comparatively expensive. The disadvantaged and poor people can hardly access these services. The government is failing to provide basic health services to citizens due to lack of sufficient funding.

All the social workers who actively participated in the discussion concluded with one voice that:

“There is a huge barrier which is affecting our existing resources at rural locations. The rural populations also could increase their well-being if there were good transportation facilities. Transportation can improve food distribution, proper utilisation of health facilities, education services, and markets which can contribute to the well-being and (help prevent) undernutrition in

children. In many places of this district, the transportation facility is poor and expensive, which the poor population can barely afford.” (FGD: Social Worker - 38).

Pertaining to resources for health care services, the group of health workers indicated some development of health facilities in rural areas of the district:

“Nearly 10 or 12 years ago, there was no health facility available, not even a single Aushadhi pasal (pharmacy) at Phedi and Rupatal areas. Now there are plenty of pharmacies, and health clinics, which are run by health workers, health posts, and sub-health posts. The people of this area can access these facilities whenever they require but the poor are still far away from using these facilities, maybe due to either poverty or lack of education.” (FGD: Health Worker - 39).

All the FGDs accepted that people are still not coming to access the health facilities in all areas. The ANMs and mothers group both raised the same issue regarding poor accessibility by malnutrition cases in the remote communities:

“There is no facility available at most of the health centres for malnutrition cases, so these facilities are not being used particularly by malnourished children. It could be a reason why focused cases are not assessing the services.” (FGD: ANM and Mothers Group - 40).

One spiritual healer responded aggressively that:

“These health professionals have always hated us and insult us at our behind. Ultimately at the last stage of children, they advise parents to visit us stating that, ‘If you have a faith in “tantra-mantra” (spirituality) then take your children to the dhami/jhankri (healer) as we cannot do any more’. I am so surprised at their advice because if the child did not get food for a long time and the doctor just gave water through a so-called saline bottle and nothing to eat, certainly the child will die without filling the stomach. I presumed this condition came about due to the scarcity of food at the household level.” (FGD: Spiritual Healer - 41).

The social workers raised important issues about resources. They explained the real story about food scarcity within the households. On their observation, the households’ access to available food is a less important cause of nutritional status than how food is distributed among members of the household, mainly to children and women. All the members of this group similarly were of the opinion that:

“A hierarchy exists in the distribution of food within families. That is, the amount of food available within one family is no guarantee that women and children will have adequate consumption and meet their dietary needs because they always have food shortage due to various reasons and poor income.”

(FGD: Social Worker - 42).

The health workers also added more views on the distribution of food and all equally voiced that:

“The inferior position of women in the hierarchy of access to food seems to influence women’s eating practices. For children, this hierarchy also influences their intake, depending on the hierarchy of how the food is shared with children during eating times. It could be one of the possible causes of undernutrition of children and women in this community.” **(FGD: Health Worker - 43).**

The mothers’ group saliently expressed their observation on food availability and consumption in rural locations. The agreement on this point is represented by the following good example:

“Most of the food habits amongst poor and rich households are influenced by tradition, culture, and beliefs which are biggest barriers in a society where assessment of food behaviour is urgently required. We need to think how to get away from this. Food shortage in the household is also very prevalent in the slum community of this area. Food shortage mainly hits to labour groups.” **(FGD:**

Mothers Group - 44).

In the summary of opinions regarding resources, all the groups actively presented their own views and argued healthily but the social workers, mothers’ group, and health workers were more vocal in sharing their opinions on this theme. There were a few dissimilar opinions presented by the policy people who particularly highlighted the government’s strategies and plans. The most common features of the discussions were particularly poor infrastructure as well as the lack of funds, low socioeconomic status, and income of households and low level of awareness about resources which contribute to raising the conditions of undernutrition.

5.6. Policy

In this theme, the debate was focused on the existing health and food policies of Nepal. The groups of pharmacists and policy-related people were more actively involved than other groups in the discussion of this theme and they actively participated in this debate, by meticulously sharing

their experiences about the issues. In contrast, the ANMs, mothers' group and spiritual healers did not discuss anything about policy. Obviously, ANMs, mothers group, and healers have no broad knowledge about health policy including nutrition because they have low socioeconomic status (deprived) and are poorly educated (see Appendix 21) as compared to the other groups. Additionally, ANMs and mothers' group are working under the health workers and policy people in the local health network. Thus, these groups were not very open during the FGD because they think that their voices might reach to higher authorities and it may affect their jobs. Likewise, the health workers were also observed to be silent or digress from the topic when discussing policy issues because apparently, they were also stressed to do healthy criticism which associated to the higher authority and they will have faced the same situation as ANMs and mothers group.

A major concern was about the free health care services being provided by the government. The group of pharmacists were agreed on this subject and stated that:

“An officially free health care policy was mainly targeted at poor and marginalised groups in the society but in practice on the ground, high disparities remain as rich people are getting more benefit than the poor. It is documented in the government records that the service has been used by poor and disadvantaged groups but practically it was used by rich and politically influential people.” (FGD: Pharmacist - 45).

A policy for the provision of free health-care services at a MoHP facility under the district hospital was progressively introduced, reducing financial barriers to access and increasing utilisation by poor and marginalised groups. However, as just cited, disparities remain as the non-poor benefit more than the poor from such programmes.

In Pokhara, there are many private sector hospitals and laboratory services which are vigorously operated; with three times, the number of private health laboratories than public sector ones. Although it has a major role in service delivery, regulation of the private health sector has been minimal. These private health institutions are still under some control from the government authorities in terms of charges, facilities, and quality.

The group of social workers and pharmacists discussed this issue more openly than the rest of the groups. So in regards to the existing health policy of Nepal, one of the social workers argued that: *“I think the existing health policy could not address the undernutrition issue of society because this policy seems a bit diverted from the underlying causes. It also fully depends on foreign assistance. There is a big doubt about sustainability.”* (FGD: **Social Worker - 46**).

Similarly, the pharmacists blamed the current political situation in the country and said:

“The current political situation of the country is getting worse even in coming days and it could not assure social protection to its people. So how can we ensure from this concurrent situation that it is fairly responsive to focus on an appropriate policy and impose it? I assume that politically there should be strong commitment and assurance required to tackle the undernutrition condition.” (FGD: **Pharmacist - 47**).

On the other hand, the group of policy people highlighted the policy issue that:

“The existing health policy is able to address underlying causes of undernutrition that was prepared by leading experts. This policy had shown some indication of progress such as achievement of (Millenium Development Goal) targets, reduction of the malnutrition rate, food security, rate of breastfeeding practices, and Maternal and Child Healthcare issues. The local partners with political commitment would help to support it vigorously.” (FGD: **Policy People - 48**).

The group of pharmacists noted the major weak points of the existing health facilities and one member of the group said that:

“In urban areas, there are unsatisfactory health care services that provide public health programmes such as immunisation and antenatal care. In the past, there were efforts to develop urban maternal and child health services. This service should be strongly imposed in all communities which would generally improve child and maternal health.” (FGD: **Pharmacist - 49**).

The group of social workers pointed out that the human resources of the health sector are always seen as insufficient. This group fairly evaluated the human resources management of MoHP. In addition, all the participants of this group equally agreed on this issue, such as:

“Problems of retention, insufficiency, poor distribution, and poor motivation exist in the health sector of Nepal. Many voices are coming out from the dissatisfied health workforce which affects the whole

health care services including quality of care. This is the major drawback of the health sector of Nepal.” (FGD: Social Worker - 50).

During the debate, one of the members of the policy people group shared a crucial point on human resources relating to nutrition. He urged that:

“The country urgently needs a skilled workforce in public health nutrition which is really lacking. Qualified human resources do not want to work at the government level because of high expectations of wages where the government cannot fulfil the demand.” (FGD: Policy People - 51).

Most of the participants from the group of health workers raised the issue of the supply system of the government and urged that it should be reviewed and revised urgently such as:

“We do not receive supplies from the region and the centre which hampers service at rural health centres. Delays in supply and budgets are the main constraints to the delivery of services in health posts and sub-health posts. It clearly signifies our poor work efficiency and efficacy. Most of the communities are generally dissatisfied with us due to the poor management of the health authority.” (FGD: Health Worker - 52).

Additionally, one health worker courageously expressed his views:

“There is huge discrimination within the existing political system because nobody follows the system properly here. There is not any provision for staff motivation with educational and training opportunities. Honestly speaking the high authority of the health department is engaged in pleasing the political leaders rather than fulfilling its own responsibility.” (FGD: Health Worker - 53).

The health service providers (ANMs, policy people, health workers, and mothers; group) generally indicated poor coordination between private health institutions and the NGOs/INGOs who are providing good services in the area. The group of pharmacists and social workers shared their evaluation of the existing health services being provided by NGOs/INGOs in the area. On the other hand, there is a good relationship between private health institutions and NGOs/INGOs. For example, the Asha Clinic and GONESHA are the best health institutions for children and are supported by foreign agencies. GONESHA has been running the Malnutrition Rehabilitation Centre in the study area.

The policy-related people realised that the level of public awareness in the community is still suffering. One of the participants from the same group said:

“I find the child care practices are really poor in the society and usually the baby is not fed nutritious food properly after six months of age. So, the public awareness service should bring change in feeding practices.” (FGD: Policy People - 54).

Another member of policy people group, from the right corner, suddenly remembered the data which was revealed by the DHS (2011) and added:

“Fortunately, exclusive breastfeeding rates are progressing from 53 per cent to 70 per cent but this proportion is not much difference between the rural and urban area which is 52 per cent and 44 per cent respectively. I would request donor groups to support the conduct of more research in the field of undernutrition which informs us of actual progress and improvement.” (FGD: Policy People - 55).

The pharmacist group also added about the weak policy on child and maternal health. Provision is very different between private and public health institutions. The policy must be the same in both health arenas. The private health sector is not following government rules and regulations with regard to public health issues. There is a lack of supervision and monitoring. For example, the female staffs working in government and private organisations are treated differently in terms of pre- and postnatal facilities.

The group of pharmacists explained that women are really deprived of facilities during delivery of babies, especially in rural areas. It is more common in poor and disadvantaged groups. One member of this group stated:

“The ladies are unfairly discriminated in the society and working institutions of this society. It has been seen that the mothers of malnourished children lack proper health care before and after birth because most of the time, mothers are expected to get back to family chores, such as working on the farm or the kitchen just after delivery and it affects the health of the mother and child and their nutrition.” (FGD: Pharmacist - 56).

The summary of this debate has addressed the availability, accessibility, and affordability of the resources such as health services and healthy diets which are basic requirements for the community to avoid undernutrition. Based on the above-recorded arguments which were explored

by the key informants, this debate was discussed mainly with two groups; one group who fully comply with government's rules, such as ANMs, health workers, policy people and mothers' group and the others who are very independent, such as the pharmacists, spiritual healers and social workers. The policy people mainly associated with government described the government's support and strategies pertaining to control over the undernutrition problem. On the other hand, other groups pointed out major defects in policy and the strategy which affected the main target groups. All the groups equally contributed their knowledge based on their experiences to enhance this theme.

5.7. Environment/time/situation

Almost all the members of all groups were observed to be very active during the debate on this topic. This theme generally was in the existing health care environment including time and situation of the household members which is closely associated with food and health-seeking behaviours (Sreeramareddy *et al.*, 2006).

Under this section, environment refers to sanitation, poor caring behaviours including poor infant and young child feeding behaviours and it is also important to note that a culture of childbearing at an early age also gives rise to a high rate of child stunting and low birth weight babies due to the low BMI of their mothers. During the FGD, the mothers shared their experiences about preparing healthy food. Most mothers had similar experiences to the one who said:

"I had great difficulties preparing nutritious foods such as halwa and lito (porridge) for my children due to time constraints in an unfavourable environment. One child out of three ate theirs but other two did not even touch it. They always demanded chau-chau, lays, and kurkure (junk foods). Nowadays the fashion of fast food amongst children is familiar due to various sources of advertisements. I also find it is very easy to provide these items which save my time as well." (FGD: Mothers' Group - 57).

Regarding the environment, another mother from the group also added that:

"When I gave lito and khichadi to my children, they got diarrhoea, vomiting, and stomach-ache. Since then I did not feed those foods that were disliked by children as well. I usually provide them ready-made (foods) which are available at the nearest shop and it also saves my time. Children are

always demanding ready-made foods because they are influenced by the role of media.” (FGD: Mothers’ Group - 58).

Generally, rural mothers are observed to maintain poor hygiene and sanitation while preparing food for their children as well as the family (Christian *et al.*, 2006; Odent, 2011). Very often, this can be noticed in children when they show adverse reactions of indigestion from consuming home-made food. Most of the children reflect this due to their weak immunity and poor absorption of high-calorie foods by their body.

The members of pharmacist group had fairly judged the real condition of children and mothers in the community which have been affected by the traditional food and health-seeking environment. Existing child care and feeding behaviours are found very fragile and mostly depending on artificial resources mostly in the urban area. The group of pharmacists debated this openly and one said:

“I have been observing child care and feeding practices mainly in the city area, (where) educated mothers mostly rely on carers or servants for feeding and care of the children. This environment has been rapidly emerging nowadays. Educated urban mothers have limited time for feeding and caring for their children due to engagement in work.” (FGD: Pharmacist - 59).

The social workers also very confidently and openly pointed out the reality of existing trends of the child feeding environment in city and village areas. They elaborated it as:

“The majority of the mothers are regularly providing ready-made foods to their children. They say, ‘Children like these foods and also it saves our time to prepare food. This fashion is heavily practised by mothers in both communities. This environment makes mothers inactive in preparing healthy food and increases child morbidity’. (FGD: Social Worker - 60).

The policy people also raised a similar point to the pharmacists. All the participants amongst the policy people equally voiced the opinion that:

“Nowadays the ready-made or fast food feeding environment is growing very fast because firstly it is liked by children, secondly, the mother saves her time (by not having) to prepare litto, halwa and khichadi/jaulo (porridge) at home and thirdly fast foods are easily available in the shops. Mothers are in high competition on providing for their children. Fast food production and the selling environment

particularly in South Asia are very different than developed countries, where food production companies have to comply with particular rules and regulations which strictly adhere to ~~with~~ public health issues, and come with clear information including nutritional value.” (FGD: Policy People - 61).

The health workers fully elaborated on the effect of the environment leading to undernutrition from the viewpoint of their experience and said:

“I find a big reason for undernutrition in our community is created by the poor health environment due to poor living conditions, poor sanitation, and poor hygiene practices. In my observation, most child health problems occur due to mistakes of parents and guardians.” (FGD: Health Worker - 62).

The social workers were actively involved in the discussion about time and environment issues which indirectly impacted the health of children. Mostly they raised the same opinions and recommendations based on their observation while visiting villages:

“Poor access to safe drinking water and sanitation facilities is equally worst in the community, which associated with acute respiratory infection, skin, and diarrhoeal diseases. All these conditions are indirectly linked to undernutrition in this society.” (FGD: Social Worker - 63).

One participant from the mothers’ group openly shared her experience about food shortage when she recalled that:

“A long time ago, my household had scarce food due to poor production of food on our land caused by over-rainfall. We could not fill our stomachs for nearly half a year. Because we had no money to buy food we could hardly feed the children. That resulted in undernutrition problems in two of my children, out of five. I will never forget this period in my life. Now modern mothers have also a scarcity of time in which they are mostly involved in (watching) TV serials, fashion, and imitation of other women about modernization. I wonder how they can be responsible for their new generation.” (FGD: Mother Group - 64).

Regarding the time and environment themes, one of the ANMs highlighted this and shared her experiences on food shortage with grief and said:

“When I was nine years old our family frequently had food scarcity during the raining season. My small brothers and sisters were screaming when they felt hungry. We had nothing to eat in our house.

My grandfather sold Chandi ko Gahana (silver ornament) of my grandmother and he bought a sack of rice and pulse from the market and fed us.” (FGD: ANM - 65).

The social worker group also elaborated the condition of food scarcity of disadvantaged and poor families in the area. A few participants of the group shared the condition of food shortages within their village. On several occasions, they personally or institutionally (Red Cross Society) provided basic foods to people when food was scarce. One of the group members said:

“The Dalits of my village had food problems nearly six months ago which occurred due to heavy rainfall and some of the family members did not find work and they had finished their stored foods. The whole family including children were left without food for several days. When I knew of this, instantly I provided food to the children and family members. Later on, these families were supported by the Red Cross. This type of occurrence is frequently happening in poor and disadvantaged communities.” (FGD: Social Worker - 66).

Environmental health including water, sanitation, waste management, and air quality are also considered as determinants of undernutrition (Rai *et al.*, 2001; Sah,2005). Environmental factors for good health such as safe water, sanitation, and hygiene remain critical aspects to be addressed along with undernutrition. These environmental factors are associated with communicable diseases which are leading causes of child deaths. Health workers and policy people actively participated in this debate and made notable recommendations more than the other groups. On this point both groups confidently voiced that:

“Most of the children in this community die due to preventable diseases which occur due to the poor environment. It can be controlled through appropriate legislation.” (FGD: Policy People and Health Worker - 67).

5.8. Food beliefs

All the participants of the FGDs were actively involved in the debate under this theme. Spiritual healers were very assertive during the debate on beliefs and taboos and the policymaker’s group was relatively less interested in this issue followed by the pharmacist group. All the participants from each group presented negative and positive beliefs mainly about a healthy diet. Food beliefs

particularly, associated with children, whether positive or negative, are strongly embedded in Nepalese society and are routinely practised by every household. Regarding the promotion and support of the food beliefs, the mothers and senior women in the households are to be blamed. In addition, religious people such as healers/shamans, priests, monks and pastors including existing traditional environment are also supporting the food beliefs in this community. Some unfortunate event or incident that occurred within a household or community after certain food items were consumed also helps to create the negative beliefs about food. For example, the majority of mothers of this society do not give pomegranates to children because they believe it causes constipation. This is an example of perception-based evidence in the community.

The beliefs or misbeliefs about nutritious food might have been continuously practised mainly from the Ayurvedic and Unani eras and they are still actively embedded in all ethnic groups as well (Stone, 1976; Storer, 1977; Subedi, 2002). Why are they so strongly rooted in Nepalese society? The first reason is that going back nearly two decades; the health care system was much more focused on urban areas, mostly the capital, cities/towns, and district headquarters. For the remote and village areas, spiritual healers (*Jhankris*) and herbal remedies (*Jadi-buti*) were the only healthcare options. Nowadays, even after the development of the healthcare system of Nepal, most people still have trust in spiritual healers. It is mainly due to beliefs because people feel that they were made sick by devils such as *Boksi* and *Bhut* and they go to healers and use herbs extensively. Shamans or healers are also still practising numerous beliefs including with foods. They have been continuously and staunchly supportive of this system as it is their main business, and they perpetuate superstitions in the society. Thus, these beliefs are still deeply rooted in Nepalese custom and tradition (Christian *et al.*, 2006; Odent, 2011). The health professionals' and the public's beliefs about health are diverse, for that reason, there is still scope for those who believe in healers and who are poor and uneducated. Things are improving and will change slowly for the better in future:

"I also read some news about undernutrition which recently revealed by WFP. It has found that a high prevalence of undernutrition is also found in well-off households. So, it made me a bit confused that

undernutrition is not due to poverty or lack of money. I felt it is associated with food behaviours. The community also thinks that obese or overweight children are a symbol of good health.” (FGD: **Social Worker - 68**).

The mothers’ group shared their experiences regarding several misconceptions about food and eating needs of pregnant women which are widespread and varied across ethnic groups:

“My knowledge was negative towards eating healthy foods e.g. dairy products, dry fruits etc. with combining meat items that caused harm to children or anyone who consumed them together. But now I believed that it really caused harm. Because I had seen a few cases who had got vomiting and diarrhoea by eating fish fry, rice pudding, and some fruits at the same time. I think it is more harmful to children. So, by seeing this, I am highly scared to counsel the people to eat dairy products and meat items at the same time. Even I couldn’t urge them about long-term breastfeeding and colostrum.”

(FGD: **Mothers Group - 69**).

The mothers’ group in the village is familiar and trusted by the women and they share all their health issues. So, they are also respected within the poor and less educated community. A mothers’ group member added that:

“Many families, around my working area, believed that feeding of pregnant women a lot of food will make delivery difficult, so they even reduce the amount of food once they notice the pregnancy. Thus, I have observed that many pregnant women are being prevented from (eating) healthy food.” (FGD:

Mothers’ Group - 70).

The health workers, pharmacists, and social workers also expressed similar views. Overall focus group participants shared their experiences about the status of healthy children at a community level. Obese or overweight children are believed to be healthy children and low weight babies signify the poor socioeconomic status of the households in this society. One experienced social worker highlighted that:

“In remote parts of Kaski white pumpkin, aubergine/eggplants, yoghurt, eggs, GLVs and some fruits are avoided while pregnant due to fear of miscarriages. Some ethnic groups believed that these food items can cause harm to the unborn baby and pregnant women are also likely to get common colds and stomach problems which harm the baby. I also heard that in hospital some doctors are also

advising women to avoid foods in some sort of conditions. I think these misconceptions generally came out from some of the Hindu scriptures and films as well.” (FGD: Social Worker - 71).

One mother from the mothers’ group, who are using complementary vitamin packets distributed by the DPHO, cited:

“I have three children, for the first two, I avoided many healthy foods while pregnant because plenty of misconceptions existed about healthy food. During the third time I was pregnant, I did have a nutritious enough diet which caused a big problem during delivery due to the big size of the baby. There are numerous negative beliefs which are associated mainly with children, women, and sick people; even I could not remember them (all).” (FGD: Mothers’ Group - 72).

Only policy people, pharmacists, and health workers were found to distinguish the cultural impact and food behaviour of community people. Policy people argued that:

“Cultural issues have a strong impact on people’s food behaviour. Food habits and practices are closely associated with the typical food behaviours of particular groups of people or cultures which follow codes of conduct in relation to food choice, cooking methods and eating and including frequency of meals, time (of meals) and portion size.” (FGD: Policy People - 73).

According to traditional Nepalese culture, food is divided into hot and cold items. Spiritual healers expressed their views on consumption of fruits and green vegetables during winter especially by children and mothers:

“Green leafy vegetables and fruits are a source of cold and children and pregnant women or lactating mothers should not eat them. They cause cold, stomachache, diarrhoea, and vomiting. Poor people have always been deprived of garnish food. They have to wait for special occasions to get healthy food. Therefore; we advised them to sacrifice black bucks, cock, and pigs and so on. The main motive to advise this is to fulfil their nutritional regimes. Thus, this way the sick child and his family consume meat and fulfil their nutritional needs.” (FGD: Spiritual Healer - 74).

Similarly, the mothers’ group members agreed that:

“We have heard from the community people that most of the doctors advised (patients) not to eat certain fruits, vegetables, and animal products during the treatment period. For instance, children are banned from consuming meat items after taking deworming medicine; aubergine/eggplant is banned

during postoperative care. We are always confused on how to advise people in the community on a healthy diet because doctors, health workers and pharmacists, and spiritual healers contradict each other.” (FGD: Mothers’ Group - 75).

ANMs shared their experience about existing misconceptions, such as:

“Some communities believe that green leafy vegetables are only consumed by the poor and beggars, so ‘We are not cooking green leafy vegetables in our kitchen. There are several misconceptions about food in this community. Therefore, most of the mothers avoid feeding of colostrum and long-term breastfeeding which they learn from the older women of their households. I think Hindu texts, some Dharmik (religious) films, and TV serials are also generally responsible for existing food beliefs.” (FGD: ANM - 76).

Beliefs about a healthy diet are very prevalent in the study population and in Nepal which was retrieved from the FGD. Generally, illiterate people have a strong negative perception about healthy foods. Besides this, educated people are also highly influenced by the social constructions and religious beliefs which contradictions between healthy and nutritious foods.

There are several stories, denunciations, and examples of gossip about the signs and symptoms of undernutrition. Some report it is due to sin in a past life, miserly parents, and parent’s bad deeds in the past. Unfortunately, there is a lack of published information about this. This issue is also very serious in the context of social norms and values:

“I think Runche, Suenas, and Fukenas are not a disease because there are not any severe signs such as swelling, redness, hotness, and pain seen. But the child is always crying, quarrelling and does not want to eat except ready-made foods. These symptoms are being emerged from witchcraft or devil eyes (bhut-pret, boksi) which are preventing and discouraging to children from good health and development, and also, they are being prevented from healthy diets such as breastfeeding including colostrum, maintain a healthy environment and etc. I do not think that crying and quarrelling is some sort of disease. These are a kind of sin from the past life or curse from the god which caused them to be born in a poor family and unhealthy environment and facing plenty of problems.” (FGD: Spiritual Healer - 77).

According to the social workers, the food beliefs which are still common in this society and being practised by the mothers in every household. The social workers emphasised the need for an awareness programme on infant and young child feeding including healthy food preparation which would address the beliefs of a range of people who influence the mother, including husband, in-laws, elders, other relatives, and community members. One of the very active social workers who mainly worked at the HIV-peer education programme of the Red Cross expressed that:

“Food belief is a very peculiar social stigma which has been carrying on from generation to generation and is strongly rooted in or attached to the religion. It has been observed that the beliefs (positive or negative) are generally transferred into the new generation and thus travel through traditional culture, religion, and literature which are practised by individuals, ethnic groups, and society. Mothers and mothers-in-law are seen more dynamic in transferring traditional cultures including food behaviours. Some points from Hindu texts, some religious films, and TV serials are also fuelling them” (FGD: Social Worker - 78).

A health worker voiced the opinion that:

“There is much gossip in the society about obese children and the healthy diet, mainly feeding on green vegetables and fruits to children and pregnant women. It is even rooted in my family and sometimes it creates family conflict due to disagreement with my parents over food beliefs. I am surprised that the obese or overweight children are recognised as healthy by this community. I consider that some Hindu texts, religious films, and TV serials (Hindi version) are also sources of knowledge about food beliefs.” (FGD: Health Worker - 79).

One of the oldest members of the mothers’ group shared her experience and main observations about beliefs which are being practised on a daily basis at the household level and said that:

“In our community, old people especially are generally influenced by religious thoughts and beliefs in regards to the dietary pattern generally emphasised for children, pregnant women, and sick people. Religious books and some Hindi films are also equally responsible for carrying this behaviour from generation to generation.” (FGD: Mothers’ Group - 80).

An ANM explained her own bad experiences which she had faced during her pregnancy:

“In my first and second pregnancies, I was completely guided by my mother-in-law on consumption of foods before and after delivery. Consequently, I was completely banned from consuming green vegetables, fruits and some dairy products and meat items because she believed that those food items may harm my baby. It seemed that she was more worried about my baby rather than me.” (FGD: ANM - 81).

One of the participants from the group of policy people recalled food beliefs from his childhood:

“My grandmother used to say me that you should not eat cow milk and meat at the same time or consecutively as that may cause leprosy. I was very curious particularly about food behaviours during my childhood and always stood against my granny’s advice. So, I did not follow her guidance and I have always been very strong. I have had not ever taken even a single tablet. Educated individuals should take a stand accordingly against the food beliefs. This will help to scrap them from every household in a short time.” (FGD: Policy People - 82).

The pharmacist group also had different experiences regarding beliefs. One expressed his views angrily and stated that:

“I do not rely on all the existing cultural beliefs about a healthy diet and have always disagreed with my parents including my mother and father-in-law- principally on food choices and feeding habits including a selection of food. I am also against the sacrifice of black ducks, cocks, and whatever. But I am highly concerned with these religious matters. I could not change my parents’ concepts, particularly on food choice and habits.” (FGD: Pharmacist - 83).

Policy people have wider experiences and gathered information on food beliefs from different areas of Nepal because they have visited many parts of Nepal during their service period. One participant raised the issue that:

“I can honestly say that the believers are proportionately higher than nonbelievers in our society and it is strongly enrooted. Nobody wants to escape from this. I find really it is very hard to abolish. It may be incited by some Hindu texts and Hindi religious films that are produced in India.” (FGD: Policy People - 84).

Another member of the group of policy people highlighted existing cultural beliefs saying that:

“I am quite against all sorts of beliefs especially about food behaviours, so I was known as chhucho manchhe (irritable person) within my village but I do not care at all. I have been trying to raise awareness on the subject with the more intelligent people of the community and they do not hear me, particularly on food behaviours, cultural and religious matters. More people still follow Hindu texts in the community which insist on them being more traditional.” (FGD: Policy People - 85).

The groups also discussed the passing-on of traditional beliefs from one generation to the next. How do the cultures or behaviour shift to the new generation and who was taking the major part in this? There was a lively debate on this point. It was very difficult to conclude because almost all the participants were followers of the Hindu religion and held strongly enrooted cultural beliefs about food. On the other hand, the majority of the focus group respondents, besides the spiritual healers, were agreed on the following statement ‘Generally, the mothers and mothers-in-law are associated with the exchange of customs and carrying-out the beliefs, whether it is positive or negative, from generation to generation. During the debate, the spiritual healers were more agitated because they are significantly associated with the beliefs. This may be due to their low level of educational status. They also appeared a bit frightened to discuss religious and cultural matters more openly because if their views should reach the community it may have a negative impact on their profession.

Beliefs and attitudes concerning breastfeeding were also associated with cultural and traditional beliefs. Most of the female participants showed considerable interest in breastfeeding and felt that breast milk was better for the child than any artificial food and supplementation. A typical comment was:

“I think breastfeeding is highly effective for children. My mother-in-law and mother taught me the importance of breastfeeding and colostrum because there are a lot of rumours about breastfeeding around this society. My mother and mother-in-law never listen to the fact about breastfeeding and colostrum practices and confronted either. I also minutely observed my mother’s health which is associated with long-term breastfeeding in the past. She is still beautiful and healthy.” (FGD: ANM - 86).

The mothers' group, pharmacists, social workers, and policy people also debated that traditional and cultural beliefs about healthy foods were not always being advocated in the community. Most of the health issues pertaining to mothers and child health are not being clearly communicated by the health workers and even by the senior members of households. In addition, policy people noted that:

“Mostly people of this area want to imitate the culture of wealthy people generally on food and health behaviours but they failed due to the poor economic ground. Poorly educated and poor people are strong followers of cultural and religious beliefs. Even when they migrate to any new places in this world, they retain the same attitudes. They also carry out these traditional and cultural behaviours at the new places.” (FGD: Policy People - 87).

An ANM shared her own experiences with existing beliefs on breastfeeding which she faced during her pre-and postnatal periods. She said that:

“I breastfed my third baby up to three years and he is still healthy. But nowadays most of the mothers just stop breastfeeding even earlier than six months. It may be due to the condition of the mothers and several existing misconceptions or rumours about breastfeeding and colostrum. These rumours really are discouraging to us. Colostrum is regarded as a form of pus, toxic, and a harmful substance by society. These rumours are strongly embedded in every mother's mind in this society. It is being promoted generally by senior women of the community and Hindu texts.” (FGD: ANM - 88).

Social workers in this area observe the health behaviours and attitudes of community people are commonly associated with old traditions and practised continuously. Some of the cultures or traditions represent negative beliefs which also vary from one community and another or one ethnic group and another. All the groups presented similar opinions on this point, but the group of spiritual healers differed because their profession is strongly attached to religion and people have high faith in them due to religion. One of the participants of the group of social workers said:

“Several mothers, either educated or uneducated, from this community, are still visiting healers. This community still has huge faith in them, with high compliance. Thus I can confidently say that the healers, senior women, and religious people are generally responsible for endorsing the traditional cultures including misconceptions in this community.” (FGD: Social Worker - 89).

The group of policy people was too guarded to confess to the existence of cultural or traditional norms and values of society which are strongly associated with religion. Thus, there are many negative and positive beliefs about healthy diets which help to increase nutritional problems. They are fully aware of this. One of the members of this group stressed that:

“I think we cannot change the attitudes and behaviours of people overnight which is very difficult work and it might take a long time. These are many issues and they differ from one society and another society. There are so many delicate issues attached to beliefs, such as an obese child being known as healthy by this community, and old people also avoid daily physical activities. So, it needs to seriously focus on this scenario. The needs assessment would be the first step on this. After that, the problems can be solved.” (FGD: Policy People - 90).

With regard to health-seeking behaviour systems, most of the participants had similar views except the spiritual healers. Most groups were able to propose possible reasons for the poor (not) accessing available health services in the area, but they also discussed cost, time, the level of awareness of the household or right decisions and trust in the services. The mothers’ group, ANMs, and social workers discussed health-seeking behaviour from different angles and expressed their experiences more openly. But the group of spiritual healers was muted and expressed that:

“Existing health institutions are ultimately costly for poor people and worthless mainly in Bhut, Prait, and Pichas (spiritual conditions). Thus, people are knocking on our doors because all the mothers care about their children and want to escape from the problems as soon as possible. We are honest, kind, and more familiar with the community and we have distinct knowledge on the matter.” (FGD: Spiritual Healer – 91).

ANMs and mothers’ group members were very open during the discussion mainly on child caring, health-seeking behaviours and beliefs. They expressed that the main trouble commonly faced by mothers in the case of a sick child was that mothers are compelled to bear all the problems and they suffer stress and fatigue as a result. They want to escape from the problem as soon as possible and thus will choose a quick course for the treatment of their children. It is also noted that some sick children have recovered after eating the meat of sacrificed birds or animals. This

means sick children may be getting their nutritive requirement by eating the meat. The group of ANMs also decisively gave similar reasons for health-seeking behaviour that includes the use of a healer's services as:

“Absolutely all the mothers would not access the service of a healer, generally, unless the entire community environment indicated it. And sharing of the positive outcomes by women after visiting the healer's clinic also assists them to access the healer's services in the village. I have heard of several positive outcomes after visiting of healers' clinics where many children become healthy after the sacrifice of animals.” (FGD: ANM - 92).

The mothers' group courageously discussed the truth of household behaviour especially during the sickness of a child. They agreed that most mothers wait for the child to recover by itself and later they also make a quick visit to a healer and wait for some days. If the child does not get better it is only then that they think to go to existing health institutions. If they do not have enough money then the child stays at home. One of the members of the mothers' group stated that:

“I have heard a lot of voices from many mothers from the community while doing home visits at my clusters when, honestly speaking, the children's mothers expressed that they do not understand the message mainly on medication and diet which is being delivered by health workers.” (FGD: Mothers' Group - 93).

Just after this remark, another participant from the mothers' group raised her voice to say that:

“Many parents in the village complain that (advice) about diet was not any different when suggested by health workers or healers, so they perceive that both have similar knowledge on this matter. Even the doctors focused more than the healers on eating patterns during sicknesses. Personally, I also become confused and irritated with doctors' food advice.” (FGD: Mothers' Group – 94).

The mothers' group and ANMs reported that the rural mothers have been maintaining some traditional breastfeeding practices including the eating of special foods by lactating mothers, even after migrated to the urban area. According to their information, the rural mothers are still recommending some Ayurvedic potions and solids to the baby in the first week of life. Most of the respondents had reported eating 'special foods' to stimulate the milk supply when breastfeeding including foods such as *ghiu-bhat*, soup of celery seeds, *ghiu-chaku*, *sutkeri ausadhi* and meat

soup, especially mutton (from the leg and head). It varies depending on ethnic groups and their culture. For example, mothers do not breastfeed unless the baby cries. It is strongly believed that a screaming child is hungry. In some ethnic groups, they give *Janma ghuti* (herbal medicine) to the baby in the first few weeks or month of life in the belief that it helps with digestion and prevents vomiting, diarrhoea/dysentery and also helps to keep the baby healthy. The mothers believed that the breast milk is heavy for babies and they cannot digest it easily so *Janma ghuti* helps baby to digest the breast milk. On the other hand, the mothers' group explained that they avoid colostrum for this reason. It was noted that the retention of cultural beliefs had a generally positive influence on breastfeeding practices. There was some rejection of concepts thought to be too 'western' which did not necessarily fit with Nepalese opinion. Obese or overweight children are regarded as healthy by this community. So, beliefs are strongly associated with food patterns which affect food frequency and preferences of children. This creates problems of undernutrition amongst children and women of the Kaski district.

5.9. Chapter summary

All the groups were equally involved in the discussion and explored very interesting issues in the debate. Discussion subjects particularly relate to the community or household environments or situation and mainly influencing the provision of a healthy diet to children.

In regards to food beliefs, the senior citizens, mainly the females of the community, and Hindu texts and films were generally blamed for influencing food behaviour and patterns of societal behaviour. The group of spiritual healers was more favourable towards religious matters than the other groups. The healers explained the rationale for sacrificing animals as a pragmatic means to fulfil the patient's nutrient requirements.

In this society, disadvantaged and lowly educated people generally share the healers' views within households. In general, all the groups found some tendency to uphold and practice food beliefs even though they viewed them both equally positively and negatively (Acharya, 2013).

The focus group discussions gathered crucial in-depth information around undernutrition problems. According to the focus group analysis financial issues (poverty) was the central factor for the high prevalence rate of undernutrition. However, the focus group concluded that the knowledge and education of mother's area are associated with child health development and mothers' food and health-seeking behaviours. Further, the focus group data revealed that local resources are another component fuelling undernutrition. Food scarcity, limited education, and poor health service uptake in the study population are perceived as big challenges. The environment, time, and financial restraints are also challenging factors on food and health-seeking behaviour especially for lowly educated and disadvantaged groups. However, the focus groups highlighted policies and strategies which are still insufficient to tackle the undernutrition problem at a community level. The 'beliefs and cultural influences' theme is strongly embedded, with cultural and religious norms and values playing a pivotal role in food recommendations and health-seeking behaviour. Many key findings that came out of the focus group analysis link to the literature and require further investigation. The FGDs have addressed the research questions and objectives (see 2.13.1 & 2.13.2) of this thesis. Finally, this assessment has covered the literature gaps which could not found in the literature.

CHAPTER SIX: DISCUSSION

6.1 Introduction

This chapter discusses the mixed-methods findings regarding maternal nutritional beliefs and attitudes towards nutritious food for rural and urban preschool-aged children. In this chapter, the quantitative findings are compared and contrasted with the qualitative outcomes and the broader literature. It is divided into eight sections: (1) knowledge about healthy food; (2) beliefs: (a) food beliefs or misconceptions; (b) beliefs about breastfeeding and colostrum; (3) attitudes; (4) child feeding practices, food insecurity and barriers; (5) health-seeking behaviours and culture; (6) mothers' views; (7) strengths and weaknesses of the study; and (8) a key summary of the thesis. The thesis has identified important gaps in literature pertaining to food and health-seeking behavioural forms (Subba *et al.*, 2008). It extensively added new knowledge to the literature (Appendix 10). The quantitative and qualitative findings have been summarised separately (see Chapters 4 and 5).

6.2 Knowledge about healthy food

This study has evaluated the ability of mothers to recognize healthy food and its importance for their children's health (Appoh and Krekling, 2006). The research used different approaches (Aldridge and Levine, 2001) as pictographs (Norman, 1990; Barrons *et al.*, 2013), structured and open-ended survey questions and FGDs (Asfaw, 2008; Acheampong and Haldeman, 2013). The results associated with mothers' knowledge about healthy food addressed: the first objective (i) and the research questions (Sections 2.13.1-2.13.2).

The quantitative data demonstrated that rural mothers' knowledge about healthy food was remarkably poorer than in urban areas, as found elsewhere (Onta, 2003; Adhikari, 2010; Acharya *et al.*, 2015; Acharya *et al.*, 2016). Surprisingly, it has been identified that urban mothers are more reactive to food beliefs than rural mothers (Sah, 2005). However, pictogram results were perceived to be poor between rural and urban mothers, whereas just over one-third of mothers

were educated or literate (see Tables 4.2, 4.11-4.12). Interestingly, rural and urban mothers had similar views about highly nutritious food items (see Table 4.13) (Onta, 2003; Subba *et al.*, 2008; Shrestha, 2015). There was not any difference regarding knowledge in the identification of the weight of children, and signs and symptoms of malnutrition (CBS *et al.*, 2006; Odent, 2011; Pokharel *et al.*, 2013) between both groups of mothers (see Tables 4.14-4.15).

Surprisingly, the results showed that more than one-third of the group of mothers were not able to select healthy food from a grocery store, whereas only 7% were incorrect in pictograph assessment (Table 4.4). It is more likely that poverty stops women from buying healthy food for their children (Atkinson, 1987; Antony and Laxmaiah, 2008) than their knowledge per se (Barton, 2001). Furthermore, the mothers' knowledge of selecting a healthy diet from the grocery store (Bandura, 1977; 1986) and pictographs assessment showed that there is neither a statistically significant difference between urban and rural mothers (Table 4.12) nor is the literacy status of the respondents significantly different (Table 4.2). However, the pictogram assessment (Barrons *et al.*, 2013) has shown that mothers were sufficiently skilled in recognising healthy food items (Norman, 1990; Hameen-Anttila *et al.*, 2004). There may be several influencing factors such as socio-cultural, gender or religious issues (Appendix 10) emerged (Pradhan Malla, 2000; Sudo *et al.*, 2005; Adhikari, 2010; Acharya *et al.*, 2016) however, mothers became very emotional during the assessment that lead to a poor outcome (Hameen-Anttila *et al.*, 2004; Barrons *et al.*, 2013).

Interestingly, the majority of mothers (81%) described the following as items of healthy food: meat, dairy products, fruits and juices, legumes, sprouts and soups (Barer-Stein, 1999). They regarded those food products as highly nutritious food items (Bandura, 1977; 1986; Sah, 2005; Christian *et al.*, 2006). However, a small group of mothers from the same locality had given negative views (Aunger, 2000) about dried fruits and staples, as they tagged them as low or non-nutritious food items (Table 4.4). It could be because staple foods are not recognized as healthy food items in some communities (Sah 2005; Acharya *et al.*, 2015). A small percentage of mothers were found to have poor knowledge in recognising non-nutritious food items (Acharya *et al.*, 2015) because they indicated that animal products (6%), green vegetables (12%), dried vegetables (12%)

and wild vegetables (13%) are food items low in nutrition (Table 4.4). It may be because such findings are a result of the responses provided by (illiterate) siblings, relatives or neighbours who were also included in the study (Acheampong and Haldeman, 2013). These findings also obtained from mothers who were only just 16 years old and with a low socio-economic status (SES) (Agarwal 1990; Ahmed *et al.*, 2000; Lamsal, 2014).

Dried fruits were also marked as low nutritious food (9%) items and not given to children to eat although some people ate them regularly (Barer-Stein, 1999; Arzoaquoi *et al.*, 2015). Dried fruits are mostly used in religious functions, whereas in some communities, people believed that green leafy, dried and wild vegetables are generally consumed by low-status people or beggars (Christian *et al.*, 2006; Nilofer *et al.*, 2013), so they marked them as low- or non-nutritious foods (Table 4.4). It was also noted that healthy food items are expensive and of limited availability (Christian *et al.*, 2006; Acharya, 2013; Ellahi, 2014). There were noticeable disagreements about highly nutritious food items (Table 4.4). Surprisingly, the majority of mothers (70%) regarded carbohydrates-rich food items also as non-nutritious food (Table 4.4) (Christian *et al.*, 2006; Adhikari, 2010). Similar responses were also observed from urban and rural mothers (Table 4.13). Considering the mothers' perceptions of nutrition, they do not seem to have reliable knowledge of nutritional values in carbohydrate-rich food (Bunik *et al.*, 2006; Carrigan *et al.*, 2006; Khanal *et al.*, 2016).

The comparative results (Table 4.11) also showed that there was no significant difference found between urban and rural mothers in regard to knowledge about highly nutritious food, but there were major differences in recognising the nutritional value of certain food items such as dried fruit and porridge (Nilofer *et al.*, 2013). Rural mothers counted dried fruits as low in nutritional value, whereas urban mothers felt porridge was of poor value because they did not count it as a nutritious food item (Subedi 2002; Ali *et al.*, 2005; Drewnowski 2005; Khanal *et al.*, 2016). Similarly, rural mothers' viewpoints were found to be more negative about green leafy vegetables (Sah 2005; Christian *et al.*, 2006; Adhikari 2010; Acharya *et al.*, 2015), than urban mothers (Table 4.11).

Regarding mothers' knowledge about the weight and height of children, the results showed that 72% of the mothers had good knowledge, but only 21% were incapable of recognizing that the main reason for normal weight (Dancer and Rammohan, 2009; You *et al.*, 2013) was due to nutritious food (Table 4.5). Similarly, there was no significant difference observed between urban and rural mothers' opinions about normal and poor weight (Table 4.14). In regard to the weight of children, the focus group participants offered additional insights. They all stated that malnutrition in children was not considered as a disease (Dugdale *et al.*, 1979; Shankar *et al.*, 2006; NPAN 2007; Pokharel *et al.*, 2009, Adhikari 2010). The community generally associated the following terms with malnutrition: crying child (*Runche Lageko*), frightened (*Sato-gayeko*), marasmus (*Sukenas*) and kwashiorkor (*Fukenas*) (see Definition no. 25 & 26 on pg. XXIV) (Adhikari, 2010). These conditions were tackled differently by society (Section 5.4) and they rarely sought medical advice or help for them (Stone, 1976; Sudebi, 1999; 2000; 2002; Müller and Krawinkel, 2005). These terms of malnutrition are very commonly used in Nepalese society which believe that these conditions (Section 5.4) are solely associated with devils; due to which, children with these conditions are taken to the spiritual or traditional healers rather than health institutions (Table 4.22) for treatment (Stone, 1976; 1986; Miller, 1979; Shakya, 2006; Adhikari, 2010).

This thesis finding showed that a large group of mothers (77%) were remarkably poor in identifying malnutrition by its actual signs and symptoms (Müller and Krawinkel, 2005; Pakpour *et al.*, 2011; Saaka, 2014; Acharya *et al.*, 2015). Nearly half of the group of mothers identified that weight is a significant sign of malnutrition, but on average 50% of the total group of mothers could not recognize malnutrition conditions by signs and symptoms (Table 4.6) (Pakpour *et al.*, 2011; Saaka, 2014). The comparative result shows that the group of urban mothers had a better ability to identify symptoms of malnutrition when a child has low weight, compared to the awareness of rural mothers on this topic (Sah, 2005). Similarly, urban mothers have better knowledge about and ability to define the reasons for the abnormal weight of children that were associated with malnutrition (Saaka, 2014) (Table 4.14). Urban mothers were seen to be more knowledgeable than rural mothers in identifying malnutrition by observing signs and symptoms,

which was statistically significant (Table 4.15) (Pakpour *et al.*, 2011; Patel and Kubde, 2014). The study found that nearly one-third of the total respondents had poor knowledge about children's weight (Nolla *et al.*, 2014; Saaka, 2014). Similarly, nearly a quarter of all respondents were well aware that children having normal weight was due to consuming nutritious food, whilst more than half of the respondents claimed it was due to medicines and good childcare by their mothers (Antony and Laxmaiah, 2008; Saaka, 2014). On the other hand, a large proportion of the group disliked exploring the reasons that could explain a child's low weight; this may be due to personal issues that were associated with their prestige and value in society (Pakpour *et al.*, 2011; Patel and Kubde, 2014). Urban and rural mothers' knowledge about determining normal weight of children was not statistically significant (38.4%:34.0%), but in regards to determining low weight, urban mothers were more knowledgeable than rural (9.0%:4.0%) (Table 4.14) (Atkinson, 1987; Antony and Laxmaiah, 2008; Pakpour *et al.*, 2011; Saaka, 2014).

Correspondingly, the FGD results also described mothers' knowledge about nutritious food (Section 5.4). At the time of the FGD, a mother who was working as an ANM, expressed her lack of confidence in determining the nutritional value of fruits and green vegetables, which she had been providing her own child with regularly (Section 5.4, FGD: ANM-14) (Atkinson, 1987; Antony and Laxmaiah, 2008; Shookri *et al.*, 2011). Most of the key informants of the FGD strongly agreed that a mother's knowledge and education are crucial components that can play a significant part in overcoming malnutrition in society. They also negatively criticized food fashion trends, artificial lifestyles, and negligence in childcare which are very common in most households, whether they are rich or poor, educated or literate (Shookri *et al.*, 2011; Biza-Zepro, 2015) (Section 5.4).

This thesis also showed that health workers in the study area were also partly seen to be lacking in the ability to explain the importance of healthy food to these mothers (Table 4.6) (Murphy, 2011). In the context of a developing country like Nepal, health workers were still distinctly poor in delivering dietary suggestions because they were mostly bound by strong traditional and religious norms and values (Stone, 1976; 1986; Subedi, 1999; Murphy, 2011). Knowledge about a healthy

diet appears to be better in high-income countries (Murphy, 2011). For example, mainly due to advice to cancer patients from health workers from developed countries like the UK, the latter have a much wider knowledge than those from developing nations (Murphy, 2011).

Shrimpton and Ghimire (2012) assessed the nutrition capacity of communities and local governments through multi-sector nutrition programmes in Nepal and found that most people could not identify malnutrition as being undesirable or as a harmful condition at all (Pakpour *et al.*, 2011; Shookri *et al.*, 2011). They also revealed that 80% of district and village committees and community groups thought malnutrition was a problem (UNICEF, 2013). With regards to malnutrition, this thesis also agreed with Shrimpton and Ghimire (2012) because the group of mothers did not think malnutrition was a problem because they linked it with other diseases rather than malnutrition (Acharya *et al.*, 2015); far less perceived it to be a critical condition (Shookri *et al.*, 2011; Shrimpton and Ghimire, 2012). This thesis further found that less than 5% of those had knowledge about malnutrition, micronutrient deficiencies and obesity (Shrimpton and Ghimire, 2012; May *et al.*, 2013; UNICEF, 2013). Drewnowski (2005) had also categorized low and high nutritious food items in his study. Hence, this thesis also explored similar results as explored by Drewnowski (2005) in regard to knowledge of mothers to recognize high and low nutritious food items.

Appoh and Krekling (2006) revealed that a child's good health status relates to better feeding practice, which in turn is associated with a mother's knowledge about a nutritious diet. Barton (2001) reminds the reader that healthy feeding of children depends on the mother's knowledge and experience, as well as on the availability, affordability, and accessibility of food. With regard to Appoh and Krekling and Barton's statements about feeding practices are similar to this thesis finding (Tables 4.4-4.6, 4.9, 4.11-4.15, 4.20-4.21).

Dancer and Rammohan (2009) showed that a mother's education has a positive influence on the nutrition of children, mainly for girls in the Terai area of southern Nepal (Sah, 2005; 2007; Sluik *et al.*, 2015). This thesis also confirmed that a mother's knowledge about child care, including nutritious foods, is strongly associated with children's potential for a prosperous and healthy life

(Sluik *et al.*, 2015). Concerning basic knowledge of food patterns, it is highly controversial within ethnic groups because each group has different subjective opinions and views regarding the same type of food due to their particular cultural values and norms (Craig, 2011; Desmet *et al.*, 2015). This thesis observed that in some aspects of recommending food, mothers are very confused and uncomfortable, and as a result are also incapable of making correct decisions on the selection of food (Tables 4.16, 4.19-20, 4.22) (Gibson *et al.*, 1998; Devkota *et al.*, 2012; Acharya *et al.*, 2016). This may be due to the influence of diversified views which occurred during the child sickness (Appendix 10).

However, Pokharel *et al.*, (2009; 2013) also pointed out that poor knowledge about general health care is a serious issue in Nepalese society and is one of the major barriers to developing and maintaining good health. The FAO and WFP (2007) cited that some households in rural areas often suffer not just economically but socially. They have limited reliable knowledge regarding nutrition, appropriate hygiene and caring practices (NPAN, 2007; Dancer and Rammohan, 2009; Shookri *et al.*, 2011), and their views regarding gender divisions within the household (Sudo *et al.*, 2005), where women are placed in an underprivileged position compared with men further aggravate this position (FAO and WFP, 2007; Simkhada *et al.*, 2010; Adhikari, 2013). In this study, the FGD participants such as ANM, Health worker, and Mothers' groups, have also raised issues around the domains of gender, inequality and empowerment which are strongly supported by findings from FAO and WFP (2007) and Pokharel *et al.*, (2013).

Many studies (e.g. Caldwell, 1979; Subedi, 2002; 2010; Sah, 2005; Sudo *et al.*, 2005; Acharya *et al.*, 2015; 2016) have shown that children are generally well-nourished where the majority of mothers are found to be literate (Barton, 2001). Educated mothers are more likely to learn relevant information about the child's health for their own and their family's benefits and advantages (Simkhada *et al.*, 2010; Adhikari, 2010; 2012). Literate or educated mothers can play active roles in alleviating the influence of cultural beliefs and taboos (Stone, 1976; Colville, 2008; Tamang and Brown, 2010).

Acharya (2000) and Marmot (2007) stated that a mother's education is likely to be the main factor of nutritional consequence at the family level since a major reason for malnutrition is simply poor knowledge about the determinants that contribute to good nutrition. Regarding a mother's knowledge, an outcome of research from this thesis is also very similar to a study conducted by Marmot (2007). According to the Nepal Demographic Health Survey (2006), children of illiterate mothers are more likely to be underweight than children of other (more literate) groups. Thus, an association between mothers' education and nutritional status exists and appears to account for several deficiency consequences (MoHP, 2007). The major marginal effects of improvements in education are likely to be found in the mountain regions where the malnutrition rate among children is one-third lower for women with primary-level education than for those with no education (NDHS, 2006; MoHP, 2007). Considering the results of this thesis regarding child feeding frequencies and practices, health-seeking behaviours, food recommendation, and knowledge (see Tables 4.3-4.5), there were many inconsistencies observed about what constitutes a healthy diet (Adhikari, 2010; Johnson *et al.*, 2012). Above-mentioned results were influenced by mothers' poor knowledge on food and health-seeking issues which are controversial in the context study population.

In general, this thesis detected that urban mothers were found to be more efficient in food recommendation, food selection, communicating, feeding and child care, including meal preparation, compared to rural mothers (see Tables 4.11-4.13, 4.16, 4.19, 4.21 & 3.22; Sections 5.4-5.5, 5.7-5.8) (Marmot, 2007; Bezner-Kerr *et al.*, 2008; Pokharel *et al.*, 2009; Johnson *et al.*, 2012).

Onta (2003) conducted a narrative survey, supported by CARE, Nepal's Child Survival Project, focusing on knowledge, practices, and coverage of the healthcare facilities, particularly on child and maternal nutrition issues by interviewing 300 mothers of 0-23 months-old children in the far-western region of Nepal. He reported that the knowledge of mothers (84%) about the signs and symptoms of children illnesses that require prompt medical services was slightly higher in the Brahmin and Chhetri caste than in Tharu and Dalits (Sudo *et al.*, 2005; Bishwakarma, 2009). The

Tharu and Dalits ethnic groups are lowly educated living in rural areas with low SES (WFP, 2009). This thesis has shown the same outcome (see Tables 4.1 and 4.2; Section 5.3, 5.7- 4-5.8) where this thesis employed a larger size (n=524) of 3-5 years old aged mothers than the sample used by Onta (2003). Furthermore, Onta (2003) demonstrated that most (91.7%) mothers did not know about a healthy diet (super flour) which was available in the community. Onta (2003) stated that nearly 62% of the mothers were not aware of the weight and height of their children even after the child reached the age of 4 months whereas nearly 68% of mothers were aware of children's illnesses when they stopped eating and or drinking (Adhikari, 2010). Similarly, Onta (2003) further found that nearly 35% of the group of mothers provide less than usual foods to the sick child but more to drink (38%). The findings of Onta (2003) are similar to the findings of this thesis around issues of the mothers' knowledge about healthy diet, and weight and height of children (see Table 4.4, 4.12-4.15; Section 5.4). However, the knowledge of mothers about healthy diet may depend upon the traditions and beliefs of households and the literacy of mothers which is still provocative (Sah, 2005; Christian *et al.*, 2006; Adhikari, 2010).

With regard to knowledge of nutritious food, Christian *et al.*, (2006) showed that the majority group of mothers had poor knowledge which was generally compounded by cultural and religious norms and values in the Sarlahi district of Nepal. Christian *et al.*, (2006) examined the food-related beliefs and practices mainly related to reducing food intake during the pregnancy. Apparently, Christian *et al.*, (2006) observed that the food-related beliefs and practices influenced women's knowledge caused a reduced intake of healthy food during pregnancy. For issue around the knowledge and recommendation practices, Christian *et al.*, (2006) and this thesis have obtained similar findings such as mothers' control over on food recommendations to under-five children (see Tables 4.7-4.8, 4.16-4.18; Sections 5.4-5.5, 5.7-5.8) whereas pregnant women reduced food intake themselves (Sah, 2005; Ellahi, 2014).

However, both studies have the same concepts while recommending healthy food to their children that they learnt during pregnancy and lactating conditions (Sah, 2005; Sudo *et al.*, 2005; Shrestha, 2015; Acharya *et al.*, 2016). Thus, this thesis evaluated mothers' knowledge that influenced food

recommendations to children in the urban and rural area of Kaski district of Nepal whereas Christian *et al.*, (2006) examined the tendency of mothers particularly during pregnancy in the rural terrain of Nepal (Odent, 2011; Acharya, 2013). The author of this thesis has a disagreement on Christian *et al.*, (2006) because educated and literate mothers are strongly bonded with the existing cultural and religious norms and values (see Tables 4.17-4.18) and it is very hard them to get rid of from these norms and values (Stone, 1976; Adhikari, 2010; Spector, 2013). Literally, mothers of this study population, have to compulsorily follow the rules and regulations of their community (Adhikari, 2010; Arzoaquoi *et al.*, 2015; Biza-Zepro, 2015). There is a strong association between community and culture and religion (Odent, 2011; Acharya, 2013). On the other hand, study time, target groups, study methods and geographical location were different than in most of the key literature (see Appendix 22). Thus, mothers' knowledge about food and health-seeking behaviours are still very traditional (Christian *et al.*, 2006; Odent, 2011).

6.3 Beliefs

This section explores in detail food-related beliefs (Upreti and Müller-Böker, 2010; Subedi, 2010; Acharya, 2013; Acharya *et al.*, 2017) amongst mothers of both urban and rural communities of the study population (Fishbein and Ajzen, 1975). It also describes the social and cultural sensitivities about long-term breastfeeding and colostrum (Odent, 2011) which is strongly influenced by misconceptions (Wasti *et al.*, 2011; Acharya *et al.*, 2017).

Shakya (2006) examined traditional food and health beliefs in the Nepali community. Food classification was associated with cultural practices and religious norms and values which differ from one ethnic group and religion to another. Shakya (2006) highlighted that food beliefs and practices are strongly associated with rituals and festivals and often seasons and the environment (Stone, 1976; 1986; Christian *et al.*, 2006; Acharya, 2013; Acharya *et al.*, 2017). This association goes beyond the availability and access to foods and to particular meaning and values that are traditionally constructed (Rai *et al.*, 2001; Sudo *et al.*, 2005). Shakya also argued that some of the beliefs are crucial, even offered ideas for current understanding, and others are basically accepted

without apparent meaning or value. With regard to food and health beliefs, the mixed-methods approach in this thesis found the same results from the mothers when responding to multiple factors particularly knowledge, and beliefs about healthy diet including breastfeeding and colostrum (see Tables 4.4, 4.7-4.8, 4.11-4.13, 4.16-4.18; Sections 5.4, 5.7-5.8). However, there still remains a need for further investigation in the field of cultural beliefs and practices for developing critical and holistic understanding about food and its implications for child health because food beliefs and taboos are strongly rooted in this community (Odent 2011; Acharya 2013; Karkee *et al.*, 2014; Acharya *et al.*, 2017). The next Sections (6.3.1-6.3.2) outline the association with beliefs about healthy food, long-term breastfeeding and its misconceptions including cultural and religious influences.

6.3.1 Food beliefs or misconceptions

This section defines existing positive and negative food-related beliefs which are strongly embedded within cultures and customs (Shakya 2006; Subedi 2010; Upreti and Müller-Böker 2010; Acharya, 2013). Food beliefs including cultural influences were strongly embedded at all levels, ethnic groups, and religion in the study population (Shakya, 2006; Sudo *et al.*, 2005; Adhikari, 2010). Mothers have still a strong association with food beliefs (Adhikari, 2010; Acharya, 2013).

For beliefs about nutritious food, the majority of the group of mothers (71%) presented high confidence that healthy foods, including colostrum, were essential for children's good health, growth and development (Contento *et al.*, 1988; Kakute *et al.*, 2005; Odent, 2011; Adhikari, 2012) (see Table 4.7; Section 5.8).

Food beliefs were reflected in some of the results of this thesis, such as mothers' food recommendation patterns (see Tables 4.7, and 4.19), health-seeking behaviours (Table 4.6, and 4.22), attitudes (Table 4.6, and 4.12) and child-feeding practices (Table 4.5; Section 5.8) (Johnson *et al.*, 2011; Acharya, 2013; Karkee *et al.*, 2014). The child feeding frequency (Table 4.5) appeared to be very inconsistent due to food beliefs (Lewis, 1994; Acharya, 2013; Acharya *et al.*, 2017).

Surprisingly, more than one-fifth of respondents were still not providing several nutritionally rich foods to their children (see Tables 4.7 and 4.17) because they believed them to cause diarrhoea, dysentery, and vomiting or constipation due to a poor digestive system (Sibeko *et al.*, 2005; Adkiakri, 2010; Acharya, 2013). Similar to the results of several studies (i.e. Rai *et al.*, 2001; Kakute *et al.*, 2005; Sah, 2005; Christian *et al.*, 2006; Adhikari, 2010; Chapagain, 2014; Karkee *et al.*, 2015), this thesis also revealed that urban mothers have more positive beliefs regarding healthy food whereas rural mothers have more negative ones (Table 4.17). Nearly one-fourth of respondents have negative perceptions about colostrum, and a similar proportion of the group of mothers still have strong faith in food beliefs which they apply in their daily practice (Tables 4.7, 4.17-4.18) (Odent, 2011).

Moreover, this thesis discovered that nearly one-sixth of the group of mothers were not providing animal products including meat items and fruits to sick children (D'Souza, 2003). Furthermore, they believed that sick children cannot digest these foods; this caused harm to their health (Tables 4.7 and 4.17). In regard to negative beliefs, only a small group of mothers agree that breastfeeding and nutritious food should not be fed to children in front of strangers, whereas a significant number of the mothers did not agree (Tables 4.7-4.8) (Kakute *et al.*, 2005; Bezner-Kerr *et al.*, 2008; Khanal *et al.*, 2016).

Acharya (2013) explored that patients undergoing postoperative care have a strong association with food beliefs. The patients mostly avoid certain food items during post-operative care whilst health professionals also counsel patients particularly about diet during hospital stays and at the time of discharge (D'Souza, 2003; Shakya, 2006). For example, yogurt, meat items, sour items such as lime, tomato and etc., some fruits and vegetables are not recommended for those with a high fever; nor are brinjal, fish and honey for patients undergoing minor or major surgeries (Shakya, 2006; Subedi, 2010; Ulak *et al.*, 2012; Acharya, 2013). This thesis obtained that the majority of the mothers' attitudes were occupied with food beliefs (Tables 4.7 and 4.17; Section 5.8) mainly from the following environments: patients counselling system, Ayurvedic and Yunani medical practices, healer's practice and multiple opinions (diversified views) which are influenced

by existing cultural and religious environments (Simkhada *et al.*, 2010; Acharya, 2013; Ellahi, 2014; Acharya, 2015; Acharya *et al.*, 2016; 2017).

Focus group participants of this thesis also explored food beliefs. Some FGD members mentioned that generally, doctors provided pre-and postoperative counselling along with guidance on dietary patterns (Section 5.8) and the practice of various groups such as Ayurvedic, healers/shamans and religious groups (Acharya, 2013). For example, for the initial few weeks, patients who had cataract surgery are made aware about hard and chewable foods such as meat with bones, dried fruits including nuts, betel nuts, dry dates, popcorn, roasted chickpeas and peas which believed that these food habits may effect on the operated eyes (Jimba *et al.*, 2003; Acharya, 2013).

In addition, FGD participants indicated that people of this society are also influenced by food beliefs which are learnt from cultural and religious ethics (Section 5). These are also transferred from reading Hindu texts, watching religious films and TV serials (Khare and Rao, 1986; Biza-Zepro, 2015). Food beliefs are also varied based on ethnicities and religions (Stone, 1976; Storer, 1977; Telushkin, 2009; Spector, 2013). For example, meat items, alcohol, garlic, onions, aubergines and many more items are totally prohibited during religious events such as the funeral ceremony, *Shraddha* (the annual commemorative ceremony in honour of deceased family members) and *Pooja (Rudri, Puran)* (Culture of Nepal, 1994). This is similar in Brahmin and Chhetri ethnicities whereas it is found to be quite different in the Janajati ethnic group even though they belong to the Hindu religion (Dahal *et al.*, 2002; Purnell, 2009; Telushkin, 2009). In Nepal, food-related beliefs are also disseminated and re-enforced by traditions and rituals (Stone, 1976; 1986; Aunger, 2000).

The researcher of this thesis, who is from Nepal, also remembers his own childhood life which was embedded with numerous food beliefs under the guidance of his mother and grandmothers (Bezner-Kerr *et al.*, 2008; Subedi, 2010; Upreti and Müller-Böker, 2010). For example, the researcher's mother strongly believed (Purnell, 2009) that eating rat's meat and drinking alcohol would help to keep away various ailments, especially those concerning the stomach and digestive system (Drewnowski *et al.*, 2005; Handzo, 2009; Telushkin, 2009; Alonso, 2015). Similarly, the

researcher's grandmother never allowed the eating of dairy products and meat items at the same time (D'Souza, 2003; Bezner-Kerr *et al.*, 2008). Her main motivation was to prevent the researcher from experiencing severe diarrhoea, dysentery, and vomiting, or leprosy (Stone, 1976; Pool, 1987; Acharya, 2012; Spector, 2013). The researcher also has noted that most Asian and African communities based in the UK are living under their own religious norms and values. So, by having food beliefs, they celebrate their own festivals and rituals in the UK, thus, they are strongly embedded with own cultures and religions (Dunn *et al.*, 2005; Ellahi, 2014). However, in regards to food beliefs, the present research perceived similar results as detailed above; the mothers were still practising the same cultural beliefs in this society (Christian *et al.*, 2006; Subedi, 2010; Ellahi, 2014).

As seen in a study by Nizami and Bhutta (2008), the notions of food beliefs came from Ayurvedic or old Greek systems of medicine. Consequently, Greek ideas about the classification of food items and ailments are widespread and intensely embedded amongst the overall population (Kleisaris *et al.*, 2014). All people in the society, including homoeopaths and doctors, utilize the theory of cold and hot food beliefs when considering diseases (Stone, 1976; Christian *et al.*, 2006; Shakya, 2006; Subedi, 2010; Upreti and Müller-Böker, 2010). Belief and faith in classified food items, such as the cold and hot effects of diet, is widespread in most parts of the globe (Stone, 1976; Miller, 1979; Purnell, 2009). According to Inam *et al.*, (2003), the origin of this theory begins in the 5th century BC in the work of Hippocrates whilst in India; this belief appears as early as the 2nd century BC. It is widespread in most of the religious groups regarding what kind of food can and cannot be consumed (Mayer-Rochow, 2009). Similarly, Buddhists are commonly vegetarians but most of them eat certain meat, whereas Hindus are often vegetarians who do not consume meat items due to their strict food beliefs (Mayer-Rochow, 2009).

Similarly, Ellahi (2014) revealed that food beliefs or misconceptions commonly exist amongst South Asian communities in the UK, particularly with regard to food and health behaviours (Ingram *et al.*, 2003). Colding and Folke (1997) noted that when specific taboos are considered to be given by God and hence play a considerable role in the religious or cultural belief system.

Ingold (1994) and Meyer-Rochow (2009) added that it is usually seen as part of a larger plan to protect the followers and defend them against evil. In effect, these circumstances set in motion an unchallenged negative impression about colostrum which is widespread amongst rural and urban mothers of Nepal (Table 4.18; Section 5.8) (Sah, 2005; Odent, 2011). These phenomena, however, have been poorly defined by existing literature (Christian *et al.*, 2006; Shakkya, 2006; Subedi, 2010).

Biza-Zepro (2015) stated that it is commonplace for the youngest and weakest children to be at an additional disadvantage in family food sharing in some conservative cultures in Ethiopia. According to Mayer-Rochow (2009), taboos indicate fairly well understood social rules that regulate human behaviour. Mostly, a taboo bans an individual from doing something which is prohibited by members of the society who regard it as inappropriate or unacceptable.

Every society has its own values, norms, beliefs, customs and practices regarding health, diseases and intake of food (Christian *et al.*, 2006; Shakkya, 2006; Upreti and Müller-Böker, 2010). Concerning food beliefs, Stirrat and Pfaffenderger (1983) revealed that in Sri Lankan culture, people believed that oily foods are considered to be chosen by the demons. Therefore, eating fried and oily foods by women during menstruation causes such a girl to become extra susceptible to evil influences (Stirrat and Pfaffenderger, 1983). In regard to food beliefs, this thesis also found same perceptions (Section 5.8) as discussed above. Most of this study population fits in one of two generations, the new (below 40 years of age) and old (over 40 years), who generally contradict each other about food and health-seeking behaviours (Christian *et al.*, 2006; Acharya, 2013). These two generations are embedded with food beliefs including cultural and religious misconceptions and generally, they are responsible to transfer it from one to other generation (Astin, 1998; Inam *et al.*, 2003; Ingram *et al.*, 2003; Acharya, 2013). Besides this, religious institutions (churches, mosques, and temples), senior citizens and some medical practitioners (Ayurvedic, Yunani, Traditional/Spiritual Healer and Quack) and health professionals are also to be blamed (Stone, 1976; Miller, 1979; Shankar *et al.*, 2006; Nizami and Bhutta, 2008).

On the other hand, the religious texts of Hindus, Muslims, and Christians, as well as religious films (Indian and Urdu) and some TV serials (Nepali, Hindi or Urdu) are also partially responsible for this (Korda and Itani, 2011; Seher, 2012; Rannamets, 2015). Traditional societies often focus narrowly on traditional medicine (Novella, 2012; George *et al.*, 2013). If any complications occurred in an individual by consuming any healthy foods, it will rapidly spread (Jack *et al.*, 2010) negative impact of the healthy food within the community (Sharma, 2002; Shakya, 2006) and thus, an individual case will become an evidence-based rumour which will only further become the notion that the particular healthy food will be banned (McNab, 2009; Dredze, 2012). For example, if the child gets a running nose after consuming a banana or any fruits during the winter, this issue becomes viral within this community. Consequently, children are not allowed to take fruits during the winter (Acharya, 2013; Ellahi, 2014). This thesis marked engrained negative or positive beliefs about what is and is not nutritious food (Lobstein and Davies, 2008). In Nepal, food-related beliefs were highly diversified across the various ethnic groups (Kakute *et al.*, 2005; Shakya, 2006; Biza-Zepro, 2015; Acharya *et al.*, 2017).

Mothers-in-law and mothers of pregnant women are imposing restrictions on certain food items such as green leafy vegetables, fruits, and some staples for children and/or pregnant and lactating women (Sharma and Kanani, 2006; Bezner-Kerr *et al.*, 2008; Madhu *et al.*, 2009). Moreover, mothers and mothers-in-law have shared bad experiences about colostrum (Odent, 2011); whereas health workers are encouraging it for feeding (Sharma and Kanani, 2006). Ultimately, new mothers do not use it because they are obliged to follow the injunctions and guidance of their mothers and yet have to increasingly consider the different perspective of health workers, hence multiple opinions have developed which make mothers confused (see Appendix 10). Storer (1977) and Shatenstein and Ghadirian (1998) have also shown that in some communities some mothers avoid providing an excessively healthy diet to pregnant women because they believed that inside the body the baby gets bigger and mothers will have difficulty in giving birth (Christian *et al.*, 2006; Das *et al.*, 2013). However, most of the study population use some form of food classification (see Appendix 14) under the cultural beliefs regarding suitable or unsuitable

foods for those in special physiological states (Stone, 1976; Subedi, 2002; 2010; Acharya, 2013). Based on cultural beliefs, certain foods are considered inappropriate for women, infants, children, pregnant or lactating women, the sick and the elderly (Christian *et al.*, 2006; Shakya, 2006; Acharya, 2013). The concept of cold and hot diets is relatively common in Nepal, but the standards for categorizing food as cold and hot (see Appendix 14) are not clear because they are not based on scientific principles or logic (Stone, 1976; Christian *et al.*, 2006; Shakya, 2006).

Jimba *et al.*, (2003) and Shanker *et al.*, (2006) have mentioned dietary patterns associated cultural norms and commonly prescribed by Tibetan/ spiritual healers throughout Nepal (Stone, 1976; Poudyal *et al.*, 2005; Kloos, 2008). These practices are also one of the encouraging factors of food beliefs (Aryal, 2014) in Nepal. Beliefs have an impact on food selection, planning, distribution and ingestion which exist in one form or another in virtually all human cultures (Shakya, 2006; Subedi, 2010). Furthermore, there are several causes and effects of dietary taboos. In numerous cultures, dietary rules and consumption have been guided by religious and spiritual sources as well as the considerations and factors which attach to both (Stone, 1976; Storer, 1977; Shankar, 2006; Kloos, 2008). Some food taboos have been created to protect individual health, with certain items prohibited because they are thought to make a person unhealthy (Kloos, 2008). Research conducted by Nizami and Bhutta (2008) and Mayer-Rochow (2009) also delineated similar notions about food-related beliefs.

The spiritual and traditional supporters or advocators usually are Hindu (Subedi, 1999; Tamang and Broom, 2010) thus in the rural areas of Nepal, many traditional beliefs continue to exist; for example, leprosy is believed to be caused by sin in one's past life or to be a curse from God (Acharya, 2012). Thus, some mothers still believe that the condition of malnutrition (Abubakar *et al.*, 2011) is also not due to lack of food or poor recommendation of healthy food, but due to devil's eyes and witchcraft (Dunn, 2015; Evans, 2015). The comparative results between urban and rural localities of this study suggested that there is no significant difference in food beliefs (Table 4.17) (Barer-Stein, 1999; Christian *et al.*, 2006; Subedi, 2010) because most of the respondents were formerly the rural residents (Bryden, 2001; Gurung, 2001; Bhagat, 2005) who

had migrated to urban areas (Basnett, 2009; Koehler *et al.*, 2009; Upreti and Müller-Böker, 2010). Therefore, their food-related beliefs and practices were still based on their original rural culture, albeit in a different setting (Ahmed *et al.*, 2003; Ali *et al.*, 2005; Dunn, 2015; Evans, 2015).

Acharya (2013) measured the food belief and practices among postoperative patients particularly during the postoperative period in various departments of teaching hospitals of Kathmandu city. The findings of this were very interesting as almost all respondents (89%) had strong food beliefs. Furthermore, the key food such as potato, fish, egg, ginger, meat, garlic, onion, and pulses was avoided by the postoperative patients (Stone, 1976). The patients believed that these protein-rich foods develop pus at surgical location sites. Acharya (2013) further claimed that citrus fruits, dairy products, fish, meat, and eggs were also avoided during postoperative care periods. But they were agreed to take fibre containing foods which needed to prevent constipation. Acharya (2013) found that a majority of the respondents replied that food beliefs have been practised since ancient times. However, this thesis discovered some similar findings around food beliefs (see Tables 4.17-4.18). With regard to food beliefs, maternal knowledge, attitudes, and practices have been fuelling and reinforcing by influencing factors such as policy, family environment, resources, cultural and religious environments. These influencing factors affected mothers' knowledge, attitudes, beliefs, and practices either positively, negatively or neutrally ultimately controlling over on food and health-seeking behaviours (see Appendix 10). However, diversified views (multiple opinions) help to cause malnutrition in mothers and children in Nepal (Acharya *et al.*, 2015; Shrestha, 2015).

Adhikari (2010) has defined key insights about malnutrition in communities where the majority of children are underweight and stunted. These community's beliefs are unrealistic and are in conflict with moderate forms of malnutrition, which would be unacceptable as public health problems (Yadav *et al.*, 2013). Furthermore, Adhikari (2010) has mentioned community terms for the malnourished children, for example, *runche* or *sato gayeko* (a crying child), *sukenas* (see Definitions 25 on pg. xxvi) (drying up) for marasmus, and *phukenas* (swollen up) (see Definitions 26 on page xxvi) for kwashiorkor for children suffering from malnourishment, which people

believe are caused by evil spirits or being touched by pregnant women, but are actually due to inadequate feeding which parents never realise (Stone, 1976; Subedi, 2010; Odent, 2011). Adhikari (2010) found care-seeking behaviour during common childhood illnesses is a crucial factor of nutritional status. However, this thesis found that child feeding practices were poor which was linked directly with cultural and religious norms and values (Biza-Zepro, 2015). This thesis strongly agreed with the major outcomes that Adhikari (2010) discovered such as food beliefs, knowledge about the sign and symptoms of malnutrition, and culturally enrooted food and health-seeking behaviours (see Tables 4.17-4.18; Sections 5.4, 5.8).

6.3.2 Beliefs about breastfeeding and colostrum

This section discusses cultural beliefs about breastfeeding and colostrum in the study population. This thesis uncovered factors that were associated with negative (traditional culture) beliefs about breastfeeding and colostrum (Paneru, 1981; MMWR, 2007; Bezner-Kerr *et al.*, 2008; Spector, 2013) (see Table 4.8). The majority of the group of mothers (71%) believed that colostrum is a highly nutritional substance and is essential for new-born babies, but more than one-quarter of the group of mothers (29%) are still not aware of this. The data suggest that over one-quarter of the mothers (27%) still believe that colostrum is a form of pus, a toxic and a dirty substance (Table 4.8), however, the majority of the group of mothers (73%) disagree with this (Kakute *et al.*, 2005; Odent, 2011). A small group (12%) stated that colostrum should be discarded because either a child will be vulnerable to vomiting, diarrhoea, and constipation or will become unhealthy later in life (Table 4.8) (Christian *et al.*, 2006; Odent, 2011).

Interestingly, nearly one-fifth of the group of mothers (19%) reported that senior members of the family and healers discouraged the feeding of colostrum (Beza-Kerr *et al.*, 2008; Odent, 2011). The result shows that 15% of the group are completely against long-term breastfeeding. This thesis showed that urban mothers have more positive beliefs about breastfeeding than those of rural mothers (see Table 4.18). However, there was no difference found between rural and urban mothers on the practice of colostrum (see Table 4.18) (MMWR, 2007). Some urban mothers still negative beliefs about colostrum which reflect migration factors (Arzoaquoi *et al.*, 2015).

(Sapkota, 2010). Many migrated mothers, from rural areas, are still practising their traditional culture's traditions regarding food and health-seeking behaviours in the urban area (Ellahi, 2014; Arzoaquoi *et al.*, 2015). In regard to food beliefs, urban mothers presented controversial results (see Tables 4.16 and 4.18).

The FGDs also confirm that most mothers have entrenched negative beliefs about both giving their baby colostrum and long-term breastfeeding (Gracey *et al.*, 1996; Acheampong and Haldeman, 2013). All the FGDs shared their experiences which they learnt from community members. Mother groups, ANMs, social workers and spiritual healers are inclined towards negative thinking about breastfeeding and colostrum compared to that of health workers, pharmacists, and policy-makers. Section 5.8 highlighted that mothers with low literacy levels gave an in-depth explanation of their ideas about using colostrum and long-term breastfeeding (Gracey *et al.*, 1996; Acheampong and Haldeman, 2013). Considering the results of the FGD, they virtually agreed that the low opinion of breastfeeding and colostrum is strongly influenced by religious, social and cultural issues (Gill *et al.*, 2004). Religious and cultural anecdotes are one of the major factors for low levels of breastfeeding (see Section 5.8) (Joshi *et al.*, 2012). Similarly, a group of traditional spiritual healers was found to be particularly negative regarding breastfeeding and colostrum (see Section 5.8) (Culture of Nepal 1994; de Boer *et al.*, 2004).

WHO (2001) has recommended breastfeeding as one of the major psychological therapies for a mother and the baby. Thus, Armstrong *et al.*, (2015) claimed that the concept of psychological therapy encouraged mothers to exclusively breastfeed their children. Similarly, Horta *et al.*, (2007) stated that breastfeeding helps to reduce maternal morbidity and child mortality. For instance, McCann *et al.*, (2007) and Mannion *et al.*, (2013) revealed that women trust that breast milk is the best food for children but they are only minimally aware that breastfeeding reduces some particular health hazards.

With regard to breastfeeding in Nepal, the NDHS (2011) projected that within the first hour of birth only 45% of children are breastfed, and within a day 85% of children are breastfed. Roughly a quarter of babies are nourished with a pre-lacteal feed. The NDHS (2011) found that nearly 70%

of babies are breastfed up to six months after birth and 88% of babies are breastfed for at least one month. Breastfeeding is widespread in Nepal (70% of children of age 6–9 months), and the average duration of breastfeeding is 34 months (NDHS, 2011). Although the initiation of breastfeeding improved slightly between 2001 and 2006, and exclusive breastfeeding increased substantially between 2006 and 2011, the current level of exclusive breastfeeding is similar to what it was in 2001. This may be influenced by misconceptions (Paneru, 1981; Bunik *et al.*, 2006; Bezner-Kerr *et al.*, 2008). A mother's milk is the best food for infants (Paneru 1981; WHO 1991) which is also recommended by WHO. WHO recommends supplemented breastfeeding to be continued up to two years or more, whilst the American Academy of Paediatrics (AAP) recommends continuation for at least one year after the age of six months (WHO, 2003; Gartner *et al.*, 2005). Furthermore, Mullany *et al.*, (2008) stated that exclusive breastfeeding practice has important effects on child survival and mortality.

In Nepal, exclusive breastfeeding in educated mothers, who are those in the highest wealth quintile, that tend to be less than lowly educated mothers (Joshi *et al.*, 2012; Armstrong *et al.*, 2015) which seems to be deteriorating generally in the city and urban areas (NDHS, 2006; 2011; Joshi *et al.*, 2012). The trend of feeding babies, colostrum or pre-lacteal feeds seems stronger amongst mothers in the richest wealth quintile (Groleau *et al.*, 2006; Joshi *et al.*, 2012). In reality, well-off and educated mothers are very conscious about long-term breastfeeding because they believe that it may affect their health which is more common in urban areas than in the rural ones (Gill *et al.*, 2004; Gartner *et al.*, 2005; Joshi *et al.*, 2012; Acharya *et al.*, 2017).

It was noticed that the concept of mothers of the Kaski district regarding breastfeeding and its long-term effects are completely at variance along with the evidence of long-term effects of breastfeeding according to the findings of Horta *et al.*, (2007). This thesis has found that mothers' beliefs about long-term breastfeeding can be negative resulting in a poor breastfeeding rate (53.1%) in Nepal (NDHS, 2011; Joshi *et al.*, 2012). Manjeshwori *et al.*, (2012) conducted one study in Bhaktapur, Nepal, which showed the prevalence of exclusive breastfeeding at one; three and six months resulted as 74%, 24%, and 9%, respectively (Joshi *et al.*, 2012). Cultural food

taboos and beliefs, deeply rooted in some communities, were found to influence breastfeeding practices (Kakute *et al.*, 2005; Vaughan, 2011). These taboos and beliefs were also major determinants influencing perceptions of breastfeeding practices (Vaahtera *et al.*, 2001; Kakute *et al.*, 2005; Christian *et al.*, 2006; Odent, 2011). Kramer and Kakuma (2012) revealed that breastfeeding is accepted as a priority area of health globally however in Nepal, it is differently perceived by the group of mothers. This may be due to influences of culture, poor education and religion (Appendix 10) (Shirima *et al.*, 2001; Bezner *et al.*, 2008; Ulak *et al.*, 2010).

With regard to breastfeeding and colostrum, numerous beliefs and misconceptions still exist in this community, resulting in completely diverse ideas between ethnic groups based on the multi-religious and multicultural make-up of society (Paneru, 1981; Slusser, 1982; Joshi *et al.*, 2012; Spector, 2013). Yadav *et al.*, (2013) discovered that one-fourth of mothers did not initiate breastfeeding within one hour of delivery whereas the majority of mothers (85.7%) fed colostrum to their children due to cultural beliefs (Odent, 2011).

However, many studies have been conducted in Nepal on child feeding including breastfeeding (i.e. Rai *et al.*, 2001; Onta, 2003; Sah, 2005; Sudo *et al.*, 2005; Odent, 2011; Yadav *et al.*, 2013; Shrestha, 2015), all these studies were associated with various factors such as mother's poor knowledge and education, poverty or economic burden, poor feeding practices, food beliefs, traditional food behaviours, and taboos that are strongly embedded in cultural or religious issues (Adhikari, 2010). This thesis agrees with literature discussing breastfeeding beliefs (see Tables 4.7, 4.8 & 4.18).

Odent (2011) investigated about early infant feeding practices and neonatal mortality across two trial surveillance area of Makawanpur and Dhanusha districts. The study focused on the discarding colostrum and neonatal mortality and Odent (2011) found that discarding colostrum was associated with child mortality in both districts ($p < 0.0001$; $p < 0.043$). Additionally, Odent (2011) discovered that there were great differences in the perception of colostrum feeding. However, practices of disposal of colostrum included squeezing out small volumes of early breast milk before feeding the new-born. Odent (2011) suggested that disposal of colostrum signifies an

essential dimension of early infant feeding in addition to breastfeeding start time, with implications for policy and research (Horta *et al.*, 2007). In regard to mothers' perceptions of colostrum, this thesis was also very close to Odent's (2011) findings. A majority of the mothers contradictorily responded that colostrum is good for new-born but it needs to be squeezed out before initiation (Table 4.18). Urban mothers' perceptions towards colostrum were more critical than those of rural mothers (16.8%:10.1%). They also believed that long-term breastfeeding is a danger to the mother's health (Gartner *et al.*, 2005; Joshi *et al.*, 2012; Ulak *et al.*, 2012

Ulak (2012) examined the factors influencing breastfeeding including exclusive breastfeeding practices, and infant feeding patterns in Kathmandu Valley. Ulak (2012) observed that mothers may introduce supplementation to the baby, before six months, due to insufficient breast milk. Ulak (2012) also found poor counselling on breastfeeding during the antenatal visit. With regards to the feeding of colostrum, there were some differences observed between Odent (2011) and Ulak (2012) as well as initiated breastfeeding within one hour of delivery. Ulak (2012) emphasized counselling to mothers who may help to reduce child morbidity and the mortality rate as well as the malnutrition problem in the community (Horta *et al.*, 2007). However, this thesis discovered a similar perception on breastfeeding practices as Odent (2011) and Ulak (2012), which added to the already high prevalence of malnutrition in Nepal (Shrestha, 2015; Acharya *et al.*, 2016). On the other hand, mothers' perceptions about breastfeeding and colostrum are strongly influenced by various factors including diversified views (Appendix 10) (Henry, 2014; Acharya *et al.*, 2017). If mothers are being educated focusing on these key influencing factors, there is the potential for this community to be free from malnutrition (Sah, 2005; Henry, 2014).

The analyses of the survey questionnaires and FGD in this study identified misconception of breastfeeding practices are highly complex which is strongly embedded with existing cultural and religious environment. The mothers are strongly associated with their cultures and religions which are highly diversified, for example, food beliefs were observed to vary according to culture, religion, and ethnicity (Sah, 2005). This would support the notion that mothers' views can be improved if an awareness-raising strategy was implemented in both urban and rural locations

including refresher training to the mothers. The results of qualitative and quantitative research indicate that misconceptions about breastfeeding including colostrum practices are significantly associated with the cultural and religious environment (Odent, 2011).

6.4 Attitudes

It is very difficult to describe beliefs and attitudes separately because they are strongly correlated to each other (Eagly and Chaiken, 2007; Subedi, 2010). It is also hard to measure what is considered to be a healthy diet (Fieldhouse 1995; Goldman and Heuveline, 2000). An attitude is a significant aspect of human behaviour which is influenced commonly by culture (Desmet *et al.*, 2015). Eagly and Chaiken (2007) stated that an attitude is a psychological tendency voiced by assessing specific entity with some degree of favour or disfavour. Moreover, attitudes cannot be observed and can only be inferred from responses to questions.

This thesis data showed that 67% of the group of mothers confidently said that nutritious foods help to keep their children healthy and with better immunity, whereas 33% do not (see Tables 4.8, 4.16) (Gittelsohn *et al.*, 1997). Likewise, 16% and 20% of respondents said that they were not giving anything to eat to their children during illness, as per advice by health workers and spiritual healers respectively (Table 4.9) (Acharya, 2013). Similarly, the reasons behind for not providing nutritious food to the children were as follows: 23% respondents said it is due to cultural beliefs of society, 40% of the mothers said children do not like to eat it, and 19% said due to fear or tension (Gorstein *et al.*, 1994). Regarding the health-seeking behaviour of mothers, only 52% children were taken to a doctor or health institution, whereas 6% of children kept at home during the illness and 17% children were taken to a spiritual healer, which half of the children visited less than twice, 16% multiple times and 27% never visited (Table 4.8).

Two-thirds (67%) of the mothers said that the regular feeding of healthy food helps to keep the child healthy and increase immune function whereas 9% of the mothers said it was just for survival and 11% of the mothers remarked just to fill the stomach (Gittelsohn, 1991). Similarly, mothers' attitudes on providing fruits and green vegetables to a child during the sickness, 19% of

the mothers showed negative attitudes, whereas 70% have positive attitudes and 11% of the mothers did not respond (see Table 4.8). On the other hand, a large majority of the mothers (70%) agreed to keep their child healthy by providing fruits and green vegetables regularly during normal health, 8% responded it caused harm to child health, 7% said to protect their child from the evil eye, and 15% of the group has no knowledge or is not familiar with it (Table 4.8). Nearly 7% of the respondents believed that fruits and green vegetables protect a child from the evil eye (Gorstein *et al.*, 1994; Subedi, 2010).

These thesis findings show the negative attitudes were strongly associated with food and health-seeking behaviours amongst the mother of urban and rural areas (Eagly and Chaiken, 2007). With regards to using the toilet, 33 individuals (6%) did not answer because of the cultural practice and social stigma (Jenkins *et al.*, 2014). The respondents might be hesitated to talk with the researcher about defecation system which exists within their households and generally, these people do not like to debate in the public area on this issue (Aryal *et al.*, 2015). For example, green vegetables are degraded in some communities because these items are generally consumed by poor people, including beggars, and are widely available and inexpensive (Gillespie *et al.*, 1996; Gittelsohn *et al.*, 1997; Giles *et al.*, 2007). Degradation and devaluation of green vegetables are still common in the Terai area (Sah, 2005; Christian *et al.*, 2006) whereas consumption of green vegetables is culturally and socially dominant in some communities (Gibson *et al.*, 1998; Fotso and Kuate-Defo, 2006). The negative perception of the consumption of green vegetables amongst high-ranked households still exists, and it is assumed that they are being regarded as greedy in society if these vegetables are consumed regularly (Sah, 2005; Gaman and Sherrington, 2013). Another good example of the negative attitudes most of the mothers were not providing healthy food to children during sickness due to fear and poor confidence (Giles *et al.*, 2007; Jenkins *et al.*, 2014; Sluik *et al.*, 2015) (see Tables 4.8 and 4.16).

Martoll *et al.*, (1998) stated that a low-birth-weight baby is prone to developing several health problems such as poor cognitive skills, higher risk of childhood morbidity and mortality, and impairment of growth. Similarly, Christian *et al.*, (2006) clearly demonstrated about food

recommendations to pregnant and lactating mothers, who were revealed to have a critical diet excluding eating green leafy vegetables and fruits (Christian *et al.*, 2006; Shakya, 2006). He explained that some believed that eating these can cause harm to the baby as well as themselves (Acharya *et al.*, 2015). Similarly, decreasing food intake during pregnancy involves a higher risk of preterm delivery (Christian *et al.*, 2006). Thus, it is one of the main reasons for low birth-weight babies born in Nepal (Seiga *et al.*, 2001; Simkhada *et al.*, 2015).

King and Bruner (2000) noted that the effects of social prestige may be more prevalent amongst certain groups. For instance, food choice varies between elderly and young women. Lawrence *et al.*, (2007) also discovered that food choices which are made by girls and young women in society are often very different from those of their elders. On this issue, Turconi *et al.*, (2015) demonstrated that it is very difficult to provide a variety of food to children where there are no options for food choices; something very different from the situation of food systems of developed countries.

Karkee *et al.*, (2014) investigated breastfeeding attitudes and supplementary feeding practice information collected from a cohort of pregnant women of the central hills of Nepal. Karkee *et al.*, (2014) claimed that attitudes towards breastfeeding were positive in the population. Furthermore, they stated that 11% of pregnant women thought of breastfeeding was unenjoyable. However, this thesis report has also discovered similar outcomes on infant and child feeding practices, mainly issues around maternal attitudes and beliefs (Tables 4.8 & 4.16). Other studies on attitudes towards infant and child feeding practices conducted in Nepal have shown similar findings (Sah, 2005; Sudo *et al.*, 2005; Yadav *et al.*, 2013). Christian *et al.*, (2006) examined the food-related beliefs, attitudes, and practices among the pregnant women to reducing healthy food intake during the pregnancy. The women's attitudes while recommending a healthy food to their children are based on what they learnt from their own during the pregnancy and lactating. But this thesis showed that mothers' attitudes were perceived as negative towards healthy food especially during their child's sickness. Thus, this thesis evaluated mothers' knowledge, attitudes, and practices

about healthy diet including food recommendation for children, whereas Christian *et al.*, (2006) examined the tendency of mothers, particularly during pregnancy in rural part of Nepal.

6.5 Child feeding practices, food situations & barriers

This section discusses the findings about existing child feeding practices, food demand by children, trends of food recommendation by parents, and major influencing factors (diversified views) (Sah, 2005; 2011; UNICEF, 2012). Food barriers and their causes are also discussed. This thesis found more than one-third of mothers (36%) do not provide animal products regularly, and more than a quarter (26%), don't have green vegetables daily (Dibley *et al.*, 2010; Das *et al.*, 2013). Nearly one-third of the mothers (29%) did not provide fruits, nearly one-fifth never gave snacks with salad, and a quarter did not regularly provide meat items to their children (see Table 4.5). The main reasons for poor feeding practices were mostly a result of existing food-related beliefs and culture (Das *et al.*, 2013) and also may be due to child preference.

Feeding pattern issues were openly discussed in the FGDs, where all participants agreed on the common themes (Sections 5.5-5.6) according to which there were not any specific schedule for feeding practice and no dietary regulations existing in this population (Dibley *et al.*, 2010; Das *et al.*, 2013). In this community, the feeding practice is based more on the availability of food rather than a choice made amongst all food. It is due to the scarcity of food as well as diversified cultural and negative attitudes (Henry, 2014), with a low level of awareness about child care (Pandey *et al.*, 2010; Sah, 2011). The majority of this group of people was poor and had low socioeconomic status and could not afford expensive and luxurious items (Pandey *et al.*, 2010; Sah, 2011; Das *et al.*, 2013; Haws *et al.*, 2017). With respect to this, the feeding pattern depended on the availability of food items and was also highly influenced by cultural and religious beliefs (Section 5.5); these beliefs generally prevent the feeding of children being informed by nutritional science (Das *et al.*, 2013). Urban mothers generally adapted to the issues surrounding food beliefs better than their rural counterparts (Storer, 1977; Shakya, 2006; Subedi, 2010; Acharya, 2013).

In Nepal, food recommendations were found to be based on the availability of the given food items in households. The mother's main tendency was to provide all types of food, and also, they seemed slightly diverted towards ready-made food (Hewitt *et al.*, 1998). Nearly half of the mothers regularly provided ready-made food whereas more than half (57%) of the children demanded it, according to their mothers (Table 4.7). Nearly a fifth of total children did not have any food choices. Similarly, more than 50% of the mothers were feeding their children only rice with animal products regularly (dairy and meat items) whereas rice with lentil soup, vegetables, and soft foods was less common (Table 4.7) (Desmet *et al.*, 2015).

Urban mothers generally were more likely to provide ready-made foods compared to rural mothers (Aemro *et al.*, 2013; Yadav *et al.*, 2013). Whilst there were no dissimilarities between rural and urban mothers on feeding rice with lentil soup, vegetables, and soft food items (Table 4.19) (Gibson *et al.*, 1998; Yadav *et al.*, 2013). Also, rural children were more likely to prefer ready-made food items than children in the urban area. Regarding food demand, mostly rice with meat items, vegetables, lentil soup and fruits, this thesis data showed that rural children had a less demand than urban children (3.2%: 11.1%). A large number of mothers started feeding solid food to their children at the age of three to six months, usually feeding three to four times a day (Table 4.3). A father's contribution to child care, including feeding, was very poor, even more so than siblings and for neighbours (see Table 4.3). This is mostly due to the social patriarchal construction of Nepalese society (Adhikari 2012; 2013). All participants of FGDs agreed that ready-made foods were popular (Section 5.7), due to media promotion. In general, the media plays a major part as a particularly influential factor to increase the use of ready-made food items (Appendix 10) (Giles *et al.*, 2007; Dredze, 2012). Advertising has produced iconic food images and entices in the form of various attractive animations and stories (Gittelsohn *et al.*, 1997). The main reasons for the popularity of ready-made food items are that they are available at any time, are tasty and have attractive packaging (Sah, 2005; 2011).

With regard to problems related to food recommendations, this thesis also revealed that 40% of the mothers said that children's dislike of homemade food items due to monotonous taste and

24% of the mothers said that maternal poor knowledge impacted on poor quality of food which prepared at home (Dibley *et al.*, 2010). More than one in five (21%) of mothers said a large family size leads to family pressures or conflicts due to financial constraints (Appoh and Krekling, 2006). Besides these, 23% of the mothers stated the cultural beliefs also negatively influenced the food recommendation to children (Table 4.9). Similarly, a low confidence level in mothers about child feeding also created fear or tension, mainly during the child sickness. Negligence in child health or poor knowledge about Infant and Young Child Feeding Practices (IYCFP) and childcare were also observed to be substantial barriers (Table 4.9) (Dugdale *et al.*, 1979; Gibson *et al.*, 1998). Similarly, other obstacles to food recommendations were associated with women's empowerment, existing beliefs and the absence of mothers or caretakers (Shakya, 2006; WHO *et al.*, 2008; Upreti and Müller-Böker, 2010; Karkee *et al.*, 2014). More than one-third of the mothers (35%) had no problems accessing and providing nutritious food regularly (Table 4.9). Interestingly, urban mothers normally faced these problems more than rural mothers. In urban areas, most were fairly dependent on the market, which sometimes may be closed due to various reasons such as political strike, natural disasters etc., making it very difficult for mothers to manage the situation in an efficient manner (Basnett, 2009; Das *et al.*, 2013). On the other hand, knowledge, affordability, availability and cultural beliefs were also important determinants which create problems for getting food items from the market (Sibeko *et al.*, 2005; Subedi, 2010; Karkee *et al.*, 2014). Poor resources influenced the food security and it affects particularly for the disadvantaged group of this study population which support to increase nutritional problem (Das *et al.*, 2013). The findings of this thesis support the above-mentioned statement (see Table 4.20-21; Section 5.5).

There is a need for more debate over healthy diets and dietary patterns (Stone, 1976; Ellahi, 2014; Henry, 2014). Besides this, if we are surrounded by multi-religious, multicultural and multi-ethnic environments (Bennett *et al.*, 2008; Subedi, 2010; 2011; NDHS, 2011), we could have huge confrontations regarding a healthy food and health-seeking behaviours (Higgs and Thomas, 2016; Henry, 2014). In every society, there are debates over various nutrients and food items such as

carbohydrates, protein, alcohol, nicotine, fat, coffee, sugar, tea or salt and whether these are good or bad for our health (Christian *et al.*, 2006; Ellahi, 2014; Higgs and Thomas, 2016). Actually, there is substantial agreement on food and health-seeking behaviours among the professionals or experts, but the public is conflicted (Ellahi, 2014). Thus, this thesis used the several questions, about healthy foods, which are associated with the research objectives (see Section 2.13.1), mothers and stakeholders (see Appendix 4a-b). Mothers' knowledge, attitudes, beliefs, and practices were affected by various factors such as resources, policy, and religion (Appendix 10) which support to generate positive, negative and neutral feelings about nutritious foods, and ultimately these feelings embark upon a food and health-seeking behaviours. The researcher of this thesis argued that a lot of poor and religious people have opinions that are not based on scientific evidence (Christian *et al.*, 2006; Henry, 2014). Thus, this thesis has not only discovered a new knowledge also added to literature and filled a gap in the literature in the field of public health nutrition. This new knowledge is termed 'diversified views' (Henry, 2014; Acharya *et al.*, 2017). The next paragraph highlights diversified views.

One of the key objectives of the thesis is to evaluate the major barriers to the food and health-seeking behaviours amongst the mothers and stakeholders (Section 2.13.1). Further, it is also to discover the food recommendation and influencing factors (Ruel, 2008; Paudel *et al.*, 2013). At this point, this thesis has identified a new element which termed diversified views which are associated with the objectives ii & viii (see Section 2.13.1). It appears that knowledge, attitudes, beliefs, and practices are influenced by various factors and people (Ruel, 2008). This process creates positive, negative or neutral insights that affect food recommendations and health-seeking behaviour of mothers (Adhikari, 2010; Henry, 2014; Karkee *et al.*, 2014; Shrestha, 2015). The findings of quantitative research demonstrated that mothers' knowledge of (a) nutritious food and (b) signs and symptoms of malnutrition; and (c) attitudes and beliefs towards healthy diets were inconsistent (see Tables 4.4, 4.6, 4.8-4.9, 4.11, 4.13-18). Similarly, the FGDs with stakeholders also reported that mother's children's mother seems strongly associated with existing cultural and religious norms and values (Ludwig *et al.*, 2011; Biza-Zepro, 2015) which resulted in

inconsistency on identifying and recommend healthy foods to their children due to in community beliefs and behaviour (see Sections 5.3, 5.5-6, 5.8). These results indicate that maternal knowledge and attitudes on healthy diets are influenced by people around them in their communities (Stone, 1976; Storer, 1977; Ludwig *et al.*, 2011; Biza-Zepro, 2015). Thus, the existing culture, religion, and beliefs in a local community are creating and maintaining these diversified views (Purnell, 2009; Ludwig *et al.*, 2011; Acharya, 2013). Most of these systems have existed for generations and are maintained through the sharing of experiences, anecdotes and stories (Regmi and Adhikari, 1994; Bezner-Kerr *et al.*, 2008; Purnell, 2009; Simkhada *et al.*, 2010; Ludwig *et al.*, 2011). For example, if one child got sick after consuming some green vegetables and fruits in the winter. The parents may perceive that green vegetables and fruits were the main cause of sickness of the child (Onta, 2003; Ludwig *et al.*, 2011; Acharya, 2013). They share this occurrence with their relatives, neighbours, and friends. During the child's sickness, relatives, friends, and neighbours will visit the sick child's home (Karkee and Jha, 2010). During the visit, they collect information relating to child sickness, including foods and medications. They then share their perceptions about the child sickness with several and similar examples based on their past experiences (Kakute *et al.*, 2005; Ludwig *et al.*, 2011). Besides the food recommendations, visitors will also advise on necessary health consultations of the child e.g. particular hospitals, doctors, healers, pharmacists, hot food and drink and etc., are good or bad for the child (Harper and Jeffery, 2009; Hamal *et al.*, 2012). Parents are receiving such a verbal support and information until these people visit the sick child (Stone, 1976; 1986; Storer, 1977; Pool, 1987). They share their experiences in different voices, but ultimately the key aim of their assistance is control over on food and health-seeking behaviours (Christian *et al.*, 2006). These visitors believe that they were supporting the sick child with their valuable opinions (Henry, 2014). These multiple opinions offered by visitors are strongly associated with existing cultures, practices and religious norms and values (see Appendix 10) and are still commonly practiced by poorer mothers (Subedi, 1999; Sudo *et al.*, 2005; Christian *et al.*, 2006). Ultimately, the parents of sick child trust visitors' opinions and often follow their suggestions (Onta, 2003; Ludwig *et al.*,

2011; Odent, 2011). At the same time, these conflicting suggestions from different visitors can create a lot of confusion, (Ellahi, 2014; Karkee *et al.*, 2014). Ultimately, due to these multiple suggestions/opinions, the parents become confused to take the right decision for their sick child (Onta, 2003; Henry, 2014). This occurrence generates the culture which does not provide green vegetables and fruits to the children during the winter and rainy seasons (Pool, 1987; Shakya, 2006; Adhikari, 2010). They believed that fruits, green vegetables and yoghurt cause children to be cold and making them sick (Onta, 2003; Acharya, 2013). The concept of cold and hot diets is common in Nepal; however, the standards for categorising food as cold and hot (see Appendix 14) are not clear because they are neither based on science nor logic (Stone, 1976; Pool, 1987; Christian *et al.*, 2006; Shakya, 2006; Ludwig *et al.*, 2011). Notions of foods being hot or cold came from a commonly accepted food classification system which influences diets (see Appendix 14) (Pool, 1987; Shakya, 2006). These diversified views emerge every time by visiting of relatives, neighbours and friends when a child is ill. Thus, this multiple opinions or diversified views are founded one of the major barrier towards healthy eating and seeking appropriate medical care (Henry, 2014). The diversified views also emerged within the South Asian community in the UK (Ludwig *et al.*, 2011; Ellahi, 2014). According to the research conducted by Kennedy and Pauline (1992), when a household migrates to another part of the country, they bring with them their traditions and culture, including food habits (Ludwig *et al.*, 2011; Ellahi, 2014). As a component of the geographical relocation, the household may adopt or reject these changes in the new place with respect to the social value, new food, eating fashion and language (Welsh, 1998; Ludwig *et al.*, 2011; Ellahi, 2014). At the conclusion, diversified views appear to be one of the key barriers for food recommendations to preschool children (Appendix 10). As part of multi-cultural and multi-ethnic environments (Bennett *et al.*, 2008; Subedi, 2010; 2011; Ludwig *et al.*, 2011; NDHS, 2011), people experience potential confrontations regarding advice on healthy food and health-seeking behaviours (Whitfield-Brown *et al.*, 2009; Henry, 2014; Higgs, 2016; Haws *et al.*, 2017). In every society, there are huge debates over various nutrients and food items such as carbohydrates, protein, alcohol, nicotine, fat, coffee, sugar, tea or salt whether these are good or

bad for our health (Christian *et al.*, 2006; Ellahi, 2014; Higgs and Thomas, 2016). Actually, there is substantial agreement among experts, but the public is conflicted (Ellahi, 2014). This thesis argues that the opinions of the people with low SES and religiously attached, may or may not be logical and scientific (Christian *et al.*, 2006; Whitfield-Brown *et al.*, 2009; Henry, 2014). However, based on the findings, this thesis has not only discovered a new knowledge also added to the literature and filled the literature gaps in the field of public health nutrition. This new knowledge is equally emerged in the condition of child sickness within every household (Acharya *et al.*, 2015; 2017).

CBS *et al.*, (2006) described the actual socio-economic status of households, food consumption including energy intake, and factors associated with causes of poverty that affected mothers' food and health-seeking behaviours and emerged as the major barriers for recommending healthy diet (Pokharel *et al.*, 2013). Furthermore, CBS *et al.*, (2006) demonstrated issues around poverty, food consumption and poverty in different levels have a strong association with undernutrition (Sibeko *et al.*, 2005; WFP, 2009; Karkee *et al.*, 2014). Since most urban residents depend on the market to supply their food needs, this large number of people creates high demand, leading to a scarcity of food items more often than in the rural areas (Kennedy and Peters, 1992; Craig, 2011; NeKSAP, 2013). Surprisingly, findings of this thesis showed that a low level of knowledge about a healthy diet and a high proportion of negative food beliefs were observed in urban areas as well (see Table 4.11). This may be due to the fact that migrated mothers have been practising and retaining their old culture even in the new urban location (Khare and Rao, 1986; Christian *et al.*, 2006; Subba *et al.*, 2008; Ellahi, 2014; Biza-Zepro, 2015).

About feeding practices, the SAARC and FAO (2008) maintained that proper feeding practices and food consumption of a child require good child care, correct food handling, adequate education on health and nutrition, health care, hygiene and sanitation (Chapagain, 2014). Concerning food barriers, food security is a major determinant in the study location (WFP, 2009; FAO, 2014b). The rural localities face major problems with food security, such as changing climatic patterns (WFP, 2013; FAO, 2014b) (which affect livelihood), lack of basic infrastructure

(roads, health institutions, and educational hubs) and low agricultural production (Obayelu, 2014; WFP, 2015). Thus, these are some of the reasons for the nutritional problems in Nepal (Sah, 2005; Karkee *et al.*, 2014; Acharya *et al.*, 2016).

Additionally, Nepal is a food-deficit country. The WFP (World Food Programme, 2007) examined the food consumption of Nepalese households and found that only 3% of households in rural areas consume healthy food whereas 16% consume very poor food. Similarly, 40% of rural households consume healthy food, whereas 11% consume food which is poor for health. Similarly, food availability in Nepal varies, and is highly dependent on the seasons, festivals and purchasing capability of households (Grimes, 2012). This thesis data show that 29% had food scarcity (Table 4.9) and urban mothers suffered more than rural ones (Tables 4.20-21). WFP (2009) stated that in Nepal, the production and availability of food, along with consumption patterns amongst several community groups, are affected by social and cultural diversity (Dredze, 2012; Karkee *et al.*, 2014), and by diverse ecological changeability, which causes variability in food security and makes monitoring activity complex and challenging (Yadav *et al.*, 2013; Acharya *et al.*, 2016). The qualitative results of this study discovered similar outcomes on food insecurity as well as revealed by SAARC and FAO (2008) (Table 5.1; Section 5.5). WFP (2009) has stated that food obtainability in Nepal is through all forms of local production, commercial imports and assistance or donations. Seasonal food insecurity is widespread in Nepal, especially more in the mountain regions as compared to the hills or the plain area, is also affected by social and cultural diversity (Dredze, 2012), and by diverse ecological changeability. This has a tendency to cause variability in food security and this makes monitoring activity complex and challenging. So, agricultural production is not sufficient for household needs (WFP, 2006; 2007; 2009). Hence, households need external food assistance; otherwise, their consumption levels go down below the minimum threshold level, leading to malnutrition (WFP, 2009).

The NLSS (2011) survey reported that over the past 15 years, food insecurity and chronic malnutrition have declined in Nepal, yet many households still remained trapped in a cycle of hunger and poverty. Twenty-five per cent of households is food deficient, meaning that the total

value of their food consumption is inadequate to ensure a basic diet (NLSS, 2011; UNICEF, 2014). Nearly half of children under five years of age suffer from chronic malnutrition and its consequences. At the national level, about 41% of children under the age of five are stunted, 29% underweight, and 11% are wasted (UNICEF, 2014). Kennedy and Pauline (1992) observed that food is closely associated with economic circumstances, social environment, religion, and the culture of ethnic groups. Fieldhouse (1995) expressed that the good health of household is influenced by food preference, eating methods, food preparation, daily meal frequency, eating times, and the size of portions consumed. Kennedy and Pauline (1992) suggested that when households migrate to different places within a country or abroad, it affects their food preferences in a number of ways, such as food access, increased cost of traditional foods (Christian *et al.*, 2006; Som *et al.*, 2007; Subedi, 2010), different shopping methods and arrangements, change employment levels, pressure from social media and the influence of racism (Kennedy and Pauline, 1992; Dredze, 2012).

According to research conducted by Kennedy and Pauline (1992), when a household migrates to another part of the country, they bring with them their traditions and culture, including food habits. As a component of the geographical relocation, the household may adopt or reject these changes in the new place with respect to the social value, new food, eating fashion and language (Welsh, 1998; Ellahi, 2014). In addition, low-income households' access to food rich in essential micronutrients, such as meat, fish, dairy products, fruits and vegetables, and bio-fortified staple foods is restricted (Sah, 2005; Karkee *et al.*, 2014) due to lack of knowledge and misinformation, financial constraints, limited availability and a related lack of demand for nutritious foods (Christian *et al.*, 2006; Subedi, 2010; Obayelu, 2014).

The NLSS (2011) has described the common problem of child feeding practices in Nepal as low income. Low-income households depend on labour exchange to provide income, enabling them to fulfil their daily calorie requirements (WFP, 2006; NLSS, 2011). Thus, people with low incomes are more likely to work in order to afford food and meet their basic needs, and so their lack of agricultural output is either due to lack of knowledge about resources or modern techniques,

leading to limited food production and food security (WFP, 2009; NLSS, 2011). With regards to food security and barriers, this thesis has discovered similar results to those discussed in the literature. In regard to economic circumstances, social environment, religion, ethnicity, and culture have a strong association with food and health-seeking behaviours (see Appendix 10) (NLSS, 2011).

WHO's (2001) recommendations about the basic standards of nutritional management include offering a diet with adequate energy-producing foodstuffs and high-quality proteins. To attain high energy intakes, feeding children at numerous intervals is required, along with feeding them nutritious food (WHO *et al.*, 2008). According to the results of this thesis, it was not possible to maintain the basic standards of nutritional management as suggested by WHO (2001) due to various influencing factors as exposed in diversified views (Appendix 10) which affect mothers' food and health-seeking behaviours (Henry, 2014; Acharya *et al.*, 2017).

A hospital-based study on complementary feeding practices conducted by Chapagain (2014) in Nepal found that 87% of mothers knew the recommended starting time of complementary feeding. Further, he stated that 53% of mothers used food from the market and 28% mothers offered porridge (*lito*) as a complementary food. This study further revealed that although 37% of mothers had proper knowledge of the frequency of food only 33% were practising it. Just 10% of mothers were offering food more frequently. This study claimed that nearly 16% of mothers provided complimentary food to their children e.g. in an ideal frequency and quality, and sufficient amount. However, this thesis also found inconsistencies in providing a healthy diet to children mostly influenced by poor knowledge, negative attitudes and cultural food practices (Tables 4.8 and 4.16).

The NDHS (2011) stated that the complementary foods are not introduced in a timely fashion (i.e. as recommended by WHO, 2001) for all children in Nepal. Only 70% of infants have complementary foods by the age of 6-9 months (Murtaugh, 1999; NDHS, 2011). Interestingly, 87.3% of all the mothers are familiar with exclusive breastfeeding but only 33% were practising this (NDHS, 2011). Chapagain (2014) stated that one of the main reasons for this big gap is a

cultural practice. Further, he added that a child is introduced to solid food after the weaning-ceremony (*pasni*) which starts between the age of five months for girls and seven for boys (Karkee *et al.*, 2014). The NDHS (2006; 2011) identified infant feeding practices in all communities to be poor, and complementary feeding practices in some communities to be generally worsening.

It was noticed that the uncertain improvement in the proportion of children receiving complementary feeding between 2001 and 2006 was followed by a greater and continuing decrease between 2006 and 2011. Since 2006, there has been a reduction in the proportion of children receiving complementary food before reaching six months. Overall, there had been an increase between 2001 and 2006 (Bennett *et al.*, 2008; NDHS, 2011). The bottle-feeding practices were found to be almost double in children under six months, though the rates remain very low (NDHS, 2001; 2006; 2011). In regards to cultural practices, this thesis also agreed with the results of Chapagain (2014) because 78% of the mothers said that supplementation age of the child is between 3-6 months (see Table 4.3). In the FGD, the food shortage issue was also discussed in-depth, and all the groups shared their experiences about food shortages regarded as one of the major causes of malnutrition in Nepal (see Section 5.5) (FAO and WFP, 2007; NeKSAP, 2013).

This thesis shows that mothers' knowledge about child feeding practices, including nutritious food, is low and derived from cultural beliefs (Bhattachan *et al.*, 2009; Subedi 2010; Biza-Zepro, 2015). On average, 15% to 25% of mothers have strong faith and attachment to existing cultural beliefs (Tables 4.7, 4.17 and Section 5.8). According to the NLSS (2011) report, if the head of the household is educated, the family members tend to eat better quality food in comparison to literate or illiterate household members. By considering the outcomes of NLSS (2011) investigation about child feeding practices, Adhikari (2010) had very clearly elaborated the major influencing factors such as cultural and religious norms and values which are still affecting these practices in Nepal (Ruel *et al.*, 2003). According to Adhikari (2010), Abubarkar *et al.*, (2011) and Acharya (2013), existing cultural and religious ethics are responsible for beliefs and negative attitudes towards food and health-seeking behavioural forms. Storer (1977) highlighted that food classification

belief are still practising in the Nepalese communities. Stone (1976) discovered that food classification beliefs are generally being applied to sick people. This thesis also has a similar agreement with Storer (1977) in regards to food classification which perceived mothers were still embedded and practising in the community which they hesitated to recognise vegetables which were shown in the pictogram may be due to the food classification system (see Table 4.12). On the other hand, rural mothers might be more influenced by food classification environment than urban women due to a lack of awareness and living in a traditional village environment (Shakya, 2006).

Likewise, Shankar *et al.*, (2001) compared visual evaluations, including the incidence of xerophthalmia, in children for both share-plate and individual plate conditions. Hatlebakk (2012) showed that poor feeding practices prevent children from fulfilling nutritive requirements and lead to a high prevalence of malnutrition in Nepal. The FAO and WFP (2007) reported that the western development region (this study area) has a lower average calorie intake (2,310 kcal/day) than the country as a whole (2,405 kcal/day) (Hirai *et al.*, 1994; Ohno *et al.*, 1997; 2005; FAO, 2010; 2013). Besides poor child feeding practices, the dietary energy supply is also poor amongst Nepalese households. The FAO (2014a) has calculated the diet and sharing of dietary energy supplies amongst the Nepalese people. Table 6.1 shows that the dietary energy supply increased by 14% between 1992 and 2014. The data show that the overall daily dietary supply is adequate, however, the share of supply is meagre. In general, dietary intake and energy supply is not sufficient, having a considerable impact on the malnutrition problem in Nepal (FAO and WHO, 1992; Dietary Practice, 2004; FAO, 2010; 2013).

Table 6.1: Dietary intake and energy supply in Nepal

Variables	1992	2002	2014
Diet			
Dietary energy supply (kcal/cap/day)	2,214	2,276	2,538
Average dietary energy supply adequacy (%)	106	108	117
Average protein supply (g/cap/day)	56	58	62
Average fat supply (g/cap/day)	36	39	41
Share of dietary energy supply			
Cereals - excluding beer (%)	73.4	69.8	68.1
Vegetables (%)	1.4	1.8	2.1
Fruits - excluding wine (%)	2.1	1.9	2.0
Meat and offal (%)	2.0	1.9	1.9
Source: FAO, 2014a			

In regard to the improvement of IYCFP in the developing world, Ruel *et al.*, (2003) and Bhutta *et al.*, (2008) commented that interventions to enhance complementary feeding practices are unclear. On the other hand, progress in improving child feeding practices in the developing world including Nepal has been slow for numerous reasons, such as a lack of clear international recommendations for some aspects of IYCFP that has prevented the development of universal indicators to define optimal feeding (Murtaugh, 1999; PAHO and WHO, 2002; Ruel *et al.*, 2003). After the child feeding regulations (see Table 6.2), the National Nutrition Programme developed a food composition chart in 2012 which is more scientific, credible and realistic. If only 50% of the community would follow the guidelines of the food composition table, it would help to reduce the nutritional problem in Nepal (WHO, 2001; PAHO and WHO, 2002; MoAD, 2012). Furthermore, this composition chart enables one to get an estimate of the average amount of different types of food and nutrients available (MoAD, 2012). Dibley *et al.*, (2011) revealed that infants and young child feeding practices in South Asia have not reached the expected levels required to achieve a considerable reduction in child mortality. In Nepal, IYCFP is generally poor and traditional (Acharya, 2000; Alonso, 2015). The present study did not assess IYCFP, but some data were collected relating to child feeding patterns, which show the poor outcomes (see Sections 4.3 & 5.6).

The food habit of the Nepalese society is very different from those in Western societies. The eating and drinking culture is closely related to caste and religion (Khare and Rao, 1986; Dahal *et al.*, 2002; Dietary Practice, 2004; Bennett, 2006). Food regimes are highly diverse: normally high in carbohydrates and low in protein, micronutrient, and fat (OCHA, 2008; Moro *et al.*, 2015). In many ethnic cultures, women commonly have a smaller amount of food—often of lower quality—and are even prone to eating leftover food (OCHA, 2008). The findings facilitated by the OCHA (2008), found that 11% of households in rural areas have poor diets, and 16% extremely poor diet patterns and eat only maize on a daily basis which is complemented by barley, rice, and tubers, depending on the season. The incidence of caste/ethnic group arrangement and social ranking are further susceptible to shocks, natural disasters and lack of food (Christian *et al.*, 2006; Moro *et al.*, 2015). This thesis also pointed out similar reasons for food behaviour forms of children which may be due to the existing cultural environment. For example, Brahmins are directed by religious rules which do not allow them to eat meat (beef, pork, and buffalo) (Tables 4.7 & 4.17) (Pool, 1987; Dietary Practice, 2004; Subedi, 2010). Subba *et al.*, (2008) examined child feeding practices of children who attended an immunization clinic in Pokhara. Subba *et al.*, (2008) included 168 mothers in the study for the evaluation of complementary feeding and breastfeeding practices. Subba *et al.*, (2008) showed that complementary feeding practices in the Pokhara urban area remain poor. Poor breastfeeding and complementary feeding practices are strongly associated with mothers' levels of education. However, Subba *et al.*, (2008) argued that cultural and religious associations are major barriers. This thesis statistics also agreed with the findings of Subba *et al.*, (2008) about breastfeeding and complementary feeding. Based on the outcomes of this thesis, the breastfeeding and colostrum feeding practices of this community is still associated with traditional and religious taboos leading to poor outcomes even though, mothers' level of awareness and education status been increased (see Tables 4.2, 4.8, 4.16-17).

The WFP (2007) also asserted that the income of households is a major factor which generally affects child feeding practices and recommendations. Poor income is also a barrier for middle- and low-income households. According to the WFP (2007) results of household income

generation, a low percentage of the population of the community is engaged in some sort of income-generation activities; for example, 15% of households are in small business, 17% work as unskilled wage labourers, 15% are engaged in handicrafts and natural resources exploitation, and only 13% work in agriculture (WFP, 2007; 2009). Hence, they cannot even fulfil their basic needs such as food, education, clothes, and health. Usually, people with low SES are low-educated and have low productivity (WFP, 2007). They also use water from unprotected wells or springs and live in poor health and unhygienic environments (WFP, 2007; Bezner-Kerr *et al.*, 2008; Douglas, 2009). Thus, WFP has only examined about food security and agricultural development including income generation of the community in Nepal. However, this thesis found 10% of mothers involved in the service and business sectors respectively and 57% in agriculture where 40% were without land (see Table 4.2). In regards to the principal source of income of the family, crop farming accounted for 29%, livestock & poultry farming only 6%, and casual wage labour 11%. However, the data show own business and service (31%) sectors to be the major source of earning, whereas remittance contributes 14% and 9% from selling firewood, and fishing (Table 4.2) which contrasted from the study conducted by the WFP (2007). These results indicate that Nepalese people are poor in terms of the source of income apparently this associated with the poor SES of the community which after food and health-seeking behaviours (Rai *et al.*, 2001; Odent, 2011).

UNCT (2007) examined the dietary system for women from three geographical areas of Nepal. Food barriers and recommendations are also strongly associated with the distribution of food within households, which was found to be highly discriminatory against girls and women (Sudo *et al.*, 2005). In general, this system is mostly reflected in areas such as the Terai where women are the most likely to have poor diets, where 40% of women of the Terai, and 22% of women of the hills have a low body mass index due to an inadequately balanced diet (UNCT 2007). NPHC (2012) and GHFSI 2013 (Feed the Future Innovation) have closely analysed the food insecurity situation of Nepal. Both studies have blamed the situation on national and global economic recessions and hikes in market prices.

Many researchers (e.g. Sahn and Stifel, 2002; Gaiha and Kulkarni, 2005; Bharati, 2007; Dancer and Rammohan, 2009) have conducted similar causes of investigations for all forms of malnutrition and demonstrated a direct or indirect link with food and health behaviours. However, Dancer and Rammohan (2009) focused on several issues about Nepal, mainly relating to food availability and consumption, including a household's financial situation. They (Dancer and Rammohan, 2009) examined mainly intra-household allocation of food - but not the amount of various type of food intake and focused on how household wealth affects the nutritional status of children.

Concerning the major barriers to getting nutritious food, according to the outcomes of this thesis (see Table 4.13), the majority of mothers expressed that poverty was a significant barrier, as well as having a little or no knowledge about healthy foods (Griffiths *et al.*, 2002; Devkota *et al.*, 2012; Desmet *et al.*, 2015). The scarcity of food in the market or community and availability of processed or fast food are also essential food barriers that were found to exist (WFP, 2009). When food was not available in one's own kitchen or garden, then processed food was fed to children due to the lack of time for food preparation and the distance required to find it (Table 4.13) (Mumtaz *et al.*, 2003; Kakute *et al.*, 2005; Kelley, 2010). According to the analysis of GHFSI (2013), Nepal's farming growth rate is only 2.5% to 3.5% whereas the annual food price inflation rate is 15% to 18% (GHFSI, 2013). In Nepal, food recommendation guidelines (WHO, 1988) and child-feeding plans prepared by the MoAD in 2012 (Table 6.2) are rarely followed by middle and low-income mothers (PAHO and WHO, 2002; Morrison *et al.*, 2008) because of busy lifestyles and time commitments for work/household chores. In addition, siblings may be likely to feed the younger children if they are not getting enough food to eat. Thus, they might not follow any dietary guidelines or food recommendations (Morrison *et al.*, 2008; MoHP, 2012; Spector, 2013). The MoHP (2012) showed that due to the parents' work commitment child feeding practices are inconsistent, mainly in middle and low-income households. On the other hand, the government's recommended feeding schedule is equally responsible for poor child feeding practices, resulting in

a high prevalence of malnutrition in Nepal (Jolly, 2010). The findings of this thesis also showed inconsistency for child feeding practices (see Table 4.3).

Table 6.2: Child-feeding schedule

6 months up to 12 months	Give adequate servings of mashed foods such as rice, lentils (<i>dal</i>), mashed bread (roti), biscuits, milk, yoghurt, seasonal fruits (such as banana, guava, mango, etc.), vegetables (such as potatoes, carrots, green leafy vegetables, beans, etc.), meat, fish and eggs
12 months up to 2 years	
2 years and older	
Source: MoAD, 2012	

Table 6.2 shows that there are no distinct criteria for child feeding schedules for the different age groups of children (Madhu *et al.*, 2009). It has differentiated child age groups but not specific food items for those particular age groups, resulting in child feeding guidelines that are very confused and unclear, and therefore, ineffectual (Barton, 2001; Chapagain, 2014). Generally, these guidelines in Table 6.2 are recommended by the entire health workforce in Nepal and certainly, influenced by cultural and religious norms and values (WHO, 2001; Sah, 2005; Chapagain, 2014). Poor child feeding practices are also responsible for high malnutrition rates in Nepal (Chirmulay and Nisal, 1993; Fildes, 1998; Pelto *et al.*, 2003; Madhu *et al.*, 2009).

NPHC (2012) explained the other cause of food barriers, such as seasonal food scarcity in Nepal. This creates a series of long-term food insecurity problems amongst study population. There are two separate agricultural lean times (NLSS, 2011), one in the winter (February to April) and another in the summer (July to August). During these two lean periods, middle-income, marginalized and low-income groups face a shortage of food in all geographical areas (Smithson, 1995; WFP, 2009). With regard to agricultural production, this is extremely vulnerable and fragile due to frequent natural and human disasters, which also destroy livelihoods. Generally, agricultural production is not keeping pace with the growing population, which is the main cause of the food deficit in Nepal (Regmi and Adhikari, 2007; Fisher and Slaney, 2013; WFP, 2013). Food insecurity is also responsible for the high prevalence of malnutrition in Nepal (Jolly, 2010). The World Food Programme (2009) has stated that Nepal is one of the most food-deficient countries in the world, mainly in the remote districts. Additionally, WFP has also estimated that

many Nepalese households will have no food in the future including many families slip in and out of hunger due to the uncertainty of their own crop production cycles, or lack of access to purchased food (NPHC, 2012). This thesis also found that nearly one-eighth of the group of mothers said that there was some level of food scarcity (Table 4.4). Thus, the author of this thesis argued that Nepal's major food insecurity causes are lack of resources, low agricultural production, seasonal food scarcity, adverse effects of climate changes, hikes in market prices, political instability and global economic recession factors which influenced food behaviours (WFP, 2007; 2009; 2013).

Conversely, the climate of Pokhara is very suitable for agriculture-industry, more than other districts of Nepal. Pokhara has the highest rainfall in Nepal (Gurung, 2001; WFP, 2009) and is richer in culture, business, tourism, education, and many aspects than other districts (Gurung, 2001; Paudel, 2008; Shrestha, 2015). However, this thesis still found some respondents from this area reporting food shortages (Table 4.4). In Nepal, human-caused food shortage is more common than the shortage caused by natural factors (Asfaw, 2008; Haws *et al.*, 2017). Market price is one of the main constraints for people of low socio-economic status (Asfaw, 2008; NDRI, 2008; UEA, 2012) whereas poor and marginalized ethnic groups cannot provide the nutritious foods essential for the growth and development of children, which leads to malnutrition (de Boer *et al.*, 2004; Som *et al.*, 2007).

Overall, this thesis has identified a very inconsistency in child feeding practices within rural and urban communities. It may be due to association with strong cultural and religious influences. Before blaming the culture and religion on influenced the child feeding practices, there may be strongest reasons associated with this, are key barriers such as poverty, low SES, low levels of awareness, lack of resources, misconceptions about healthy food (Christian *et al.*, 2006; Shakya, 2006; Adhikari, 2010; Desmet *et al.*, 2015), and more importantly diversified views (multiple opinions) which emerged from mothers' past incidences and evidences which they have faced directly (Henry, 2014). For example, the child gets constipation by consuming pomegranate because pomegranate is rich in iron which can cause constipation. Likewise, most of the Nepalese

people do not take dairy products and meat items at the same time because they believed that it may cause vomiting or diarrhoea or both. Perhaps it was the inability to digest high protein foods which caused diarrhoea or vomiting. In order to overcome on it, proper training and orientation on child feeding practices of mothers, better food policies and supplies, and income generation schemes could improve such poor child feeding practices and should be considered a priority by local government agency including policy people. The existing policy should be reviewed and revised based on food and health-seeking behaviours including cultural and religious norms and values.

6.6 Health-seeking behaviours and culture

This section describes health-seeking behaviours and cultural issues amongst rural and urban mothers. Many researchers around the world such as Delgado *et al.* (1994), Goldman and Heuveline (2000), Ahmed *et al.* (2000), Nakagawa *et al.* (2001), Uchudi (2001), Nyamongo (2002), Stephenson and Hennink (2004), Poudyal *et al.* (2005), Subedi (2010) and Acharya (2013) have focused on health-seeking behaviour, beliefs and cultural issues. Further, they also highlighted that mothers are still strongly embedded with the existing traditional and religious norms and values which might be a potential and that may affect food and health-seeking behaviours towards childcare (Som *et al.*, 2007; Acharya *et al.* 2015).

This thesis revealed that more than 50% of mothers opt for modern health institutions for the treatment of their children (see Table 4.6). Conversely, 17% of mothers are still visiting healers' clinics, and 6% revealed quite negative attitudes towards health-seeking behaviour (Hoff, 1992; Jin *et al.*, 2002). This thesis showed that educated people are still strongly influenced by traditional and religious issues generally in food and health-seeking behaviour (Tamang and Broom, 2010). This thesis indicated that a majority of people (57%) frequently visit healers because other people have strong faith in spiritual healing (Table 4.9) and mothers from rural community visit healers (16%) than urban community (1.1%) (Table 4.22). The people found that healers are affordable (cheaper), more easily accessible and familiar to society (Stone, 1976).

Therefore, healers' services are widely available and acceptable for the rural community (Miller, 1979; Shankar *et al.*, 2006; Adhikari, 2012). Therefore, mothers visit healer's clinic regularly even in critical conditions of children. Further, this thesis showed that 6% rural mothers keep their children at home during the sickness whereas only 0.4% of urban mothers (Table 4.22). This result indicates that urban mothers are better aware of their children's health needs than rural mothers.

Specifically, Subedi (2002) observed that mothers are aware of available local health systems rather which they use rather than improving their knowledge or awareness of food and health-seeking behaviour (Upreti and Müller-Böker, 2010). However, this, in turn, links to issues such as social organisation, social capital and social responsibility (Sah, 2005; Black *et al.*, 2008; Shrestha, 2015). In Nepal, there are common features of food and health-seeking behaviours which are strongly embedded and regularly practised by most people (Sah, 2005; Simkhada *et al.*, 2010; Acharya, 2013), mainly poor and non-educated households in both rural and urban settings (Subedi, 1999; 2010; Tamang and Broom, 2010).

A body of research agrees with Pokharel *et al.*, (2009) on behavioural aspects, such as child feeding behaviour, as important for child nutrition (Black *et al.*, 2008). Onta (2003) highlighted the lack of knowledge on well-being and health safety along with nutritious food and uptake of health services in Nepal. It may be attributed partly to traditional/spiritual supporters and their status in society (Mishra and Retherford, 2000; Lobstein and Davies, 2008).

With regard to hand-washing, Shrestha-Basnet (2008) stated that children of poor and illiterate households rarely wash their hands before meals, nor do mothers explain this practice. But nowadays, these views and practices can be nurtured to sustain their children's learning and the household's productivity (Fisher, 1990). Due to the establishment of integrated health care programmes in Nepal (Gautam, 2011), community members are beginning to observe and hear about changes, and develop an interest in it, prompting others to adopt the newly introduced forms of behaviour that can be of advantage to them (Shatenstein and Ghadirian, 1998; Mahat *et al.*, 2011). Hutter (1996) has found changes in food consumption behaviour during pregnancy more

than at any other stage of life. At the same time, Seiga *et al.*, (2001) demonstrated that pregnant women require more food during pregnancy to develop the foetus.

In Nepalese culture, after delivery, women are supposed to stay indoors with the baby compulsorily for a period of eleven days and untouched until all of the rituals are completed (Furuta and Salway, 2006; Martin, 2008; Simkhada *et al.*, 2010), and they are strictly under the dietary restrictions (Som *et al.*, 2007; Gandhi, 2012).

The study by Sah (2005) was conducted in a remote part of Dhanusha district which investigated the factors that cause child malnutrition including child feeding practices. Sah (2005) also evaluated the impact of rice scum (rice glue after washing) on children. As a cultural practice, most of the educated mothers discard rice scum in this community. Thus, Sah (2005) noted that children from households who do not discard rice scum are relatively better nourished. In regard to cultural practices such as discarding of rice scum, this thesis has given similar views on cultural issues and illustrated that rural mothers do not recommend green leafy vegetables to their children because they believe that green leafy vegetables were only consumed by beggars and cause harm to children (Section 5.8). Data from this thesis showed that mothers' food behaviours and practices are completely bounded with different factors e.g. policy, religion, resources, family environment (Appendix 10) which are resulted in positive, negative or neutral feelings that control the food and health-seeking behaviours of mothers.

In Nepal, food and health-seeking behaviour are influenced by existing traditions (Sibeko *et al.*, 2005; Odent, 2011). The members of households still rely on some part of the traditions which have been carried out in a similar manner generation after generation (Tamang and Broom, 2010). These traditional cultures or beliefs are especially applied with regard to health for pregnant and lactating women, children, and those suffering from illnesses (Storer, 1977; Khare and Rao, 1986; Pool, 1987; Christian *et al.*, 2006). For example, people belonging to the higher Brahman or Chhetri caste normally never cook or eat meat items such as mutton, chicken, fish, and eggs during the period of rituals (Khare and Rao, 1986; Purnell, 2009; Spector, 2013). Changing a mother's attitudes towards food and health-seeking behaviour is not an easy task (Jin *et al.*, 2002;

Acharya, 2013; Acharya *et al.*, 2015). It might take longer to improve it even if great attention is paid.

Stone (1976) discussed the caste system and practices of the spiritual/traditional healer, Ayurveda, and herbal including food classification. Stone (1976) clarified why this community is strongly embedded with cultural and religious norms and values which still exist in the community. Poudyal *et al.*, (2005) conducted a study in rural Nepal which linked health-care-seeking behaviour as well as the health policy of Nepal: it has found that individuals prefer to visit healers before visiting other health-care workers. This may be due to the fact that healers are very accessible; they are inexpensive and are believed to diagnose conditions accurately. The study found that the aid of a doctor was only to seek as a fall-back option and only if deemed necessary (Stone, 1976; Storer, 1977). This thesis revealed that the majority of people are still surrounded by the existing traditional and religious culture, which influences their food and health-seeking behaviours (see Section 5.8).

Kroeger (1983) mentioned that the following factors influence health-seeking behaviour: cultural and socio-demographic factors, women's autonomy, economic factors, health services and disease patterns, and physical accessibility. Stephenson and Hennink (2004) have categorized these mainly as economic conditions, physical and financial accessibility, cultural beliefs, and socio-demographic status, women's autonomy, and disease pattern and health-service issues. However, cultural practices and beliefs remain prevalent regardless of age, the socio-economic status of the family or level of education (Perez-Cuevas *et al.*, 1996) which negatively affects health-seeking behaviour. Women of this community are highly vulnerable and disadvantaged due to the life cycle, gender discrimination, child-rearing, low nutrition, health-care seeking, lack of education and gender (Hasan and Khanum, 2000; Uchudi, 2001; Shrestha, 2015). One South African study conducted by Pronyk *et al.*, (2001) found that 72% of patients with contagious ailments accessed government services more than for other medical conditions, whereas 15% attended a spiritual or traditional healer, and only 13% accessed a private doctor. This thesis also revealed similar findings to Pronyk *et al.*, (2001) (see Table 4.6; Section 5.8). It may be due to the existing

traditional health behaviours (Biswas *et al.*, 2017). In Southern Africa and South Asia, including Nepal, similar characteristics of health-seeking behaviours are found (Biswas *et al.*, 2017). In both South Africa and Nepal, there is already a substantial problem of decision-making or late presentation, mainly amongst women (Chapagain, 2014). A study by Ahmed *et al.*, (2000) also noted that multiple health-seeking practices are used by people in the Philippines, which may delay in diagnosis of children's condition. Furthermore, Ahmed *et al.*, (2000) found only 29% of patients had initially visited a health centre, whilst 53% had visited a private doctor. Similarly, 69% of patients had been told by a member of the family to seek medical advice based on their symptoms. With regard to health seeking practices, the outcomes of this thesis are also more similar with Ahmed *et al.*, (2000) such as 52% children attended doctor's clinic, 17% children visited healers and 25% of the children visited health institutions during their sickness (Table 4.8; 4.12). There is also great concern about people not utilizing government health services (Hanson and Berman, 1998; Ahmed *et al.*, 2000). There are many factors that have been identified as leading causes of poor utilization of government health services (Section 1.10) in Nepal. So, people in Nepal have various options for health-care services, and households are free to select any health-care institutions, including healers based on accessibility, availability, and affordability (Stone 1976; 1986; Foster and Pinstrup-Andersen, 1981; Astin, 1998; Ryan, 1998; Olenja, 2003). Government health services are poor and limited, so wealthy people rarely access them (Subedi, 2010). Middle and low-income people usually depend on government health services, herbal medicine, and spiritual healers, but those who do not have faith in government services, of course, choose private ones (Dahal and Baral, 2015).

Health-seeking behaviours are found to be very vague and diverse as per resources, attitudes, knowledge, tradition, and practices: they mostly depend on cultural and religious norms and values (Shrestha, 2015; Biswas *et al.*, 2017). To some extent, it is understandable because most of the population follows the traditional culture of a society (Ellahi, 2014; Biswas *et al.*, 2017).

With regard to the culture of the study population (Tables 4.1-4.2), it is highly diverse due to the multi-ethnic, multi-cultural, multi-religious and multi-lingual composition of Nepal (NDHS,

2011; NPHC, 2012; CDSA, 2014) in general, the Kaski District is a reflection of this. These factors are strongly correlated with each other. Each ethnic group has, to some extent, its own culture, language, and religion (NDHS, 2011; NLSS, 2011). For example, one group does not allow meat, fish, and eggs in the ritual function whereas another group accepts them (Christian *et al.*, 2006; Subedi, 2010; Upreti and Müller-Böker, 2010). Most people learn their culture from their daily work, such as using the right hand for eating, using water instead of toilet paper cleaning up, ways of meeting and greeting seniors, avoiding beef and pork based on the caste system (Khare and Rao, 1986; Kakute *et al.*, 2005).

Shrestha (2015) has mainly examined health-seeking behaviour among the mothers (n=102) of sick children from a rural area of Kathmandu district. Only 84% of mothers sought health treatment and 69% reach health facilities, and one third (31%) of the mothers accessed healers. Shrestha (2015) found education of the mothers, sex of the child, illness of child and mothers' awareness are the key factors influencing food and health-seeking behaviours of the mothers. Considering health-seeking behaviour, the results of this thesis also concur with Shrestha (2015). For example, mothers' attitudes and health-seeking behaviour were observed to be negative as they did feed their children when sick. Shrestha (2015) claimed that there was no relationship between health-seeking behaviour and the occupation of mothers. But this thesis has a disagreement with Shrestha (2015) because it was perceived the strong relationship between health-seeking behaviour and the occupation of mothers where housewife (57%) and unemployed (10%) mothers mostly visited healer's clinic and restricted to feed their children when sick.

Utmost thought on child care, particularly those suffering from malnutrition and other diseases, should be taken to identify the danger of various health issues, prevent illnesses, and treat them immediately (Sah, 2005; Biswas *et al.*, 2017). For these reasons, food and health-seeking behaviour is of major significance and is essential to the health of the individual as well as the community (Shrestha, 2015). However, the process of responding to perceived health-seeking behaviour involves multiple steps (Simkhada *et al.*, 2010). Thus, it is very important for mothers

to be able to recognise the malnutrition problem and seek quick action which can help to reduce the under-five-years child' malnutrition rate in the community.

Reflecting on quantitative and qualitative data, this thesis determined that the health seeking behaviour of some mothers is predominantly obsessed and embedded in existing traditional and religious norms and values which means it is very difficult to bring change to their attitudes, particularly on food and health-seeking behaviour in this community (Sudo *et al.*, 2005; Odent, 2011; Acharya *et al.*, 2016; Biswas *et al.*, 2017).

This thesis concluded that the desired health care seeking behaviour, particularly related to child health, for an illness occurrence, should be obtained by seeking first and foremost help from a trained allopathic doctor, spiritual healers (Stone, 1976; Karkee *et al.*, 2014) in this community setting (Tables 4.8 and 4.22). Yet a consistent finding from several researchers is that, for some sicknesses, mothers are choosing healers, quacks or homeopaths, pharmacies (Harper *et al.*, 2001; Tamang and Brooms, 2009), or untrained allopathic doctors above formally trained health professionals or government health institutions (Ahmed *et al.*, 2001). For instance, Yamasaki-Nakagawa *et al.*, (2001) described that mothers in Nepal were more likely than fathers to seek help from healers first. Likewise, Rahman (2000) in a rural area of Bangladesh, 86% of mothers received health care from non-qualified health care providers which have implications for diagnosis, and mothers have been found to have significantly longer delays to diagnosis than fathers (Yamasaki-Nakagawa *et al.*, 2001). Hence, this thesis also revealed similar results mainly mothers were involved in child care than fathers as Yamasaki-Nakagawa *et al.*, (2001) stated. In Nepal, all the mothers are responsible for the childcare. But fathers have all the rights such as shopping, health care, education and other social networking. In case of there is no father then only mothers are active (Malla Pradhan, 2000).

Health-seeking behaviour amongst the mothers of this Ph.D. study population is found to be very complex and more diverted towards cultural and religious dimensions (Barton, 2001; Acharya *et al.*, 2016). Because mothers from both 'rural and urban' locations are free to access available health services whether these are private or government (Christian *et al.*, 2006; Shrestha, 2015).

The accessing health care services are also depending on household's source of income, accessibility, and level of knowledge about available health services (Onta, 2003; Sah, 2005; Karkee *et al.*, 2014). In regards to health-seeking behaviour and attitudes amongst mothers of this Ph.D. study population are strongly associated with cultural and religious beliefs (Subba *et al.*, 2008; Chapagain, 2014) (Table 4.8). Therefore, it may be beneficial to conduct a comparative study across these factors, such as food and health-seeking behaviours in order to explore the connection amongst social capital, health-seeking behaviour, community participation, and malnutrition (Karkee *et al.*, 2014).

6.7 Mothers' views to solve the problems

This section provides important suggestions expressed by the respondents. Several suggestions were collected from mothers to overcome the problem of malnutrition (Rastogi *et al.*, 2011; Szwajcer *et al.*, 2012).

The group of mothers from the survey questionnaire largely covered most of the relevant issues (see Tables 4.10 and 4.23) such as policy, knowledge about healthy food, food and health-seeking behaviours, existing beliefs, and economic scarcity (Dahal and Baral, 2015). A large number of respondents (60%) suggested that regular feeding of fresh and healthy food to mothers and children certainly fulfils the nutritional requirements of the body. Secondly, they focused on exclusive breastfeeding (57%) and encouraged mothers to feed their babies colostrum (Table 4.10). Thirdly, 56% of the group of mothers pointed out awareness of a healthy diet, education, training, research and seminars which helped to disseminate the information to all levels of people (MacNab, 2009). Likewise, 51% of mothers clearly spoke about existing policy which should be reviewed and revised. On the other hand, a small group of mothers of the questionnaire (14%) also focused on supplementation, improving care and avoiding the cultural practices and beliefs which were regularly practised by all mothers (Table 4.10) (Oli *et al.*, 2015).

A majority of urban mothers were observed to be more alert on providing valuable opinions than rural mothers (see Table 4.23). The comparative statistics showed that there were no considerable

differences found between urban and rural mothers, but proportionately urban mothers were more optimistic than rural ones (Table 4.23). They were also found to be more realistic, proactive and knowledgeable than rural mothers (Gracey *et al.*, 1996). Based on socio-economic status and responses on mothers' views, this thesis (Tables 4.2 and 4.23) showed that urban mothers are educated, well-off, more exposed and open new to information and more conscious of the subject than rural ones (Gracey *et al.*, 1996). Based on information available on table 4.23 where urban mothers were found smarter to sharing their views on controlling of the nutritional problem in the society. It may be because rural mothers were struggling to provide snacks and other food supplements for their children, which is why they were more familiar with readymade food items than urban mothers. Statistically speaking, in general, there are no statistically significant variances found between urban and rural mothers on cultural practices about healthy food (11.6%:10.5% & 7.8%:9.0%) (see Table 4.17) and policy issues (22.3%:21.4%) (Table 4.23) (Spector, 2013). This could be because 49% of the group of mothers were not interested in providing suggestions (Table 4.10), or they gave it low priority (Bezner-Kerr *et al.*, 2008). The mothers also suggested that there should be activities for raising awareness, enhancing the workforce, and carrying out research and dissemination of the research outcomes (Fallah *et al.*, 2013).

The focus group discussions in Section 5.6 also brought out the same issues of policy which focus on public health, including nutritional aspects (Szwajcer *et al.*, 2012). In the FGDs, policy people, pharmacists, health workers and social workers were seen to be more active than the rest of the groups. A majority of key informants mostly talked about free health services, neglect in rural areas, shortage of resources (including workforce), poor health care system, and generally excessive dependence on foreign support (see Section 5.6) (Chapagain, 2014; Karkee *et al.*, 2014; Shrestha, 2015). Three groups such as the ANMs, mothers, and healers were very quiet during the discussion particularly on policy issues (Mallick *et al.*, 2014; Oli *et al.*, 2015). This may have been due to their poor knowledge regarding existing health policy and environment (Chapagain, 2014). On the other hand, it may have been due to the official hierarchy; some of the members of

the focus groups were silent on policy issues and health facilities because they work under the policy people (MoHP, 2003; Adhikari and Maskay, 2004; SOLID Nepal and Merlin Nepal, 2012). The quantitative part of this study showed that a large group of mothers has very poor knowledge (86%) about supplementation, snack programmes and ORS (Table 4.10), whereas statistically there is no significant difference between urban and rural mothers (28.4% versus 30.3%) (Table 4.23) (WHO, 1998; Appoh and Krekling, 2006; Acheampong and Haldeman, 2013). This finding may be influenced by women's status, education, empowerment, and rights in society (Pradhan, 1985; Malla Pradhan, 2000; ADB, 2001). With regard to awareness issues, a large group of mothers from rural and urban locations (Table 4.23) responded that they did not attend any health education classes or awareness activities about nutrition in the area (Fisher, 1990; Huang, 1995; Seher, 2012). They indicated that pharmacists, healers, and teachers (39%) and health workers (33%) play an important role in delivering information (Table 4.10 and 4.23) about healthy food (Darnton-Hill, 2013). Statistically, these two groups contribute equally to provide dietary guidance in the community (Table 4.10). The existing health institutions in the area are observed to have a poor role in these activities (Marinek, 2006). At the same time, a large group of urban mothers has visited doctors and private health institutions whereas rural mothers were more likely to go to healers (Table 4.23).

This study revealed that urban mothers were more likely to attend awareness activities than their rural counterparts (Table 4.23). In the urban area of Kaski district, there are many NGOs focusing on maternal and child health (Table 4.23) and several awareness campaigns have been conducted regularly, which urban mothers take more advantage of more than rural mothers (Micklewright and Stewart, 2000; Marinek, 2006; Seher, 2012). Surprisingly, rural mothers received nutritional information from health workers, whereas urban mothers gather it from health institutions, pharmacists, healers, teachers and others (Table 4.23) (Sethi *et al.*, 2003; MoHP, 2012; Darnton-Hill, 2013). The present study gathered very effective opinions from mothers to solve nutritional problems (Table 4.10 and 4.23) (IRIN, 2013). These suggestions are highly relevant and have a potential towards tackling the existing malnutrition problems of Nepal (Dhakal, 2015).

The main philosophy behind this assessment was to evaluate the mothers' conscientiousness and sensitivity to nutritional problems (Brahm, 2015). Similarly, the following researchers had also revealed similar ideas or views of various participants particularly on improvement of the nutritional status of community people; Kroeger (1983), Delgado *et al.*, (1994), Ahmed *et al.*, (2000), Goldman and Heuveline (2000), Hasan and Khanum (2000), Nakagawa *et al.*, (2001), Uchudi (2001), Nyamongo (2002), Stephenson and Hennink (2004), Poudyal *et al.*, (2005), and Subedi (2010). Mothers' views also were directed towards agricultural development which is a very relevant and appropriate issue raised by them (Table 4.10). According to a joint study conducted by the FAO and WFP (2007), the existing trend of farming in Nepal still follows traditional agriculture systems and is poorly developed. There are still knowledge gaps about how to reshape farming to improve nutritional outcomes (Jha, 2010; FAO, 2011; WFP, 2013b). It is not clear how income from farming production is being paid, and to what extent this impacts upon families' intake of nutritious foods (NFSMS, 2015).

In 2015, Nepal signed up to the SDGs (Sustainable Development Goals) (SDG Nepal, 2015; United Nations, 2015). Of the seventeen SDGs, goal 2 focuses on food availability: it aims to "end hunger and ensure access by all people, in particular, the poor" (United Nation, 2015, p.3). SDG goal 2 relates to ending hunger, achieving food security and improving nutrition and promoting sustainable agriculture (Gostin and Friedman, 2015) and is therefore also relevant for this thesis. Mothers' suggestions for improvement (see Table 4.23), focused on improving nutrition for the entire populations with large-scale food fortification, free health services, breastfeeding, and a review of the policy (NLSS, 2011; Rastogi *et al.*, 2011; Szwajcer *et al.*, 2012; MI Nepal, 2015). Mothers' views and goals of SDGs are similar when it comes to improving nutrition (Kumar *et al.*, 2016).

Urban mothers focused on providing suggestions to solve nutritional problems (Table 4.23) such as that improvement of the food supply in the community and household which supports a balanced diet, particularly focus on mothers and young children (Thatte *et al.*, 2009). A group of mothers (Table 4.10 and 4.23) clearly focused on the consumption of healthy foods, good care,

existing health facilities, income and level of knowledge which is associated with their health (Lee *et al.*, 2009; Rastogi *et al.*, 2011). They also mentioned (Table 4.10 and 4.23) that improving the nutritional quality of food through agricultural development and practices, and have advocated for proper interventions can support an increase in demand for food as the SDGs emphasised (SAARC and FAO, 2008; WFP, 2013b).

According to Howard *et al.* (1997), appropriate training and education would help to improve knowledge for child feeding behaviour and it would certainly support changes to mothers' attitudes and recommendations about healthy food (Adhikari, 2010; Parmar *et al.*, 2013). Adequate training and education are essential for any type of health service, even in the developed world (Philipp, 2004; Martinek, 2006; Zibah Consults Ltd., 2009; Baral *et al.*, 2013). Infant feeding depends on the attitudes, practices, and recommendations of the health professionals and mothers. All respondents agreed that the malnutrition problem can be reduced by educating mothers about effective utilisation of inexpensive locally available foods (Table 4.10 and 4.23) (Huff, 1992; Rastogi *et al.*, 2011; Szwajcer *et al.*, 2012; Fallah *et al.*, 2013).

6.8. Philosophical underpinnings and theory

This section discusses the philosophical foundations and underpinning theoretical justifications of this thesis. There are a number of theories that attempt to clarify the problems of maternal knowledge about healthy diet. The enquiry for this thesis is whether and how theories of maternal literacy on a healthy diet can help our understanding of rural and urban mothers' experiences (Ludwig *et al.*, 2011). The theory of food behaviour mentioned in the literature reviewed (see Section 2.9.17) addresses the inadequacy of preschool-aged children's dietary intake (see Appendix 22). This thesis has used mainly two theoretical models to support the theories adopted by this thesis. The first one is the UNICEF conceptual framework (see Figure 1.1) which explains potential causes of malnutrition along with essential nutrition strategy (UNICEF, 1990). The second theoretical model, developed by Marks *et al.*, 2001 (see Appendix 6) considers notions of belief, knowledge, and behaviours, in relation to the major influencing issues of food and health-

seeking behaviours (Onta, 2003). Each theoretical model contributes something to our understanding of how the underlying causes of malnutrition affect rural and urban communities, particularly mothers' food and health-seeking behaviours (Section 2.9.17) (Onta, 2003; Ludwig *et al.*, 2011). This section discusses the key reasons for maternal knowledge about healthy diet, which influenced by existing beliefs and cultural issues from a theoretical perspective (Section 2.13, objectives i-viii) (Ludwig *et al.*, 2011). Social theory helps us to better understand the reasons for maternal knowledge about healthy diet including existing beliefs, attitudes, and major barriers to food recommendations amongst rural and urban mothers (Onta, 2003). The theoretical overview for this thesis has been constructed based on an appraisal of a number of previous researchers, e.g. UNICEF (1990) theoretical framework and conceptual framework for monitoring food and nutrition-related literacy (Marks *et al.*, 2001). In the second theoretical model (see Section 2.9.17b), key theories about monitoring food and nutrition-related literacy are synthesised. This section helps the reader to understand the researcher's interpretation of these theoretical models as applied to the analysis and in the discussion of this thesis (Nutbeam, 1996; Marks *et al.*, 2001). The next few paragraphs highlight of the key factors among rural and urban mothers that resonate with the conceptual framework of mothers' literacy issues including food and health-seeking behaviours (UNICEF, 1990; Marks *et al.*, 2001; Onta, 2003; Ludwig *et al.*, 2011).

The conceptual framework of this Ph.D. research project is based on a general public health behavioural change model. Social scientists argue that 'meaning' (food in this thesis) arises out of the social interaction people have with each other (Marks *et al.*, 2001). Therefore, no study of behaviour would be complete without considering these social interactions. Socioeconomic and cultural influence can include direct influences (Ludwig *et al.*, 2011), like group decision-making (Nutbeam, 1996), as well as indirect influences, like imagining how friends would react to a particular situation. The meaning attached to food is a matter of theoretical perspective, cultural background or personal interpretation (Nutbeam, 1996; Ludwig *et al.*, 2011). The latter two are the ones that apply to the individual and so are both influenced by the context of the individual

(King, 1996; Marks *et al.*, 2001). Thus, the meaning attached to food links to our definition of reality, which is a collective social process where groups influence what individuals experience and believe (Marks *et al.*, 2001). The social construction of reality means we perceive reality in accordance with our preconception of it; our perceptions of another person affect our behaviour towards that person, and finally, our behaviour influences the person in such a way that they fulfil our expectations of them (King, 1996; Nutbeam, 1996; Ludwig *et al.*, 2011).

This Ph.D. study is mainly focusing only one level of the pyramid, the food-nutrition-related 'literacy' (knowledge, attitudes, and beliefs) (Marks *et al.*, 2001). The major focused point of this study would be what sort of knowledge (King, 1996; Marks *et al.*, 2001) about nutritious food is available to poor mothers of Kaski district (Onta, 2003). Likewise, it will explore food recommended by the mothers of the rural and urban part. It also will search about existing beliefs about nutrition, which is strongly embedded in this society. How does health promotion (Nutbeam, 1996) that provided by various programmes in that area, helping with rural and urban mothers to recommend nutritional food for their children? Furthermore, it will collect information about the health-seeking behaviours of the rural and urban community (Marks *et al.*, 2001). In the FGD, in all groups, a majority of participants expressed their dissatisfaction that the level of information, focusing on existing cultural food beliefs, provided by the nutrition-related institutions which had not sufficient to change food and health-seeking behaviours of the mothers (Biza-Zepro, 2015). This opinion suggests that the mothers are unsatisfied with and unconvinced about the existing nutrition institutions' information (Karkee *et al.*, 2013; 2014). Therefore, it appears that in order to anticipate any food and health-seeking behaviours change a project requires to sufficiently exchange appropriate information with mothers that many eventually support them review their traditional and cultural beliefs (Storer, 1977; Adhikari, 2010; Ludwig *et al.*, 2011). The study conducted by Furst *et al.*, (1996) found that multiple factors including resources, the social framework, life course, physiological and psychological traits, food contexts and sensory perceptions influenced the food behaviour (Onta, 2003; Ludwig *et al.*, 2011; Shrestha, 2015). Furthermore, based upon a conceptual model adopted for this thesis, additional

investigation was coherent to the children (Marks *et al.*, 2001). Findings from the survey in this thesis suggest that social frameworks become more influential to the maternal food knowledge which represented strongly held beliefs and attitudes about a healthy diet (Onta, 2003; Sah, 2005; Acharya *et al.*, 2015; 2017). Furthermore, findings of this thesis suggest that food-related behaviour albeit food recommendation is affected by inherent personal and social factors (see Chapter 4 & 5). The theory compromised food behaviour described a process wherein the mothers assesses and judges the healthy food and its impact on child health (see Section 2.9.17) (Onta, 2003; Ludwig *et al.*, 2011).

In developing countries like Nepal, the public health problems are increasingly those of human behaviour: encouraging healthier lifestyles, understanding the social determinants of health, and barriers to effective public policies, including health care policies (King, 1996; Ludwig *et al.*, 2011; Karkee *et al.*, 2014; Shrestha, 2015)). This study aimed at those with some understanding of health and health care with little exposure to social research which is affecting the well-being of the community people (Ludwig *et al.*, 2011; Subedi, 2010; 2011). It is varying due to unbalanced of socioeconomic status and high discrimination by caste division in the society (Nutbeam, 1996). To change behaviour, we need to understand what motivates people to act (Ludwig *et al.*, 2011). That may seem straightforward, but recent thinking by neuroscientists suggests that understanding how consumers think is not as easy as we first thought (Marks *et al.*, 2001; Karkee *et al.*, 2014). They say that 95% of our thinking happens in the unconscious, so superficial opinion research frequently fails to give us insight into what people think, feel, believe and do (Khare and Rao, 1986; Nutbeam, 1996; Marks *et al.*, 2001; Ludwig *et al.*, 2011)). What's more, the New Economics seminal paper on behavioural economics suggests it is no longer enough simply to give people the right information, incentives, and disincentives, and expect them to act in their own best interests (Khare and Rao, 1986; Marks *et al.*, 2001). Other factors like emotion, habit, social context, the fear of loss and the behaviour of others play a critical role (Onta, 2003; KC *et al.*, 2011). So how do they gain a deep understanding of these wider issues? The social setting has on aspects of individuals, including their behaviour, values, and emotions demonstrated above, it

is clear that what one individual (or researcher) may view as 'normal' is likely to have some social construct and society takes for granted the way most people act in a society is normal (Delgado *et al.*, 1994; Marks *et al.*, 2001). This thesis applied to elucidate the level of knowledge, attitudes about nutritious food and food recommendation by mothers to their children and community people of rural and urban (Acharya *et al.*, 2015). What are the major barriers to recommend healthy food for their children and what mother do to prepare it? In this study, it has compared the level of knowledge about healthy food recommendation between rural and urban community (see Sections 4.3.1-3, 4.3.9). This thesis mainly evaluated for what were the major gaps (Walters and Doyle, 2002; Onta, 2003; Ludwig *et al.*, 2011) between rural and urban and rich and poor people of the community and why the nutritional problem is a significant public health problem of developing country like Nepal (see Section 2.9.1-15). The next section outlines a key summary of the chapter. Above discussed two theoretical models of this thesis (Section 2.9.17) call for additional research to more clearly elucidate the active components of independence, capability and understanding support, about food and health-seeking behaviours that facilitate effective change amongst the mothers including a member of the households (Walters and Doyle, 2002; Onta, 2003; Christian *et al.*, 2006). Despite the complexities of cultural and religious issues, it remains the case that the mothers' food and health behaviours play a critical role in child health outcomes and in the efficacy of food practices (Ludwig *et al.*, 2011; Acharya, 2013; Biza-Zepro, 2015). These theoretical models (see Section 2.9.17) suggest that mothers' literacy can enhance their efficacy to stay beyond the existing cultural practices and able to overcome it (Subedi, 1999). Despite this, this issue is not being described in any literature. One hand, no one can stand against of this environment from the community (Walters and Doyle, 2002; Onta, 2003; Whitfield-Brown *et al.*, 2009; Adhikari, 2010). On the other hand, the existing awareness campaigns, which are being carried out by various institutions including government are still very low to address the existing malnutritional status of the children (Onta, 2003; Whitfield-Brown *et al.*, 2009; Adhikari, 2010; Ludwig *et al.*, 2011).

6.9 Strengths and limitations of the study

It is significant for researchers to reflect on the strengths and limitations of their own work (Grbich, 1999). In a qualitative study, this consists of reflecting on the role and influence that the researcher during the research process itself (Watt, 2007; Denscombe, 2010). In doing so, the researcher enables others to understand and make sense of the work, draw their own conclusions about research data, findings, and validity (Pope *et al.*, 2000). However, as this is a mixed-methods study the reflections on the strengths and weaknesses (Maxwell, 2009; Wilson and Stutchbury, 2009) also cover the quantitative questionnaire and the particular mix of methods in this thesis.

This thesis evaluated maternal knowledge, attitudes and beliefs amongst rural and urban mothers about food and health-seeking behaviours including food recommending barriers. This investigation is based on a cross-sectional review of ‘a comparative study of maternal views of nutritional and beliefs about a healthy diet for rural and urban preschool-aged children (Oninla *et al.*, 2006; Parmar *et al.*, 2013). The children’s mothers were questioned based on a combination of convenience and quota sampling procedures (de Winter, 2013). The sub-sections below highlight the major strengths and weaknesses of this investigation.

6.9.1 Strengths

This part of the thesis discusses the process and findings of the study, identifying particular strengths. Earlier in Chapter 3, the philosophical argument (Wilson and Stutchbury, 2009) that supported the research methodology used in this thesis, was discussed and justified to issues around sampling, reliability, validity, and generalisability. The adoption of critical realism (Bhasker, 1989; Hammersley, 1992), allowed the identification of social phenomenon from representations of the phenomenon in the survey questionnaire including FGDs along with the uncovering of a range of mechanisms which drew the attention back to existing knowledge, attitudes, beliefs, and behaviour.

The researcher of this thesis had experience of and insight into the government health care system as well as other systems e.g. Ayurvedic medicine and faith healing for over two decades. Prior to this journey, he had also worked in several relevant organizations (Narayani Eye Care Programme/AOCA Japan, Swiss Red Cross, CWS UK/Kid Asha, Prevention and Blindness Control Programme (WHO-Nepal), Red Cross and Dental College) initiating and facilitating a range of community development activities such as management, fundraising, networking and health promotion. This knowledge and experience gave him a broad view of Public Health Nutrition. In order to avoid influencing the participants, the study was conducted where he was not local or had any family association. This proved to be a strength as respondents and participants made their assessments of the researcher from an earlier knowledge of the work delivered in the study area, rather than on the basis of familial relationship or connections. This thesis shows additional key strengths (Section 3.3.1). First, the main strength of this thesis is that it selected a mixed-method approach, combining both qualitative and quantitative approaches to gain insights mothers' knowledge, attitudes and beliefs that influence food and health-seeking behaviours of the children in Nepal (Lee *et al.*, 2009; Parmar *et al.*, 2013). The major strength of this approach is that it broadens the understanding of the research problem where the evaluation included a survey of a large number of mothers of children three-to-five-year old for the quantitative analysis.

For the qualitative section of the study, FGDs were identified based on certain pre-selected criteria (Maxwell, 2009). Whilst the quantitative analyses showed several risk determinants and outcomes, the qualitative analysis examined in detail the reasons behind food and health-seeking behaviour. Consequently, this thesis has been able to identify key food barriers impacting on the health of children aged between three and five. There has been a highly effective debate concerning how to assess qualitative study methods, particularly, whether the same three criteria can be used (Ryan *et al.*, 2001). According to Ryan and colleagues (2001), when different criteria have been developed for qualitative approaches, there have had strong parallels with those used for quantitative approaches. The way in which selection criteria are applied may vary between

approaches of qualitative and quantitative methods. For example, qualitative studies often use purposive sampling to select a group of people or a setting with particular characteristics, whereas in quantitative methods generalisability is ensured often through random sampling and statistically assessment through comparison with the characteristics of a wider population (Marshall and Rossman, 1989).

The most appropriate criteria to evaluate qualitative methods are validity, reliability, generalizability, acceptability, cost, and objectivity (Ryan *et al.*, 2001). The following discussion will include the possible errors and biases in study design, research ideas, data collection processes, sampling and analysis of the data that may have affected these criteria (Bowling, 1997). Secondly, this thesis has employed survey questionnaires and FGDs as data collection methods in order to reach to the reality of the issues related to healthy diet (MacColl *et al.*, 2001). The next strength is the public health perspective of the study through which it has investigated maternal knowledge, attitudes, and beliefs about a healthy diet and explored major barriers for recommending a healthy diet to children under five years of age (Lee *et al.*, 2009; Acharya *et al.*, 2015). Moreover, it has excluded all clinical and pathological investigations as it sought to provide insights into the local community (Goodburn *et al.*, 1995; Ludwig *et al.*, 2011; Parmar *et al.*, 2013).

This research has some methodological strength. Questions relating to maternal knowledge, attitudes, and beliefs including major barriers to following food recommendations were developed to suit mothers of young children linked to the present literature (MacColl *et al.*, 2001). The questionnaire was developed by adapting questions from similar previously conducted surveys (Section 3.6.1.7). The questionnaire was bilingual (English and Nepali) for achieving effective communication between researcher and respondents. More importantly, the questionnaire was tested twice (in UK and Nepal) through a pilot study and revised to make it suitable for research purpose. A further strength of the thesis is that the researcher is bilingual, which strengthens the rigour of language-based inquiry (Larkin *et al.*, 2007) and is more likely to represent participants' experiences effectively and efficiently.

Additionally, the researcher has prior experience from his Master's degree in conducting research in Nepal (Acharya, 2012). The success of a 95% response rate amongst the participants contacted should be considered a success; the literature mentions that a high response rate for research entails 91% (Section 3.6.1.3 and Table 4.1) for a face-to-face method of subject enrolment (Sitzia and Wood, 1998). As the respondents joining in this research represented diverse age groups, castes, ethnic groups, religions, languages and educational status, the inner validity of these outcomes is reflected as reliable and acceptable. Most prominently, it has discovered new knowledge about diversified views.

6.9.2 Weaknesses

Besides the several strengths emphasized above, there are a number of limitations to this investigation which is important to describe here. First, this is a cross-sectional study and it is impossible to establish cause-and-effect associations amongst health hazards and health status as well as many socio-economic issues. Thus, when a longitudinal study is required to determine any relationship or another outcome of the research, an investigation has been expected to be outside the scope and time frame of this thesis. Secondly, with regard to the questionnaire, one main weakness, as stated in Appendix 4a is that knowledge was only assessed by using pictographs, showing pictures of locally available fruits and vegetables and gathering information by asking participants to recognise whether they are nutritious foods or not. Besides this, there are several limitations of a questionnaire which has already discussed in this thesis (see Section 3.5). In conducting this kind of study, each aspect related to health care could have only been talked about by the respondents through asking them a limited number of questions. Besides, as highlighted in Sections 4.2.4 to 4.2.9, there were a few responses provided to the open-ended question on the survey questionnaire: it is difficult to analyse these responses expressively.

Participants in the FGD were selected based on quota or convenience sampling rather than a random sampling procedure. Therefore, selection bias could be a potential limitation of this qualitative part of the study. Similarly, this evaluation was conducted in Nepal particularly in a well-developed area in terms of the development of infrastructure, availability of many resources

and, moreover, a famous tourist area of the country, after the capital (Shrestha, 2015). Further, due to the lack of resources and time and poor list of community population, mainly female groups at Pokhara and Lekhnath city (CBS, 2001; 2011; NDHS, 2011), it was difficult to conduct randomised or longitudinal research. The target population of this research, mainly children's mothers, were available in their own houses, in a preselected study location during the survey period.

Similarly, this research population only included females (3-5-year-old children's mothers) and restricted to those children who were breastfed, not living in selected study locations, and children younger than three and over age five. The selection bias, however, has unlikely affected the validity of the study findings. Moreover, the study design of this thesis is also a limitation. Hence, it is also not considered to have any major impact on the validity of the research findings. Time management was observed as the major limitation (as it is for any Ph.D. thesis), putting immense pressure on the researcher throughout the process because it must be completed within the allocated time frame, enforced by enrolment in the course.

The next constraint was gathering funds for the study which was an essential part of the process (Leroy *et al.*, 2007). A limited budget always puts high pressure on scholars because without proper funds the study could not be completed in a rigorous and academic manner. Hence, funding was a crucial element of this journey. The third limitation was observed in the study included several challenges and risks associated with fieldwork abroad such as local political conditions, social and cultural environments, and several other unseen hurdles. Gaps in the literature of the particular subject, mainly Hindu cultural and religious information amongst Nepalese ethnicities, were also considered as another limitation. Therefore, the research was restricted to one area which has been considered as another weakness of the study.

This investigation employed eleven enumerators to execute the questionnaire after three days of theoretical and practical training on data collection (Zebah Consultants Ltd., 2009). This study surveyed illiterate, literate and educated mothers who were associated with diverse socio-economic status and multi-cultural ethnicity (Khare and Rao, 1986; Pradhan, 2006; Subedi, 2011).

Some mothers from the study area had difficulty understanding and speaking the Nepali language. In such a case, specific language interpreters had been employed for translating from specific languages such as Gurung, Magar, Tamang, Newari, and Thakali to Nepali. However, the researcher of this study is a Nepali native who did not have these language barriers.

The study observed that the majority of the group of mothers, whether educated, rich, illiterate or poor, had similar notions particularly regarding food and health-seeking behaviour (Jin *et al.*, 2002; Kakute *et al.*, 2005). Many mothers were influenced by cultural and religious norms and values and have more or less similar perceptions particularly in food and health-seeking behaviour. Thus, this thesis focused on mothers only which could involve bias in evaluating knowledge, attitudes, and beliefs about healthy diet and hence is considered as another limitation. One of the limitations of a mixed-method research is that the researcher's time and effort are divided between two methods such as quantitative and qualitative (Johnson and Onwuegbuzie, 2004). If there had only been a quantitative part, the study could have included more participants and some of the statistical analysis might have been considered as stronger with a larger sample. Similarly, if there had only been a qualitative part, the study could have included more interviews, perhaps from other sectors as well. This would have made it a different study and possibly a more robust one.

This research has used FGDs (Perilla *et al.*, 1998; Gill *et al.*, 2004) and survey questionnaire (Bowling, 2002) as its methods of data collection. In the FGD, the study did not include mothers because of confidentiality reasons and, in particular, cultural and religious issues which are very difficult subjects for Nepalese women to discuss in a group (Devkota, 2011). The researcher of this thesis is a Brahmin by caste, Hindu and from a middle-income family. This background could have influenced the women in an FGD as nearly all belonged to a low caste and were poor. He is educated person, however, is compelled to follow the cultural and religious norms and values of his community (Kakute *et al.*, 2005).

6.10. Key summary

This chapter has provided a summary of key findings of this thesis which was then discussed in relation to the wider literature on six different variables which influenced the maternal knowledge, attitudes, and beliefs about healthy food including health-seeking behaviours. The knowledge, attitudes, beliefs, and child feeding practices including cultural issues evaluated in this thesis are compared to other inquiries based in Nepal and elsewhere, especially South Asia. The survey questionnaire identified a deficit maternal knowledge on healthy food, negative attitudes towards healthy food and health-seeking behaviours, child feeding and breastfeeding practices are still under the traditional patterns. Moreover, food recommendation patterns are still influenced by cultural and religious norms and values. The FGD highlighted key factors around food and health-seeking behaviours, which are mainly poverty, knowledge/ education, poor resources, policy/strategic issues, environment/situation, and food belief including cultural influences. These themes are explained in Chapter 5. More importantly, some FGD participants expressed positive experiences in the contrast to existing misconceptions, cultural and religious issues which are directly or indirectly associated with healthy food. There were no significant differences observed between rural and urban mothers regarding religious and cultural issues relating to food and health-seeking behaviour. But urban mothers are found more educated, knowledgeable and sensitive towards child health care than rural mothers. Finally, this thesis identified new knowledge ‘diversified views’ which is one of the key barriers and influenced food and health-seeking behaviours (Appendix 10). This thesis has added this new knowledge to the literature which is a potential finding in the field of public health nutrition. Furthermore, it incorporated personal reflections. The key strengths of this thesis are: (1) a mixed-methods approach to gain insight into mothers’ knowledge, attitudes and beliefs about healthy food that influences food and health-seeking behaviours of the children; (2) comparing on rural and urban perspectives in Kaski district of Nepal; (3) the public health prospect; and (4) having a bilingual researcher with previous research experience. On the other hand, the main limitations/weaknesses of this thesis are: (1) only included mothers in the survey questionnaire; (2) exclude any clinical and

pathological investigations, and (3) exclude mothers of currently breastfed children, and of children below three and over five years old children. The overall conclusions of this thesis are presented in Chapter 7.

CHAPTER SEVEN: CONCLUSION

7.1 Introduction

The conclusion signals the end of this research report and concludes with the key messages of the Ph.D. investigation. This mixed-methods study was undertaken to explore mothers' perceptions about a healthy diet (see Sub-section 3.3).

This thesis discovered new knowledge which adds to the pre-existing literature. The diversified view (see Section 6.5) is one such new factor which inhibits the ability to effectively recommend healthy food to children, pregnant and lactating women in this study population. The diversified views concept is associated with ten influencing factors which give three distinct impressions (negative, neutral or positive) which emerged based on individual's experience and feeling. The neighbours and relatives share their good and bad experiences related to that illness including its pros and cons. Moreover, they also suggest further food restrictions or recommendations particularly regarding this medical condition and appropriate health-seeking points. Hence diversified views are a powerful factor and include a plethora of views and perspectives across from one extreme position to another, and with each having varying degrees of credibility.

There are still many questions left unanswered about the issues of food and health-seeking behaviours amongst the rural and urban communities of Kaski district and many possible truths brought through this investigation. This study aimed to establish the key association with healthy foods, and traditional and religious norms and values including major barriers which have been practised by the community regularly. Moreover, the researcher contended that adhering to historical legacies about healthy foods, particularly to provide children under five, pregnant and lactating women, as complex as those of cultural practice and religious norms and values, keeps local poor people from being able to understand and practise. Furthermore, it needs to develop paradigms of analysis that allow researchers to perceive and interpret their cultural attitudes, and behaviours related to the issues of healthy food. Cultural and religious practices derived oppressions that are more fundamental to how people understand healthy foods.

This study was also presented at some international conferences where nutrition experts and delegates carefully discussed the outcomes; particularly existing knowledge, beliefs, and attitudes about a healthy diet. They provided useful comments some of which have influenced the analysis and were therefore incorporated in the thesis. The conclusions are presented below in different categories: (1) knowledge; (2) attitudes; (3) beliefs; (4) barriers; (5) mothers' views; (6) behaviours; and (7) overall conclusion.

7.2 Knowledge

In general, it was observed that the meaning of undernutrition and malnutrition (see definition no. 16 & 21 on pg. no XXV and XXVI) were understood to be the same by the community as well as the majority of the informants of this study (see Chapter 2; 2.9.11).

Mothers' knowledge about nutritious food was generally found to be very poor in both rural and urban areas. This is also related to their ability to identify the difference between nutritious and non-nutritious food items and choosing healthier food for their children. Similarly, poor knowledge was shown about recognizing signs and symptoms related to undernutrition, including age-related weight and height (see Sections 6.2 and 4.2.6). Furthermore, in general, they were also deficient in information about child care and feeding practices. The findings revealed that these poor (i.e. low economic status) mothers were poor at providing a healthy diet to their children (see Sections: 6.2; 1.8.2; 2.9.6).

Maternal education has been identified as an important factor in improving child health outcomes. Besides this, the mothers' knowledge about a healthy diet was influenced by religious and cultural norms and values, which were mostly derived directly from socio-cultural environments (see Sections 6.2; 2.9.3). The mothers' knowledge is generally limited by religious and cultural norms and values (see Sections 1.9; 6.3-4) including geographical variances (rural and urban) about food and health-seeking behaviours (see Sections 6.6; 4.3.12). The socio-economic class was a key determinant, as better knowledge existed about a healthy diet among mothers who were mainly from better-off and educated families. Women with a higher economic status were likely to have

changed their thinking regarding different traditional food beliefs or misconceptions (see Sections 6.3; 6.3.1) and had adjusted their lifestyle accordingly. Concerning knowledge associated with a healthy diet, elder cohorts, i.e. those 'more than 55 years old', generally have the more conservative views, whereas younger groups (between 20 to 40 years old) have more modern ideas (see Sections 4.2.1; 6.3.1). Knowledge about diet shared by the educated community was generally not a high priority in a community that relies on practical experience (see Section 6.2). Not surprisingly, the study population gave a high priority to practical-based knowledge rather than academic-based knowledge because they perceived that appropriate results come from practical experience. This section is associated with the main aim of this thesis, which sufficiently covered the literature gaps (see Section 2.13.1-2).

7.3 Attitudes

The study showed that most of the mothers experienced negative attitudes, especially about healthy food and health-seeking behaviours which generally deprive children and women from a good food. Healthy food was closely correlated with health-seeking behaviours due to dietary influences from medical practitioners such as Ayurvedic (Homeopathy), traditional/spiritual healers, quacks, and pharmacists during periods of ill health (see Sub-section 1.10.1). In Nepal, most people in the community (see Sections 6.4 and 4.2.6) are highly pessimist towards food and health behaviours and always criticised that bad outcome are caused by particular foods (see Section 6.6). In Nepal, there are several common misconceptions about healthy food and these are closely correlated with socio-cultural and religious norms and values (see Sections 1.9 and 2.9.3). This misconception directly or indirectly influences the food and health-seeking behaviours (see Sections 6.3; 2.9.12-13). On the other hand, in general, many are highly conscious about existing food beliefs which they have been practising routinely. In particular, to some degree, they do not commonly consume particularly animal products, green vegetables and fruits including oily, sugary and ready-made food. They mostly practice these beliefs and rituals during illness and

religious functions. Thus, due to cultural practice pertaining food and health-seeking behaviour, this helps explain the high prevalence rate of undernutrition (see Section 2.9).

In the study population, it was observed that the younger population mostly have positive attitudes whereas older people are more likely to have negative attitudes towards nutritious food and health behaviour (see Sections 6.4; 1.10.2; and 2.9.8). This thesis claimed that the section ‘attitudes’ is associated with objective i, and it has discovered the major attitudes particularly associated with food and health-seeking behaviours amongst the mothers (see Section 2.13; 2.13.1).

7.4 Beliefs

There were several misconceptions about the consumption of nutritious foods in the study population, which generally derived from traditional and religious values and norms (see Sections 6.3.2; 5.8; 4.2.11-12; 2.9.11-12). These misconceptions were strongly associated with food and health behaviours and prevented mothers from recommending healthy foods. Therefore, most of the mothers showed negative beliefs about healthy diets. Combined with diversified views and being poor, these negative views lead to women making the wrong decisions (see Section 6.3.1 and Appendix 10). At the same time, the misconceptions and beliefs about healthy diets were also strongly linked with the multi-cultural, multi-religious, multi-ethnic and multi-lingual (see Sections 1.8; 6.4 and 6.6) society. All these elements together mean that people can pass on the wrong messages and information, and adversely affecting people’s food choices and health (MacNab, 2009). Some food beliefs are also found to be highly beneficial to undernourished children such as the reason behind advising scarifying animals (see Section 5.8). This section is associated with objectives ‘i’ and ‘ii’ (see Section 2.13.1) which sufficiently elucidated and complimented the literature gaps.

7.5 Barriers

This study explored food barriers that are due to various causes associated with climate change; traditional agricultural methods correlated with poor accessibility, availability and affordability of the resources (see Sections 6.6; 5.5; 4.3.10-11) and the educational status of mothers. Lack of

resources was a major barrier which affected mothers' food recommendations (see Sections 5.5 and 4.2.4). Consequently, there were limited options for portions and food choices due to poor resources. In this environment, there is no point to think about a healthy diet where people are struggling to find basic food. In the context of the social environment of the study population, one of the major barriers was multiple-opinions or diversified views. The community had its own values and norms in a society which had to be followed by individuals residing in poor communities. People shared many issues within the community and they were supported in their community (see Appendix 10). This is the main platform where diversified views are being generated; consequently, affecting food and health-seeking behaviour (see Sections 6.2-4 and 6.6). To my knowledge, no previous studies have investigated the influence of diversified views which influence food and health-seeking behaviour in Nepal in the area of public health. This section has clarified the objective ii which was given under the Section 2.13.1.

7.6 Mothers' views

The group of mothers provided very relevant feedback regarding steps to tackle the problems of undernutrition in this community. Regarding the solutions, the mothers were particularly focused on a healthy diet, suitable policies, awareness and proper dissemination of scientific outcomes which can be gained from several research and survey sources (see Sections 6.7 and 4.2.14). They objectively emphasized their views about overcoming existing problems in this society, which covered all the provisions for an improved nutritional status of children (see Sections 6.7; 4.2.14; and 4.3.13). The public health services in Nepal are still suffering from various problems including lack of resources. It is always under-resourced in terms of service coverage and quality. Thus, most well-off people do not trust it and still choose private health institutions. This variable has explained the study objective vii which was presented under the Section of 2.13.1.

7.7 Behaviours

Health behaviours (positive and negative) are influenced by cultural, social and physical frameworks. These are designed by individual selections and external limitations (Section 6.9.2).

Positive behaviour regarding healthy diet is virtually associated with health promotion and prevention of diseases, while negative behaviour is linked with risky behaviour (Section 6.6).

In the present study, healthy food-related choices or judgements made by mothers appeared to be influenced by a highly complex array of factors (see Sections 1.9 and 2.9). These included mainly; eating behaviour, the price of various food items, demographic influences, ancestral and family influences, concepts of health, the seasonal vulnerability of food, ethical concerns, and broader societal tendencies (see Sections 1.9-11; 2.9).

In regard to food and health behaviours, the younger generation was less likely to be affected by traditional and religious elements, whereas the old generation is more likely to be influenced. Unfortunately, however, the new generation always surrenders to the old generation due to cultural and religious norms and values. Thus, a belief about healthy food is widely spread throughout the community (see Sections 6.6; 2.9.2; 4.2.7). This trend has been changing slowly in educated households in the community. From time to time, this information is highlighted by social media and local newspapers (Section xxx). Thus, the above examples show how people of this area strongly wedded to cultural and religious practices. This variable is linked with main aim and objectives of this thesis (see Section 2.13.1 'iii').

7.8 Overall conclusion

Understanding healthy eating behaviours in pre-school children are crucial to help prevent undernutrition, growth retardation, malnutrition and acute child nutrition problems and in addition to preventing prolonged and long-term health problems. In this study, it was found that mothers were mostly responsible for these issues and role models for their children regarding eating habits (see Sections 4.2.3; 2.9.5; 1.9.4). Hence, it is important to determine mother's knowledge, attitudes, beliefs about healthy diet and major barriers for recommending healthy foods. These are also affected by some determinants such as socioeconomic status, a mother's educational status, age, working status, and knowledge of nutritional food and child health. The nutritional

knowledge level of the mother could be effective on eating behaviours of children (see Sections 6.2; 2.9.8; 1.10.2).

After the review of the literature and the findings of this research, it can be said that mothers are an important source of information for children including child care and feeding. Mothers' knowledge about child care and feeding practices are crucial factors for a healthy life of children (see Section 6.2). Thus, this study examined mothers' capability on recognizing healthy diet. The present study also addressed major influencing factors regarding nutritious foods. The mothers who had a better level of nutritional knowledge about healthy foods fed their children more with animal products, vegetables, fruits, and grains and less fast or junk food items than those mothers who have a poor level of knowledge on a healthy diet (see Sections 4.2.8; 4.2.11; 4.3.6). The study determined that most of the mothers have a low level of knowledge, negative attitudes, and have minds burdened with several beliefs about healthy food (see Sections 4.2.8; 4.2.11-12). Besides these, mothers are trapped by several barriers such as diversified views 'exist each time of child sickness', existing cultural and religious norms and values, which prohibit or restrict following recommended healthy diet (see Sections 4.2.13; 4.3.9-11). Consequently, Nepal is facing severe malnutrition problems (see Section 2.9). The study examined mothers' own views on how to tackle this problem. The majority of mothers raised relevant and important issues which supported the factors to overcome the problems (see Sections 6.7; 4.2.14). The results from this study of mothers' nutritional knowledge and attitudes support the inclusion of knowledge and attitudes in dietary interventions (see Sections 6.7; 4.2.14).

Finally, the study results showed that the majority of the group of mothers were feeling uncomfortable on recognizing healthy food items, may be due to social and religious frameworks, and presented inconsistent results (see Sections 4.2.6-13) and also equally given multiple responses about nutritious food. On the other hand, knowledge, and attitudes about healthy food (see Section 2.9.8) are strongly associated with cultural and religious beliefs (see Sections 2.9.11-12). Hence, including other determinants (see Sections 1.10; 2.9) these variables are observed major barriers to recommending healthy food to their children. The above-stated variables are

strongly associated with sociocultural ethics and religious norms and values (see Sections 1.9.1; 1.9.2; 2.9.3-4). Similarly, it was also noticed that a majority of the group of mothers presented multiple responses on healthy food (see Sections 4.2.6-13).

Nepal is a multi-lingual, multi-cultural and multi-ethnic country (see Section 1.8). This study did not analyse religious, cultural and ethnic matters in detail (see Sections 1.9.1 - 1.9.4; 2.9.3- 2.9.4). Thus, it is important to compile cultural, religious and ethnicity issues in regard to a healthy diet. Subsequently, there are more studies needed to be conducted in other parts of Nepal investigating a larger study population in order to give researchers and policymakers a general idea about mothers' knowledge about healthy diet and its consequences on the nutritional status of children.

Both research approaches (quantitative and qualitative) revealed that knowledge about a healthy diet is significantly different among rural and urban mothers (Section). Rural mothers have poorer beliefs and attitudes about nutritious food than urban ones, this finding has correlated with the available literature in this regard (Christian *et al.*, 2006; Odent, 2011; Acharya, 2013). However, food and health-seeking behaviours are reasonably similar across both groups of mothers (Shakya 2006; Subba *et al.*, 2008; Acharya, 2013) and these are strongly embedded with cultural and religious norms and values (Sah, 2005; Bennett *et al.*, 2008; Acharya, 2013; Shrestha, 2015). Based on this thesis finding, urban mothers have observed shown strong and wider perspectives on controlling of undernutrition conditions in society more than rural (Onta, 2003; Sudo *et al.*, 2005; CBS *et al.*, 2006; Bennet *et al.*, 2008; Subba *et al.*, 2008). One possible explanation is that rural mothers typically are more traditional and are more likely to prepare homemade foods which are processed under the poor hygienic environment and provide to their children whereas urban mothers are more aware and sensible towards food and health-seeking behaviours. But urban mothers are modern in food recommending and thereby promoting poor quality of ready-made food items due to the busy lifestyle (see Sections 5.5, 5.7-8 and 2.9).

Finally, this thesis has remarkably elucidated the underpinning aims, the objectives and research questions that aimed to explore (see Section 2.13).

CHAPTER EIGHT: RECOMMENDATIONS

8.1 Introduction

The recommendations resulting from this investigation may help poorer or low SES groups in the community and local government to tackle the problems of undernutrition more precisely. The findings from this study reinforce the need to focus on nutritional issues in Nepal and conclude with the following recommendations. They are divided into three parts 1) short-term, 2) medium-term, and 3) long-term recommendations.

8.2 Community level (short-term)

- 8.2.1. Findings showed that child feeding practice was poor due to traditional and religious values and the fathers were least involved in child feeding and caring than the grandparents and siblings. Based on this information, further analysis of IYCF practices including the importance of child care is urgently recommended at the community level (see Sections 6.3.1-6.3.2; 6.5; 7.2-7.4).
- 8.2.2. In this study mothers' knowledge, attitudes and beliefs about recommending a healthy diet to the children were remarkably poor. More research is needed about healthy diets and their key factors including existing practices and beliefs followed by various ethnic groups at the community level (see Sections: 6.2-6.3; 6.5-6.7; 7.4-7.7).
- 8.2.3. Based on this study finding, mothers' food and health-seeking behaviours were encrypted with their own traditional and religious norms and values. However, there still are gaps in the literature about food recommendations pertaining to social and religious norms and values. Therefore, this study recommends further baseline surveys and needs assessment to focus on food and health-seeking behaviours, particularly targeting ethnic groups and religions in remote communities (see Sections: 5.6; 6.4; 6.6-6.7; 7.7).
- 8.2.4. This study showed that the health and environment of the study population were still critical (see Table 4.2). Thus, it is strongly recommended that the government and donor

agencies support latrine construction and usage or consider a water and sanitation programme which is directly linked to child ill health such as diarrhoea and dysentery (see Sections: 5.4; 6.3.2; 6.5-6.6; 7.3; 7.5).

8.3 Policy level or government agency (medium-term)

- 8.3.1. Based on the key findings of the focus group discussions, under the policy and strategy theme (Section 5.6), the existing nutrition policy and strategy was not able to achieve the goals that focus on coordination between private and public health. It is recommended that the existing policy including coordination with the referral system should be revised and monitored more effectively. This would help in identifying nutrition-related problems earlier and prevent or minimise harmful consequences to the child's condition (see Sections: 6.7; 7.5-7.6).
- 8.3.2. This study showed a low level of knowledge amongst rural and urban mothers on healthy foods. Thus, there is a need to focus on creating a level of awareness targeting various groups in the community such as the old and young generations including multi-religious, multicultural and multi-ethnic groups (see Sections: 6.3; 7.8).
- 8.3.3. The pictogram's' outcomes showed significantly poor knowledge of mothers regarding the identification of nutritious food (see Table 4.12). However, to increase the knowledge about existing healthy food items amongst the community people, there is an urgent need to organise the practical base training focusing on healthy food and their impact on the health of children in the community.
- 8.3.4. Based on the outcomes of this study, there remain gaps in the issues around attitudes, beliefs, existing cultural and religious norms and values including ethnic minority groups. It is recommended that research is conducted on the efficacy and effectiveness of promising and relevant interventions on undernutrition (see Sections: 5.5-5.6; 6.5-6.7; 7.5-7.6; 7.8).

- 8.3.5. This study indicated that maternal nutrition knowledge, attitudes and food beliefs were affecting food recommendations for children particularly those living in rural parts. Therefore community-based management of undernutrition, including food supply, strengthening appropriate tools, skills and support systems for critical case detection, early diagnosis and completing treatment is recommended to underpin policy (see Sections: 6.7; 7.8).
- 8.3.6. From the findings of this research, the health sector was revealed as still limited due to insufficient funding and human resources. It is strongly recommended to focus on sustainable multi-sectorial methodologies to improve nutrition throughout the life cycle by addressing social and economic determinants of all forms of undernutrition in the Nepali society (see Sections 5.3 & 5.5).

8.4 Academics/researchers and donors (long-term)

- 8.4.1. The qualitative outcomes of this study showed that Nepalese people were poor and that the country needs sufficient funding to deliver appropriate health services (see Sections 5.3; 5.5-5.6). This study recommends urgent support to train the health workforce, develop the infrastructure, provide instruments and equipment, and conduct more research in health overall.
- 8.4.2. The study showed that mother's literacy status was significantly linked to a state of undernutrition. Therefore, local government policy needs to provide free education to both boys and girls. Moreover, this study suggested the need for further investigations on how science-based nutrition knowledge influences better child nutrition at the household level (see Sections: 5.6; 6.2; 6.7; 7.2; 7.5-7.6).
- 8.4.3. This study showed poor education of the mothers was influenced by food and health-seeking behaviours. Therefore, this study recommends that nutrition education to the mothers should be provided in order to eradicate the existing misconceptions about nutritious food, tradition, and higher social barriers to access including exclusive

breastfeeding practices, diversification of food, provision of three meals plus two snacks a day for children under five; and for feeding practices during periods of illness (see Sections: 7.2-7.7).

- 8.4.4. This thesis results showed that rural and urban mothers have different views about healthy diet and health-seeking behaviours for the undernourished children which affect the local health management of undernutrition. Nutrition programmes should be focused on rural communities focusing on disadvantaged and low-income groups. Caste or ethnic group-based data collection is urgently required in the community because of each caste or ethnic group has own distinct food practice (see Sections: 6.5-6.7; 7.5; 7.7).
- 8.4.5. Based on the findings of this thesis, the main reason for poor utilisation of public health services by the community people was generally due to high faith in healers, poverty, and poor knowledge. It is recommended that government health services, at all levels, is enhanced and equipped with a skilled workforce as well as the provision of modern equipment and improved capacity in the nutrition section at both national and community levels (see Sections 6.3-6.7; 7.5-7.6).
- 8.4.6. Based on the qualitative findings of this study, this thesis argues that further improvement on the level of coordination between community (see Sections 5.5; 5.6 & 5.7), district, and national level be made. This improved coordination will ensure the improvement of the quality of health services including proper supervision and monitoring of nutrition programmes and the availability of free health care services to mothers and children (see Sections 5.3; 6.5-6.7; 7.5-7.6; 7.8).
- 8.4.7. This study found the policy and strategic issues were still influencing the food and health-seeking behaviour of the community people. Thus, it is recommended that all donors, researchers, and multi-national companies provide technical guidance and support in regard to the development and promotion of a comprehensive strategy and plan of action for the provision of community-based interventions focusing on maternal and child health (see Sections: 6.5; 6.7; 7.5-7.6; 7.8).

- 8.4.8. This study showed that food and health-seeking behaviours were strongly inculcated with traditional and religious norms and values due to poor awareness. The ‘3P awareness strategy’ is the best approach that mainly targets the groups of different levels which involve policy people, professionals, and public/people. In the context of Nepal, political groups and Red Cross would be the best groups to deliver this strategy (see Sections: 5.6-5.7; 6.2; 6.5; 6.7; 7.2; 7.6; 7.8).
- 8.4.9 This study has identified new knowledge, diversified views (multiple opinions) which have influenced food and health-seeking behaviours of the mothers. Therefore, it is urgently required to conduct several community-based studies underpinned by the multiple opinions (diversified views) particularly about food and health-seeking behaviours (see Sections: 5.6; 5.7; 6.2; 6.5; 6.7; 7.2; 7.6; 7.8).

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APPENDICES

Appendix 1. Ethical approval letters

Appendix 1a. Nepal Health Research Council



Nepal Health Research Council



NHRC

Ref. No. 1438

Executive Committee

Executive Chairman
Prof. Dr. Chop Lal Bhusal

Vice - Chairman
Dr. Rishi Ram Koirala

Member-Secretary
Dr. Shanker Pratap Singh

Members
Prof. Dr. Meeta Singh
Prof. Dr. Suman Rijal
Dr. Narendra Kumar Singh
Dr. Samjhana Dhakal
Dr. Devi Gurung

Representative
Ministry of Finance
National Planning Commission
Ministry of Health & Population
Chief, Research Committee, IOM
Chairman, Nepal Medical Council

3 July 2012

Mr. Jib Raj Acharya
Principal Investigator
Bournemouth University, UK

Ref: Approval of Research Proposal entitled A comparative study on Nutritional Problem in Preschool Aged Children of the Kaski District of Western Development Region of Nepal

Dear Mr. Acharya

It is my pleasure to inform you that the above-mentioned proposal submitted on 11 May 2012 (Reg. no. 36 /2012 please use this Reg. No. during further correspondence) has been approved by NHRC Ethical Review Board on 1 July 2012 (2069-03-17).

As per NHRC rules and regulations, the investigator has to strictly follow the protocol stipulated in the proposal. Any change in objective(s), problem statement, research question or hypothesis, methodology, implementation procedure, data management and budget that may be necessary in course of the implementation of the research proposal can only be made so and implemented after prior approval from this council. Thus, it is compulsory to submit the detail of such changes intended or desired with justification prior to actual change in the protocol.

If the researcher requires transfer of the bio samples to other countries, the investigator should apply to the NHRC for the permission.


Further, the researchers are directed to strictly abide by the National Ethical Guidelines published by NHRC during the implementation of their research proposal and submit progress report and full or summary report upon completion.

As per your research proposal, total research amount is US\$ 2,600.00 and NHRC processing fee is US\$. 100.00.

If you have any questions, please contact the research section of NHRC

Thanking you.

Sincerely Yours,


Dr. Shanker Pratap Singh
Member Secretary

Appendix 1b. BU Recommendation letter for main Ethical Approval



School of Health & Social Care

Prof B. Gail Thomas
Dean
thomasg@bournemouth.ac.uk
Direct line +44 (0) 1202 962114

Ref: GT/letters/Jib Acharya
Date: 13th June, 2012

The Member Secretary
Nepal Health Research Council (NHRC)
P.O. Box 7626
Ramshah Path
Kathmandu
NEPAL

Re: Jib Raj Acharya

I can confirm that Mr Jib Raj Acharya is enrolled in a full-time research MPhil/PhD doctoral programme within the School of Health and Social Care at Bournemouth University.

He has been registered on the programme since 26th April 2011 and is self funded.

Mr Acharya is carrying out his field study in Nepal, and his study subject is:

A comparative study on nutritional problem in preschool aged children of geographical area of Kaski district of Nepal

Should you have any questions regarding his enrolment or his studies, please do not hesitate to contact me.

Yours faithfully

A handwritten signature in black ink that reads 'B. Gail Thomas'.

Prof. B. Gail Thomas
Dean

Appendix 2. Informed consent form for interview and interview guide

Bournemouth University, UK
Nutritional Survey in Kaski District of Nepal
July 2012

INFORMED CONCENT FORM

I am Jib Raj Acharya, a Nepalese student at Bournemouth University, UK. I am conducting a research study to ask rural and urban mothers of 3 – 5 years old children of urban and rural area of the kaski. I would very much appreciate your participation in this survey. I would like to know more about your knowledge, attitudes and beliefs about nutrition and in general, what type of food that provided/recommended by mothers to their children. Similarly, this information will help the local government to make further plans on the nutrition issues of rural and urban society. If you agree to take part, it will probably take about 30-45 minutes. I have a number of questions, would like to ask you but I would also like to hear about anything else you feel is relevant. I will be either writing down or recording your answers but the information you provide, will be kept strictly confidential and will not be shown to other persons. Participation in this study is voluntary, and if I ask you any question you don't want to answer, just let me know and I will jump up on to the next question; or you can stop the interview at any time. However, I hope that you will participate in this study since your views are very important. If you would like more information about this study, please contact on 009779843139230, or 9849450069.

Note: You can only take part if you have children aged between 3 to 5 years old, child birth certificate/record is compulsory).

At this time, would you like to ask me anything about this study?

Would you like to take part in the study?

Signature of interviewer:

Date:

Language of Interview: Nepali

Respondent Agrees to be interviewed:

Start the interview

RESPONDENT DOES NOT AGREE TO BE INTERVIEWED:

End the interview.

Appendix 3. Consent form to participate in focus group discussion

Nutritional Survey, Kaski (Nepal) Bournemouth University, England 2012

FGD Consent form, Demographics of Participants and rules

Focus Group Participant Demographic and ground rules (फोकस ग्रुप छलफल का नियमहरु र सहभागीहरुको विवरणहरु)		
Date (मिति):	Time (समय):	Place (स्थान):
What you do/profession: तपाईंको काम <input type="checkbox"/> Service (सर्विस) <input type="checkbox"/> Labour work (मजदुरी) <input type="checkbox"/> Private practice (प्रा. प्राक्टिस) <input type="checkbox"/> Social work (सामाजिक काम) <input type="checkbox"/> Run the pharmacy (फार्मसी चलाउने) <input type="checkbox"/> FCHV (महिला स्वयं सेविका) <input type="checkbox"/> Traditional/Spiritual Healer (धामी भक्ती) <input type="checkbox"/> Politician (राजनीतिज्ञ) <input type="checkbox"/> Policy maker (निति निर्माण कर्ता) <input type="checkbox"/> Child carer (सबच्चाको हेरविचार गर्ने)	How long have you been Staying in this place? (तपाईं कति वर्ष देखि यो स्थानमा बस्दै आउनु भएको छ ?) <input type="checkbox"/> Less than 5 years (५ वर्ष भन्दा कम) <input type="checkbox"/> 5 to 10 years (५ देखि १० वर्ष) <input type="checkbox"/> more than 10 years (१० वर्ष भन्दा बढि)	Remarks
Your age (तपाईंको उमेर): <input type="checkbox"/> 20 to 30 (२० देखि ३० वर्ष) <input type="checkbox"/> 31 to 50 (३१ देखि ५० वर्ष) <input type="checkbox"/> 51 to 60 (५१ देखि ६० वर्ष) <input type="checkbox"/> over 60 (६० वर्ष भन्दा माथि)	Your gender (लिंग): <input type="checkbox"/> Male (पुरुष) <input type="checkbox"/> female (महिला)	

FOCUS GROUP INTRODUCTION (फोकस ग्रुप छलफलको परिचय)

WELCOME (यहां उपस्थित सम्पूर्ण महानुभावहरुलाई हार्दिक स्वागत गर्दछु)

Thanks for agreeing to be part of the focus group. We appreciate your willingness to participate.

(फोकस ग्रुप छलफलको लागि राजी भै उपस्थित भै दिनुभएकामा हामी तपाईंहरुलाई धन्यवाद दिन चाहन्छौं)

INTRODUCTION (परिचय)

Moderator (कार्यक्रम संचालक): Mr.....

Assistant moderator (सह कार्यक्रम संचालक).....

PURPOSE OF FOCUS GROUPS (यो कार्यक्रम को उद्देश्य):

We have been asked by Mr. Jib Acharya, a PhD student of Bournemouth University of UK, to conduct the focus groups. (हामीहरुलाई वर्तमानमा विश्वविद्यालय वेलायतमा पि.एच.डी.मा अध्ययनरत श्री जीव आचार्य ले यो कार्यक्रम संचालन गर्न भन्नु भएको हो):

The reason we are having these focus groups is to find out nutritional status of preschool aged children of Kaski district. (हामीले यो कार्यक्रम बाट कास्की जिल्ला का स्कूल नजाने बालबालिकाहरुमा पोषणको अवस्था वारेमा जानकारी प्राप्त गर्नेछौं):

We need your input and want you to share your honest and open thoughts with us. (हामीलाई तपाईंहरुको अमूल्य सलाह र सुझावहरुको आवश्यकता छ, र इमान्दारीता र खुल्ला विचार लिएर सहभागी भैदिन हुनअनुरोध गर्दछौं):

GROUND RULES (कार्यक्रमका नियमहरु):

1. WE WANT YOU TO DO THE TALKING. (कृपया सबैजनाले पालै पालो बोलिदिनुहोला)

We would like everyone to equally participate. (यस कार्यक्रममा सबै जनाले बराबरीरूपमा भाग लिइ दिनुहोला):

We may call on you if I haven't heard from you in a while. (हामीहरूले तपाईंलाई सोध्न सकेछौं यदि तपाईं बाट कुनै जवाफ नआएको खण्डमा।):

2. THERE ARE NO RIGHT OR WRONG ANSWERS. (यहां कुनै सही र गलत उत्तरहरू हुने छैनन्):
Every person's experiences and opinions are important. (कार्यक्रम सबै सहभागीहरूको अनुभव र सम्बन्धित विषयमा धारणा आवश्यक हुनेछ।)

Speak up whether you agree or disagree. (छलफलमा सहमत वा असहमत भएमा आफ्नो धारणा व्यक्त गर्नु होला)

We want to hear a wide range of opinions. (हामी यस विषयमा तपाईंको स्वतन्त्र र खुल्ला विचार सुन्न चाहन्छौं)

3. WHAT IS SAID IN THIS ROOM STAYS HERE (तपाईंले दिनुभएका विचारहरू अति गोप्य राखिने छ र यो कोठा भित्र मात्रै सिमित रहने छन्।)

We want folks to feel comfortable sharing when sensitive issues come up. (तपाईं जब कुनै घतलाग्दो र संवेदनशिल विषयमा छलफल हुंदा सबैजनाले आफ्नो अनुभव कुनै संकोच विना आदान प्रदान गरिदिनुहोला।)

4. WE WILL BE TAPE RECORDING THE GROUP DISCUSSION (by your permission only).
(शायद हामी यो छलफल लाई टेपमा रेकर्ड पनि गर्ने छौं।)

We want to capture everything you have to say. (तपाईं - हामी तपाईंले भनेका सबै यथार्थ कुराहरूलाई रेकर्ड गर्ने छौं।)

We don't identify anyone by name in our report. You will remain anonymous. (हाम्रो रिपोर्टमा कसैको पनि नाम द्वारा परिचय दिने छैनौं र तपाईंले दिनुभएका संपूर्ण सूचना, सल्लाह र सुझावहरू अति गोप्य रहने छन्।)

5. There will be 6 - 9 people of same professional in each group. (यो कार्यक्रमको लागि एकै व्यवसाय भएका ६ देखि ९ जना को ग्रुप हुनेछ।)

6. A Focus Group Discussion is not: A debate, Group therapy, A conflict resolution session, A problem solving session, An opportunity to collaborate, A promotional opportunity, An educational session हाम्रो (यो फोकस ग्रुप डिस्कसन वादविवाद, सामुहिक औषधि, विवाद छिनो फानो गर्ने, समस्या समाधान गर्ने, कुनै अवसर जुटाउने, शिक्षा र प्रचार प्रसार गर्ने साधन होइन।)

7. The focus group is conducted by a team consisting of a moderator and assistant moderator. The moderator facilitates the discussion; the assistant takes notes and runs the tape recorder. -यो कार्यक्रममा एक जना कार्यक्रम संचालक र एक जना रिपोर्ट किपर हुने छन्।)

Thank you (धन्यवाद)

Appendix 4. Research tools

Appendix 4a. Interview questionnaire

Nutritional Study in Nepal 2012 Interview Questionnaire

Serial No.:

Address: Village:

Ward No. :

Age of respondent:

Gender of respondent: M / F

Section 1: Household and Socio-demographic information

S.No	Please tick or circle in right answer and fill in the blank where appropriates.	
1.	Area (Locality)	1. Urban 2. Rural
2.	Age of child	Year.....Month.....
3.	Gender of child	1. Male 2. Female 3. Other
4.	Education of respondent	1. Illiterate (No any formal education obtained) 2. Literate (Under SLC to lower Secondary school) 3. Educated (School Leaving Certificate to PhD)
5.	Religious	1. Hindu 2. Buddhist 3. Christian 4. Muslim 5. Other
6.	Ethnicity	1. Brahmin 2. Chhetri 3. Janajati 4. Dalit 5. Madheshi 6. Other
7.	Occupation	1. Farmer 2. Housewife 3. Business 4. Service 5. Labour 6. Unemployment 7. Other 88. Don't know 99. Do not want to answer
8.	Are you heading the household?	1. Yes, I am 2. No, I am not
9.	Who is giving an interview from this house?	1. Mother 2. Father 3. Grandfather 4. Grandmother 5. Other (Please specify) 88. Don't know 99. Do not want to answer
10.	Is this child still breastfed?	1. Yes 2. No 88. Don't know 99. Do not want to answer
11.	Who is responsible for taking care of this child now?	1. Mother 2. Father 3. Grandmother 4. Grandfather 5. Other 6. >15 yrs. old children

		7. None 8. >15 years old children 88. Don't know 99. Do not want to answer
12.	Who usually feeds this child?	1. Mother 2. Father 3. Grandmother 4. Grandfather 5. Other 6. >15 yrs. old children 7. <15 Yrs old other children 8. Child himself 9. None 88. Do not know 99. Do not want to answer
13.	Can you tell us the size of your family?	1. Two 2. Three 3. Four 4. Five 5. More than 6 people 88. Do not know 99. Do not want to answer
14.	How many children, between 3 -5 years old, are at your home?	1. One 2. Two 3. Three 4. Four 5. Five 6. More than 6 88. Do not know 99. Do not want to answer
15.	What is the household's principle means of livelihood (during this season)?	1. Crop farming 2. Livestock farming/Poultry 3. Casual wage labour 4. Remittance 5. Own business or salaried job/ service 6. Firewood, natural resource collections & sale 7. Fishing 8. Assistance program (pension, NGO, Disability allowance & etc.) 88. Do not know 99. Do not want to answer
16.	Do any members of this household own any agricultural land?	1. Yes 2. No 88. Do not know 99. Do not want to answer
17.	Does the household own any livestock, herds, farm animals or poultry?	1. Yes 2. No 88. Do not know 99. Do not want to answer
18.	Where does your household get drinking water from?	1. Public tap 2. Private tap 3. Tube well, borehole, trade/ pump, 4. Protected dug-well, springs 5. Unprotected well 6. Rain water 7. Pond, lake or stream 8. Purchase bottle/jar 9. Neighboring tap 10. Other 88. Do not know 99. Do not want to answer
19.	Do you purify the drinking water?	1. Yes 2. No

		88. Does not know 99. Do not want to answer
20.	Where do members of your household usually defecate?	1. Closed latrine in own homestead 2. Closed latrine outside of homestead 3. Open latrine/toilet 4. Open field/ Jungle/ House yard/Road 5. Pound/Lake/River/Stream 88. Do not know 99. Do not want to answer
21.	What types of fuels do you use mainly for cooking?	1. Electricity 2. LPG 3. Natural gas 4. Biogas 5. Kerosene 6. Charcoal 7. Woods 8. Straw 9. Shrubs, Grass, 10. Dung (Animal) 11. Other 88. Do not know 99. Do not want to answer
22.	Do you read newspapers at home? If yes, how often?	1. Everyday 2. Once a week 3. Some times in a month 4. No/Never 88. Do not know 99. Do not want to answer

Section 2: Food Recommendations

23.	How many times did you give your child to eat yesterday during the day and evening?	1. One- time 2. Two - three times 3. Four or more times 4. Other 88. Do not know 99. Do not want to answer
24.	What types of feasts did you feed to your child yesterday evening? (Tick on possible answers)	1. Dal curries & rice 2. Dal, curry, rice & vegetable 3. Milk & rice 4. Ghee (butter) & rice 5. Dal rice & meat 6. Rice & yogurt 7. Gundruk (died veg soup) & rice 8. Rice, chilly & salt 9. Dhindho (fafar, maize & millet) 10. Bread with salt 11. Dal curry, gram soup and peanut 12. Yellow colour's fruits and green leafy veg 13. Pudding 14. Nothing 15. Other 88. Do not know 99. Do not want to answer
25.	Do you give meat, fish & egg to your child weekly?	1. Yes 2. No 88. Do not know 99. Do not want to answer
26.	What was the age of your child when you started to feed soft and liquid feasts?	1. Less than 1 month 2. Three months 3. Six months 4. Nine months 5. One year 6. Other

		88. Do not know 99. Do not want to answer
27.	How many times do you give vegetables to your child in a day?	1. Once 2. Two-three times 3. Four-five 4. Do not like to eat salad 5. Never give salad and vegetable to child 88. Do not know 99. Do not want to answer
28.	How many times do you give fruits to your child in a day?	1. Never 2. Two-three times 3. Four or more times 4. Sometimes 88. Do not know 99. Do not want to answer
29.	How often do you give tiffin/snacks including salad to your child?	1. Once in a month 2. Once in a week 3. Two-three times in a week 4. Four or more times in a week 5. Never 6. Child dislikes 88. Do not know 99. Do not want to answer
30.	How many times do you give meat to your child in a month?	1. Some times in a month 2. One- two times in a week 3. Three or more times in a week 4. Never 5. Child dislikes meat 88. Do not know 99. Do not want to answer
31.	How many times do you give fruit juice to your child?	1. Some times in a month 2. Once in a week 3. Two-three times in a week 4. More than seven times in a week 5. Never 6. Child dislikes 88. Do not know 99. Do not want to answer

Section 3: Food Scarcity (Please tick or circle on possible answers)

32.	Did your household experience any food shortage in the past 12 months?	1. Yes 2. No 88. Do not know 99. Do not want to answer (if yes, go to Q. No. 33 a & b)
32. a.	If food shortages were experienced, what was the primary reason for this shortage?	1. Own production/food depleted 2. Lack of labor opportunities & income 3. Increased in food prices or high market 4. Remittance did not come 5. Household members migrated out 6. Food scarce in the market 7. No nearby market/ poor accessibility 88. Do not know 99. Do not want to answer
32. b	If food shortages were experienced, then which month was the shortage?	1. Jun-Jul (Ashadh) 2. Jul-Aug (Shrawan) 3. Aug-Sept (Bhadra) 4. Sep-Oct (Ashwin) 5. Oct-Nov (Kartik) 6. Nov-Dec (Mangsir) 7. Dec-Jan (Paush) 8. Jan-Feb (Magh) 9. Feb-Mar (Falgun) 10. Mar-Apr (Chaitra)

		11. Apr-May (Baishakh) 12. May-Jun (Jestha) 88. Do not know 99. Do not want to answer
Section 4: Knowledge (please give best answer for Q.no 34, 35, 36, & 44)		
33.	Give us the name of highly nutritious foods!	1. 2. 3. 4. 5. 88. Do not know 99. Do not want to answer
34.	Do you have any knowledge about signs and symptoms of malnutrition?	1. 2. 3. 4. 5. 88. Do not know 99. Do not want to answer
35.	In your opinion, which foods have no nutritious value; give us name of least nutritious foods?	1. 2. 3. 4. 5. 88. Do not know 99. Do not want to answer
36.	Why do you need to provide nutritious foods to your children?	1. To survive 2. Fill the stomach 3. To get immunity 4. To keep healthy 5. To grow child fast 6. Other 88. Do not know 99. Do not want to answer
37.	What do you think about feeding of green leafy vegetables and red, yellow colors fruits to your child during the illness period?	1. Bad for children health 2. Good for children health 3. No knowledge about it 4. Other 88. Do not know 99. Do not want to answer
38.	Do you know about the weight of your child at a moment?	1. Normal 2. Low 88. Do not know 99. No answer (if answer is 1 then skip Q No. 39 b and if answer is 2 then skip Q. No.39 a)
38. A	Do you know the reason why your child has normal weight?	1. Due to nutritious food 2. Due to medicines 3. Good taking care of 4. Treated by spiritual/ traditional healer 5. Other 88. Do not know 99. Do not want to answer
38. b	Do you know the main reason why the weight of your child is low?	1. Poverty 2. Poor nutritious food 3. Poor childcare 4. Other 88. Do not know 99. Do not want to answer
39.	Are you able to select or choose healthy or nutritious foods at the grocery store?	1. Yes I can 2. No I cannot 3. Do not have confidence 88. Do not know 99. Do not want to answer
40.	In the shown pictures, which one is/are nutritious or no nutritious?	1. Right (all correct, out of ten) 2. Wrong (all incorrect, out of ten)

		3. Partially right (up to six correct) 4. Partially wrong (six wrong out of ten) 88. Do not know 99. Do not want to answer
41.	Do you think it is important to give fruits and vegetables to your children?	1. To keep child healthy 2. To make child sick 3. To protect child from devil eyes 4. Other 88. Do not know 99. Do not want to answer
42.	Which of these foods do you think is/are non-nutritious?	1. Fish, Meat, Egg and Liver 2. Green vegetables 3. Fruits 4. Milk, Yogurt, Butter 5. Mixed of grains 6. Rice, Potato & Bitten rice 88. Do not know 99. Do not want to answer
43.	In your opinion, what do you do to overcome child malnutrition? Give five points on this.	1. 2. 3. 4. 5. 88. Do not know 99. Do not want to answer

Section 5: Cultural effect /Beliefs about nutritional food (Please provide best answer based on your experience)

44.	What do people think about regular feeding to the children the dairy and animal products? Give reasons!	1. 2. 3. 4. 5. 88. Do not know 99. Do not want to answer
45.	What are the existing beliefs about nutritious food in this community? List!	1. 2. 3. 4. 5. 88. Do not know 99. Do not want to answer
46.	What do people of this area think about to feed colostrums? Please give five concepts.	1. 2. 3. 4. 5. 88. Do not know 99. Do not want to answer
47.	Have you ever feed to your children the dairy product, fish and meat at a time or together?	1. Yes 2. No 88. Do not know 99. Do not want to answer
48.	What sort of food do you give or feed your children regularly? Give us name.	1. 2. 3. 4. 5. 88. Do not know 99. Do not want to answer
49.	Give us the name of foods which your child likes most. (Tick on possible answers)	1. Noodles 2. Biscuits & chocolates 3. Rice, pulse & vegetable 4. Fish, meat & egg 5. Bitten rice & sugar 6. Rice & Ghee

		7. Rice & milk 8. Fruits 9. Others 88. Do not know 99. Do not want to answer
--	--	---

Section 6: Barriers/ Difficulties to recommend nutritional food.

50.	What are the major burdens to recommend nutritious food to your child?	1. Lack of knowledge 2. Food scarce in the market 3. No money/expensive 4. High misbelieves or cultural influence about nutritious food 5. No time to prepare 6. Other 88. Do not know 99. Do not want to answer
51.	What are the main difficulties to get nutritious food for your child? List five reasons!	1. 2. 3. 4. 5. 6. No problems 88. Do not know 99. Do not want to answer
52.	Why do you not providing nutritious food to your child? List five reasons.	1. 2. 3. 4. 5. 6. No problems 88. Do not know 99. Do not want to answer

Section 7: Health seeking behaviours (please tick or circle in possible answers)

53.	Where do you take your children when he gets sick?	1. Doctor's clinic 2. Spiritual/traditional healer 3. Asha Clinic 4. Health/Sub health post 5. Ward office 6. Gandaki hospital 7. Private hospital/ nursing homes 8. Nowhere 9. Other 88. Do not know 99. Do not want to answer
-----	--	--

Section 8: Involvement in Health Education/Promotional activities (pleases tick or circle on possible answers)

54.	Have you ever attended any health education awareness classes about nutrition in your area?	1. Yes 2. No 88. Do not know 99. Do not want to answer
55.	How did you get the information about healthy food? From where?	1. Health workers 2. FCHV/Mother groups 3. Doctors 4. Ward Office 5. Church 6. Hindu temple 7. Health organizations 8. Teacher 9. Pharmacist 10. Spiritual/traditional healer 11. Media (Radio/TV) 12. Newspaper, magazine, book, & news bulletin etc. 88. Do not know 99. Do not want to answer

Section 9: Attitudes (please tick on possible answers)

56.	Do you believe that providing healthy food will help keep your children healthy?	1. Yes 2. No 88. Do not know 99. Do not want to answer
57.	Why did you not recommend eating anything to the child during the illness?	1. Not available at home 2. Advised by healer 3. Advised by health worker 4. As per belief of society that do not feed anything during the illness 5. Tension and fear 6. Child does not like to eat 7. Other 88. Do not know 99. Do not want to answer
58.	How many times did you take your child to spiritual or traditional healer during the illness?	1. One-two times 2. Many times 3. Never 88. Do not know 99. Do not want to answer
59.	What sort of foods do you like to give your child?	1. Readymade food 2. Rice, pulse & vegetables 3. Soft food and liquids 4. Milk, yogurt, ghee and rice 5. Rice with meat, fish and eggs 6. Other 88. Do not know 99. Do not want to answer

Thank you very much for your participation and time.

Name and signature of enumerator:

Date:

Appendix 4b. Agenda for focus group discussion

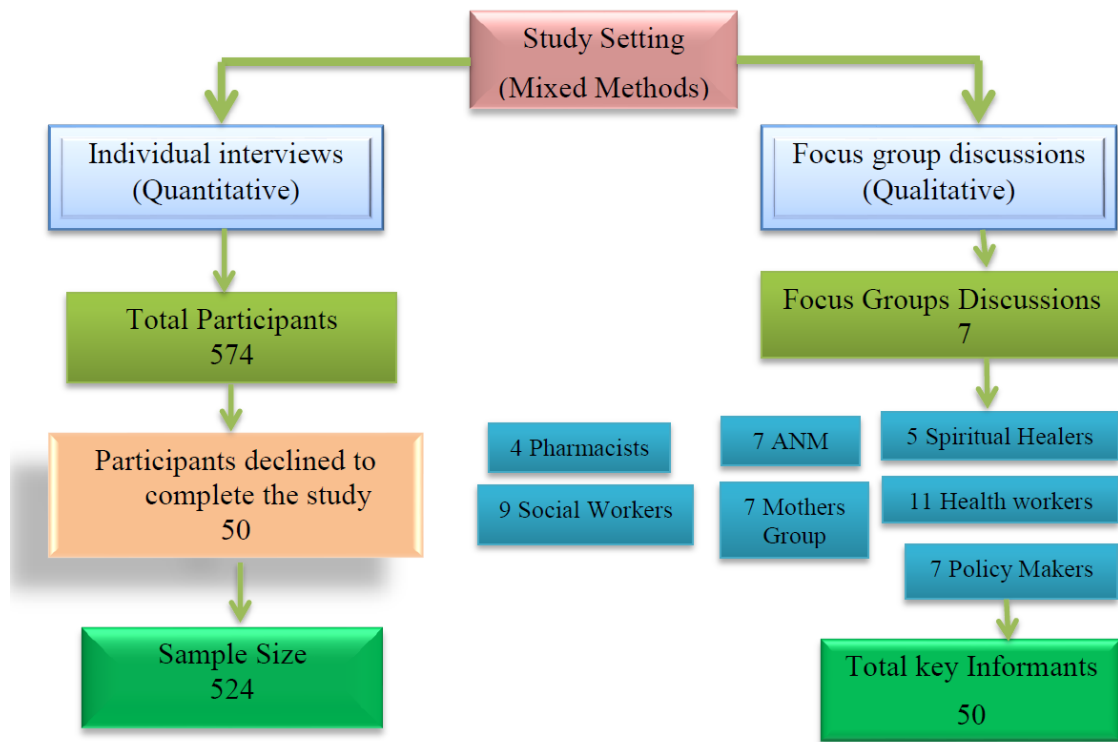
Nutritional Survey, Nepal 2012

FOCUS GROUP DISCUSSION AGENDA

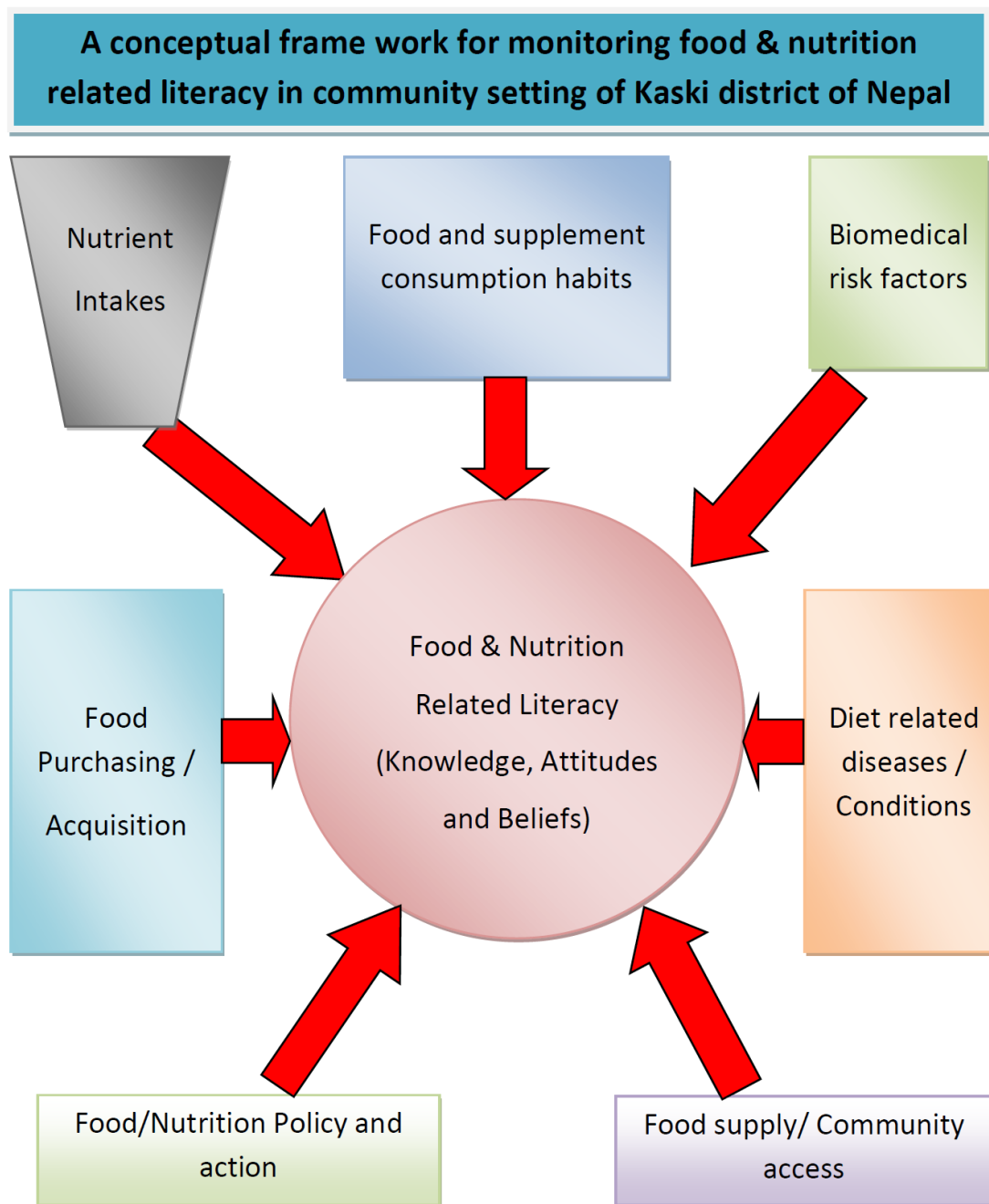
1. Which ethnic group of this area have greater problems in feeding their children healthily? Why is this problem?
2. In your opinion, rural or urban mothers have appropriate knowledge of nutritious food recommendation to their preschool-aged children and why? Do you think there is a difference between rural and urban mothers regarding their knowledge of healthy food for their preschool children? Why do you think this is the case? What kind of knowledge or information is lacking?
3. What are the difficulties faced by mothers to providing nutritious foods to their children?
4. What do people in Pokhara and surrounding areas regard as the most nutritious foods for their offspring?
5. What do people in Pokhara and surrounding areas regard as the least nutritious foods for their offspring?
6. In your observation, what challenges exist for mothers giving nutritious food to their preschool-aged children and how do they attempt to overcome them?
7. To what extent are poor people aware of health promotion message around health eating? Please outline your answer.
8. 8. What do poor people do when their malnourished children fall ill? Where or to whom do they go for diagnosis and treatment?
9. Do spiritual/traditional healers help people in your community with health problems related to malnutrition and poor diet?
10. What kind of information is provided by the FCHV towards nutritious food especially for ill or malnourish children?
11. What are the major factors that affect the local availability of certain foods (last six months) and where they get food from?
12. What major factors seem to help mothers in providing healthy nutritious food to their preschool aged children?
13. In your own opinion, what are the main difficulties in preparing nutritious food for preschool aged children?
14. How would you help solve malnutrition in your community?
15. What are your main issues about the nutritious food problems in Nepal?

Appendix 5. Diagram of the study design

Diagram of study designed



Appendix 6. Diagram for conceptual framework



Adopted from: Marks et al 2001

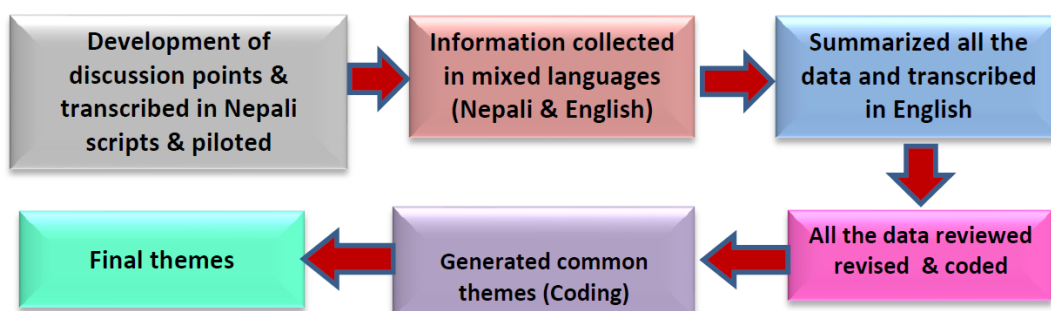
Appendix 7. Focus group data generating cycle

Bournemouth University, UK

Kaski Nutrition Survey

2012

FGD data generation cycle

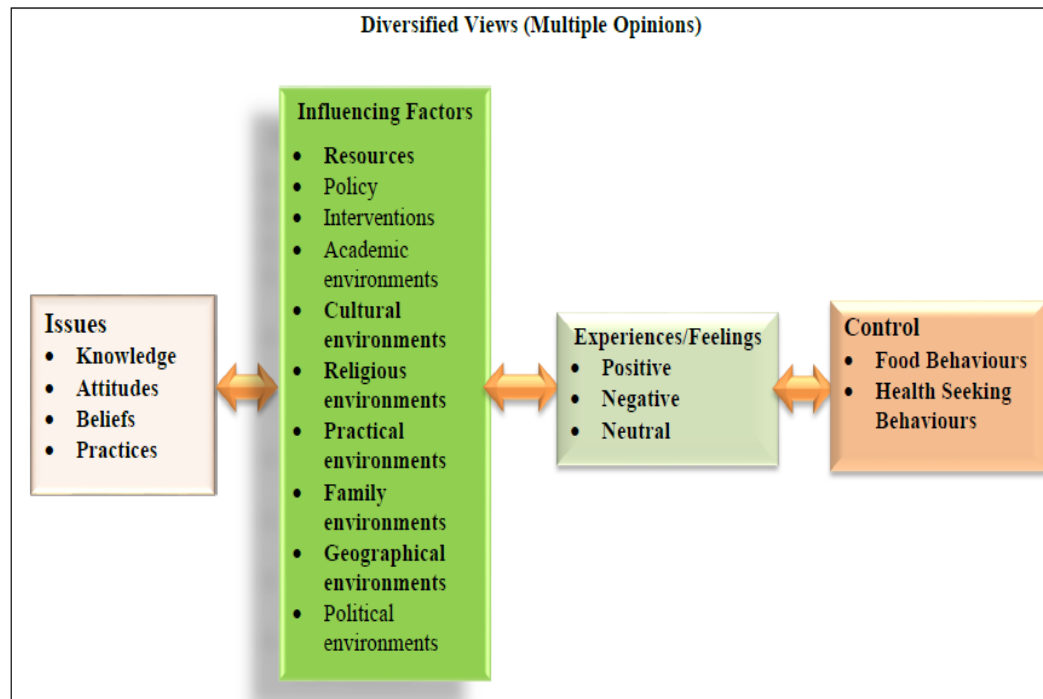


Appendix 8. Qualitative data analysis form

The summary of statements	Summary of synonymous category	Common themes	Final themes
1.			
2.			
3.			
4.			

At the final stage of analysis, the different format was used. At the left side of the table, the summary of the statements was sequentially placed in rows then drawn the summary of synonymous categories in the columns. At the right side of the table, noted common themes and at the end, the final themes abstracted from each issue. Focus Group Discussion analysis has been based on Appendix 9 diagram (see Appendix 9).

Appendix 10: Diagram of diversified views



Note: The highlighted variables (on the diagram above ('Influencing Factors' section) were strongly associated directly with the study's aim, objectives and research questions. Non-highlighted variables are also important, but to a less direct degree than the highlighted ones. Thus, the highlighted variables are commonly revealed to be the key/activating issues (Knowledge, Attitudes, Beliefs and Practices) about healthy foods which present positive, negative and neutral views that directly or indirectly control/influence food and health seeking behaviour either positively, negatively or neutrally. The study found mostly negative outcomes, towards the healthy diet. Diversified views (DV) emerged when relatives, friends and neighbours visit sick child home. They generally collect information about the causes of child sickness, shared similar past experiences and advised for food and further health consultation. DV emerges during the visit to the sick child, which creates multiple opinions and ultimately confused the mothers for proper decision particularly food and health seeking behaviours.

Appendix 11. Focus group data record log book

Qualitative Data Record Log-Book

Name of the group:				Date:		
No. of participants:				Start time:		End time:
Participant's identification no. and their statements						
Discussion agenda	01	02	03	04	05	06
1. Which ethnic group is most affected with undernutrition?	Dalits	Chhetri	----	Dalits	Dalits	Dalits
2.						
3.						
4.						

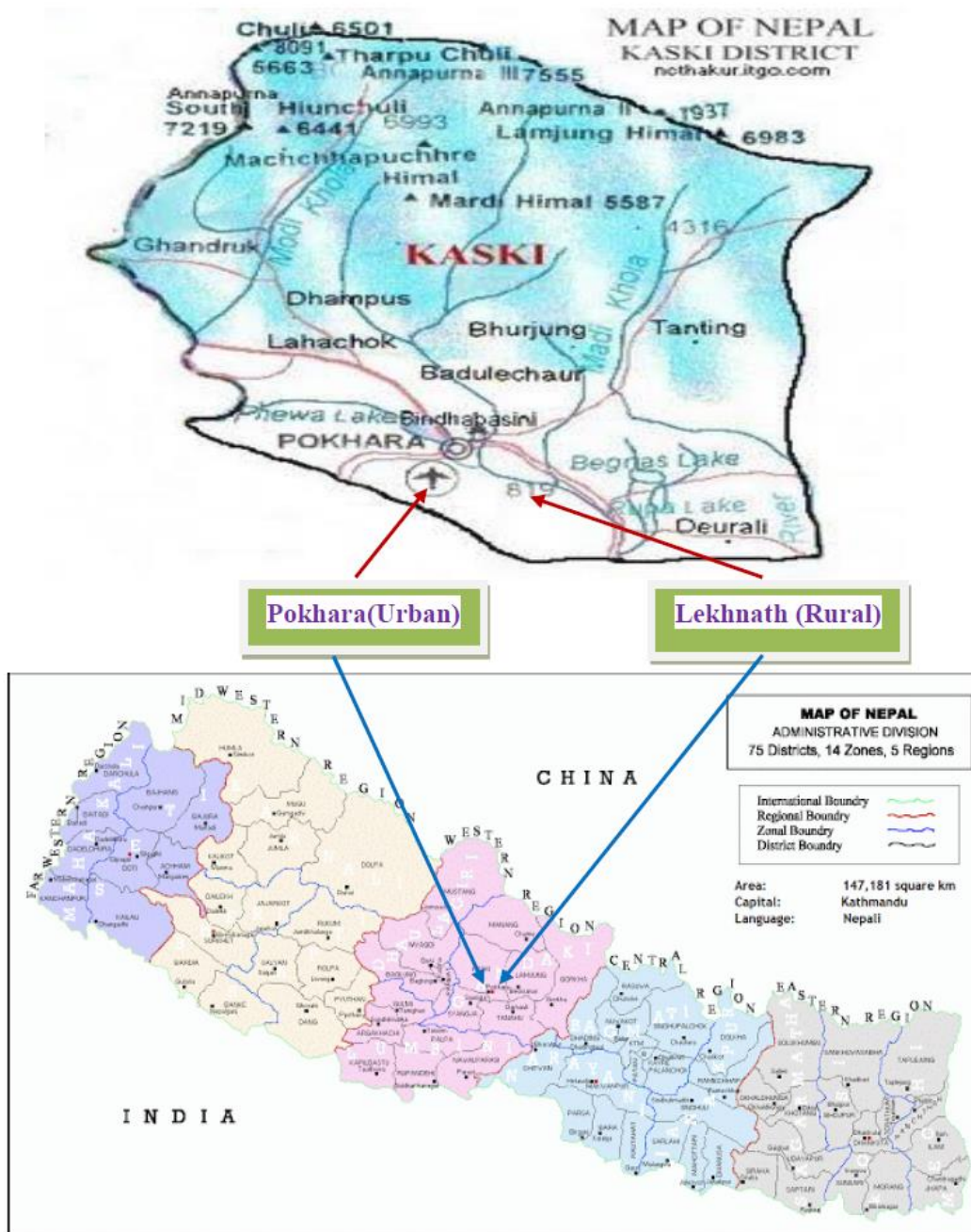
This format was developed for recording focus group data. On the top right, the name of the group and no. of participants recorded. On the left side of this form is for the record of date and time. Likewise, on the left side of the format is for discussion agenda such as '1' is for agenda no.1, '2' for agenda 2 and so (see Appendix 4b). In the middle of the form informs the participant's identification and their statements. For example, agenda no.1 discusses vulnerable ethnic group in the area and participant '01' says Dalits and '02' says Chhetri and '03' is silence. Thus, it is recorded as above shown. An example of focus group data record is given in below. The demography of individual's was recorded on the front page of this register.

The image shows a handwritten focus group data record log book with two pages. The title 'FGD 3' is written at the top. The left page contains three discussion points (01, 02, 03) and their corresponding statements from participants. The right page contains three discussion points (04, 05) and their corresponding statements, along with a 'Remarks' column. The handwriting is in Nepali and English.

Discussion Point	Participant 01	Participant 02	Participant 03	Participant 04	Participant 05	Remarks
01. <i>असुखी गर्भवती महिलाहरूको स्वास्थ्य र पोषण स्थिति</i> → असुखी गर्भवती महिलाहरूको स्वास्थ्य र पोषण स्थिति → lower cost that will be more nutritious due to lack of core food.	Not taking care of children from parents either rich or poor → lack of appropriate environment to care of children			same to 1 view	Pregnant women are not pregnant women one day and another day	Remarks: some women are related to other rich or poor
02. <i>रुखी क्षेत्रमा भोजनको कमी र पोषणको कमी</i> → rural area in Bhairavi area and some other areas → lack of time to urban mother	Urban area in and some parents do job in nearby areas children in care used that they start refuse to eat → lack of time to urban mother		more services available in urban area of transportation use in some countries mostly exist in urban area	due to high wages rural women goes from work from 11 days of pregnancy	Lack of time to urban mother care also	→ lack of time in rural mother, improper management
03. <i>अशिक्षित महिलाहरूको ज्ञानको कमी</i> → lack of knowledge	more use of chemicals → weak governmental policy → date expire should warn → <i>दातुको म्याद</i>		→ lack of appropriate technologies	vegetables, fruits in chemical area would use more chemicals so difficult to identify whether organic or inorganic	mostly rural area in urban and other food and use in urban area in financial problem → lack of knowledge	→ lack of education knowledge → more use of chemicals → weak governmental policy → financial problem

As shown in the above-shown register, rows are representing serial numbers of the discussion points and summary of the statements that reacted by participants. The columns are representing the participants along with their arguments. The last row of the format is used for the summary of the discussion. The enumerators have used both languages for the focus group data record.

Appendix 12. Study sites: Pokhara (Urban area) and Lekhnath (Rural area)



Source: <http://www.weallnepali.com/about-nepal/map-of-nepal>

Appendix 13. Pictographs of green leafy vegetables and fruits

Nutritional Survey

Pokhara, Kaski 2012

Pictographs of Green Leafy Vegetables and Fruits



Appendix 14. Lists of food classifications: ‘Hot’, ‘Cold’ and ‘Neutral’.

Foot classification under the cultural beliefs

Classifications of food items which are associated food beliefs/taboo are briefly described. Traditionally food items are grouped into main three parts: Beneficial, Curative and Harmful. These food beliefs are found to have extremely influenced by households’ food practices. The controversial food items with several types are not listed here because these may not appropriate to other ethnic groups and households. First, two opinions about beneficial food types are common and the other two mainly exists in the rural area in Nepal. Some beliefs are common, some are limited and some are typically family specific to the local community.

The following messages about food classification were gathered by the author during the questionnaire interview.

Neutral food items	Cold food items	Hot food items
Boiled potato, Cooked rice	Pumpkin, radish, cabbage, tomato cauliflower, radish leaves, rape leaves, mustard leaves, spinach, eggplant, cucumber, <i>Jau</i> (Barley), <i>Phafar</i> (Buckwheat)	Potato, sweet potato (fried or baked), Pineapples, <i>Tarul</i> (yam), Garlic (leaf/ bulb), water cress, spinach, colocasia tuber, bitter gourd, snake gourd, dried leaves, bamboo shoot, saffron and nettle
Red lentil (Musuro), boiled potato, green lentil	Green peas, gahat, soybean Masyang, yellow lentil, Various fruits: Papaya, apple, banana	Staples: wheat, millet, rice bread, Chapatti and beaten rice Yellow lentils (Rahar), Bengal gram (Chana), dry pea, horse gram, cluster bean, roasted beans
Lemon, Orange	Duck, sheep, pork, duck eggs, yoghurt, cow’s milk buttermilk, milk, Coconut oil	Mango, jack fruit, guava, pomegranate, banana, nuts Coconut
	Aniseed, coriander seed	Fish, Chicken, goat, pigeon, chicken, eggs, buffalo milk, clarified butter
	White beer (chhyang, rice beer/Jand) Sugar, salt	Mustard oil, sesame oil Onion, garlic, chilly, ginger, pepper, celery seed, dill seed, cumin seed, saffron, chilly, fenugreek seed Alcohol, tea, coffee Jaggery, molasses, honey

Beneficial food items

- Soup of celery seeds (Jwano) helps to increase milk secretion/production in lactating mothers. It is widespread within Nepalese society whereas Newar community uses white beer (Thon) for this purpose.
- Taking a glass of warm milk daily that helps to keep health condition good
- Intake of a spoon of Ghiu (clarified butter) daily it increases body power
- Dhindo (porridge prepared by maize) and Gundruk (fermented dried vegetables) are heavy foods which give more energy than other food items mainly for farmers.
- Herbal medicines (Jadi Buti) are the best remedies which have no any side effects as Angreji Dabai (allopathic medicines)
- Guava, banana, papaya and are given to relief from constipation.

Curative foods

- Large proportions of the mothers strongly believe that some food items have curative effects such as Sesame seeds, celery seeds, horse bean (Gahat), black bean (Mas), banana, and guava.
- Most of the ethnic groups use lemon with hot water to cure common cold
- A spoon of honey with ginger juice help to cure a cough
- Celery seeds and turmeric powder boiled with water help to cure common cold and cough
- Green banana, fenugreek seeds, and yoghurt using to cure diarrhoea in the community
- Soup of Gahat (horse-gram) for relief from the problem of gallstone (Patthari)
- For the swelling of body or any part of body use stinging nettle soup (Sisno soup) to reduce swelling
- Use mint leaves either fresh or dried and cold water extract of mint leaves for a headache due to heat
- Use water of coriander seed to cure urine problems mainly in women
- Use boiled water with saffron seeds and Misri (type of sugar) for dysentery
- Solve the problem of night blindness in children, feed mashed liver (goat, chicken, pork) , baked egg, mashed green-gram, Bhingaraj (Eclipta prostrata), and rice water (Chaulani pani)
- Some community believed that chilli and alcohol help to kill worms

Harmful foods

- Pregnant women are not allowed to eat white pumpkin/winter melon, papaya and honey because it may cause abortion
- Roti or Chapati (Bread of wheat) reasons a headache due to acidity so it is banned for the person with a gastric problem.
- Fresh and uncooked radish is believed a source of a cough and gastric problem so children, pregnant and lactating women and old people are not allowed to eat.
- It is believed that sheep meat causes swelling and joint pain
- Some ethnic group of the study area believed that a bitter gourd causes low pressure and weakness
- Widely believed that pomegranate and guava cause constipation so not providing to children, pregnant women and old age.
- Some community believed the sour food and fruits cause cold, diarrhoea, stomach ache and fever
- Colostrum is a poisonous, toxic and form of pus which harms to children. It causes constipation, diarrhoea, stomachache and vomiting to child
- In winter, some ethnic groups are not providing yoghurt, buttermilk, fruits and green vegetables to and lactating mothers and children because they believed that these items cause cold and stomach-ache to children.
- It is widely believed that animal products, legumes, and honey are not consumed at the same time that causes diarrhoea/dysentery, vomiting and or constipation.
- Cauliflower causes gastric problem and acidity.
- Green vegetables, yoghurt, some fruits, buttermilk, and some staples are the source of common cold and restricted to sick and old age people, children and lactating mothers.

Appendix 15. Training schedule for enumerators

Training manual for enumerators

Research title: A Comparative Study on Nutritional Problems in Preschool Aged Children of the Kaski District of Western Development Region of Nepal

Research methods: Mixed methods (Qualitative and Quantitative)

Research tools: Structure questionnaires and Focus Group Discussions

Research question: What is the level of knowledge and attitudes about the food recommendation/preparation for preschool aged children amongst rural and urban mothers?

Research Objectives:

General:

To measure the level of knowledge and attitudes about the food provided for preschool aged children amongst rural and urban mothers.

Specific:

Individual study

- To know the knowledge of food for children amongst mothers of rural and urban, how this links with food purchasing/ consumption.
- To find out attitudes/beliefs regarding food amongst rural and urban mothers
- To assess health seeking behaviour for malnourished children in rural and urban communities and rationale for choices in health services to overcome health illnesses (where they go for treatment such as health institutions (private or government), traditional/ spiritual healer, or quack)
- To collect information about knowledge & attitudes towards food from Female Community Health Volunteers (FCHV)
- To determine factors that affect availability of food (last six months), where they access good food at religious & cultural events
- To determine the challenges that exist for mothers giving their children food and how they attempt to overcome them
- To measure the level of knowledge of and attitudes towards health promotion.

Epidemiological study data

- To establish population-based problems using epidemiological data of nutritional status of preschool aged children (aged 3 to 5 years) in Kaski district
- To identify higher risk groups for under nutrition: gender, age, caste/ethnic group, wealth ranking etc

Target groups for FGD and Interview:

- Mother of 3-5 year old children (for semi structure questionnaires)
- FCHV, Policy maker, Pharmacist, Health worker, Spiritual/Traditional healer, Social worker and Red Cross Volunteer (for focus group discussion)

Ethical approval:

- BU
- NHRC
- PSMC
- CWSN
- LGIC

Study area: Urban and Rural Part of Pokhara and Lekhnath

- MCH Clinic of PSMC (focusing urban area and rural community)
- Asha Clinic

Sample size:

- 200 mothers of Urban area
- 200 mothers of slum area
- 50 persons from 7 FGD (7 persons of each group of Mothers Group, PM, Pharmacist, Social Worker, Spiritual healers, ANM, and HW)

Pilot study:

Venue: Hemja and Laltin Bazaar

Sample of pilot study (Target): 20 mothers of each place, One Focus Group Discussion for FCHV or Social Worker of Hemja or latin Bazaar

Exclusion criteria

- Mother of breastfed children
- Mother from outside of research area

Data analysis

- SPSS computer software for quantitative
- NVivo for qualitative

No. of enumerators involving in the study

- 10 student from BPH stream
- 1 Research Assistant from BPH Tutor

Expected date to complete data collection

- 7 – 10 days for planning of Interview and FGD
- 20 days for questionnaire interview (10x20x20)
- 6 days for focus group discussion

Benefit for the enumerator

- Exposure on research method
- Practical empowerment on research
- Appreciation letter will be provided on behalf of BU
- Transportation, tea snacks and lunch or dinner will be provided by the principle investigator
- Institutional link will be established between La Grande and BU

Appendix 16. Signs and symptoms of malnutrition conditions

According to the NHS (<http://www.nhs.uk/Conditions/Malnutrition/Pages/Symptoms.aspx>) a child with malnutrition shows the following signs and symptoms:

- Feeling tired all the time and lacking energy
- Frequently getting infections
- Taking a long time to recover from infections
- Delayed wound healing process
- Poor concentration
- Difficulty keeping warm
- Depression
- Poor or lack of appetite
- Poor digestion or disruption in the normal process of digestion (diarrhoea & vomiting)
- Poor immune system
- Poor growth of weight and height
- Changes in behaviour: irritable, sluggish or anxious
- Changes in hair and skin colour
- Loss of weight

Appendix 17. Outcomes of pre-test and piloting

The following outcomes have been obtained from pre-test and piloting of questionnaires.

Pre-test in UK	Pre-test in Nepal	Pilot in Nepal
<ul style="list-style-type: none"> ★ Removed name of the district and participants from the form ★ Corrected dual meanings, direct and impolite words and sentences in Nepali language ★ All the Nepali translated words reviewed and corrected ★ Unrelated questions deleted and total reduced from 64 to 59 ★ All the questions divided into nine sections in numeric order: households and socio-demographic contains 16 questions, food scarcity 3Qs, knowledge 11Qs, beliefs 4Qs, food recommendation 12Qs, food barriers 5Qs, health seeking behaviours 1Q, involve in educational activities 2Qs, and attitudes 3Qs. ★ Section 4: in Q2 Nepali word was amended, & added new variable 'other with code 88' in Q4. Similarly, Nepali word in Q6 was corrected 	<ul style="list-style-type: none"> ★ Questionnaire in Nepali script only and questionnaire format reviewed and revised. ★ All answers of questionnaires were setup into Arabic sequential order. ★ Removed name of district, participant, answer column, from form ★ Removed ethnicity, occupation, education & religion from the top of form & moved into section 1 ★ All questions presented in sequential numeric order (total questions are 57 but Q34 & Q40 have two sub-questions each. ★ Seven questions were added in section 1, two questions deleted from section 2 which presented dual connotations. Likewise, Q34 divided into two sub-questions as 34a & 34b. Q40 parted into two sub-questions as 40a & 40b. In section 5, Q2 amended in Nepali and one question deleted. In section 6, two questions deleted and one from section 9 . ★ Section 1: Q4, 5, 8 	<ul style="list-style-type: none"> ★ Heading of questionnaire form was changed ★ Age and gender of respondent was added at the top of section ★ Age and gender of child was added in section 1. ★ In section 2, one question deleted. ★ In section 5, three new questions added. ★ In section 6, one question deleted which presented dual meanings ★ In section 9, two new questions added ★ Section for enumerator's name, signature and date was added at the end of questionnaire form

<ul style="list-style-type: none"> ★ Revised all the questions, reduced the answer options and fixed for open-ended questions (19, 30–32, 42–44, 50, 51) ★ All the questions presented in both scripts (English & Nepali) 	<ul style="list-style-type: none"> added ‘other’ in answer column & corrected Nepali in Q16 ★ In SS questions added the variable ‘does not know’ with code 88 ★ Section 2: Q1: correction of Nepali language & added <i>Dal Bhat Tarkari</i> in Nepali, Q5: correction made in Nepali ★ Section 3: Q2 & Q3 changed into sub-questions and given as Q1a and Q1b. ★ Some deleted and added: in section 1: households and socio-demographic contains 16 questions, food scarcity 3Qs, knowledge 11Qs, beliefs 4Qs, food recommendation 12Qs, food barriers 5Qs, health seeking behaviours 1Q, involve in educational activities 2Qs, and attitudes 3Qs. 	
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Sources: van Teijlingen and Hundley (2002); Creswell (2009).

Appendix 18. Table of dietary patterns and sharing of food

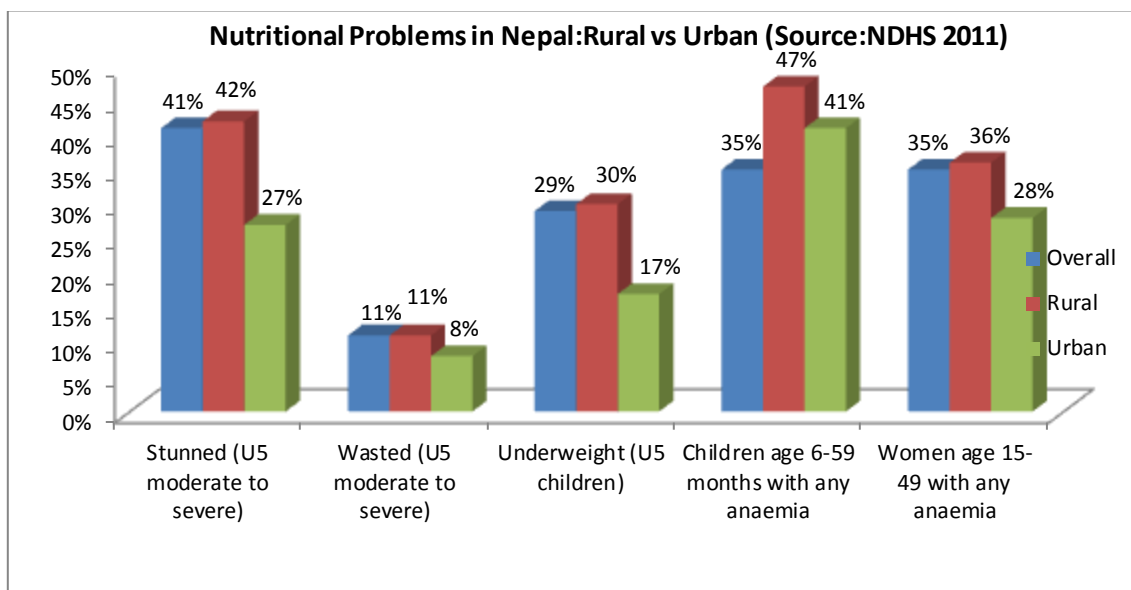
Dietary patterns and Share of Food			
THEMES	1992	2002	2014
Diet patterns			
Exclusive breastfeeding, children <6 mths (%)	na	68.3	53.0
Min. dietary diversity, inf. and young child (%)	na	na	na
Min. meal frequency, inf. and young child (%)	na	na	82.0
Dietary energy supply (kcal/cap/day)	2214	2276	2538
Average dietary energy supply adequacy (%)	106	108	117
Average protein supply (g/cap/day)	56	58	62
Average supply of animal protein (g/cap/day)	9	9	10
Average fat supply (g/cap/day)	36	39	41
Share of dietary energy supply			
Cereals, excluding beer (%)	73.4	69.8	68.1
Starchy roots (%)	3.1	3.9	4.8
Sugar and sweeteners (%)	1.7	2.1	2.0
Pulses (%)	2.8	3.1	3.4
Tree nuts (%)	0.1	0.4	0.3
Oil crops (%)	0.0	0.0	0.0
Vegetables (%)	1.4	1.8	2.1
Fruits, excluding wine (%)	2.1	1.9	2.0
Alcoholic beverages (%)	0.0	0.0	0.1
Stimulants (%)	0.0	0.0	0.0
Meat and offal (%)	2.0	1.9	1.9
Vegetable oils and animal fats (%)	7.1	7.8	8.0
Fish, seafood and aquatic products (%)	0.1	0.1	0.1
Milk, excluding butter (%)	3.6	3.6	3.7
Eggs (%)	0.2	0.2	0.2

Source: FAO 2014a

The healthy diet amongst the Nepalese population was described by FAO (2014a). This Table basically explains diet patterns and share of food supply in different years: 1992, 2002, and 2014. The table describes, for children under six years: dietary patterns, frequency of meals, dietary energy supply, share of dietary energy supply and exclusive breastfeeding between 1992 and 2014. The statistics of this table are significantly associated with undernutrition among Nepalese children.

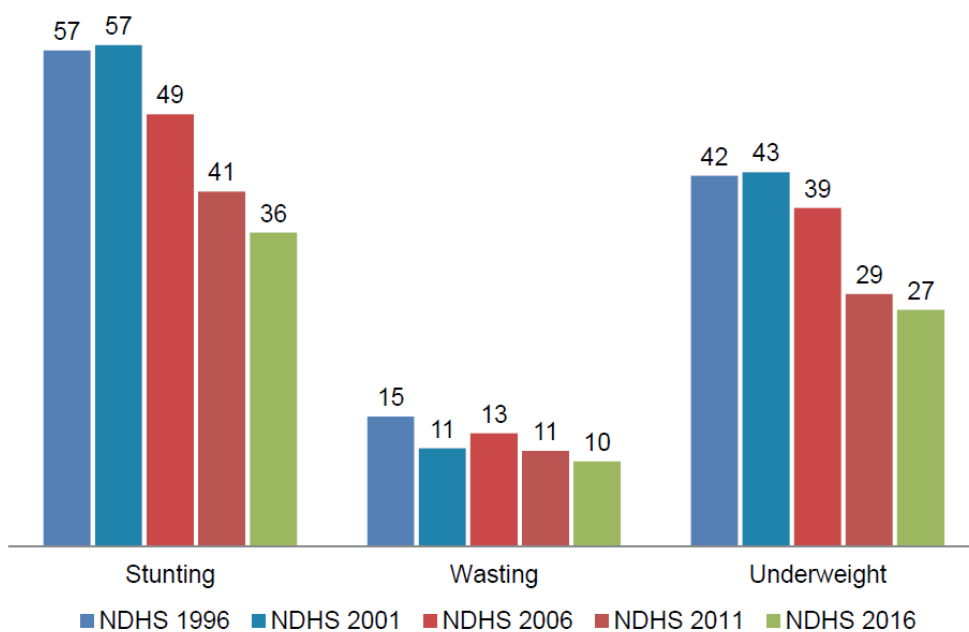
Appendix 19. Figure of nutritional status of Nepal: Rural vs. Urban and its trends

Nutritional Status in Nepal: Rural vs. Urban



Trends in nutritional status of children, 1991 - 2016

Percent



Appendix 20: An example of focus group data analysis framework

An example for focus group analysis

Pharmacists	Auxiliary Nurse Midwife (ANM)	Spiritual Healers	NAME OF THE GROUPS				Policy Makers	Summary or Conclusions
			Mothers Group	Health Workers	Social Workers			
Slum community, poor people and underserved population. Mainly due to poverty and lack of awareness	Poor and, illiterate population mainly lower caste. Due to lack of awareness and education	Underserved community's children mainly due to not taking care of children and away from the faith, cultural beliefs & poor environment	Poor & illiterate community mainly due to lack of money (poverty) and knowledge of children care (education)	More in poor and underserved community due to poor socio economic status, social taboos and education	Mainly poor community and schedule caste due to poor financial condition, poor knowledge, artificiality culture, and high market price	Brahmin, Chhetry and Deprived group, mainly due to lack of education, poverty and traditional eating pattern	All ethnic groups of Nepal those who are living under poverty, unaware about nutritious food, illiterate, and culturally and socially bounded in food practices and health seeking behaviours	
Rich & educated mother of urban or rural area. Because reach & educated mothers are conscious and familiar with market and fashionable items	Urban mothers are very conscious than rural. Because they are aware and familiar with market. They are rich & educated. The competitive environment also exists in urban area	Rural mothers have poor knowledge because of poverty and poor education. Urban mothers are more conscious and knowledgeable on nutritious food	In practice, rural mothers are more conscious than urban mothers. Because urban mothers are always busy with work, TV programmes, marketing and welcoming guest etc	Urban mothers have appropriate knowledge but not using it in proper way due to various factors exists. It seen that urban mothers are more practical and compliance with health related messages that delivered by HP/SHP	Urban mothers are more knowledgeable than rural. Because urban mothers are rich and familiar with market and product. On the other hand they are showy and competitive with their neighbour	Urban mothers are more fascinated & competitive with their neighbours. They have money, knowledge and an idea on child care. They are very familiar with market and product. They also are staying at nearby accessible, available and choice able point.	Mostly rich and educated mothers are highly conscious on nutritious food than illiterate and poor mothers of rural area. Urban mothers are more fashionable and familiar with valuable items which are available in market. They can afford and staying at accessible point than rural mothers.	

An example of FGD analysis (Thematic analysis)

Discussed points	Summary of themes	Common themes	Coding
In your observation, which ethnic group of this area is more vulnerable by the nutritional problem and Why?	All ethnic groups (Dalits, Jana jati, brahman, chhetry) of Nepal those who are living in poverty, unaware about nutritious food, illiterate, and culturally and socially bounded in food practices and health seeking behaviours	<ul style="list-style-type: none"> Poor people Disadvantaged group (Brahman/ Chhetry dalits, lower castes) Illiterate Poor knowledge Environment 	Poverty Education Environment
In your opinion, rural or urban mothers have appropriate knowledge of nutritious food and recommendation to their preschool aged children and why?	Mostly rich and educated mothers are highly conscious of nutritious food than illiterate and poor mothers of rural area. Urban mothers are more active, clever and fashionable than rural mothers. They also familiar with healthy foods which are available in the market. They are affordable and staying at the accessible point than rural mothers. Rural mothers have no or limited options for recommendations where urban have many.	<ul style="list-style-type: none"> Rich family/Urban mothers Educated/conscious Fashionable /active Limited options for rural mother Many options for urban mother 	Poverty Education Resources (Availability/ Accessibility)
What are the difficulties faced by mothers to providing nutritious foods to their children?	The common difficulties that faced by both communities are poverty (lack of money & high market price, lack of time, poor resources & knowledge about nutritious food. Similarly women empowerment, decision-making power within the household, government policy and cultural factors.	<ul style="list-style-type: none"> Poverty/High market price Poor knowledge about healthy foods Lack of time Lack of resources Women empowerment Decision making power Government policy Cultural factors 	Policy Education Resource (Availability, Accessibility, Affordability)

Appendix 21. Definition of Literacy Status

In regards to meaning of literacy, the UNESCO defines it as the ability to understand, identify, create, communicate, interpret, and compute, using printed and written materials associated with varying contexts. Literacy involves a continuum of learning in enabling individuals to achieve their goals, to develop their knowledge and potential and to participate fully in their community and wider society (UNESCO 2004: *The Plurality of Literacy and its implications for Policies and Programs. UNESCO Education Sector Position Paper*: 13).

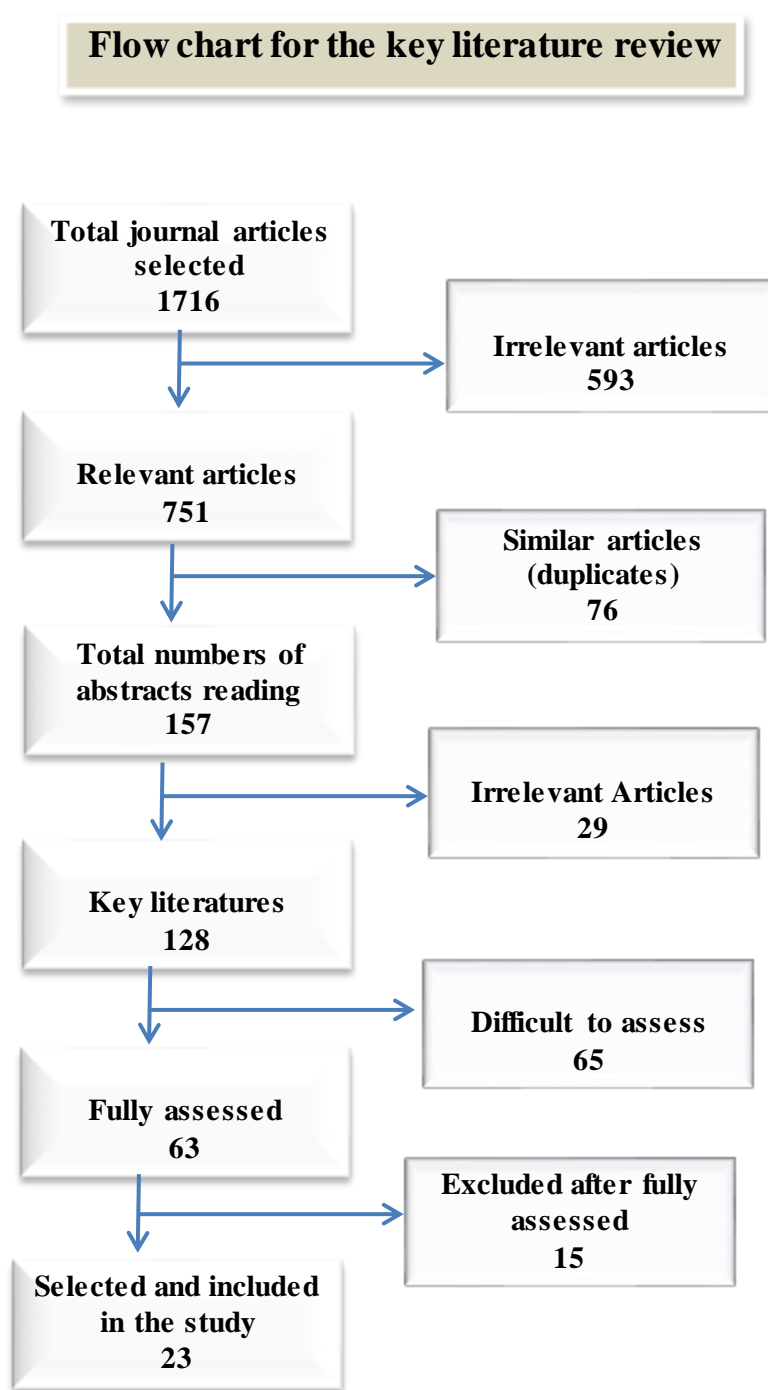
This thesis has used the following definition for the literacy status of the respondents.

Illiterate: In this thesis, illiterate refers who have could not read and write well and acquired the informal education of extensive knowledge, learning or culture.

Literate: In this thesis, literate refers who able to read and write and having or showing extensive knowledge, learning or culture and who have also got an informal qualification from below School Leaving Certificate (SLC) degree.

Educated: In this thesis, educated person refers who have acquired academic university degree (SLC to Ph.D. level).

Appendix 22. Flow Chart for the Key Literature Review



The lists of 23 key literature:- Acharya, 2000; Rai *et al.*, 2001; NDHS, 2001; 2006; 2011; Onta, 2003; Sah, 2005; Sudo *et al.*, 2005; Christian *et al.*, 2006; CBS, *et al.*, 2006; Shakya, 2006; Bennett *et al.*, 2008; Subba *et al.*, 2008; Bishwakarma, 2009; Adhikari, 2010; 2012; Odent, 2011; Ulak *et al.*, 2012; Acharya, 2013; Pokharel *et al.*, 2009; 2013; Yadav *et al.*, 2013; Chapagain, 2014; Karkee *et al.*, 2014; Shrestha, 2015; Acharya *et al.*, 2016.

Assessment of Knowledge, Beliefs and Attitudes towards Healthy Diet among Mothers in Kaski, Nepal

- JIB ACHARYA, PROF. EDWIN VAN TEIJLINGEN,
JANE MURPHY, PhD, & MARTIN HIND, PhD

Abstract

The study aims to assess the knowledge, attitudes and beliefs about nutritious food mothers in Kaski district in Nepal whose children are aged 3 to 5. A cross-sectional and community-based survey method was used during the study. Both urban and rural mothers lacked knowledge of what food is nutritious or not whilst their attitudes and views appear ill informed. Mothers from both rural and urban communities have high faith in traditional healers. Thus this study suggests that a different approach was needed because the public health problems are associated with behaviour. Thus, special attention should be paid on appropriate intervention of under-nutrition in poor communities like this.

Key Words: Healthy diet; knowledge; attitudes; childhood; under-nutrition; stunting.

1. Introduction

Under-nutrition at an early age leads to a drop in mental and physical growth during childhood; it disturbs school performance and leads to lower income in later life. Nepal has some of the highest under-nutrition rates in the world with 11 per cent of under-fives wasted, 29 per cent underweight and 41 per cent stunted. The more remote hill and mountain regions have a very high prevalence of stunting which is above 60 per cent (NDHS, 2011).

GDP (gross domestic product) per person

in Nepal (US\$1,049 P/A) is very low, i.e. less than US\$3 per person per day (World Bank, 2013). Farm production does not keep up with population growth as 33 districts out of 75 have food deficits; hence 4.5 million Nepalese are undernourished. The WFP (World Food Programme) stated that most of the households living below the poverty line, have squeezed the amount of meal and stay without food during farm lean times (Fisher and Slaney 2013), hence nearly 70 per cent of children are poorly fed. Thus the children have physical and mental stunting and remain unhealthy

for life with lowered productivity (WFP 2013; Murphy and Girot 2013). Much of the problem of deaths of children resulting from under-nutrition, estimated to be over half of childhood deaths in low-income countries, can be attributed to just mild and moderate under-nutrition, varying from 45 per cent for deaths due to measles to 61 per cent for deaths due to diarrhoea [de Onis, 2004]. Most studies on child nutritional status have focused on prevalence of under-nutrition among under-five children and socio-economic, demographic and cultural factors associated with child under-nutrition in Nepal (Reed, 1996).

Global scenario of poor nutrition and underlying cause

Malnutrition refers to deficiencies of micronutrients, under-nutrition, and obesity. This paper focuses particularly on under-nutrition. Malnutrition remains one of the most common causes of morbidity and mortality among children under five children throughout the World (UNICEF, 2005). Internationally, more than 10 million children under five die every year from avoidable illnesses despite effective health interventions and half of the deaths are due to malnutrition. Generally malnourished children are more vulnerable with weak health (Caulfield, 2004). Under-nutrition is very high in South Asia even compared to Africa (de Onis, 2000).

Between 1990 and 2006 child stunting in Southeast Asia has dropped from 52 per cent to 42 per cent. One study in Bangladesh found high prevalence rate of underweight (40%) and stunting (42%) in children under five (Siddiqui, 2011). Research in Mongolia and Dhankuta of Nepal also found high prevalence rates of under-nutrition which were 15.6 per

cent stunting, 1.7 per cent wasting and 4.7 per cent underweight and 27 per cent stunting, 37 per cent wasting and 11 per cent underweight respectively (Otgonjargal,2012; Sapkota,2009).

In the developing world, the major factors of under-nutrition are multifaceted and interlinked and include: low diet and infections, access to health facilities, food security, sanitation and healthy environment and child feeding/caring practices (Acharya et al.2015) which are influenced by family socio-economic circumstances (Müller, 2005). According to a study in Bangladesh the BMI (Body Mass Index) of mothers, pre and postnatal visits, age of mothers, education of parents and family economic status are all major factors of under-five child malnutrition (Siddiqi 2011; Murphy 2011). No link was found with social class and source of drinking water (Sapkota 2009). A study conducted in Dhankuta, explored that low socio-economic status of households were high risk determinants for underweight and stunting, on the other hand, children from educated and joint households were found less likely to be stunted than those in nuclear households. It has seen that caste or ethnic group and mother's age at child gestation have an important link with stunting but it was not linked with the education level of mothers (Sapkota, 2009).

In regards to association with socio-economic status and malnutrition, a study conducted in rural area of Gumbrit had found that household income was strongly associated with malnutrition (Edris 2006). Under-nutrition is strongly associated with social class, as well as ecological and economical determinants which differ from nation to nation (Ellahi 2014).

The significant linked determinants of poor nutrition comprises of household income, level of education, parents status in terms of nutrition, access to safe drinking water, sanitation, primary health care facility access as well as child's age and gender (Vijayaraghaven et al. 1990). These contributing factors of under-nutrition may vary between communities, regions and countries over time. Presented literature showed that factors such as child caring, knowledge of health practice, parent's education level, age of child, birth weight of children, lack of decision making mainly on spending of money, and lack of cattle effect on family and community strongly affects the level which the child develops (Zewdu, 2012; Murphy 2011).

Regional assessment of United Nation's Standing Committee on Nutrition revealed that condition of stunting (32%) and underweight (40%) in Nepal which exceeded the average prevalence rate in South Central Asia (UN/SCN, 2010). NHDS (2011) report showed progress on child nutritional status with underweight reduced to 29 per cent and stunting to 41 per cent (NDHS, 2011). In Nepal maternal under-nutrition is also a major alarm. According to NDHS (2011) that one-fifth of women ages 15 -49 are underweight (less than 18.5 BMI). However, this also has been progressing to a lesser degree. Similarly, NHDS 2011 reported that prevalence rates of anaemia in children (46%) and women (35%) are a major health problem in Nepal. However, child and maternal under-nutrition is a serious concern that urgently requires targeted, effective interventions to tackle these issues (Acharya 2015).

Scenario of nutritional problems in South Asia and Nepal

Stunting still remains a main challenge in South Asia. This region accounts about 40 per cent of the global burden of child stunting in the world (WHO, 2014). The stunting prevalence of under five years aged children in South Asia has reduced from nearly 61 per cent to 38 per cent between 1990 and 2012 (UNICEF, 2014).

The Nepal Demographic and Health Survey in 2011 showed that prevalence of under-nutrition was 11 per cent wasting, 41 per cent stunting and 29 per cent underweight with some but not much improvement between 2006 and 2011. Similarly, the women aged between 15-49 years have a fairly high prevalence of anaemia (35%), and more in rural (36%) than in urban (28%) areas of the country. Rural women (36%) are more affected which compare to national level (35%) in prevalence of anaemia. Rural prevalence is equal to urban which indicates that public health intervention on nutrition must focus in both parts of the country (NDHS, 2011).

2. Objectives

The study aims to address two aims: first to assess the level of knowledge, attitudes and beliefs about food recommendation for preschool aged children amongst rural/urban mothers; and secondly, establish major barriers amongst mothers to feeding their offspring healthy food.

3. Methodology

A cross-sectional, community-based survey of 524 mothers in *Kaski* district of Nepal among children aged 36-60 months who were no longer breastfed

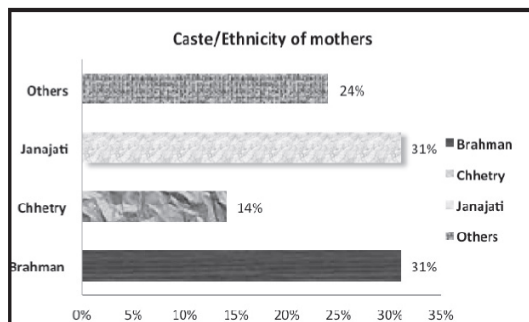
at the time. The questionnaire included: socio-demographic measurements, knowledge, beliefs and attitudes about nutritious food, as well as child feeding patterns, food recommendation, major barriers, food insecurity and health-seeking behaviours. Data were added to a computer data base and analysed using SPSS.

Study Location: Pokhara Sub-Metropolitan City, ward no.1, 6, 8, 15 and 17, Lekhnath Municipality, ward no. 2, 8, 14, 15, and 16 of *Kaski* district, Nepal. The study received ethical approval from the Nepal Health Research Council & Bournemouth University.

4. Findings of the Study

- Ethnicity and Caste
Graph 1 explains the quantitative information about caste or ethnicity of the mothers who represented in the study. The study shows 31% mothers belong to high caste *Brahman* and *Janajati* and only 24% mothers were belong to Dalits and *Madhesi* communities.

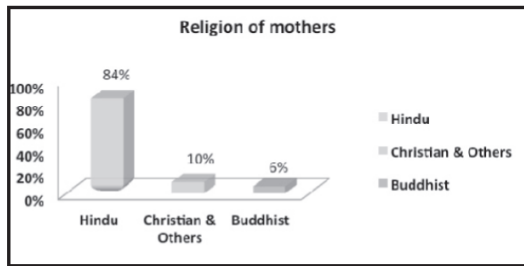
Graph 1.



- Religion of the Mothers

The study reveals that most of the mothers were Hindu (84%) and 6% mothers was Buddhist, 11% were Christians & others including Muslim (Graph 2).

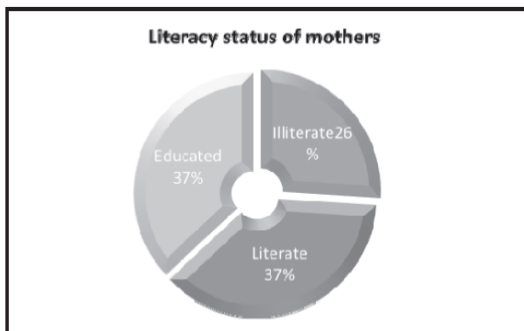
Graph 2.



- Literacy Status

According to study around 26 per cent participants have found illiterate whereas 74 per cent participants found literate and educated in the study area (Graph 3).

Graph 3.



- Major barriers to recommending nutritious foods included: lack of knowledge (19%); high market prices (21%); and cultural influences or beliefs (7%).
- Around 55 per cent children were providing fruits once in week. Similarly 29 per cent of families never given fruits and 19 per cent tiff in with salad to their children.
- Around 19 per cent of mothers could not choose nutritious food from the grocery store.
- About 12 per cent respondents have lacked food, 68 per cent lacked the food in June July & August, 13 per

cent in December, January & February and 9 per cent in March, April & May respectively.

- Nearly 57 per cent children had been taken at least once to a faith healer and 16 per cent on multiple occasions for the treatment.
- About 20 per cent of mother believed that eating green leafy vegetables and fruits during illness affect child health negatively.
- Nearly 8 per cent respondent feed dairy product and meat items at a same time to their children whereas 92 per cent did not practice.
- Almost 19 per cent mothers of the community believed that feeding of green leafy vegetables and fruits during the illness period caused harm to child and only 10 per cent mothers had no knowledge about it.
- Around 11 per cent children have fed one-two times, and 79 per cent fed three - four times a day respectively whereas nearly ten percent child fed nothing in last 24 hours.
- The study revealed that 65 per cent mothers, 6 per cent father, 14 per cent grandparents and 16 per cent others were responsible to taking care of children respectively.
- The study have found that 66 per cent mothers, 5 per cent fathers, 18 per cent grandparents and 11 per cent others were responsible to feed their children.

Nepal has diverse scenario which makes various socio-cultural aspects such as culture, religion, caste /ethnicity, and language (Bhattachan, 2009). The

majority of the people are Hindu (NDHS, 2011). The official language is Nepali but there are more than 92 different languages spoken across the country. There are more than 103 different castes/ethnic groups all over the country (WHO Country Cooperation Strategy 2006 -2011). There is a strongly embedded caste system which describes the social stratification by ethnicity. Even though it is officially banned, there are social differences related to caste and ethnicity (Bennett 2005).

This study has found that nearly 42 per cent mothers have no or poor knowledge on sign and symptoms of under-nutrition. Most of them reported that they are unaware (Murphy, 2011) that the children presenting the following signs and symptoms are correlated with under-nutrition: crying, irritating, quarrelling, not sleeping, diarrhoea & vomiting, low weight, lean and thin, short in height and slow in growth, poor appetite, looking as ill health, and rough or dry skin.

The lack of knowledge on wellbeing and health safety along with nutritious food and health services uptake in Nepal include traditional supporters and their status in the society (Acharya et al., 2014). The misbelieves are strongly embedded in the poor and underserved community as well as in some part of urban area because of migration due to decade long conflict in the country. The Spiritual and Traditional supporters or advocators usually are Hindu, as the proportion is 87 per cent of the population (Tamang and Broom, 2010). In rural part of Nepal, many traditional beliefs still exist, for example, leprosy is believed to be caused by sin in one's past life or

to be a curse from God (Acharya, 2012). The poor community strongly trusts traditional healers and however they have first choice is spiritual/traditional healers in case of minor health issues. The priest, illiterate household, traditional healer and elderly relatives still have high levels of trust which is still influencing by them in the society (Acharya, 2012).

Almost the whole of the Nepali society is using the traditional medicine as the first step of health care and they go to traditional or spiritual healers with any health problems (Tamang and Broom, 2010). One key problem is the poor decision making by family members in urban or rural areas due to the lack of recognition of complications of any ailments (Moestue, 2008). However, there is a lack of knowledge (Murphy, 2011) on health care issues in Nepalese society.

The study revealed that majority of respondents (57%) had more than six members living together. Similarly, 35 per cent had less than six and nearly 8 per cent households living with less than four family members. As the context of Nepalese society, mainly in Hindu culture, the family structure is called extended family, that consisted of the immediate family, which involves grandparents as well as close relatives such as aunts, uncles and cousins who all live together in the same dwelling. This family structure might change from immediate to extended household (Andersen, 2007). Big family size leads to poor nutrition status of children. The children from poor and disadvantaged group (Thomas et al. 2011) are more vulnerable of poor nutrition. This might

be difference due to study period, health service delivery, locality of the study, socio-economic characteristics, occupation and age. Most of the children are taken into work in places such as farming fields, construction sites, and factories by their parents if there is no one available to look after them at home.

Mainly the level of knowledge on nutritious food and poverty are the major barriers seen in the field of nutrition that are associated with food security, food prices, and income trends of households (Acharya 1981). Poverty, caste, gender and social inequalities and conflict are regarded as secondary barriers for the nutritional problems in Nepal (Bishwakarma 2008, 2009; Adhikari, 2010). The ten-year conflict in Nepal has increasingly centralised systems, disrupted the development of rural areas and badly affected health services (Devkota & van Teijlingen, 2010). Although the risks involved in lack of transport, high service cost, long distances, full trust on traditional healers because they are easily available and affordable for poor people, insufficient health resources, and lack of capacity to treat serious problems at the nearby primary health care service centres (Adhikari, 2010). At the same time, the country is on the way to accomplish the MDGs 4 and 5 targets (DFID, 2009).

The ethnic or traditional beliefs concerning to contamination of food and social values and norms in which rural women are not preferred because of their low rank have negative significances on the foods of women particularly by reducing their intake of desired, rich of micronutrient food such as meat items,

dairy products and vegetables (Gittelsohn et al., 1997). This type of traditional beliefs and manners could have a mostly negative influence on pregnant women given the intensified functional needs for various micronutrients. Thus, ethnic beliefs and practices that impact women's nutritional eating during pregnancy have significant insinuations for both micronutrients and macronutrient lacks among pregnant women in Nepal.

Beliefs about the 'hot or cold' quality of food and their effects, on the health of human, are likewise widespread in the world, and have a strong impact on eating manners during illness, pregnancy, and lactation and (Ferro-Luzzi, 1980). Most of the South Asian region, these body states are supposed to be principally sensitive to the hot or cold merits of food and depending on an individual's physical state, hot or cold foods are believed to have either a negative or positive effect on the human body (Bryant et al., 2003)

Often, it has been recommended that the sense of women is in fact having a big baby will result in increased labour risk, among women with short build in the context of south Asian region (Rush, 2000).

In various countries across the globe, pregnant women have been observed to reduce food intake during pregnancy, a behaviour generally referred to in the literature as poor eating behaviour (eating down) (Karim et al., 2003). It is reported that the causes of poor eating behaviours in South Asian contexts, where the behaviour is hypothetically general, were connected to fears that having a large baby could lead to more difficult deliveries. Nichter (1983) revealed

beliefs about food intake behaviour of pregnant women in India where food taken by pregnant women fills up the stomach space available for the foetus, therefore women often eat less in order to the foetus to thrive in the limited shared space.

The food beliefs in South Asia relate to *Ayurvedic* medicine and religion (Hill 1990; Nagpal, 2003). According to food beliefs of *Ayurveda*, wherein whole foods have been classified into hot and cold, is profoundly embedded in the epistemological grounds of many cultures and can provide a theoretical framework for expressing the complex links between diet and health (Beardsworth, 1997). These hot and cold beliefs are held by many people in South Asia (Subedi, 2010). This perception is believed to come from Hindu or *Ayurvedic* ideals and has been influential in medical practices (Nagpal, 2003). This belief system is complex and does not reflect that ideal by dominant Western scientific medicine which generally prescribes to evidence based medicine and classifies food into groups representing the main micronutrient composition such as protein, fat, alcohol and carbohydrate (Nichter, 1989). Adherence to these beliefs also tends to be stronger in the rural community of Nepal and among the disadvantaged and illiterate (Fieldhouse, 1995). During these days, food beliefs regarding hot and cold is vary between locality and ethnic groups as well as regions and countries. In general use of the hot and cold food categorise scheme avoid in the locality, through like general the use of the hot and cold food categorise scheme avoid in the community, though

likely to differ between persons due to variances in understanding and economic capitals, may mean that conventional nutritional counselling is ineffective among those who follow this beliefs and reject scientific values, at least those in relation to food choice (Fieldhouse 1995; Singh, 1991). The rejection of recommendations therefore, may not be due to persons not wanting to make changes but somewhat the recommendations not being compatible with their beliefs so health workers would not to know lay ideologies and adapt their techniques accordingly (Fieldhouse, 1995).

Beliefs about Breastfeeding and colostrums

It has been observed that some women of the Nepalese communities, mainly from the rural locality and non-educated background, do not breastfeed on the day of child birth and even second day which is common in South Asia (Darmstadt, 2006). They stimulate their breasts and squeeze out the colostrums (Bandyopadhyay, 2009). In terms of breastfeeding rates, it is high in Nepal if it compared with England rates at six months and six weeks.

This study found that nearly 20 per cent of the mothers explored negative perceptions such as becoming weak, breast shrinkage and even breast cancer development, all in regards to regular and excessive breastfeeding to children. Similarly, 16 per cent mothers had negative perceptions about feeding of colostrums such it form pus, dirty materials and bad smells, do not feed without squeezing. At the same time 71 per cent had positive perceptions about

the feeding to colostrums such as it is good for child health, pious, and highly nutritious substance and compulsorily feed to new born (Acharya et al., 2014).

A key indicator of chronic under-nutrition is stunting - when children are too short for their age group compared to the WHO growth standards. About 178 million children globally are stunted, resulting from not enough food, a vitamin and mineral-poor diet, and disease. As growth slows down, brain development lags and stunted children learn poorly (Sapkota, 2009). Stunting rates among children are highest in Africa and Asia. In south-central Asia 41 per cent has affected.

Good nutrition during pregnancy ensures a healthier baby. WHO recommends exclusive breastfeeding for six months, introducing age-appropriate and safe complementary foods at six months, and continuing breastfeeding for up to two years or beyond (Riordan and Hoover 2005).

In regards to observation of construction materials for the building of residents, this compulsorily observed during the interview within the urban or rural area. In regards to use of construction materials of the houses, sources of safe drinking water and use of cooking fuels, sanitation, drinking water purification, ownership of land, family size, income of the household were measured as a compilation indicator of household prosperity and assets (Rutstein and Johnson, 2004). However, in Nepal poverty, education, sanitation and safe drinking water are associated with child under-nutrition. Educational status is included as a separate variable in analyses since it is not a component of

the wealth index. The population wealth quintiles and education offer a measure of socioeconomic status.

There are several impacts of food selections with age, gender, and social class along with ethnicity, attitudes, culture, and composition of household and deeply rooted beliefs mainly in Nepal including South Asian Region (Ellahi, 2014). In terms of inequalities, the people that belong to educated and advanced socio-economic groups tend to have good diet. This may be due to be better capable in conceptualizing the association between health and nutrition (Cox & Anderson, 2004) but the reality that the group with higher incomes are able to pay for nutritionally balanced and high quality foods (Cox & Anderson, 2004). Nutritious foods such as meat items, dairy products, fruits and green vegetables often cost more than low quality or cheap foods. The cheap or low quality foods can be lower in important nutrients (James et al., 1997). Poor income groups may also be limited in their capacity to purchase nutritious diets due insufficient access, physically and micro-financial subjects which effect in only the necessary basics purchased and the related social variables such as religion that has one of the most powerful roles in the selections and following selection of diets (Dindyal, 2004).

5. Conclusion and Recommendations

Knowledge and attitudes towards nutritious food of rural and urban mothers are still poor. Beliefs about food practices are still strongly embedded as they are elsewhere in Nepal. Urban mothers had better food recommendation, whereas

rural mothers experienced huge barriers. Meat, fish, eggs and dairy products are often not provided to children due to cultural influences. Mothers from both communities have high faith in spiritual healers. Child feeding practices in the community is very poor compared to developed countries. Approximately one-fifth mothers still believed that feeding of nutritious foods during the illness period caused harm. The research found strong hold on the beliefs about healthy foods within the community such as impure and pure, cold, hot and neutral, harmful, beneficial or curative. Following beliefs is strongly embedded in the society that, 'if a pregnant woman eats more she will have bigger baby which can cause problem during labour'. Therefore; pregnant woman are not allowed to take nutritious food in the rural part of Nepal. This study would endorse community based nutrition programme should be established and integrated with public health network at community level. Nutrition education programmes should be provided, using various methods by mobilising local level stakeholders, focusing on knowledge, attitudes and beliefs about nutritious food to community people targeting to poor, disadvantaged and vulnerable communities which indicated in this study mainly poor knowledge, enrooted traditional beliefs and inappropriate attitudes of parents about nutritious food.

Acknowledgements

Nepal Health Research Council, Global Supplementary Grant Program/OSF, Europe; Sight and Life, Switzerland; PGR Development Fund & Santander Bank, BU.

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The authors Mr Acharya, Public Health Researcher/PhD Scholar, Professor Teijlingen, Associate Professor Dr. Murphy and Sr. Lecturer Dr. Hind are affiliated with Faculty of Health and Social Sciences, Bournemouth University, England
Lead author's E-mail: acharyajr@gmail.com

Study on Nutritional Problems in Preschool Aged Children of Kaski District of Nepal

J ACHARYA*¹, E VAN TEIJLINGEN^{1,3}, J MURPHY¹ AND M HIND¹

¹Faculty of Health & Social Sciences, Bournemouth University, Bournemouth, UK

²Visiting Professor, Manmahan Memorial Institute of Health Sciences affiliated with Tribhuvan University, Nepal

³Visiting Professor, Nobel College affiliated with Pokhara University, Nepal

*Email: jacharya@bournemouth.ac.uk

Received: 25 January 2015 | Revised: 19 February 2015 | Accepted: 4 March 2015

Published online: April 06, 2015

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Abstract Undernutrition remains a key public health burden in Nepal. This study aimed to measure knowledge, attitudes, and beliefs about nutritious food amongst mothers of 3 – 5 year olds from rural and urban areas. A cross-sectional mixed-methods approach comprised a quantitative survey and qualitative focus groups. The community-based survey included 524 mothers of children who are no longer breastfed. Open-ended and structured questions investigated knowledge, beliefs and attitudes about nutritious food, child feeding patterns, and major barriers, food insecurity, and health seeking behaviours. Focus groups were held with key informants, a thematic analysis was applied to the qualitative data.

Results: Major barriers to recommending nutritious foods included: lack of knowledge (19%); cost (21%); and culture/beliefs (7%). Nearly 55% children were given fruit once a week. Almost 37% of mothers never gave meat, fish and egg regularly to their children and 34% did not choose healthy food from stores, and 12% lacked food. Most children (57%) had been taken at least once to a spiritual healer and 16% had been taken more than once. The qualitative analysis suggested that important factors of knowledge, attitudes, and beliefs about healthy diet are poverty, education, strong cultural beliefs, family size, household income, time and a growing preference for fast food.

Conclusion: Knowledge of and attitudes towards nutritious food is still poor. Beliefs about food practice are strongly embedded in Nepal. Thus, this study shows that policymakers should consider a public health intervention and approach based around changing these largely cultural beliefs and behaviours.

Keywords: Malnutrition; Knowledge, attitudes and beliefs about nutritious food; poverty; health

BACKGROUND

Undernutrition at an early age leads to a drop in mental and physical growth during childhood and disturbs school performance and decreases earning potential in a later life Christakis [19], [23]. Nepal has some of the highest undernutrition rates in the world. For example, 11% of under-fives are wasted, 29% are underweight and 41% are stunted. However, these issues are often exacerbated in remote hill and mountainous regions, where stunting is above 60% [44].

Journal of
Multidisciplinary
Research in Healthcare
Vol. 1, No. 2
April 2015
pp. 97–118

Acharya, J
van Teijlingen, E
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The GDP (gross domestic product) per person in Nepal (US\$1,049 p/a) is very low [77]. Farm production does not keep up with population growth. On this basis, 33 districts out of 75 have food deficits and 4.5 million Nepalese citizens are undernourished. WFP (the World Food Programme) stated that most of the households, who live below the poverty line, have squeezed the amount of meal and stay without eating during farm lean epoch. WFP estimated that nearly 70% of children are poorly fed in Nepal. Thus the children of Nepal experience physical and mental effects including stunting, which means they face lifelong ill health and relative to other nations are less productive [71]. Many child deaths result from undernutrition, estimated to be associated with over half of total childhood deaths in developing countries, can be attributed to just mild and moderate undernutrition, varying from 45% for deaths due to measles to 61% for deaths due to diarrhoea [19]. Most studies on child nutritional status have focused on prevalence of undernutrition among under-five children and socioeconomic, demographic and cultural factors associated with child undernutrition in Nepal [34].

Global scenario of poor nutrition and underlying cause

Malnutrition refers to deficiencies of micronutrients, undernutrition, overweight and obesity. Malnutrition not only affects people's health and wellbeing, it also people physical and mental growth, suppressing body immune system, increasing risk of non-infectious and transmissible diseases, reducing productivity and other negative social and economic consequences on individuals, households, societies and nations [36].

In this paper we use malnutrition to mean undernutrition. In that sense over the past decade, many nations have managed to decrease the burden of undernutrition. According to joint assessment programme of UNICEF, WHO and World Bank, 805 million people are affected from hunger in 2012 and 2014, nearly 161 million children who are under five years of age, suffering from stunting (chronic malnutrition), and wasting (acute malnutrition) affects 51 million children of under five years age of children [66]. While, undernutrition was the major underlying cause of under five children in global which accounts 45% of total deaths in the global in 2013. FAO, claimed that the dietary risk factors with inadequate physical activity responsible for nearly 10% of disability and ailment of the global burden.

Thus the nutritional status of a locality, groups of the region of country indicates the socio-economic status of the population [17]. Nutritional status is expressed as one being normal, underweight, stunted, wasted, over weight and micronutrient deficit. Nutritional status is linked to the availability of healthy food, income sources, local food production is good, and getting nutrition awareness good environment, enough dietary intake including healthy feeding pattern, proper utilization of food, which depends on physiological status of the body, which in turn, is influenced by the environmental situation, accessibility to safe water, and the morbidity status that is the result of inadequacies in these situations [76]. Nutritional status is result

of a multifaceted inter-relationship between environmental and social factors and the individual in a community. Key determinants (availability, affordability, and accessibility, purchasing power of people, dietary intake, education, agriculture, and healthy environment) are also important to address this problem [64]. It is only possible to tackle the problem of nutrition from the community by implementing comprehensive nutrition programmes (curative, preventive and promotive). This study focused on undernutrition of children aged 3-5 (as reported by their mothers) and correlates this with determinants.

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Literature review

Malnutrition remains one of the most common causes of morbidity and mortality among children under five children throughout the World [67]. Internationally, more than 10 million under five children die every year from avoidable illnesses despite effective health interventions and half of the deaths are due to malnutrition. Generally malnourished children have poor immunity power to infection which is more like to die. They are more vulnerable with weak health [15]. Undernutrition is very high in South Asia even compared to Africa [20].

In Sub-Saharan Africa chronic undernutrition has been a problem for young children. More children of these who fail to reach the normal international standard height for age. Similarly, between 1990 and 2006 child stunting in Southeast Asia has dropped to 42% from 52%. Nigerian rural community study revealed that wasting, underweight and stunting prevalence rates were 9%, 23.1%, and 26.7% respectively. This study carried out on influence of socio-economic determinants on nutritional status of children [7], [57]. Similar study at Bangladesh found high prevalence rate of underweight (40%) and stunting (42%) in under five children [58]. The research in Mongolia and Dhankuta of Nepal also found high prevalence rates of undernutrition which were 15.6% stunting, 1.7% wasting and 4.7% underweight and 27% stunting, 37% wasting and 11% underweight respectively [50],[56]. One study conducted in preschool aged children of rural part of western Kenya found that prevalence of wasting 4%, stunting 30% and underweight 20% respectively [33].

In the context of developing world, the major factors of undernutrition multifaceted and interlinked and include: low diet and infections, access to health facilities, food security, sanitation and healthy environment and child feeding/caring practices which are influenced by family socio-economic circumstances [42]. According to a study in Bangladesh that the BMI of mothers, pre & postnatal visits, age of mothers, education of parents and family economic status are major factors of under-five child malnutrition [58]. In regards to association with nutrition status and socio-economic determinates Osun state of Nigeria study (2009) showed that children of less educated mother of the area had two times the prevalence rate of stunting. Similarly children of mothers with secondary education were frequently suffered by wasting and less educated mothers but there was no any reliable association in the

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design of stunting or wasting with education level of paternal. Higher prevalence of wasting was observed with poor income of mothers and overcrowding. Thus, no link was found with social class and source of drinking water [56]. The study was conducted in Kwara state of Nigeria, to collect information on prevalence and cause of malnutrition among under five children of farmers group, found that malnutrition were significant link with child age and gender, body mass index and education level of mother, calorie consumption of the family, sanitation and hygiene such as clean drinking water and system of defecation [68]. A study conducted in Dhankuta Nepal, explored that low socio-economic status of households were high risk determinants for underweight and stunting on the other hand, children from educated and joint households were found less likely to be stunted than those in nuclear households. It has seen that caste or ethnic group and mother's age at child gestation have important link with stunting but it was not linked with education of mothers. Alike, Alrawakeeb valley of Sudan found that education of mothers of under five children to be strongest determinates associated with malnutrition [56], [49].

In regards to association with socio-economic status and malnutrition, a study conducted in rural area of Gumbrit, had found that household income was strongly associated with malnutrition [25] and Beta- Israel study also revealed that child's age, gender, history of infections (diarrhoea), length of breastfeeding, child feeding practices such as method of feeding, pre lacteal feeds, colostrum, types of diet, age of complementary food, were the major contributing factors for undernutrition [5]. Undernutrition is strongly associated with social class, ecological, economic and many more other determinants which differ from nation to nation. Besides this most serious problems are primarily low consumption of meals, household's income, locality, education, occupation of parents, birth spacing or interval, sanitation and hygiene and source of drinking water [63],[80]. According to a study conducted in rural Tigray of Northern Ethiopia (2005), pre-lacteal feeding practice, age of child, characteristics of maternal anthropometric, insufficient complementary foods, and locality were the major contribution factors for the stunting and underweight [41].

The major significant linked determinants of poor nutrition comprises income of households, level of education, parents status in terms of nutrition, access to safe drinking water, sanitation, primary health care facility and access, child's age and gender. These contributing factors of undernutrition may vary between communities, regions and countries and over time. Presented literature showed that factors such as child caring, knowledge of health practice, parent's education level, age of child have strong, low -birth weight of children, lack of decision making mainly on spending of money, and lack of cattle effect on family and community variables which the child develops [39],[81].

Regional assessment of United Nation's Standing Committee on Nutrition revealed that condition of stunting (32%) and underweight (40%) in Nepal which exceeded the average prevalence rate in South Central Asia [65]. NHDS (2011) report showed

progress on child nutritional status with underweight reduced to 29% and stunting to 41% [44]. In Nepal maternal under-nutrition is also a major alarm. The report of NDHS (2011) presented that one-fifth of women ages 15-49 have underweight (less than 18.5 BMI). However, this also has been progressing to a lesser degree. Similarly, NHDS (2011) reported that prevalence rate of anemia in children 46% and women 35% which to be a major health problem in Nepal. However, child and maternal under-nutrition is a serious concern that urgently requires targeted, effective interventions to tackle these issues [44].

Scenario of nutritional problems in South Asia and Nepal

Stunting still remains a main challenge in South Asia. This region accounts about 40% of the global burden of child stunting in the world [73]. The stunting prevalence of under five years aged children in South Asia has reduced from nearly 61% to 38% between 1990 and 2012 [66].

Nepal Demographic and Health Survey in 2011 showed that prevalence of undernutrition in Nepal was 11% wasting, 41% stunting and 29% underweight. It has slightly improved in stunting (49%) and underweight (29%) between 2006 and 2011. But the wasting (11%) remains more or less same which declined from 13% to 11% between 2006 and 2011. The below given bar chart illuminate clear feature

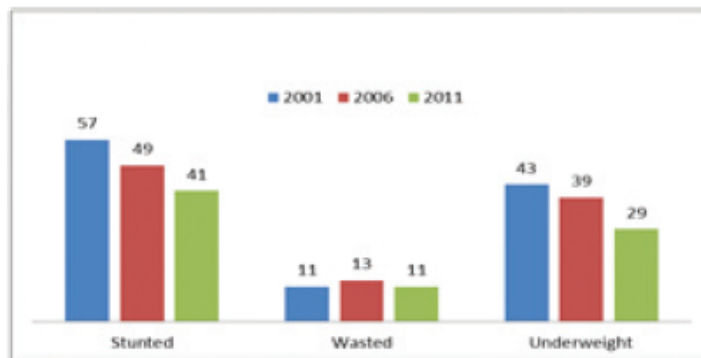


Figure 1: Nepal Demographic and Health Survey 2011
 Nutritional Status of Nepal
 Source: NDHS, 2011

about it. So the existing figures indicate that intervention should be focused on rural parts mainly in poorest quintile [44].

Similarly, the women aged between 15-49 years of age have a fairly overall high prevalence of anaemia (35%), and more in rural (36%) than in urban (28%) parts of the country. Rural women (36%) are more affected which compare to national

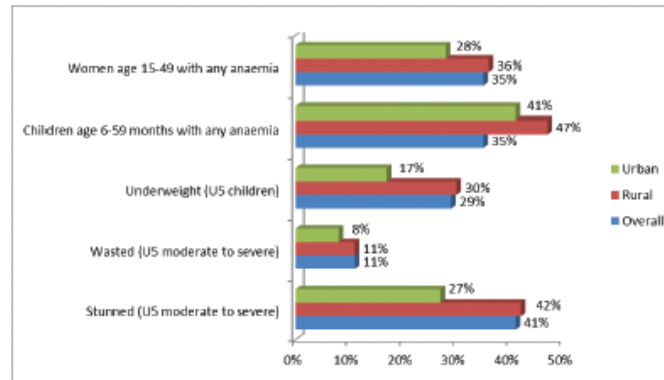


Figure 2: Nutritional problems in Nepal: Rural vs Urban (Source: NDHS 2011)

level (35%) in prevalence of anaemia. According to below graph (graph 2), rural prevalence is equal to urban so, it indicates that public health intervention on nutrition must focus in both parts of the country [44].

Aims and objectives

To address some of the issues raised above this study aims to address two aims: First to assess the level of knowledge, attitudes and beliefs about food recommendation for preschool aged children amongst Rural/ Urban mothers; and secondly, establish major barriers amongst mothers to feeding their off-spring healthy food. The objectives are:

Individual study

- Establish the knowledge of food for children amongst rural and urban mothers.
- Find out attitudes/beliefs regarding food amongst rural and urban mothers.
- Assess health seeking behaviour for malnourished children in rural and urban communities and rationale for choices in health services to overcome on health illnesses (where they go for treatment such as health institutions (private or government), traditional/ spiritual healer, or quack)
- establish knowledge of, attitudes towards and beliefs on nutritious food of Female Community Health Volunteers (FCHV)
- Determine factors that affect availability of food (last six months), where they access good food at religious & cultural events
- Describe the challenges that exist for mothers giving their children food and how they attempt to overcome them
- Measure the level of knowledge of and attitudes towards food-related health promotion.

Epidemiological study

- Establish population-based problems using epidemiological data of nutritional status of preschool aged children (aged 3 to 5 years) in Kaski district.
- Identify higher risk groups for under nutrition: gender, age, caste/ethnic group, wealth ranking.
- Assess health seeking behaviour for malnourished children in rural and urban communities and the rationale for choices in health access

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Research Methods: Mixed methods approach with quantitative (structured interview questionnaire) and qualitative (focus group discussion).

Sample size: 473

The study focuses on mothers of children between 36-60 months old. Sample size calculated using by sample size calculation software (FluidSurveys™). The questionnaire survey data was collected 524.

Study Location: Pokhara and Lekhnath of Kaski district, Nepal



Figure 3: Map of study location

Source: ezilon maps (<http://www.ezilon.com/maps/asia/nepal-maps.html>)

Ethical consideration

The study received ethical approval from the Nepal Health Research Council & Bournemouth University.

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Exclusion criteria

- a. 0 – 35 month old children
- b. >5 years old children
- c. Breast feeding children

Rationale

Justification Undernutrition is one of the main health problems facing children in under five age group in Nepal. The prevalence of undernutrition enforces costs on the Nepalese economy as well as society. The high mortality rate associated with poor nutrition leads to the loss of the economic prospective of the child. It harms children in several ways, predisposing children to diverse infectious diseases, psychosocial mal-development, and deficiencies on cognitive skills. The prevalence of undernutrition in Nepal is comparatively well known, but not specific to the regions, localities and residence so far and also fluctuate among districts, localities and dwelling and insufficient statics available in study area particularly public health prospectively. Previously conducted studies in other parts of the country were still lacking in addressing the public health prospectively and main associated factors of undernutrition. Therefore, this study was design to assess the associated factors mainly public health prospective among children aged 36-60 months can be used as a reference in priority setting and designing effective nutritional programmes in Kaski district of Nepal.

RESULTS

Firstly it shows demographic characteristics of both approaches: **Quantitative** and **Qualitative**. This section describes the outcomes of this study which is divided into two parts: a) Quantitative and b) Qualitative. The major results of Quantitative approach are described in figures and summary. Similarly Qualitative results are presented in words form.

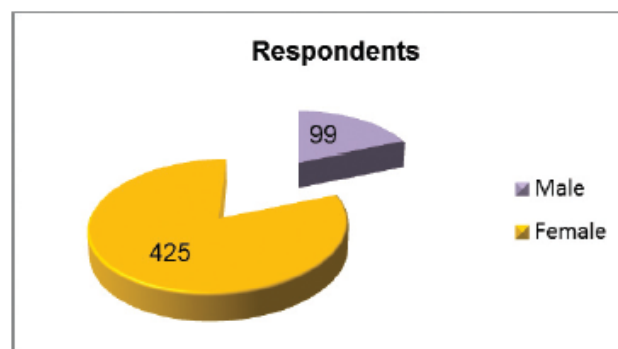


Figure 4: Gender of interview respondents

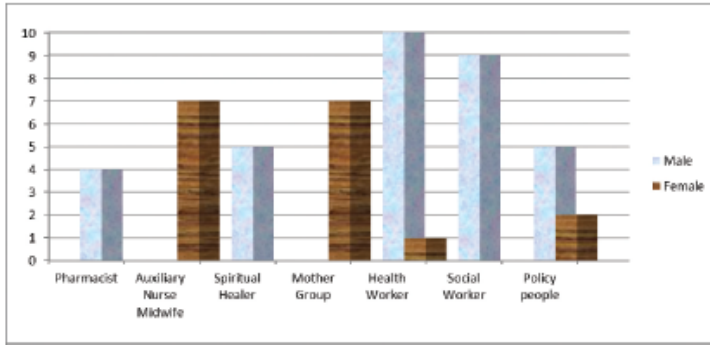


Figure 6: Gender distribution of FGDs

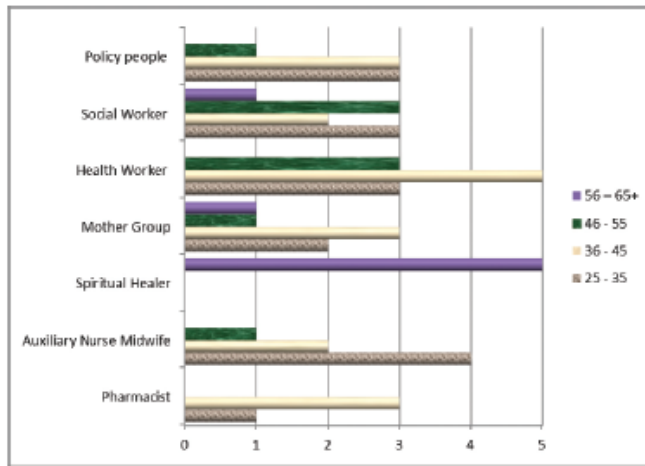


Figure 7: Distribution of age groups of FGDs

a. Quantitative outcomes

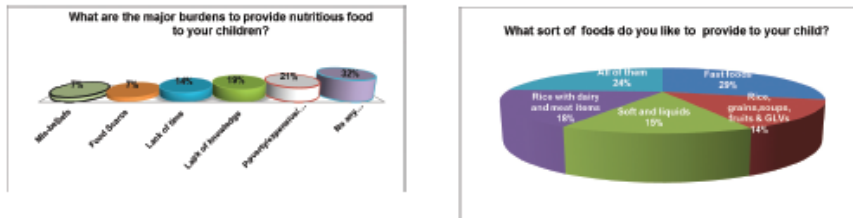


Figure 8

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- Major barriers to recommending nutritious foods included: lack of knowledge (19%); high market prices (21%); and cultural influences or beliefs (7%).
- 55% children are providing fruits once in week. Similarly 29% of families never give fruits and 19% tiffin with salad to their children.
- 19% of mothers cannot choose nutritious food from the grocery store.
- About 12% respondents lacked food, 68% in June July & August, 13% in December, January & February and 9% in March, April & May respectively.
- Nearly 57% children had been taken at least once to a spiritual healer and 16% on multiple occasions for the treatment.
- About 20% of mother believed eating green leafy vegetables and fruits during illness affect child health negatively.
- Nearly 8% respondent feed dairy product and meat items at a same time to their children but 92% do not.
- Almost 19% mothers of the community believed that feeding of green leafy vegetables and fruits during the illness period caused harm to child and only 10% mothers have no knowledge about it.
- 11% children have fed one – two times, and 79% three - four times a day respectively. But nearly ten percent child fed nothing in last 24 hours.
- The study revealed 65% mothers, 6% father, 14% grandparents and 16% others were responsible to taking care of children respectively.
- The study found 66% mothers, 5% fathers, 18% grandparents and 11% others were responsible to feed their children

b. Qualitative Outcomes

Recognize that the root causes of and factors leading to malnutrition are complex and multidimensional:

- a) Poverty, underdevelopment and low socio-economic status are major contributors to malnutrition in both rural and urban areas;
- b) The lack of access at all times to sufficient food, which is adequate both in quantity and quality which conforms with the beliefs, culture, traditions, dietary habits
- c) Malnutrition is often aggravated by poor infant and young child feeding and care practices, poor sanitation and hygiene, lack of access to education, quality health systems and safe drinking water, foodborne infections and parasitic infestations, ingestion of harmful levels of contaminants due to unsafe food from production to consumption;

Food behaviour and culture are strongly associated in Nepalese community. Food habits and practices are strictly linked to the wider culture. The people follows the codes of conduct in relation to food consumption, food preparation methods and eating habits, select of food, the meals taken daily, time and portion of meal eaten and size.

Regarding the most affected ethnic groups, all groups noted that poor, illiterate and underserved populations areas vulnerable and due to poverty, poor knowledge and strongly embedded cultural beliefs and taboos.

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In the context of Pokhara city, living standard is higher than other cities of Nepal. Because of Pokhara is a main tourist area in Nepal. Consumable items mainly fruits; green vegetables and other commodity are expensive. Disadvantaged and poor groups are particularly affected by high market price [16].

"I cannot buy healthy foods due to lack of money as well as high prices."

FGD: Mother Group Nadipur, Pokhara

"There is no any choices on healthy diets by low income groups because they hardly capable to afford dairy product & meat items thus children from this groups are more vulnerable of undernutrition."

FGD: Policy People, Pokhara

In Nepal woman's status is very low and it is even more mainly in poor and disadvantaged groups [38]. They work nearly double than men in this community. In some ethnic group, they hardly get time for child care and feeding. They are responsible mainly farm and house works.

"I have no time to care of my daughter due to loads of house and office work. My daughter is being cared by my mother-in-law whose mind is completely occupied by beliefs and taboos mainly on child care and feeding."

FGD: ANM, Pokhara

"Poor people of this area are deprived of basic capabilities rather than simply a lowness of income. They are also destitute of basic needs, rights and opportunities and suffered from the natural disaster."

FGD: Policy Maker, Pokhara

Most of the women reported that they squeezed out colostrum due to cultural beliefs about colostrum and advised by mother-in-laws, spiritual healers and some point of health workers. Though it is disagreeing to the World Health Organisation recommendation that breastfeeding should start in the first hour after birth, it is important because it indicates that women were providing it to infant [74]. It is energetic in terms of stimulating mothers milk supply [52]. This may be why the practice of colostrum discarding action being done mainly in South Asian region which is not a harmful as previously thought [48].

" In my case, I could not feed colostrum to my children because my mother-in-law forced me to discard colostrum before start the breastfeeding. But I had repeatedly explained her about significant of

DISCUSSION

Nepal has diverse scenery which makes various socio-cultural aspects such as culture, religion, caste /ethnicity, and language [13]. The majority of the people are Hindu. The official language is Nepali and there are more than 92 different languages spoken across the country. There are more than 103 different castes (ethnic groups) all over the country [75]. There is a strongly embedded caste system which describes the social stratification by ethnicity. Even though it is officially eliminated but there are social differences related to caste and ethnicity [9].

This research found that nearly 42% mothers have no or poor knowledge on sign and symptoms of undernutrition. Most of the them reported that they are unaware that the children presenting the following signs and symptoms are correlated with undernutrition: crying, irritating, quarrelling, not sleeping, diarrhoea & vomiting, low weight, lean and thin, short in height and slow in growth, poor appetite, looking as weak health, mentally regarded, rough or dry skin.

The lack of knowledge on wellbeing and health safety along with nutritious food and health services uptake in Nepal include traditional/ spiritual supporters and their status in the society. The mis-beliefs are strongly embedded in the poor and underserved community as well as in some part of urban area because of migration due to ten year conflict in the country. The Spiritual and Traditional supporters or advocators usually are Hindu, as the proportion is 87% of the population [62]. In rural part of Nepal, many traditional beliefs still exist, for example, leprosy is believed to be caused by sin in one's past life or to be a curse from God [1].The poor community strongly trusts traditional/ spiritual healers and however they have first choice is spiritual/traditional healers in case of tiny health issues. The priest, illiterate household, spiritual/traditional healer, old parents have still high trust on mis-belief which is still influencing by them in the society.

Almost the whole of the Nepali society is using the traditional medicine as the first step of health care and they go to traditional or spiritual healers with any health problems [62] . One key problem is the poor decision making by family members in urban or rural areas due to the lack of recognition of complications of any ailments [40].However, there is a lack of knowledge on health care issues in Nepalese society.

This study has found that demographic determinants such as age of mother, level of education, age and gender of child, family type and size were found to be associated significantly with nutritional problems in 3-5 years old children of Kaski district [51],[59]. Present study revealed that majority of respondents (57%) had more

than six members living together. Similarly, 35% had less than six and nearly 8% households living with less than four family members. As the context of Nepalese society mainly in Hindu culture the family structure is called extended family that consisted by the immediate family structure which is involving of grandparents with close relatives such as aunts, uncles and cousins who all live together in the same family. This family structure might changes from immediate to extended household [4]. Big family size leads to poor nutrition status of children. The children from poor and disadvantaged group are more vulnerable of poor nutrition. This might be difference due to study period, health service delivery, locality of the study, socio-economic characteristics, occupation and age. Most of the children taken to working places such as farming field, building construct site, and other house chores, by their parents if there is no anyone available to look after the small children at home.

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Mainly the level of knowledge on nutritious food and poverty are the major barriers seen in the field of nutrition that are associated with food security, food prices, and income trends of households [2]. Poverty, caste, gender and social inequalities and conflict are regarded as secondary barriers for the nutritional problems in Nepal [21],[10],[11],[3]. The ten-year long conflict in Nepal has increasingly centralised systems, disrupt the development of rural areas and badly affected health services [22] and ultimate aims to migrate to secure place. Although the risks involved in lack of transport, high service cost, long distances, full trust on spiritual and traditional healers because they are easily available and affordable for poor people, insufficient health resources, and lack of capacity to treat serious problems at the nearby primary health care service centres. At the same time, the country is on the way to accomplish the MDGs 4 and 5 targets [23]. Similarly, child undernutrition can also lead to poorer health and higher risk of mortality in later life. Many factors have been associated with poor nutrition. Mainly these include the magnitude of poverty as measured by socio economic status, availability of food and poor diet, practice of breastfeeding, the incidence of infectious and parasitic ailments, health care access, immunisation history, vitamin A supplementation, care during pregnancy, water supply and sanitation, health seeking behaviour, and demographic characteristics, including age and sex of child, mother's age and child spacing [54],[60],[70],[69].

P. Fieldhouse defines the custom and culture as "*Minority groups, whether they be defined in social, cultural or ethnic terms may hold values which differ from those of the dominant culture and this is reflected in their beliefs, attitudes and practices related to food*" [26].

The ethnic or traditional beliefs concerning to contamination of food and social values and norms in which rural women are not preferred because of their low rank have negative significances on the foods of women particularly by reducing their intake of desired, rich of micronutrient food such as meat items, dairy products and vegetables [28]. This type of traditional beliefs and manners could have a mostly negative influence on pregnant women given the intensified functional needs for various

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micronutrients. Thus ethnic beliefs and practices that impact women's nutritional eating during pregnancy have significant insinuations for both micronutrients and macronutrient lacks among pregnant women in Nepal.

Beliefs about the 'hot or cold' quality of food and their effects, on the health of human, are likewise widespread in the world, and have a strong impact on eating manners during illness, pregnancy, and lactation and [27]. Most of the South Asian region, these body states are supposed to be principally sensitive to the hot or cold merits of food and depending on an individual's physical state, hot or cold foods are believed to have either a negative or positive effect on the human body [14]

Often, it has been recommended that the sense of women is in fact having a big baby will result in increased labour risk, among women with short build in the context of south Asian region [55].

In Iran, African regions, South Asia and even some European countries, pregnant women have been observed to reduce food intake during pregnancy, a behaviour generally referred to in the literature as eating down [31]. It is reported that the causes of eating down in South Asian contexts, where the behaviour is hypothetically general, were connected to fears that having a large baby could lead to more difficult deliveries. In Nichter (1983) revealed beliefs about food intake behaviour of pregnant women of India, that the food taken by pregnant women that stocks equal cosmos in the stomach as the fetus and women eaten less meal in order to give the baby space to thrive in the limited shared space [47].

The food beliefs In South Asian culture commonly associated with ancient Ayurveda as well as Hindu religion [29],[43]. According to food beliefs of Ayurveda, whole foods have been classified into hot and cold, are profoundly embedded in the epistemological grounds of many cultures and can provide a theoretical framework for expressing the complex of linkages between diet and health [8]. Hot and Cold beliefs are held by many people in South Asian Region. This perception is believed to come from the ancient Hindu or Ayurveda and has been influential in medical practices [43]. This perception also practiced in Unani medical systems [61]. This beliefs system is complex and does not reflect that ideal by dominant Western Scientific medicine which generally prescribes to evidence based medicine and classifies food into groups representing the main micronutrient composition such as protein, fat, alcohol and carbohydrate [46]. Adherence to beliefs also tends to be stronger in the rural community of Nepal and among the disadvantaged and illiterate [26]. During these days food beliefs regarding hot and cold is vary between locality and ethnic groups as well as regions and countries. In general use of the hot and cold food categorise scheme avoid in the locality, through like general the use of the hot and cold food categorise scheme avoid in the community, though likely to differ between persons due to variances in understanding and economic capitals, may mean that conventional nutritional counselling is ineffective among those who follow this beliefs and reject scientific values, at least those in relation

to food choice [26]. The rejection of recommendations therefore, may not be due to persons not wanting to make changes but somewhat the recommendations not being compatible with their beliefs so health workers would not to know lay ideologies and adapt their techniques accordingly [26]. According to Fieldhouse (1995) the social and human behaviours are influenced by a variety issues as well as surroundings and financial pressures which impact on food choices and physical activity.

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Beliefs about Breastfeeding and colostrum

It has been observed that some women of the Nepalese communities, mainly from the rural locality and non-educated background, do not breastfeed on the day of child birth and even second day and it is common in South Asian region as well [18]. They stimulate their breasts and squeeze out the colostrum [6]. In terms of breastfeeding rates, it is high in Nepal when compared with breast feeding rate in England at six months and six weeks.

This study found that nearly 20% of the mothers explored negative perceptions such as mother become weak, ugly, breasts may shrink, get older in early life, may develop breast cancer, in regards to regular and excessive breastfeeding to children. Similarly 16% mothers had negative perceptions about feeding of colostrum such as it is forms pus, is toxic, dirty and smells bad. Hence they believe that colostrum needs to be squeezed out and should not be fed to the baby.

On the other hand, 71% of the community had positive perceptions about the feeding colostrum such as " it is good for the child's health, and it is a highly nutritious substance and compulsorily to be fed to the new born."

Malnutrition is a major contributor to the total global disease burden. More than one third of child deaths worldwide are attributed to undernutrition. Poverty is a central cause of under nutrition. As per the World Bank statistic (2015), Nepal's GDP per capita (US\$1,049/pa) is very low to fulfil the basic need of the households[77].

A key indicator of chronic undernutrition is stunting - when children are too short for their age group compared to the WHO child growth standards. About 178 million children globally are stunted, resulting from not enough food, a vitamin- and mineral-poor diet, and disease[7], [67]. As growth slows down, brain development lags and stunted children learn poorly. Stunting rates among children are highest in Africa and Asia. In south-central Asia 41% are affected [67].

Hidden hunger is a lack of essential vitamins and minerals in the diet, which are vital to boost immunity and healthy development. Vitamin A, zinc, iron and iodine deficiencies are primary public health concerns [73]. About 2 billion people are affected by iodine deficiencies worldwide; and vitamin A is associated with more than half a million deaths of under-five children globally each year [73], [81].

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The rise in overweight and obesity worldwide is a major public health challenge. People of all ages and backgrounds face this type of malnutrition. As a consequence, rates of diabetes and other diet-related diseases are escalating, even in developing countries. In a few developing countries, up to 20% of children under-five are overweight[73].

Good nutrition during pregnancy ensures a healthier baby. WHO recommends exclusive breastfeeding for six months, introducing age-appropriate and safe complementary foods at six months, and continuing breastfeeding for up to two years or beyond[74]. About 20% of deaths among children under-five worldwide could be avoided if these feeding guidelines are followed. Appropriate feeding decreases rates of stunting and obesity and stimulates intellectual development in young children [78].

Observation during the interview period also included construction materials for the building of residents within the urban and rural area. In regards to use of construction materials of the houses, sources of safe drinking water and use of cooking fuels, sanitation, drinking water purification, ownership of land, family size, income of the household, were measured as a compilation indicator of household prosperity and assets [37]. However, in the context Nepalese society, poverty, education, sanitation and safe drinking water are associated with child under-nutrition. Educational status is included as a separate variable in analyses since it is not a component of the wealth index. The population wealth quintiles and education offer a measure of socioeconomic status.

There are several impacts of food selections with age, gender, and social class along with ethnicity, attitudes, culture, and composition of household and deeply enrooted beliefs. In terms of inequalities, the people that belong to educated and advanced socioeconomic groups tend to have good diet. This may be due to being capable to well conceptualize the association between health and nutrition [16] but the reality that the group with higher incomes are capable to pay for nutritionally balanced and high quality foods. Similarly low income groups could not afford food choice which included fruits, meat items, and green vegetables [16]. Nutritious foods such as meat items, dairy products, fruits and green vegetables often cost more than low quality or cheap foods. The cheap or low quality foods are lower in important nutrients [30]. Poor income groups may also be limited in their capacity to purchase nutritious diets due to insufficient access both physically and financially. Only the basic necessities were purchased and the social variables religion had one of the most powerful roles in the selection of which diet to be followed [24].

CONCLUSION/RECOMMENDATION

Knowledge and attitudes towards nutritious food of rural and urban mothers are still poor in both societies. Beliefs about food practices are still strongly embedded in Nepal.

Urban mothers had better food recommendation, whereas rural mothers experienced huge barriers. Meat, fish, eggs and dairy products are not provided to children due to cultural influences. Mothers from both communities have high faith in spiritual healers. Child feeding practices in the community is very poor compare to developed countries. Approximately 20% mothers still believed that feeding of nutritious foods during the illness period caused harm. The research found that community people have strong hold on the beliefs about healthy foods within the community such as impure and pure, cold, hot and neutral, harmful or beneficial or curative. Following beliefs is strongly embedded in the society that “if a pregnant woman eats more she will have bigger baby which can cause problem during labour”. Therefore, pregnant woman are not allowed to take nutritious food in the rural part of Nepal. This study would endorse community based nutrition programme should be established and integrated with public health network at community level. Nutrition education programmes should be provided, using various methods by mobilising local level stakeholders, focusing on knowledge, attitudes and beliefs about nutritious food, to community people targeting to poor, disadvantaged and vulnerable communities which indicated in this study mainly poor knowledge, enrooted traditional beliefs and inappropriate attitudes of parents about nutritious food.

Study on Nutritional
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Children of Kaski
District of Nepal

ACKNOWLEDGEMENTS

The authors of this study would like to thank Global Supplementary Grant Programme/ Open Society Foundation, Europe; Sight and Life, Switzerland; Post Graduate Research Development Fund of Bournemouth University and Santander Bank for generous support for this study and Nepal Health Research Council for the ethical approval.

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PT-025

Poster

A comparative study of nutritional problems in preschool aged children in Nepal.

*Acharya, J., van Teijlingen E., Murphy, J., Hind, M.
Bournemouth University*

Introduction and Objectives: This paper explores diversity of cultural beliefs, knowledge and habits about food and nutrition that have affected health in positive and negative ways. The main objective is to measure the level of knowledge, attitudes and beliefs about 'nutritious' food for children amongst poor mothers in Nepal.

Materials and methods: A mixed-methods study was conducted in an urban and rural area of Nepal.

Sample: A questionnaire study was conducted with 524 mothers of 3-5 year old children as well as and seven Focus Group Discussions (FGD), consisting of Pharmacists, Auxiliary Nurse Midwives, Health workers, Social workers, Mothers, Spiritual healers and policy makers.

Data collection: Data collection took place in three successive phases: coordination, field management, piloting and survey from 25 June to 27 September 2012.

Analysis: Quantitative data was analyzed using SPSS (v20.0) reporting mothers' knowledge, attitudes and beliefs in respect of their children's nutrition. Results are presented in cross-tabulated form. A thematic analysis was used in the qualitative data analysis. Ethical approval has been obtained from the Nepal Health Research Council and Bournemouth University.

Result: The study included more urban mothers (56%) than rural ones (44%). Major barriers to recommending nutritious foods included: lack of knowledge (15%); high prices (19%); and culture/ beliefs (6%). The study showed nearly 55% children were provided with fruits once in week. Almost 15% of mothers never gave salad to their children and 6% of mothers could not choose nutritious food from the grocery store, 12% of the respondents lacked food. The majority of children (57%) had been taken at least once to a spiritual healer for treatment and 16% more than once. 20% of mothers believed eating green leafy vegetables and fruits during illness affected child health. Only 8% of the respondents provided meat, fish, egg and milk during times of illness to their children. Green leafy vegetables were rarely given to their children. Alike, children occasionally received other vegetables and fruits. Social worker (FGD) said that the mothers' beliefs that green vegetables and fruits cause common cold, diarrhoea and stomach-ache in children. According the Pharmacists (FGD) poor communities believed that nutritious foods are luxurious/ unaffordable and family conflict. Mothers (FGD) thought that if a pregnant woman eats more, she will have a bigger baby and a difficult delivery.

D: Food belief practices amongst mothers in Nepal: A qualitative overview



**Food belief practices amongst mothers in Nepal:
A qualitative overview**



Acharya, J., van Teijlingen, E., Murphy, J., Hind, M.

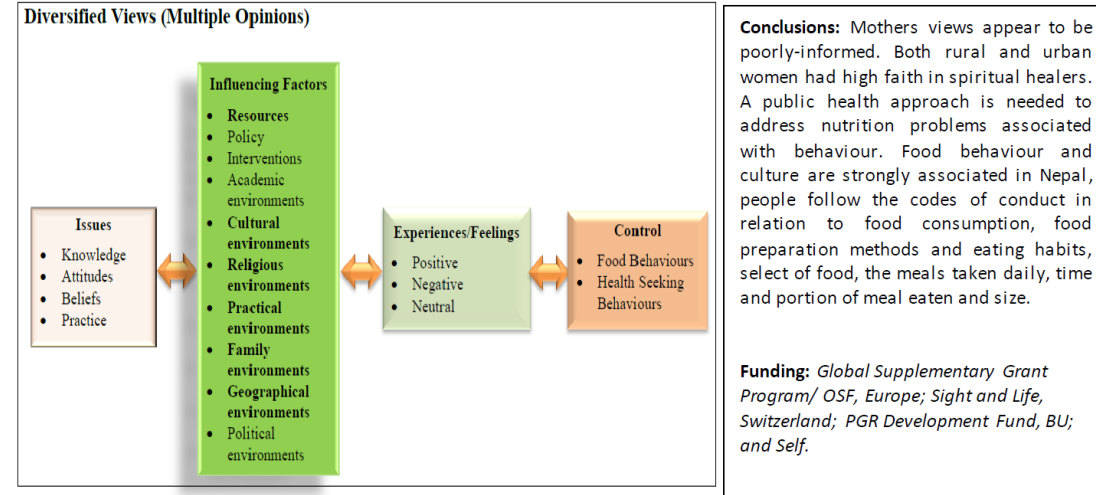
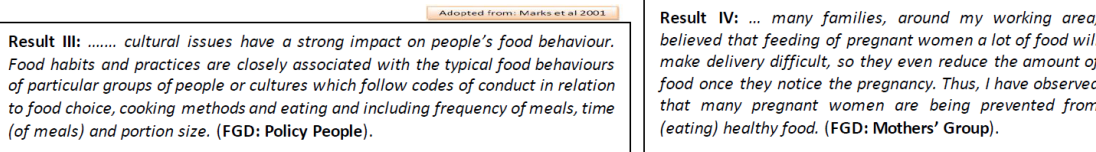
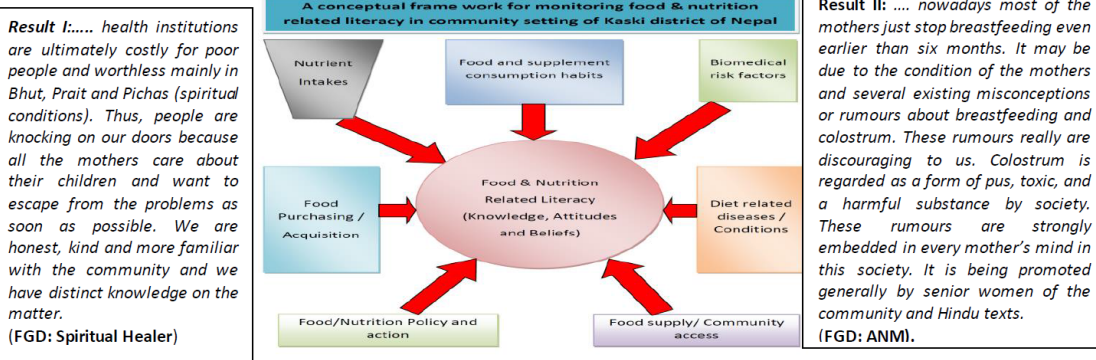
Faculty of Health & Social Sciences, Bournemouth University, England.

Background: Mothers in Nepal misunderstand the role of healthy eating to combat nutritional problems leading to improper feeding of young children which can lead to several complications, particularly in preschool-aged children.

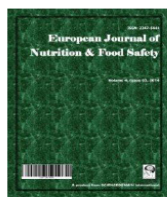
Research Questions: What are the maternal views about healthy food? What is the mothers' food and health seeking behaviours towards preschool aged children? What are the major factors that affect food recommendations?

Methods: A qualitative research comprising seven focus groups of 50 participants in total. Focus groups were recorded and transcribed, translated and the data were analysed using a thematic analysis.

Results: we identified six key themes related to food beliefs: poverty, knowledge, resources, policy, environmental effects, beliefs and cultural influences. All FGDs thought that poor, illiterate and underserved populations are vulnerable and due to poverty, poor knowledge and strongly embedded cultural beliefs & taboos. This study found 'diversified views' as a major barrier to food recommendation.



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European Journal of Nutrition & Food Safety
5(5): 389, 2015, Article no.EJNFS.2015.077
ISSN: 2347-5641



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A Comparative Study on Nutritional Problems in Preschool Aged Children of Nepal

Jib Acharya^{1*}, Edwin van Teijlingen¹, Jane Murphy¹ and Martin Hind¹

¹Bournemouth University, Bournemouth, Dorset, UK.

Article Information

DOI: 10.9734/EJNFS/2015/20873

Special Editors:

Lucie Bohac, Micronutrient Forum Secretariat, Canada.
Klaus Kraemer, Director, Sight and Life, Basel, Switzerland.

Chief Editor

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Conference Abstract

Received 5th February 2015
Accepted 1st March 2015
Published 14th August 2015

ABSTRACT

Objectives: Measure the level of knowledge, attitudes & beliefs about nutritious food for children amongst poor rural and urban mothers.

Methods: Quantitative questionnaire study.

Results: The study included more urban mothers (56%) than rural mothers (44%). Major barriers to recommending nutritious foods included: lack of knowledge (15%); high market prices (19%); and cultural influences or beliefs (6%). The study shows nearly 55% children are providing fruits once in week. Similarly nearly 15% of families never give salad to their children. Nearly 16% of mothers cannot choose nutritious food from the grocery store. Likewise 12% respondents lacked food. Nearly 57% children had been taken at least once to a spiritual healer and 16% on multiple occasions for the treatment. Nearly 20% of mother believed eating green leafy vegetables and fruits during illness affect child health. Nearly 8% respondent feed meat, fish, egg and milk during times of illness to their children but 92% do not.

Conclusions: Knowledge and attitudes towards nutritious food of rural and urban mothers are still poor in both societies. Beliefs about food practice are still strongly embedded in Nepal. Urban mother had better food recommendation, whereas rural mother experienced huge barriers. Meat, fish, egg and dairy products are not provided to children due to cultural influences. Mothers from both communities have high faith in spiritual healers.

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Correspondence: Lucie Bohac, Coordinator, Micronutrient Forum Secretariat (email: lbohac@micronutrient.org)

Note: This abstract was presented at "The Micronutrient Forum Global Conference – Bridging Discovery and Delivery", 2-6 June 2014, Addis Ababa, Ethiopia.