FACTORS ASSOCIATED WITH UTILIZATION OF MATERNAL HEALTH SERVICES IN SELECTED MOUNTAINOUS VILLAGES OF KASKI DISTRICT, WESTERN NEPAL.

Miss Anu Koirala

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University
บทคัดย่อและแฟ้มข้อมูลฉบับเต็มของวิทยานิพนธ์ตั้งแต่ปีการศึกษา 2554 ที่ให้บริการในคลังปัญญาจุฬาฯ (CUIR)
เป็นแฟ้มข้อมูลของนิสิตเจ้าของวิทยานิพนธ์ที่ส่งผ่านทางบัณฑิตวิทยาลัย
The abstract and full text of theses from the academic year 2011 in Chulalongkorn University Intellectual Repository (CUIR)
are the thesis authors' files submitted through the University Graduate School.

A Thesis Submitted in Partial Fulfillment of the Requirements
for the Degree of Master of Public Health Program in Public Health
College of Public Health Sciences
Chulalongkorn University
Academic Year 2014

Copyright of Chulalongkorn University

ปัจจัยที่เกี่ยวข้องกับการใช้บริการสุขภาพอนามัยแม่และเด็กในพื้นที่ภูเขา เมืองคาสกิ เขตตะวันตก ประเทศเนปาล

นางสาวเอนู โกยราลา

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาสาธารณสุขศาสตรมหาบัณฑิต
สาขาวิชาสาธารณสุขศาสตร์
วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2557
ลิขสิทธิ์ของจุฬาลงกรณ์มหาวิทยาลัย

Thesis Title	FACTORS ASSOCIATED WITH UTILIZATION OF MATERNALHEALTH SERVICES IN SELECTED MOUNTAINOUS VILLAGESOF KASKI DISTRICT, WESTERN NEPAL.
By	Miss Anu Koirala
Field of Study	Public Health
Thesis Advisor	Alessio Panza, M.D., M.Com.H, DTMH

Accepted by the Faculty of College of Public Health Sciences, Chulalongkorn University in Partial Fulfillment of the Requirements for the Master's Degree

.....Dean of the College of Public Health Sciences
(Associate Professor Sathirakorn Pongpanich)

THESIS COMMITTEE

.....Chairman
(Associate Professor Ratana Somrongthong, Ph.D.)
.....Thesis Advisor
(Alessio Panza, M.D., M.Com.H, DTMH)
.....Examiner
(Nanta Auamkul, M.D., M.P.H.)

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

เอนู โกยราลา : ปัจจัยที่เกี่ยวข้องกับการใช้บริการสุขภาพอนามัยแม่และเด็กในพื้นที่ภูเขา เมืองคาสกิ เขตตะวันตก ประเทศเนปาล (FACTORS ASSOCIATED WITH UTILIZATION OF MATERNALHEALTH SERVICES IN SELECTED MOUNTAINOUS VILLAGESOF KASKI DISTRICT, WESTERN NEPAL.) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: นพ. อเลซซิโอ พันซ่า, 97 หน้า.

เนปาลมีอัตราการตายของมารดาสูงที่สุดในโลก แม้ว่าเนปาลจะมีการเริ่มดำเนินการอย่างมากมายเกี่ยวกับโปรแกรมการดูแลมารดาที่ตั้งครรภ์ให้ปลอดภัย ดังนั้นวัตถุประสงค์หลักของการศึกษานี้คือ เพื่อศึกษาปัจจัยที่เกี่ยวข้องกับสุขภาพของมารดาที่สัมพันธ์กับการเข้ารับบริการอนามัยแม่และเด็ก (ANC) ในระหว่างการคลอดและการเยี่ยมหลังคลอด .

การศึกษานี้เป็นการศึกษาแบบภาคตัดขวาง ในมารดาจำนวน 200 คนของกลุ่มอายุช่วงวัยเจริญพันธุ์ ที่ได้ให้กำเนิดบุตรภายใน 2 ปีจากการสำรวจในหมู่บ้านดิห์ตานและหมู่บ้านดฮามปุสของตำบลกัสกี ซึ่งอยู่ในภาคตะวันตกของเนปาล สำหรับการเก็บข้อมูล การศึกษานี้ได้ใช้แบบสอบถามปลายปิดเพื่อเก็บรวบรวมข้อมูลจากผู้มีส่วนร่วมในงานวิจัย ส่วนการวิเคราะห์ข้อมูลถูกดำเนินการโดยการทดสอบไคสแควร์และวิเคราะห์ข้อมูลโดยใช้การวิเคราะห์การถดถอยโลจิสติกหลายตัวแปร

ผลจากการศึกษาพบว่า การครอบคลุมของบริการอนามัยแม่และเด็กมีถึง 98% และครึ่งหนึ่งของมารดาซึ่งได้เข้ารับการบริการถึง 4 ครั้ง โดยเป็นไปตามคำแนะนำของรัฐบาลประเทศเนปาล นอกจากนี้ 80% ของผู้ตอบแบบสอบถามทั้งหมดพบว่ามีการคลอดบุตรในโรงพยาบาลจากการทำคลอดโดยบุคลากรที่มีความเชี่ยวชาญ (Skilled Birth Attendants; SBA) และมีเพียง 24 % เท่านั้นที่ไปโรงพยาบาลหลังการคลอด อายุและการศึกษาของผู้มีส่วนร่วมในงานวิจัย การศึกษาของสามี สถานะทางการเงิน ระดับความรู้ของมารดา และระดับของแรงจูงใจ มีความสันพันธ์ไปในทิศทางบวกอย่างมีนัยสำคัญทางสถิติจากการวิเคราะห์สองตัวแปร หลังจากการควบคุมตัวแปรโดยใช้การวิเคราะห์สถิติแบบหลายตัวแปร พบว่า ระดับของการศึกษา อาชีพ ความรู้เกี่ยวกับสุขภาพของมารดาและแรงจูงใจ มีความสัมพันธ์กันอย่างมีนัยสำคัญ

แม้ว่าระบบบริการสุขภาพของมารดาแบบไม่เสียค่าใช้จ่ายจะถูกดำเนินการเพื่อสร้างแรงจูงใจ การครอบคลุมของบริการสุขภาพอนามัยของมารดายังคงมีเปอร์เซ็นต์ที่ต่ำในหมู่บ้านบริเวณหุบเขาของประเทศเนปาล การศึกษาครั้งนี้ได้เน้นไปที่ปัจจัยซึ่งสัมพันธ์กับการใช้ประโยชน์จากบริการด้านสุขภาพของมารดาในหมู่บ้านบริเวณหุบเขาของเนปาล ในการศึกษาครั้งต่อไปมีความจำเป็นที่จะต้องลงรายละเอียดให้ลึกกว่าเดิมโดยร่วมผู้มีส่วนเกี่ยวข้อง เพื่อหาสถานการณ์ที่เกิดขึ้นจริงในหมู่บ้านบริเวณหุบเขาของเนปาลในส่วนที่เกี่ยวกับกับการบริการสุขภาพของมารดา

สาขาวิชา สาธารณสุขศาสตร์ ลายมือชื่อนิสิต .....

ปีการศึกษา 2557 ลายมือชื่อ อ.ที่ปรึกษาหลัก .....

5778827753 : MAJOR PUBLIC HEALTH
KEYWORDS: FACTORS / UTILIZATION / MATERNAL HEALTH SERVICE / KASKI / NEPAL

ANU KOIRALA: FACTORS ASSOCIATED WITH UTILIZATION OF MATERNALHEALTH SERVICES IN SELECTED MOUNTAINOUS VILLAGESOF KASKI DISTRICT, WESTERN NEPAL.. ADVISOR: ALESSIO PANZA, M.D., M.Com.H, DTMH, 97 pp.

Background Nepal has the highest maternal mortality rate in the world even though Nepal started and implemented various initiative safe motherhood programs national wise .The main purpose of this study was to identify the related maternal health factors associated with the utilization of antenatal care (ANC) visits, delivery and postnatal visit.

Methods Community based crossectional study was conducted among 200 mothers of reproductive age group who delivered baby within 2 years of the survey in Dhital and Dhampus village of Kaski district, Western Nepal. The close structured questionnaire was used for collecting the information from the participants. Data analysis was done by chi-square test and multivariable logistic regression.

Results The findings from the study showed that the coverage of ANC visit was 98% only half of the women visited 4 ANC visits as recommended by the government of Nepal. Out of total respondents 80% of the respondents delivered in the hospital by skilled birth attenadant and only 24% visited hospital after the delivery. Age of the respondent, husband education, respondent education, income status, level of maternal knowledge and level of enabling factors were statistically significant and positively associated in bivariate analysis. Multivariate analysis showed level of Age, occupation of respondent, level of maternal health knowledge and enabling factors were significant after controlling the variables.

Conclusions

The coverage of the maternal health service is still low in mountainous village of Nepal even the free maternal health services are provided with the incentives. This study just slightly highlights the factors associated with utilization of maternal health services in mountainous villages of Nepal. Further and deep investigation is necessary to go in the details by the concerned authority to find actual scenario of the mountainous part of Nepal in relation with the maternal health services

Field of Study: Public Health Student's Signature .....

Academic Year: 2014 Advisor's Signature .....

ACKNOWLEDGEMENTS

Firstly, I would like to sincerely express my gratitude and appreciation to the contribution of my thesis advisor Dr.Alessio panza for his valuable suggestions, and guidance during the entire period of thesis writing. Furthermore, I am very thankful to Asst. Prof. Ratana Somrongthong and Dr.Nanta Auamkul to donate her time as my examination committee and for giving me fruitful suggestion for improvement of my thesis.

I would also like to take this opportunity to express my special thanks to health post in charge Mr. Chhabiraman Paudel for helping me by providing data collection area under the major circumstances like earthquake. Without his support, I would not be able to proceed my research in time. I am very grateful to those women who participated in my study and helped to make successful even though they were experiencing aftershocks of earthquake and also my special thanks goes to Nepal health research council for providing me suggestions and comments for my proposal as well as ethical approval. Also big thanks goes to Dhital and Dhampus VDC to grant me permission for doing data collection there.

I would also like to thanks the family of College of Public Health Sciences, which includes all the professors who have taught me and guide me throughout the study period and all the supporting and loving staffs. My big thanks goes to my classmates and the seniors that have been very supportive, friendly, and warm to me. Because of them I was able to complete my 1 year stay in Bangkok and I will cherish all the memories which I spent here throughout my life.

.Finally, I express my deepest thanks to my grandparents, Mom, Aunty and Mama as well as god for supporting, believing, encouraging me in every moment of my life. Thank you for everything you have done for me.

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

CONTENTS

Page
THAI ABSTRACT iv
ENGLISH ABSTRACT v
ACKNOWLEDGEMENTS vi
CONTENTS vii
LIST OF TABLE 11
LISTS OF FIGURE 13
ABBREVATION 14
CHAPTER I 15
Introduction 15
1.1 Background of the Study 15
1.2 Rationale of the study 17
1.3 Objectives of the study 17
1.4 Research hypothesis 18
1.5 Research questions 18
1.6 Variables of the study 18
1.7 Operational Definitions 20
Chapter-II 23
Literature Review 23
2.1 Introduction 23
2.2 Skilled birth attendant 24
2.3 Postnatal care 24
2.5 Maternal health service provided in Nepal 26
Newborn care 27
2.6 Health system in Nepal 27
2.7 Framework of Andersen behavioral model 28
2.8 Review of related research article 30
2.9 Availability of the transportation in mountain Nepal 35
Chapter III 37

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Page

Methodology 37
3.1 Study design: 37
3.2 Study area: 37
3.3 Study population: 38
3.4 Sample selection procedure: 38
3.5 Sampling technique 39
3.6 Sample size calculation: 40
3.7 Measurement tools: 40
3.8 Validity and reliability: 42
3.9 Data collection 42
3.10 Data analysis: 42
3.11 Ethical consideration 43
3.12 Limitation of the study: 43
3.13 Expected Benefit and Application 44
CHAPTER IV 45
RESULTS 45
4.1 Socio-demographic factors 45
4.2 Results from the maternal health knowledge related part 47
4.3 Results from enabling factors part 50
4.4 Level of enabling factors 52
4.5 Maternal health service utilization 52
4.6 Bivariate analysis of factors associated with utilization of maternal health services in reproductive age group women 54
4.7 Association between socio-demographic factors and ANC visit 54
4.8 Association between levels of maternal health related knowledge and ANC visit 57
4.9 Association between enabling factors (availability and accessibility) and antenatal visit 58
4.10 The Association between socio-demographic factors and person assisting during delivery 58

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Page

4.11 Association between levels of maternal health related knowledge and person assisting during delivery 61
4.12 The association between enabling factors and person assisting during delivery 62
4.13 The association between socio-demographic factors and postnatal care after child birth 62
4.14 The association between levels of maternal health related knowledge and post-natal visit 65
4.15 The association between Enabling factors and Postnatal visit 65
4.16 Multivariable logistic regression analysis 66
4.17 Logistic regression analysis between all independent variables and Number of antenatal visits. 66
4.18 Logistic regression analysis between all independent variables and person assisting during delivery 67
4.19 Logistic regression analysis between all independent variables and postnatal visit. 67
4.20 Summary of all significant variables of multivariable logistic regression 68
Chapter V 69
DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS 69
5.1 Discussion 69
5.2 Conclusions 74
5.3 Recommendations 75
5.4 Future study 76
REFERENCES 77
APPENDICES 83
APPENDIX A Informed Consent Form 84
APPENDIX B Questionnaire code No…… 85
APPENDIX C 92
APPENDIX D 93
Female Population by Age group of Kaski district(National Planning Commission Secretariat 2012). 93

Page

APPENDIX E Work Plan 94
APPENDIX F Budget 95
VITA 97

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

LIST OF TABLE

Table 1 Statistics of Maternal health service in Nepal (Annual report 2012/2013) (Department of health service Nepal) 25

Table 2 Maternal health service indicators by the Residence and Geographical zone in Nepal (Ministry of health and population 2011). 25

Table 3 Socio-demographic characteristics of the respondents (N=200) 46

Table 4 Number and percentage of respondent response to knowledge questions (N=200) 48

Table 5 Level of Maternal health related knowledge 50

Table 6 Number and percentage of respondent response to Enabling factors 51

Table 7 level of enabling factors (Availability and Accessibility) 52

Table 8 Maternal health service 53

Table 9 Association between socio-demographic factors and ANC visit 55

Table 10Association between levels of maternal health related knowledge and antenatal care visit 57

Table 11 Association between enabling factors and antenatal visit 58

Table 12Association between socio-demographic factors and delivery by SBA 59

Table 13Association between levels of maternal health related knowledge and person assisting during delivery 61

Table 14 Association between Enabling factors and person assisting during delivery 62

Table 15Association between socio-demographic factors and postnatal care after child birth 62

Table 16 Association between levels of maternal health related knowledge and post-natal care 65

Table 17 Association between Enabling factors and postnatal visit 65

Table 18 Logistic regression analysis of socio-demographic factors, level of maternal health related knowledge, level of enabling factors with number of ANC visits 66

Table 19 Logistic regression analysis between all independent variables and person assisting during delivery.....67

Table 20 Logistic regression analysis between all independent variables and postnatal visit. 67

Table 21 The summary of four significant variables with three dependent outcomes 68

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

LISTS OF FIGURE

Figure 1 Conceptual Framework Factors associated with utilization of maternal health services in Nepal **(Andersen 1995)** 19

Figure 2 The emerging model 29

Figure 3 Jeep available in Nepal 35

Figure 4 Bamboo basket in Nepal 36

Figure 5 Map of Kaski district 37

Figure 6 Sampling technique 39

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

ABBREVATION

ANC	Antenatal Care
FCHV	Female Community Health Volunteer
NDHS	Nepal Demographic Health survey
NGO	Non-Government Organization
PNC	Post Natal Care
SBA	Skilled Birth Attendant
USBA	Unskilled Birth Attendant
VDC	Village Development Committee

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

CHAPTER I

Introduction

1.1 Background of the Study

Nepal has the highest maternal mortality rate in the world even though Nepal started and implemented various initiative safe motherhood programs national wise and still maternal health services continue to be underutilized specially in the rural areas of Nepal(Hussein, Bell et al. 2011) .

Many programs and strategies are established and implemented by the government of Nepal for achieving the goal of the Millennium Development Goals (MDGs) 4 and 5 which aims for a three-fourths reduction in maternal mortality by the year 2015 (Demographic 2012). About 350,000 women of reproductive age die because of pregnancy and childbirth related causes in the world each year and 99 % of the death occur in developing countries like Nepal (Ghebrehiwet and Morrow 2010).

The MMR according to Nepal Demographic and Health Survey (NDHS) 2011 is 281 per 100,000 live births and infant mortality rate is 46 per 1000 live birth (Ministry of health and population 2011). The recent study done in the eight selected districts of Nepal in 2008/2009, MMR is found to be 229 per 100,000 live births, where the ratios range from 153 to 301 district wise (Suvedi, Pradhan et al. 2009). The study in Nepal suggests that maternal care is low and are not utilized effectively in Nepal. Several studies have examine the association between the different factors and maternal service utilization but the results are not consistent. The antenatal care received by the pregnant women from the skilled health provider (doctors, nurse and midwifery) is 58% while 15% of the women did not receive any antenatal care .Only 50% of the pregnant women make four or more ANC visit during their entire pregnancy and other 50% did not complete the recommended ANC visit. In Nepal, 59 percent of all births still continue to occur at home and only about 36 % of deliveries are assisted by a skilled birth attendant (doctor or nurse/midwife). Only 45% of the women received postnatal care

after the two days of delivery(Ministry of health and population 2011). As there are many programs for reducing MMR, still there are lack of trained health workers and the medical equipment, especially in rural and mountainous areas which consist more than 70% of the population in Nepal (Ministry of health and population 2011).

Maternal health service includes the health service during antenatal care , delivery and postnatal care by the health service provider which are crucial for the survival and wellbeing of both mother and child. ANC services creates a platform for the pregnant women about the delivery of evidence based clinical interventions, counseling on maternal health , birth and emergency preparedness. The WHO recommend all the pregnant women to make the four antenatal checkups that is first at 4^{th} month, second at 6^{th} month, third at 8^{th} month and fourth at 9^{th} month of pregnancy (Villar, Ba'aqeel et al. 2001). Delivery of pregnant women in the health facility by the skilled birth attendant who are the health professional like nurse, midwife and doctors is essential for the safe delivery and immediate postnatal period as well as they play an important role in identifying, managing and referring the complications in women and the newborn baby. Postnatal care visit helps the mother for providing care for themselves and the newborn and recommended for the women to receive at least three postnatal checkups (Ministry of health and population 2011).

Global evidence shows that all pregnancies are at risk, and can get many problems during pregnancy and delivery . So, providing sufficient amount of access to prevention and care during pregnancy and childbirth, we can save the life of many women and baby that helps in minimizing maternal morbidity and mortality.

There are many studies regarding factors associated with maternal health service, but most of the studies are limited in urban or nearby areas. Utilization of maternal health service is important for the further improvement of maternal and child health however there is insufficient knowledge about the current magnitude of the various factors influencing the use of these services. So, with the aim to fill the gap and increase the participation of women of reproductive age for the utilization of maternal health service this study is going to be conducted in different kind of population living in rural and mountainous region with poor transportation facility of Nepal.

1.2 Rationale of the study

Safe Motherhood Program is the Priority one program (P1) in Nepal Government because it is still a great public health problem and a country is counted as having high mortality ratio in the world that is 281 deaths per 100,000 births (Ministry of health and population 2011).

There is large difference between the urban and the rural areas and according to the recent data 88% urban women had all ANC visit while 55 % rural women did not complete ANC visit as well as 73% are birth in urban are assisted by SBA as compared with the 32% in rural areas. So, ANC coverage of mountain region is only 52 percent as compared with 53 percent in hill region and 63 percent in Terai region. The rate of birth by SBA in the mountain region is only 18.9% as compared with Terai region i.e. 42.8% (Annual report 2012/2013). Dhital and Dhampus villages are located in a mountainous part of western Nepal with very less transportation facility where most of the residents in the village are "Janjatis" (distadvantage ethnic group of Nepal)

1.3 Objectives of the study

1.3.1 General objective

- To describe the related maternal factors and their association with the utilization of the ANC visits, Delivery and Postnatal visits among the reproductive age of women in selected mountainous villages, Western Nepal

1.3.2. Specific objectives

- To describe the socio-demographic factors and their association with ANC visits, delivery and postnatal visits.
- To find out the health related knowledge of the women associated with ANC visits, delivery and postnatal visits
- To study enabling factors associated with utilization of ANC visits, delivery and postnatal visits.

1.4 Research hypothesis

- Socio-demographic factors are associated with the utilization ANC visits, delivery and postnatal visits.
- Health related knowledge of the women are associated with the utilization ANC visits, delivery and postnatal visits
- Enabling factors are associated with the utilization of ANC visits, delivery and postnatal visits

1.5 Research questions

- What are the socio-demographic factors that are associated with the utilization ANC visits, delivery and postnatal visits?
- What are the health related knowledge of women that are associated with the utilization ANC visits, delivery and postnatal visits?
- What are the enabling factors that are associated for the utilization of ANC visits, delivery and postnatal visits?

1.6 Variables of the study

1.6.1 Dependent variable

- Utilization of maternal health service (ANC visits, delivery and postnatal visits)

1.6.2 Independent variable

The Andersen behavioral model framework is adapted for the use of maternal health services, to group the independent variables associated with utilization of maternal health services**.** It comprises of predisposing, enabling factors which are listed in detail in the conceptual framework.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

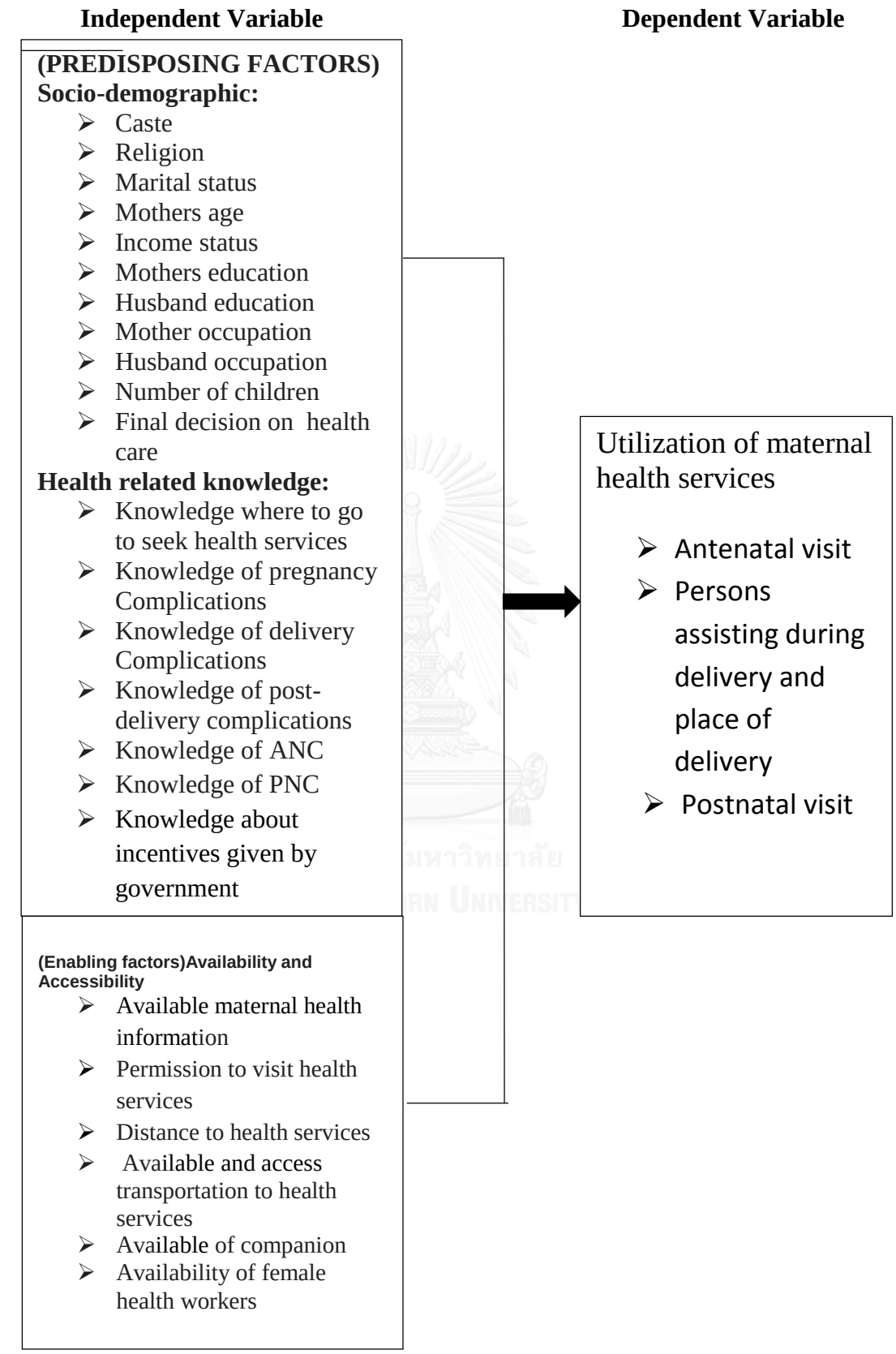

Figure 1 Conceptual Framework *Factors associated with utilization of maternal health services in Nepal* ***(Andersen 1995)***

1.7 Operational Definitions

Independent Variables

1. Caste: It refers to the sociocultural structure of the Nepalese society which is classified into two group's lower caste group and upper caste group. Upper caste groups includes Brahmin and Chhetris. Lower caste group includes Dalit , janajatis in my study.

2. Religion: It is classified into Hindu, Buddhist, Muslims, Kirants, Christians

4**. Marital status-** It refers to the women who are married

3. Mothers age: The self-reported completed years of the women between 15-49 years at the time of survey

4. Income Status: The income status of household refers to the total money from different source of income in a month of the family.

5. Mother's Education: It was recorded on the basis of completion of the level on the Nepalese education system no education, Primary level. (Grade1-5), Secondary: (Grade 5-10) and higher education (SLC above) according to Nepalese education system.

6. Husband Education: It refers to the education status of the husband that is No education, Primary level. (Grade1-5), Secondary: (Grade 5-10) and higher education (SLC above) according to Nepalese education system.

8. Number of children: The number of the alive children given birth by a respondent.

9. Mother's Occupation: It covers occupational information of the respondent like Housewife Agriculture, Service holder and others

10. Husband's occupation: It refers to the occupation of the husband which are divided into Agriculture**,** Labor**,** Professional and Others

11.Final decision maker on health care: It refers to the decision maker of the family regarding the health of the mother. It is categorized into women alone, women with partner and Other members(in home)

12. Knowledge of pregnancy complication- It refers to the knowledge of women about the problems that occurring during pregnancy like anaemia, preeclampsia, gestational diabetes, miscarriage and others.

16. Knowledge of delivery complications- Refers to the knowledge of women about problem that can occur during child birth such as placental abruption, uterine rupture, inverted uterus and excessive bleeding.

17. Knowledge of post-delivery complications Refers to the knowledge of women regarding the complication that can occur after the child birth like hemorrhage, hemorrhoid and constipation, postpartum depression, vaginal discharge and problems in breastfeeding.

18. Knowledge about the incentives: Refers to the knowledge of money given by the government of Nepal after visiting health facility for ANC and delivery like cash for antenatal service, institutional delivery.

19. Knowledge of ANC: It refers to the knowledge of the service that are included in the antenatal care service in Nepal by the women such as monitoring blood pressure, weight, monitor fetal heart rate, TT immunization, iron and deworming tablets.

20. Knowledge of PNC: It refers to the knowledge of the service that are included in the postnatal care service in Nepal like management of mothers and newborn complication, postnatal vitamin A and iron tablets, immunization of newborn

22. Permission to visit health service: It refers that the women get chance to visit maternal health service from their husband, mother in law especially if they only approve

21. Distance to health service: The minimum time required to reach the nearest health center.

22. Transportation to go to health facility It refers to the available different mode of transportation to reach the health service like hammock, jeep, helicopter etc..

23. Presence of companion- It refers to the people who company to go the health service like husband, friends, and mother in law.

24. Availability of care by female health workers: Refers to nurse, midwife and female doctors available in the health facility for providing the health service like antenatal checkup, delivery and postnatal care.

25. Availability of information regarding service: It refers to available health information of reproductive health services. It includes health information by the health professional, media, friends and relatives**.**

.

Dependent variables

1. Antenatal Visits: It refers to the frequency of receiving antenatal service of the pregnant women.

Start of ANC refers to: The women when they first time go to receive antenatal service during their pregnancy time.

2. Place of delivery: The place of delivery done by the women in the health facility or Non- health facility (like home, way rather than health service)

3. Person assisting during delivery: It refers to the person who assist during delivery such as skilled birth attendant**: (**Assistance during delivery by the health professional like midwife, nurse and doctors and who has got the training of needed to manage normal pregnancies, childbirth and immediate postnatal period) TBA (Help without professional skills during delivery) and None (without the help of anybody)

4. Postnatal visit: Refers to the women who visit health facility for the identification and management of her own health and newborn complication after the delivery of a baby. It refers to the three times visit recommended by the government of Nepal.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Chapter-II

Literature Review

2.1 Introduction

Maternal mortality is one of the most significant public health problems in the developing countries and reduction in maternal mortality has been identified as essential component of the United Nation's Millennium Development Goals

Antenatal care

Antenatal care which is known as care during pregnancy is essential for diagnosing and treating complications that could endanger the lives of mother and child. Antenatal care helps to prevent the various complications that occurs in pregnancy period and delivery and even after the child birth because there is always contact of the health providers that helps in minimizing the risk that could happen in the future. Moreover, there is sufficient evidence that care during pregnancy is an important opportunity to deliver interventions that will improve maternal health and survival during the period immediately preceding birth and after birth. Furthermore, when the women are informed about the benefit of the antenatal care checkup then they are more likely to visit hospital and they will decide to deliver in the health institution which finally benefit health of both mother and child (Organization 2009).

Antenatal visits offer many useful information for the women which includes nutrition and the prevention of malaria, HIV infection, tetanus and tuberculosis, as well as obstetric care (Organization 2009). As antenatal care is the essential tool in diagnosing and preventing risks during pregnancy but many women in developing countries do not maximally utilize this service.

2.2 Skilled birth attendant

Skilled birth attendant who helped in the delivery of women are considered as the key indicator of progress towards reducing maternal mortality worldwide and which is the part of fifth Millennium Development Goal 2015.Use of SBAs during pregnancy, labor and delivery during the postpartum period could prevent many instances of maternal morbidity and mortality. Unfortunately, qualified midwives, nurses and doctors are often not available in the rural areas of many developing countries where most women are delivered (Organization 2008). Although all women and babies need pregnancy care, care in childbirth is most important for the survival of pregnant women. However, around the world one third of births take place at home without the assistance of a skilled attendant. WHO strongly advocates for "skilled care at every birth" to reduce the global burden of 536,000 maternal deaths every year There are still 3 million still births and 3.7 million newborn deaths each year (Safer 2004).

Traditional birth attendant in Nepal

The government of Nepal has no specific skilled birth attendant training for the traditional birth attendant. Various NGO/INGO has provided training for traditional birth attendant in some villages in Sarlahi district of Nepal (Thatte, Mullany et al. 2009). In Kaski distict, western Nepal, traditional births attendant do not have any kind of skilled birth training for the delivery purpose.(source primary health care of Dhital)

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

2.3 Postnatal care

It is defined as the immediate care given to mother and baby after the delivery. The postnatal care comprises of identifying and management of the complication occurred in mothers and newborn baby and also the referral to the appropriate hospitals for the better treatment when it is necessary.

The Complication which occur during delivery comprises for a huge proportion of maternal morbidity and mortality. Three quarters of all maternal deaths occur from complications either during delivery or in the immediate post-partum period. These complications include: hemorrhage (25% of maternal deaths); infections (15 %);

complications of abortion (13%); eclampsia or related hypertensive disorders (12%; and obstructed labor (8 %) (Organization 2009).

Table 1 Statistics of Maternal health service in Nepal (Annual report 2012/2013) (Department of health service Nepal)

	2010/2011(%)	**2011/2012 (%)**	**2012/2013 (%)**
Four times ANC visit	57	57	**56**
Delivery by SBA	36	44	**45**
Delivery in Health institution	37	44	**45**
Three times Postnatal care	NA	56	**49**

Table 2 Maternal health service indicators by the Residence and Geographical zone in Nepal (Ministry of health and population 2011).

Type of Residence	**Receiving antenatal care from a skilled provider (%)**	**Delivered by skill provider (%)**	**Women with postnatal check up in the first two days after birth (%)**
Urban	87.9	72.7	72.4
Rural	54.9	32.3	41.7
Geographical zone			
Mountain	52.1	18.9	30.7
Hill	53.2	30.4	36.7
Terai	63.0	42.8	52.4

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

2.4 "**Aama program" for Safe motherhood**

Since the fiscal year 2013/014 revised Aama guideline has implemented in Nepal. Aama program consist of four components and they are safe delivery incentive program, a cash incentive scheme, free delivery in health institutions, incentive to health worker for home delivery and incentive to women for 4ANC visits.

Women who delivered their baby in health institution are paid immediately by cash NRs 1500(US$15) in mountain region, NRs 1,000 (US$10) in hill region and NRs 500 (US$5) in Terai region. This amount of money is sufficient for paying transportation like ambulance fee in Nepal .Cash payment of 400 NRs (US$4) is given for women for the completion of 4 ANC visit at the 4, 6, 8 and 9 months of pregnancy following institutional delivery. A cash payment of 100 Nrs (US$1) is provided to health workers for doing delivery in the home (Annual report 2012/2013).

Note: 1 US dollar in Nepal can buy 2 kilos of rice. In 9 july 2015 the exchange rate of 1 US dollar=101.688 NRs (Conveter).

2.5 Maternal health service provided in Nepal

The four antenatal checkups are recommended in Nepal i.e. the first is at 4th month, second is at 6th month, and third at 8th month and the last is at 9th month. When the pregnant women go for the antenatal checkup blood pressure, weight and fetal heart rate are monitored. The service also includes providing information, education and communication and behavior change communication for the danger sign that can happen in the pregnancy. The pregnant women are provided with the tetanus toxoid immunization, iron and deworming tablets as well as the malaria prophylaxis if necessary. They also provide the information for the birth preparedness package which includes the delivery by skilled birth attendant, money, transportation and the blood (Annual report 2012/2013).

Delivery care

The delivery care includes skilled birth attendants at deliveries that can be either in home or health facility. The complicated case are detected and referred after providing first aid by health worker to appropriate hospitals where the emergency obstetric services are provided for the 24 hours Health system in Nepal. The obstetric first aid are provided at home, HP/SHP if complication occur and using Emergency

obstetric care Kit. The registration of births and maternal and neonatal deaths (2012/13).

Postnatal care

In our country Nepal three postnatal visit are recommended for the women and the newborn for the 3 times that is within 24 hours of delivery, second checkup is at third day and the last checkup is at the seventh day after the delivery which is the critical time for both the mother and newborn baby (Annual report 2012/2013).

The postnatal visit provides information about the promotion of exclusive breastfeeding during six month, education about the nutrition and also the postnatal vitamin A and iron supplementation for the 45 days after delivery, immunization of the newborn baby as well as the counseling of the personal hygiene and also the family planning services.

Newborn care

The ministry of health and population of Nepal has keep focus on the safe delivery kits, cord care, prevention and management of hypothermia, dying and bathing the newborn and other health care services. Since 2011 the community based newborn care program has been started in Nepal and has been implemented in various district for the promotion of the newborn care and that includes the wiping newborn baby immediately after the birth with soft and dry cloth, Kangaroo care of mother that is skin to skin contact, providing advice on inclusive and exclusive breastfeeding, bathing the baby only after 24 hrs. and taking care of the umbilical(Ministry of health and population 2011)**.**

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

2.6 Health system in Nepal

For providing basic minimum health services in the country, the health system of Nepal is focusing in the primary health care, health post and the sub health post. However these health post and sub health post are not available with the high technology of equipment, expert doctors and lack of essential medicine and it is not equitable distributed throughout the country. Many health workers feel that working in the rural part of the country is to be deprived from the different opportunities available. For the easy access of the health service each village development committee has a health post. Village development committee (VDC) is a lower administrative part of

the local development with the small number of population and limited number of the facilities compared with the municipalities. The VDC keeps the record of the birth, death, migration that occur in the village. Each VDC has a 9 ward and each 9 ward has the female community health volunteer who provides basic health service and put the information of the health status voluntarily and they are given training time to time to update their knowledge. Especially they are focused for the maternal, reproductive and neonatal health. They have register to record the information about the pregnancy , antenatal checkup , place of delivery as well as the postnatal checkup and as well as they give counseling to the women and their family to utilize the service when they are pregnant. These register book are finally submitted to the health post so it is easy to find out health status of the women in the village.

2.7 Framework of Andersen behavioral model

The model was first developed in the late 1960's to help to understand of why family use the health services, to define and measure equitable access to health care to assist in developing policies to promote equitable access. It suggests that people's use of health services is a function of their predisposition to use services, factors which enable us to use, and the need for care. The demographic factors include age and sex that represents biological imperatives suggesting people need health service. Social structure represents the position of people in the society and the way of dealing and solving the problems. Education, occupation and the caste are the traditional to measure the social structure. Predisposing part also consist of the health related knowledge which is related with the utilization of services. One of the important part in the enabling resource is the availability and accessibility of transportation, health information, health workers in the hospital that can be strongly associated with the utilization of the service. The Emerging model is shown in the figure

Environment Population characteristics Health behavior Outcomes

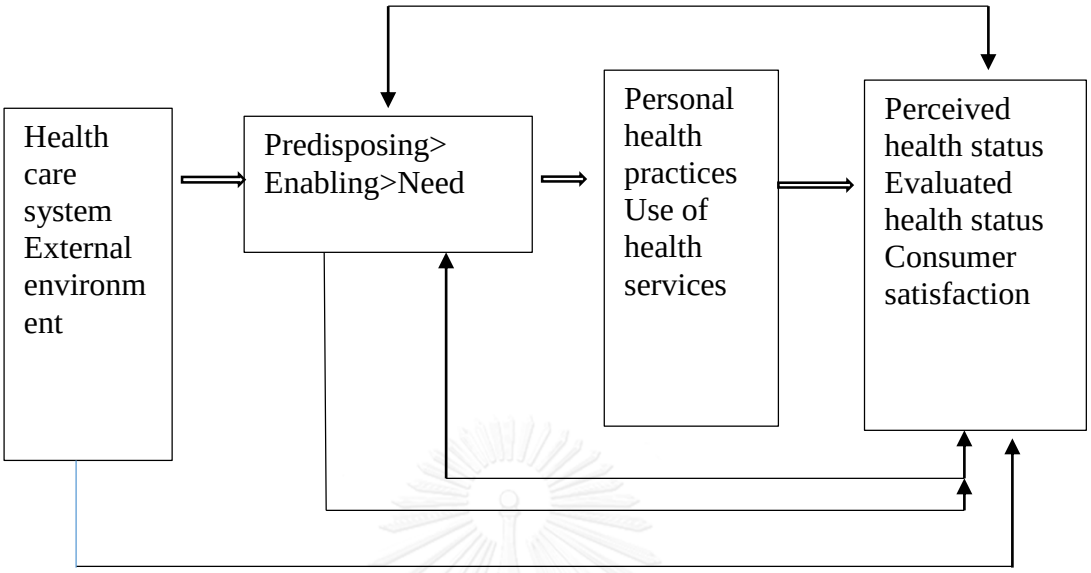

Figure 2 The emerging model

This model provides the multiple influences on health services use and also on the health status. This model has been used in the many studies for studying the factors associated with the health services utilization. This model groups the different factors in a order depending upon the how the factors act directly upon the behavior of an individual for the utilization of the health service (Andersen 1995).

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

2.8 Review of related research article

Maternal mortality

The descriptive study done in the Kathmandu medical college Teaching Hospital for the 24 months found that 5 maternal death occur during this period .The five maternal deaths three were due to pregnancy complicated with hepatitis E infection, one each due to Eclampsia and amniotic fluid embolism (Shrestha, Saha et al. 2010). The study done in Sarahi Nepal from 1994 to 1997 found that 18 women died in their pregnancy time, 16 died before the onset of labor and 2 after labor began. Out of all death, 86% of the death was related to disease. From the pregnancy to the 6 weeks following outcome, death of the women were due to hemorrhage , retained placenta, obstructed shock, obstructed labor, eclampsia and the infections (Pradhan, West et al. 2002).

The Nepal and demographic health survey 2006 suggested maternal mortality is 281 maternal deaths per 100,000 live birth. The study examines trends in maternal mortality, use of maternal health services and socio-demographic changes in Nepal. The supporting information rea also drawn from the from the Health management information system and the indicators from Nepali facilities on emergency obstetric care, which were collected in 13 of 75 district over the period of interest (Pant, Suvedi et al. 2008).

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Socio-demographic factors

The study done in the Jamaica showed that women living in the urban areas are more likely to deliver on a health facility as compared of the women from the rural areas. Although, in general, women in higher socioeconomic groups tend to exhibit patterns of more frequent use of maternal health services than women in the lower socioeconomic groups, factors such as education appear to be important mediators (Leslie and Gupta 1989).

Various studies has shown that socio-demographic factors have influence in the utilization of maternal health service. The results from the different study shows that education, caste, parity, maternal age, economic status are also the important factors for the utilization of the health service.

Education is one of the important factors that helps to increase the female decision making power, decision about their marriage as well as the health care service utilization. Various studies have shown mothers' education is positively associated and significant with the utilization of maternal health service (Celik and Hotchkiss 2000).

In comparison to the illiterate without any formal education, secondary level adolescents were 2.2 times more likely to utilize ANC services, establishing a significant relationship between the two variables which was found in the study conducted in Western Uganda among the adolescents. The women who have better education understand the importance of antenatal care and they are mostly found to complete the recommend ANC visit (Nielsen, Liljestrand et al. 2001, Erci 2003). Husband's education is another determining factors especially in the developing country like Nepal as it is a patriarchal country. Navaneetham and Dhaemalingam found that husbands education plays statistically significant role in Andra Pradesh of India in deciding about the antenatal care service of the women (Navaneetham and Dharmalingam 2002).

Parity and antenatal service are strongly interrelated with each other. Those women having higher number of children creates the barrier to visit the ANC service as they have to take care of their children (Erci 2003).

Types of the family is also the important factor for the women to utilize the ANC service. Women from the nuclear family are relatively less likely to use the service than the women who have joint family. An analytical cross-sectional study in UP, India showed that, maternal health care services use among upper caste women were almost three times more likely to use ANC than that of lower caste(Ram and Singh 2006, Acharya and Rimal 2009) . A quantitative study conducted in Nepal showed that, wealth is also associated with both the timing of antenatal care and no. of antenatal visit such that those socio-economically disadvantage had late and few no. of ANC visit respectively (Matsumura and Gubhaju 2001).

Study from the two rural district of Nepal showed that majority of the women have home delivery and only 6% of them use SBA for their delivery (Acharya and Rimal 2009).

The study in southern Tanzania found that increasing age of women above 35 years are less likely to use the skilled birth attendance compared with the young age of women who are in their 20s as well as those women who have higher education are more like to go health facility for their delivery but the women with only less schooling years do not use skill attendance for their delivery (Magoma, Requejo et al. 2010).

Income status of the family has a direct relationship for the use of the service. Those women who are from the high economic status are like to use the service from the early time of pregnancy and likely to complete the recommended visits than those with the low economic status. The cost for the transportation fee and other necessary laboratory tests cannot be afford by the women from the low economic status. Mothers who are job holder do not visit for the antenatal service as compared with the non working women in India (Pallikadavath, Foss et al. 2004).Those women who are married to job holder husband have sufficient money and they adequately use the service than the women are married to jobless husband. Ethnicity also plays important role in Nepal as the study done there found that the women who are from the higher caste like Bahun and Chhetri use the skilled attendance than backward caste like Damai and Kami.

The women who are above 35 years old have more risk during pregnancy and childbirth but the study found that these women do not use SBAs during their delivery and the women having more number of children are also less likely to utilize the SBAs. A cross-sectional study conducted in Afghanistan found that illiteracy and low income status are the important barrier factor for the use of skilled birth attendance (Mayhew, Hansen et al. 2008). Different studies from Nepal have shown that women who have less than primary education and those who do not had the knowledge of antenatal care are relatively more to do home delivery.

Women's position in household

In the developing countries like Nepal where male are the head of the family and the women have to follow their decision even in their health seeking behavior.as well as the mother in law also plays the important role in the home as well as her decision is important for the daughter in law to use the maternal health service. So the women are less likely to use the ANC service in Nepal if they do not get the permission from their husband **(Matsumura and Gubhaju 2001).** The women are less to use the service if

their friends, family and the relatives do not support them in their decision about the ANC service**.** Those women who have friend for their travel are more utilizing the service in Pakistan (McCaw-Binns, La Grenade et al. 1995). Low utilization of SBA is also significantly associated with those women who have male people as the head and decision maker in the family in the Pakistan. A study in rural north India find the utilization of ANC service was positively associated with women's autonomy in their family.

Women's knowledge

Women who are exposed to the mass media like reading newspapers, listening radio and watching television are significantly associated with utilization of ANC service. High level of exposure of mass media were more likely to utilize the service. The women having the knowledge of complication in the pregnancy like to visit the health service and also the women with the history of obstetric problems in the last pregnancy used the service in the India (Matthews, Mahendra et al. 2001). Mothers less exposed to mass media and women lacking knowledge about the complication in pregnancy are found to be less utilizer of antenatal service in Indonesia (Titaley, Dibley et al. 2010).

Distance from the health facility:

A cross-sectional survey was conducted in South Western Ethiopia using the pre-tested structured questionnaire which shows that, those women who do not utilize the service reasons, is long distance from health facility being. The longest travelling time for the nearest health facilities results in the fewer number of antenatal visits is found in the study done by (Magadi, Madise et al. 2000). Furthermore the qualitative studies done by the Mathole found that poor roads, lack of good transportation as well as the barriers like the big rivers are closely associated with poor utilization of ANC service (Mathole, Lindmark et al. 2004).

Transportation

Nepal is a mountainous country and it has a challenging the way for the transportation which creates the hindrance for utilizing the maternal health service of as well as poor road connection and lack of good transport facility.

Maureen and his team found in a cross -sectional study that the long distance from the house to the health facility was also associated with the low utilization of

skilled birth attendance. Also the another study in the southern Tanzania found that women who live near the health facility less than 5km use health facility for delivery than the woman who resides more than 5 km.

Mostly in the rural part of the country, long walking distance are the barriers factors for using the maternal health service(Regassa 2011).

Availability and Accessibility of the service:

The barrier factors for women in developing countries from getting the life-saving health care needs include: cost (direct fees as well as the cost of transportation, drugs and supplies); multiple demands on women's time; the poor quality of services, including poor treatment by health providers, also makes some women reluctant to use the services.

In some communities lack of information regarding about the maternal health service visit prevent women from accessing maternal health services (Simkhada, van Teijlingen et al. 2006).

Availability of the service or the presence of health care worker in the health facilities and waiting time for the service are associated with the service utilization. The availability of health worker in the community can enhance the pregnant women to attend the ANC service as well as utilize the skilled birth attendance at the time of their delivery. The opening and closing time for providing service also seems the barrier factor in urban slum dwelling women in Bangladesh (Chowdhury, Mahbub et al. 2003) as well as the pregnant women who have to wait for a long time to take the service are likely to go home without having the antenatal checkup (Mathole, Lindmark et al. 2004). A cross-sectional study showed that, women who utilize skilled birth attendant is related with the availability of female doctor or midwife in the health facility in Afghanistan(Mayhew, Hansen et al. 2008) . Study from the Nepal suggest that the availability of female health worker in the health facility increases the number women attending the health facility for their check up and delivery purpose. In some countries like Tajikistan the medical service provided free of charge they think as a low standard and unsafe for their delivery and do not utilize the service and likely to deliver in the home by the traditional birth attendants (Falkingham 2003). The behavior of the health worker and their support is associated for the women to use the health service. Women

in rural Guatemala prefer to delivery in the home due to the lack of support and co-operation from the staffs of the health facilities (A Glei and Goldman 2000).

Most of the women from the rural area of Tanzania likes to deliver in the health facility but due to long walking distance and unavailability of transportation, they are compelled to deliver in the home (Bicego, Curtis et al. 1997).

In poor country like Nepal the economic factors and the lack of transportation not only plays the significant role but also the environment in the health facility like crowded, noisy , water and light , privacy and availability of health staffs is also very important for the female clients to use the service. Pradhan and his team found that in the study of maternal morbidity that lack of refresher training and development in the staff, shortage of medicine and advance equipment, lack of referral system are also the barrier factors for the pregnant women to use the service (Pradhan, Suvedi et al. 2010).Study from the Yirgalem Town of Ethiopia found that the maternal care is not utilized by the women those are pregnant without planning and do not desire for it (Belay 1997).Women do not take ANC as an important if they do not face any problem in their pregnancy or they loss their child previously (Harrison 2001).

2.9 Availability of the transportation in mountain Nepal

This picture shows the mode of transportation (jeep) in my study area.

Figure 3 Jeep available in Nepal

The below picture shows about the bamboo basket which is used for various purposes like carrying the pregnant women, baby when necessary in the mountain village Nepal.

Figure 4 Bamboo basket in Nepal

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Chapter III

Methodology

3.1 Study design:

Quantitative**,** Community based Analytical Cross-sectional study.

3.2 Study area:

The study was carried out in Dhital and Dhampus village of Kaski district of the western part of Nepal. Dhital and Dhampus are two VDCs of the Kaski district and situated in the mountainous part of country with very less transportation facility. The estimated population of the villages are about 5,500. Almost 70% percent of the population is dependent on agriculture and remaining are foreign job, labour, business and other. Most of the people living there are Janjatis like "Gurung" and "Damai and Kami" and they mainly speak Nepali and Gurung language. These villages are also the route of trekking from where we can enjoy the view of different beautiful mountains.

Figure 5 Map of Kaski district

3.3 Study population: Reproductive age mothers (15-49) years.

Inclusion criteria

The women of reproductive age group of 15-49 years who had delivered at least 1 baby within the last 2 years and should be the resident of the study area.

Exclusion criteria

Those women who refused to participate in the study and women having hearing and speech disability.

3.4 Sample selection procedure:

Kaski district was selected purposively from the Nepal and from the Kaski district Dhital and Dhampus VDC were selected by purposive sampling as there were health staff who were available for providing the information about the village and assist during data collection process. From the Dhital and Dhampus villages, reproductive age women who delivered a baby with in last 2 years were selected. To find out all the women who delivered in the last 2 years, help was taken from VDC birth registration report as well as female community health volunteer register of each ward. By looking in the report of birth registration report the list of all mothers who had delivered last 2 years was noted. Thus all the list of mothers was obtained for the appropriate sample size for the study.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

3.5 Sampling technique

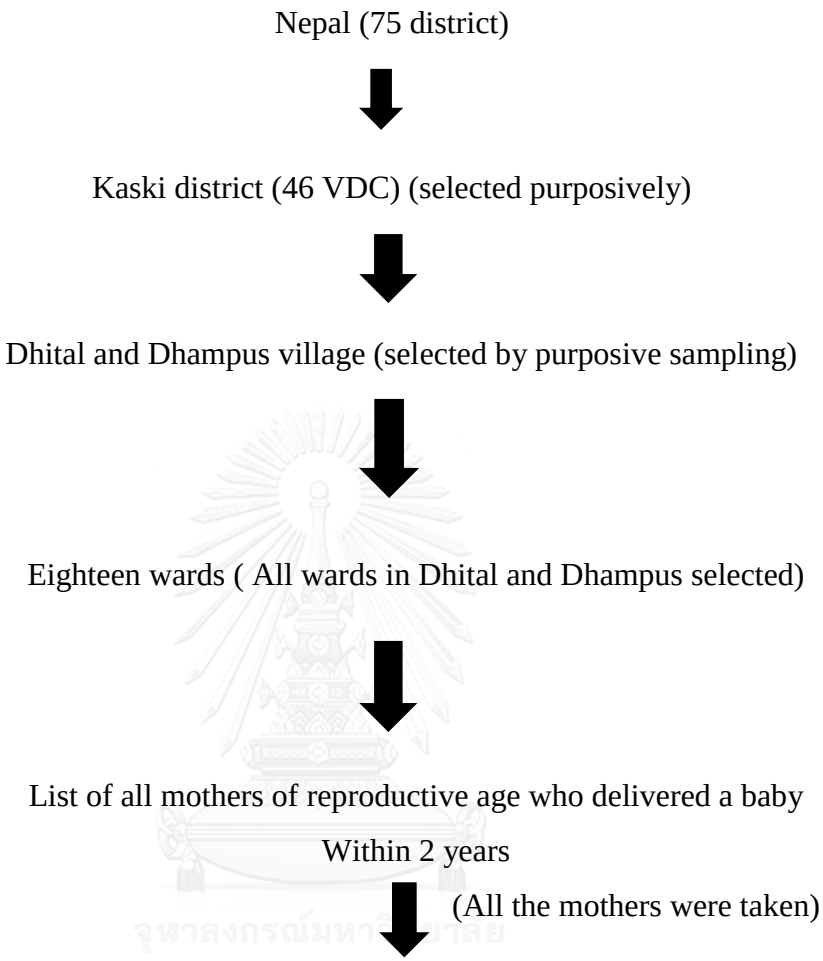

Figure 6 Sampling technique

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

3.6 Sample size calculation:

Give the very scattered population and relatively small number of women who have delivered in the 24 months prior to the survey was interviewed. The approximate numbers of these mothers were 213 (source VDC /birth registration section, FCHV). Only 200 respondents were interviewed in my study.

3.7 Measurement tools:

The questionnaire consisted of closed structured questions in Nepali which were taken from the NDHS and other articles. There were total 55 questions which were divided into 4 parts. The questions which were taken from the NDHS (Q.N A1, Q.N A2, Q.N A3, Q.N A4, Q.N A5, Q.N A7, Q.N A8, Q.N A9, Q.N A11, Q.No.C1, Q.No C5, Q.No C6 Q.No D1, Q.No D2, Q.No D3, Q.No D4, Q.No D5, Q.No D6) were in Nepali and for the questions that were taken from the other articles (Q.N.A 6 and Q.N.A10,Q.NoB1,B2,B3,B4,B5,B6,B7,B8,B9,B10,B11,B12,B13,Q.No.C2,C3,C4,C7 ,C8,C9,C10,C11, D7) were in English. So, the questions from other article were translated into Nepali language by a expert Nepali who is from maternal health field and fluent in English. The translation of first expert was back translated into English by a second expert from the maternal health and fluent in English who doesn't know the original questions. The two expert then came together to sort out the differences and reach an agreement of the final questionnaire. It consisted of 4 parts which are described below.

A. Predisposing factors (Socio-demographic characteristics-Age, marital status, caste, religion, education, income of the household and final decision on health care). The questions which were taken from the NDHS are Q.N A1, Q.N A2, Q.N A3, Q.N A4, Q.N A5, Q.N A7, Q.N A8, Q.N A9, Q.N A11 and remaining Q.N. 6 and Q.N 10 were from other article.
B. (Maternal Health related knowledge- knowledge of seeking health service, knowledge about pregnancy complication, delivery, post-delivery complication, and Knowledge of ANC, PNC and government incentives). There were total 16 questions in health related knowledge part. All of them were positive questions. The score was given 1 if the respondent said "yes" and "0"

score was given if the respondent said “No”. The maximum score for the knowledge part was 40 and minimum was 0. There were multiple answers and if the respondents knew each answer from the multiple answer then score 1 was given for each answer. Then the score was added up. The cutting point of knowledge was categorized into three groups according to Bloom’s classification (Bloom 1956).

- Good level of knowledge : >80% of total score (33-40)
- Moderate level of knowledge: 60-80% of total score (24-32)
- Low level of knowledge: <60% of total score (<24)

C. Enabling factors (Availability and Accessibility of transportation, maternal health information, female doctors, company, and permission from the family members). The questions taken from the NDHS were Q.No.C1, C5,C6 and remaining Q.No.C2,C3,C4,C7,C8,C9,C10,C11 were from other article. There were 11 questions related with the enabling factors. The score was given 1 if the respondent said “yes” and 0 score was given if the respondent said “No” for each questions. The maximum score for enabling factors was “21” and the minimum was “0” score. There were multiple answers and if the respondent’s respond each answers from the multiple answer then score 1 was given for each answer and was added to sum up to find out the level of enabling factors. Since the standard cut off point was not available for the enabling factors. The median score was calculated for the enabling factors and it was 11. By taking cut off point on median score , level of enabling factors were categorized into two groups that is

Good enabling factors- (12-21) score

Low enabling factors – (1-11) score

D. The questionnaire also consist about outcome variables -Utilization of maternal health services (ANC, SBA and PNC). The Q.No. D1,D2,D3,D4,D5,D6 were taken from the Women’s part of NDHS and D7 was from other article.

3.8 Validity and reliability:

Validity

The structured questionnaires were checked by content validity method with the help of the experts from public health, doctor as well as advisor for the accuracy, clarity and appropriateness of the questionnaire. The questionnaire was modified according to their comments.

Reliability

The 20 samples were conducted for the pretesting in Sedi village of Kaski district. Cronbach's alpha coefficient was used to test the reliability and it was 0.78.

3.9 Data collection

Data were collected by doing face to face interview with the help of close structured questionnaire in the women's home. The collection of the data was done by the researcher herself and three research assistant. The research assistants were bachelor of public health student from the Shree medical and technical college who had already good experience of the data collection. . The training was provided by the principal researcher for 1 day to teach the process of data collection. The main objective of training was to build the skill of conducting interviews, eliciting inform consent and establishing rapport building with the respondents. Training allowance, lunch and refreshments was provided for research assistant.

Firstly, the home visit was done by identifying the women's home with the help of FCHV of each ward of the village. Then after meeting the participant the verbal explanation was done about the purposes and utilization of the study and the researcher. The inform consent was taken and women who agreed to participate signed in the consent form. Then the interview of the research was started. After the interview the women were rewarded with the antibacterial soap.

3.10 Data analysis:

Filled up questionnaires were checked by the researcher and incase finding the error the research assistants were contacted for the correction. The data were edited and coded after the completion of data collection process. Then all the data were analyzed

by using SPSS 21 programs package. Firstly, Descriptive statistics frequency distribution and percentage were used for all variables. Secondly, Chi-square test was used for the cross tabulation to determine whether there is a significant relationship between dependent variable and independent variable since all the data were converted into categorical data. Fisher exact test was used when percent of the cell have expected count greater than 5 (less than 20%). Binary logistic regression step mode was used to observe the significant associations. All the p-value which are less than 0.2 and those variables which are significant from the literature review were put into multivariable logistic regression. Multivariable logistic regressions was used in order to identify the importance of multiple independent variables and dependent variables. 5% level of significance was used.

3.11 Ethical consideration

Approval was taken from the Nepal Health Research Council of Nepal as well as the VDC of Dhital and Dhampus of Nepal. Before the start of the survey researcher conducted the meeting with the village health leaders to explain the purpose of the study in Dhampus and Dhital VDC. Interviewees were given right to decide to participate in the study. Inform consent was taken before the start of the interview.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

3.12 Limitation of the study:

Due to the limitation of time and resources only two villages were chosen for the study area. The findings of my study cannot be generalized for whole mountainous village of Nepal because the study area was chosen by the purposive and convenient sampling.

The study was not able to cover all the eligible women of that villages because of earthquake they were migrated to safer place. The study was conducted under the circumstances of major earthquake in Nepal so there may be some biases in the findings of the research.

3.13 Expected Benefit and Application

Village level

The study intends to increase the awareness of health personnel and all other concerned persons about the possible causes of not utilizing maternal health service.

District level

The data can be applied for the planning and utilization of maternal and child health services in the study area by the District health office.

National level

The result of this study may provide insights to policymakers about potential health strategies to increase the uptake of maternal health service within similar socio-demographic characteristics.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

CHAPTER IV

RESULTS

This chapter includes results of descriptive and analytical statistics based on data collected by quantitative study among reproductive age group of women of selected mountainous village of Kaski district, Western Nepal in the month of May, 2014. First part of this section focuses on descriptive statistics such as frequency and percentage for socio-demographic characteristics, maternal health related knowledge, enabling factors and maternal health services. The second part focuses on the associations between independent and dependent variables. Associations and their strength were analyzed by bivariate and multivariable logistic regressions.

4.1 Socio-demographic factors

Table 3 shows the socio-demographic factors of the sample reproductive age group women. The total women included in the study were 200 who gave birth in the last 2 years. Half (50%) of the women were between the age group of 20-24 years. Housewife (86%) was the main occupation among women whereas agriculture (49%) was the main occupation for their spouse. Most of the respondents had primary education (61%) whereas 7% of the women were illiterate. Regarding the decision making about women's health about 31 % of the women took decision themselves about their health and more than half (69) of women took decision with their husband. For the caste of the respondents, more than half (57%) of them were from the lower caste. There were 70 % of the respondent having less than 10000 of the family monthly income while only 5.5% of the respondent had only more than 20,000 family income.

Table 3 Socio-demographic characteristics of the respondents (N=200)

Socio-demographic characteristics	Frequency	Percentage
Age of respondents		
15-19 years	13	6.5
20-24 years	100	50
25-29 years	61	30.5
30 and above	26	13
Education of respondent		
Cannot read and write	14	7
Primary Education	122	61
Secondary Education	47	23.5
Higher Education	17	8.5
Marital status		
Married	197	98.5
Widow	3	1.5
Husband Education		
Cannot read and write	6	3
Primary Education	88	44.7
Secondary Education	81	41.6
Higher Education	21	10.7
Religion		
Hindu	179	89.5
Buddhist	21	10.5
Caste		
Upper caste	86	43
Lower caste	114	57

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Socio-demographic characteristics	Frequency	Percentage
Income status		
< 10000	139	69.5
11000-20000	50	25.0
More than 20000	11	5.5
Total number of children		
1-2 children	140	70.0
2-4 children	41	20.5
More than 4	19	9.5
Occupation of respondent		
Housewife	171	85.5
Agriculture	23	11.5
Service	6	3
Decision maker of health		
Myself	61	30.5
Myself and husband	139	69.5
Husband occupation		
Agriculture	95	48.2
Labor	32	16.2
Business	20	10.2
Foreign job	50	25.4

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

4.2 Results from the maternal health knowledge related part

The data in the below Table 4 shows that all of the women(100%) had knowledge about the seeking the place of maternal health service .The table also shows that respondents had knowledge about the pregnancy ,delivery and postnatal complications but very few of them answer the types of complications which can occurred in this period. The majority of the women had good knowledge about the ANC, but less than half do not have knowledge of PNC.

Table 4 Number and percentage of respondent response to knowledge questions (N=200)

Variables	**N**	**(%)**
Knowledge seek maternal health service	200	100
Government health post	199	99.5
Private hospital	162	81
FCHV	8	4
(Multiple answers)		
Knowledge of pregnancy complications	**192**	**96**
Anemia	145	72.5
Preeclampsia	163	81.5
Gestational diabetes	4	2
Preterm birth	10	5
Miscarriage	6	3
Placenta previa	12	6
Hypertension	8	4
(Multiple answers)		
Knowledge of delivery complication	**185**	**92.5**
Placental abruption	26	13
Uterine rupture	20	10
Inverted uterus	29	14.5
Excessive bleeding	170	85
(Multiple answers)		
Knowledge of post-delivery complications	**182**	**91**
Hemorrhage	181	90.5
Hemorrhoid and constipation	10	5
Postpartum depression	3	1.5
Vaginal discharge	45	22.5
Problems in breastfeeding	51	25.5
(Multiple answers)		

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Variables	N	(%)
Knowledge about ANC	**197**	**98.5**
Monitor blood pressure	185	92.5
Monitor weight	187	93.5
Monitor fetal heart rate	179	89.5
TT immunization	186	93.0
Iron and deworming tablets	186	93.0
(Multiple answers)		
Knowledge about PNC	**84**	**42.0**
Management of mothers and	20	10.0
Management of newborn complication	49	24.5
Postnatal vitamin A and Iron tablets	57	28.5
Immunization of newborn	29	14.5
Postnatal family planning	14	7.0
(Multiple answers)		
Knowledge about government incentives	**197**	**98.5**
Cash for 4ANC	184	92.0
Cash for institutional delivery	184	92.0
Free delivery in health facility	169	84.5
Cesarean delivery	17	8.5
(Multiple answers)		

Table 5 shows the level of maternal health related knowledge. The total score was divided into 3 level of knowledge: “good knowledge” with the score more than 32 but nobody had good knowledge in my study. Majority (81%) of the respondents had low maternal health related knowledge while only 19% had moderate level of knowledge.

Table 5 Level of Maternal health related knowledge

Level of knowledge	Frequency	Percentage
Low knowledge (<24)	159	81
Moderate knowledge (24-32)	41	19
Total	200	100.0

4.3 Results from enabling factors part

Table 6 shows the number and percentage of respondent's response to enabling factors which includes available maternal health information, transportation, distance, available female doctors. Analysis of the enabling factors reveals that almost all respondents have available maternal information and the source of the information was mostly from the FCHV (98%) and health facility (75.5%).All of the respondents had permission to visit the health services from their husband, mother in law and relatives and moreover these people were the companion while visiting the health services. It was also found only half (53.5%) of the women access the transportation facility. The most available mode of transport was jeep then the hammock in those villages.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Table 6 Number and percentage of respondent response to Enabling factors

Variables	N	(%)
Available health information/education	**196**	**98.0**
About maternal health service		
Information from FCHV	196	98.0
Information from health facility	151	75.5
Information in women's group meeting	49	24.5
Information from media	16	8.0
(Multiple answers)		
Permission to visit the health service	200	100
Time less than 1 hour to reach health post	82	4
(by walking, hammock and bamboo basket)		
Transportation to go to the health post	**107**	**53.5**
Hammock	18	9
Bamboo basket	5	2.5
Jeep **(Hospital**)	**95**	**47.5**
(Multiple answers)		
Companion while visiting the health service	**164**	**82**
Husband	54	27
Mother in law	75	37.5
Friends	38	19
Relatives	48	24.0
(Multiple answers)		
Availability of the service by female	**198**	**99**
Care providers in health post		
Antenatal check up	195	97.5
Delivery	187	93.5
Postnatal care	176	88
(Multiple answers)		

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

4.4 Level of enabling factors

Table 7 shows that only 40% of the respondents had good level of enabling factors while more than half (60%) of the respondents had low level of enabling factors.

Table 7 level of enabling factors (Availability and Accessibility)

Level of enabling factors	Frequency	Percentage
Low enabling factors (1-11)	120	60
Good enabling factors (12-21)	80	40
Total	200	100.0
Mean=10.83		
Median=11.00		
S.D= ±2.03		

4.5 Maternal health service utilization

Table 8 shows that Out of total 200 women, it was found that almost all (98%) of the women visited ANC and those who visited, about half (49%) of the women did not visit recommended four ANC service**.** For the place of delivery, about (20%) women still delivered in the home with the unskilled birth attendants. Those women who had delivered in the hospital were all assisted by the skilled birth attendants and got first postnatal care. Majority (76%) of the women did not visit the postnatal care services after the child birth**.**

Table 8 Maternal health service

Characteristics	Frequency	Percentage
Visited ANC in last pregnancy		
Yes	196	98
No	4	2
Time of visit		
Early visit	174	87
Late visit	22	11
Frequency of ANC		
Less than 4	95	48.5
Four and above	101	51.5
Place of delivery		
Hospital	160	80
Home	40	20
Person assisting during delivery		
Unskilled birth attendants	40	20
Skilled birth attendants	160	80
Receive first postnatal care (Within 24 hours)		
Yes	160	80
No	40	20
Visit all postnatal care after child birth		
Yes	48	24
No	152	76

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

4.6 Bivariate analysis of factors associated with utilization of maternal health services in reproductive age group women

Chi-square test was used to observe the relation between different independent variables which were socio-demographic, level of maternal health related knowledge and level of enabling factors with ANC visit, persons assisting during delivery, PNC visit.

4.7 Association between socio-demographic factors and ANC visit

Table 9 shows the relationship between women's socio-demographic factors and their association with the number of antenatal visits**.** There was no statistically significant association between antenatal care services and Age of the respondents, marital status, Religion, Caste, Total number of children, Husband occupation, Respondents occupation and Decision maker of women's health

The three variables

- Education of respondent,
- Husband's education and
- Income status were statistically significant. Education of the husband and the respondent were positively significant. The better level of education of both husband and wife, it was found to have more ANC visits. Income status of the family was also positively significant with the ANC visits.

Table 9 Association between socio-demographic factors and ANC visit

Variables	Number of ANC visit			
	Less than 4	4 and above	X^2	P value
	N (%)	N (%)		
Age of respondents				
15-19 years	6(54.5)	5 (45.5)	1.041	.594
20-24 years	50(50.0)	50 (50.0)		
25-29 years	26(44.1)	33 (55.9)		
30 years and above	13(50.0)	13(50.0)		
Education of respondent				
Cannot read and write	7 (50)	7 (50)	11.971	.007*
Primary Education	66(55.5)	53(44.5)		
Secondary Education	20 (43.5)	26(56.5)		
Higher Education	2(11.8)	15(88.2)		
Marital status				
Married	93(48.2)	100(51.8)	.404	.612#
Widow	2 (66.7)	1 (33.1)		
Husband Education				
Cannot read and write	5(83.5)	1(16.7)	12.893	.005*
Primary Education	49(56.3)	38(43.7)		
Secondary Education	35(44.3)	44 (55.7)		
Higher Education	4(19.0)	17(81.0)		

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Variables	Number of ANC visit			
	Less than 4	4 and above	X^2	P value
	N (%)	N (%)		
Religion				
Hindu	86(49.1)	89(50.9)	.297	.649#
Buddhist	9 (42.9)	12(57.1)		
Caste				
Upper caste	40(47.1)	45(52.9)	.120	.774#
Lower caste	55(49.5)	56 (50.5)		
Income status				
Less than10000	76(80)	60(59.4)	10.375	.006*
11000-20000	18(18.9)	36(35.6)		
21000-30000	1(1.1)	5(5)		
Total number of children				
1-2 children	64 (46.4)	74 (53.6)	1.041	.594
2-4 children	20(51.3)	19(48.7)		
More than 4	11(57.9)	8 (42.1)		
Occupation of respondent				
Housewife	81(46.6)	93 (53.4)	2.282	.174#
Agriculture	14(63.6)	8 (36.4)		
Decision maker of health				
Myself	34(57.5)	27 (44.3)	1.873	.217#
Myself and husband	61(45.2)	74 (54.8)		

Variables	Number of ANC visit			
	Less than 4	4 and above	X^2	P value
	N (%)	N (%)		
Husband occupation				
Agriculture	49(52.7)	44 (47.3)	2.292	.514
Labor	14(45.2)	17(54.8)		
Business	7(35.0)	13(65.0)		
Foreign job	23 (46.9)	26 (53.1)		

(#fisher exacts test,*p-value<0.05)

4.8 Association between levels of maternal health related knowledge and ANC visit

Table 10 shows the association between levels of maternal health related knowledge and ANC visit. There is significant positive association between the level of maternal health related knowledge and the number of antenatal care visits. When the level of knowledge increases women are more likely to have more ANC visits.

Table 10Association between levels of maternal health related knowledge and antenatal care visit

Characteristics	Antenatal care		X^2	p-value
	Less than 4	4 and above		
	N (%)	N(%)		
Level of Knowledge				
Low knowledge	85 (54.8)	70(45.2)	12.035	.001*
Moderate knowledge	10(24.4)	31(75.6)		

(*p-value<0.05)

4.9 Association between enabling factors (availability and accessibility) and antenatal visit

Table 11 shows there is not significant association between the enabling factors and the ANC visit (p>0.05) The enabling factors includes availability of the maternal health information, permission to visit health services, transportation to the health service , availability of the companion and the female doctors in the hospital.

Table 11 Association between enabling factors and antenatal visit

Characteristics	**Antenatal care**		**X^2**	**p-value**
	Less than 4	**More than 4**		
	N (%)	**N (%)**		
Level of Enabling				
Low	63(54.3)	53 (45.7)	.3882	.059#
Good	32(40.0)	48(60.0)		

(#fisher exact test)

4.10 The Association between socio-demographic factors and person assisting during delivery

Table 12 shows the statistically significant association between the age and occupation of the respondents with the person assisting during delivery while other variables were not statistically significant. Housewives were more likely to deliver in the hospital by the SBA as compared with the agricultural women. There was positive association between the respondent occupation and age with the SBA.

Table 12Association between socio-demographic factors and delivery by SBA

Variables	**Delivery**			
	Unskilled birth attendant	**skilled birth attendant**	**X^2**	**P-value**
	N (%)	**N (%)**		
Age of respondents				
15-19 years	7(53.8)	6(46.2)	10.027	.018 *
20-24 years	17 (17)	83(83)		
25-29 years	11(18.0)	50 (82.0)		
30 years and above	5(19.2)	21 (80.8)		
Education of respondent				
Cannot read and write	5(35.70	9(64.3)	4.31	.229
Primary Education	25(20.5)	97(79.5)		
Secondary Education	9(19.1)	38(80.9)		
Higher Education	1(5.9)	16(94.1)		
Marital status				
Married	38(19.3)	159(80.7)	4.146	.103#
Widow	2(66.7)	1 (33.3)		
Husband Education				
Cannot read and write	2(33.3)	4 (66.7)	3.793	.285
Primary Education	18(20.5)	70 (79.5)		
Secondary Education	17(20.7)	65(79.3)		
Higher Education	1 (4.8)	20(95.2)		

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Variables	Delivery			
	USBA N (%)	SBA N (%)	X^2	p-value
Religion				
Hindu	38(21.2)	141(78.8)	1.609	.260#
Buddhist	2(9.5)	19(90.5)		
Caste				
Upper caste	17(19.8)	69(80.2)	.005	1.000#
Lower caste	23(20.2)	91(79.8)		
Income status				
Less l 10000	32(23.0)	107(77.0)	2.816	.245
11000-20000	6(12.0)	44(88.0)		
More than 20000	2(18.2)	9(81.8)		
Total number of children				
1-2 children	27(19.3)	113(80.7)	.155	.925
2-4 children	9 (22.0)	32(78.0)		
More than 4	4 (21.4)	15(78.9)		
Occupation of respondent				
Housewife	31(17.5)	146 (82.5)	5.994	.024#*
Agriculture	9(39.1)	14 (60.9)		
Decision maker of health				
Myself	17 (27.9)	44 (72. 1)	3.397	.084#
Myself and husband	23(16.5)	116(83.5)		

Variables	Delivery			
	Unskilled birth attendant	skilled birth attendant	X^2	p-value
	N (%)	N (%)		
Husband occupation				
Agriculture	18(18.9)	77(81.1)	7.230	.065
Labor	6(18.8)	26 (81.2)		
Business	0	20(100.0)		
Foreign job	14(28.0)	36(72.0)		

(#fisher exacts test,*p-value<0.05)

4.11 Association between levels of maternal health related knowledge and person assisting during delivery

Table 13 shows there is statistically significant association between the level of knowledge and person assisting during delivery. The level of knowledge is positively associated with the SBA. When there is increase in the level of knowledge, women's are more likely to deliver by the SBA.

Table 13Association between levels of maternal health related knowledge and person assisting during delivery

Characteristics	Delivery		X^2	p-value
	Unskilled	skilled		
	N (%)	N (%)		
Level of Knowledge				
Low knowledge	38(23.9)	121(76.1)	7.371	.007*
Moderate knowledge	2(4.9)	39(95.1)		

(*p-value<0.05)

4.12 The association between enabling factors and person assisting during delivery

Below table 14 shows there is positive association between the level of enabling factors and person assisting during delivery and is statistically significant. If there is good enabling factors women are less likely to deliver by unskilled birth attendants.

Table 14 Association between Enabling factors and person assisting during delivery

Characteristics	**Delivery**		**X^2**	**p-value**
	Skilled	**Unskilled**		
	N (%)	**N (%)**		
Level of Enabling				
Low	87(72.5)	33(27.5)	10.547	.001*
Good	73 (91.3)	7(8.8)		

(*p-value<0.05)

4.13 The association between socio-demographic factors and postnatal care after child birth

Table 15 shows that only husband education was positively significant with the postnatal visit. While other socio demographic factors are not significant.

Table 15Association between socio-demographic factors and postnatal care after child birth

Variables	**Postnatal care**			
	Yes	**NO**	**X^2**	**p value**
	N (%)	**N (%)**		
Age of respondents				
15-19 years	3(23.1)	10(76.9)	.239	.971
20-24 years	23(23.0)	77 (77.0)		
25-29 years	16(26.2)	45(73.8)		
30 years and above	6 (23.1)	20(76.9)		

Variables	Postnatal care			
	Yes	NO	X^2	p- value
	N (%)	N (%)		
Education of respondent				
Cannot read and write	2(14.3)	12 (85.7)	5.293	.115
Primary Education	27 (22.1)	95 (77.9)		
Secondary Education	11(23.4)	36 (76.6)		
Higher Education	8(47.1)	9(52.9)		
Marital status				
Married	48(24.4)	149(75.6)	.962	1.000#
Widow	-	3(100.0)		
Husband Education				
Cannot read and write	1(16.7)	5(83.3)	8.250	.041*
Primary Education	16(18.2)	72(81.8)		
Secondary Education	21(25.6)	61(74.4)		
Higher Education	10(47.6)	11 (52.40)		
Religion				
Hindu	41(22.9)	138(77.1)	1.121	.289#
Buddhist	7(33.3)	14(66.7)		
Caste				
Upper caste	21(24.4)	65(75.6)	.014	1.000#
Lower caste	27(23.7)	87(76.3)		

Chulalongkorn University

Variables	Postnatal care			
	Yes	NO	X^2	P value
	N (%)	N (%)		
Income status				
Less l 10000	29(20.9)	110(79.1)	2.658	.265
11000-20000	15(35.0)	35 (70.0)		
More than 20000	7(63.6)	4 (36.4)		
Total number of children				
1-2 children	36(25.7)	104(74.3)	1.360	.507
2-3 children	7(17.1)	34(82.9)		
More than 4	5(26.3)	14 (73.7)		
Occupation of respondent				
Housewife	44(24.9)	133 (75.1)	6.22	.605#
Agriculture	4(17.4)	19(82.6)		
Decision maker of health				
Myself	14(23.0)	47(77.0)	.053	.859#
Myself and husband	34 (24.5)	105 (75.5)		
Husband occupation				
Agriculture	22(23.2)	73(76.8)	5.802	.122
Labor	8(25.0)	24(75.0)		
Business	9(45.0)	11(55.0)		
Foreign job	9(18.0)	41(82.0)		

(#fisher exacts test,*p-value<0.05)

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

4.14 The association between levels of maternal health related knowledge and post-natal visit

Table 16 shows that there is positive significant association between the level of knowledge and postnatal visit after child birth.

Table 16 Association between levels of maternal health related knowledge and post-natal care

Characteristics	postnatal visit		X^2	p-value
	Yes	No		
	N (%)	N(%)		
Level of Knowledge				
Low knowledge	25(15.7)	134(84.3)	29.130	.0000**
Moderate knowledge	23(56.1)	18(43.9)		

**p<0.001

4.15 The association between Enabling factors and Postnatal visit

Table 17 shows that there is significant positive association between the level of enabling factors and postnatal visit after child birth and it is statistically significant.

Table 17 Association between Enabling factors and postnatal visit

Characteristics	postnatal visit		X^2	p-value
	Yes	No		
	N (%)	N(%)		
Level of Enabling				
Low	19(15.8)	101(84.2)	10.969	.0000**
Good	51(63.7)	29(36.3)		

(**p<0.001)

4.16 Multivariable logistic regression analysis

All the independent variables were analyzed by using Binary logistic regress with stepwise mode with all dependent variables. There were all total 13 independent variables which were significant, p-value less than 0.2 and significant from the literature review and that were put into the final regression model and the 13 variables were age, education, marital status, number of children, husband education, respondent education, respondent occupation, husband occupation, and decision maker of women's health, income status, level of maternal health related knowledge and level of enabling factors.. These all variables were put into binary logistic regression with each dependent variables. Those variables which maintained or become strongly significant are shown in the following tables.

4.17 Logistic regression analysis between all independent variables and Number of antenatal visits.

Below table 18 shows that after controlling the independent variables, husband education and level of knowledge maintain the statistical significant and positively associated with ANC visits.

Table 18 Logistic regression analysis of socio-demographic factors, level of maternal health related knowledge, level of enabling factors with number of ANC visits

Variables	**B**	**Adjusted OR**	**95%CI**	**P value**
Husband education (Reference: no education)				.019*
Husband education (Primary education)	1.782	5.941	.603-58.527	.127
Husband education (Secondary education)	2.064	7.874	.806-76.896	.076
Husband education (Higher education)	3.358	28.734	2.357-350.290	.008*
Level knowledge (Reference: low level)	1.328	4.175	1.641-8.669	.002*

(*p-value<0.05)

4.18 Logistic regression analysis between all independent variables and person assisting during delivery

Table 19 reveals that independent variables such as age, level of knowledge and enabling factors were statistically significant and were positively associated with person assisting during delivery.

Table 19 Logistic regression analysis between all independent variables and person assisting during delivery

Variables	B	Adjusted OR	95%CI	P value
Age (Reference 15-19)				.023*
Age (20-24)	2.081	8.010	2.101-30.542	.002*
Age (25-29)	1.796	6.025	1.497-24.243	.011*
Age (30 above)	1.997	7.364	1.450-37.408	.016*
Level of knowledge (Reference: low level)	1.693	5.438	1.184-24.987	.030*
Level of enabling (Reference: low enabling factors)	1.244	3.468	1.374-8.752	.008*

***p-value<0.05**

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

4.19 Logistic regression analysis between all independent variables and postnatal visit.

Table 20 shows that only level of knowledge and level of enabling factors were statistically significant and have positive association with the postnatal visits.

Table 20 Logistic regression analysis between all independent variables and postnatal visit.

Variables	B	Adjusted OR	95%CI	P value
Level of knowledge (Reference: low level)	1.831	6.238	2.889-13.467	.000**
Level of Enabling (Reference: low level)	.973	2.646	1.290-5.427	.008*

***p-value<0.05,** p-value<0.001**

4.20 Summary of all significant variables of multivariable logistic regression

Table 21 The summary of four significant variables with three dependent outcomes

Variables	ANC visit	Delivery	Postnatal visit
Husband education	.019*	NS	NS
Age of respondent	NS	.023*	NS
Level of knowledge	.008*	.030*	0.000**
Level of enabling factors	.002*	.008*	.008*

NS: Not significant, *p-value<0.05,**p-value<0.001

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Chapter V

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

The main objective of my study was to identify the socio-demographic factors and its association with utilization of maternal health service, level of maternal health related knowledge and availability and accessibility factors (enabling factors) and its association with the utilization of ANC visits, delivery and postnatal visits of reproductive age group women in two mountainous village of the western Nepal. This chapter is divided into following three sections.

5.1 Discussion

This study includes the total 200 women of reproductive age group. Almost all of the participants were married and about half of the participants were from the age group of 20-24 years old and this result is similar with some previous study done in mountainous village of Kaski district, Western Nepal (Acharya and Pandey 2015). The report from Kaski district showed women from 20-24 age group were about 12% and women from 25-29 age group women were about 10% which are higher in percentage as compared with other age group given in the data in the appendix (National Planning Commission Secretariat 2012). This result is similar with my findings where the age group of women 20-24 years old are 50% and 25-29 age group are 30% which are higher in number compared with other age group in my study area also the median age of women at first birth is 20.1 years old. More than half of the women (61%) had education only of primary level . This study had good mix of both caste being the lower caste highest and upper caste in second. Similar result was shown by the population Census 2011.Employment status plays an important role in having good utilization of maternal health services. In this study, majority of husband were farmer and the respondent were housewife. The utilization of maternal health services refer in my

study were ANC visit, person assisting during delivery and the postnatal visit. The results of my study showed that almost all (98%) of the women had ANC visit which shows the somewhat similar result like the report from the western development region of Nepal (Annual report 2012/2013). One of the cross-sectional study conducted in rural Nepal showed that about 79% of the women completed 4 ANC visit(Dahal). In my current study half 48.5% of the respondents did not complete the four complete ANC visit recommended by the government of Nepal which is different from above mentioned study as well as from the result of annual report of Nepal. (Annual report 2012/2013)

The previous study from the Nepal showed that 93% of the deliveries took in the home(Simkhada, van Teijlingen et al. 2006) . In my study it was found 80% of women were assisted by SBA which is more than expected as the study area was rural and mountainous part of Nepal .Another community based study done in the pumdi humdi of the Kaski district of western Nepal showed that about 20% of the women still delivery in the home without skilled birth attendants which is similar to the current study finding (Acharya and Pandey 2015). The study done in the Pokhara showed that 6.7% of the home deliveries were assisted by the SBA (Sreeramareddy, Joshi et al. 2006)**.** However, in my study the home delivery was done by the relatives and friends as well as the traditional birth attendants. It was also noticed that those who delivered in the hospital were found to be helped by the SBA and women who delivered in the home were found to be helped by the friends and relatives and also the traditional birth attendants but they had not got the training of the SBA.

The cross-sectional study done in the Madhya Pradesh of India found that 37.4 % of the reproductive age group of women received the postnatal care after the child birth(Jat, Ng et al. 2011) .In contrast the postnatal care visit after the child birth was found only 24% in my study which is quite different from this study . This may be low because the postnatal visit refers to the visit after the child birth. So those women who delivered in the hospital, they already got the first postnatal care so most of the women did not went to receive the remaining postnatal care as recommended by the government of Nepal. Even though the total PNC visit after the child birth for the national wise is not satisfactory. The annual report of Nepal also shows that only 49% of the women complete total PNC visits (Annual report 2012/2013).

Infant mortality

According to the data from the health post, primary health care as well as the FCHV records, there were no infant mortality in the last 2 years in Dhital and Dhampus district which is the exceptional case for the mountainous village of Nepal. But the raw fact sheet from the department of health service annual report showed that there were 69 infant death in the Kaski district. (Department of Health Services 2013/2014).These unexpected finding of the no infant moratlity in my study area in the last two years can be explored only through in-depth interviews with the mothers as well as female community health volunteers and is recommended for the health post staffs to find out the current magnitude of infant mortality in those villages.

Association between the independent variables and dependent variables

As shown in the result section education level, women education is statistically and positively associated with the antenatal visits. Data analysis from the utilization of maternal health services in Nepal also shows that women with more than primary level were significantly more likely to have more ANC visits (Matsuma and Gubaju). Also the study done in Bangladesh, developing country like Nepal also found the women having higher education are more likely to utilize the services(Rahman, Islam et al. 2009). Education develop more capabilities in the women as well as educated women are more likely to seek higher quality services and have more ability to use maternal health inputs for producing better maternal healthy. Even the husband education plays an important role in patriarchal country like Nepal. The more husband is educated the more the women is benefited and also may be the more educated husband has more awareness about the importance of ANC visits in the pregnancy .However the study done in Western Nepal showed that there was no association between the husband education with ANC visits and delivery (Acharya and Pandey 2015).

The study done in rural area of Nepal showed that ethnicity was significantly associated with the utilization of ANC service. However in my study ethnicity had no association with the ANC visits. As my study area also had majority number of lower caste but the results showed there was no association with the delivery, ANC and PNC but my result was similar to the Kaski district of western Nepal(Acharya and Pandey 2015). This may be due to the fact that lower caste people are also educated and has

good source of income unlike past years in Nepal. The participation of the women in taking final decision about their health care was not significantly associated with ANC visits, delivery by SBA and postnatal visits in my study. The previous studies showed that women with higher number of children were less likely to go hospital for the delivery as the women have more experienced from the previous children and they think it is not so necessary to go to the hospital (Ochako, Fotso et al. 2011). But this result is not consistent with my findings. There was no association found between the number of children and the delivery by SBA. Study from the Karachi Pakistan showed that number of children, income status and mother education was highly significant with the post-natal care (Agha and Carton 2011).In contrast my study showed only husband education was significantly associated with the postnatal visits after the child birth. This findings of my study is consistent with other studies which have examined the women decision associated with various maternal health outcomes. A maternal health study carried out in the Kenya found no significant association of women's participation in decision making concerning their health on the utilization of maternal health services (Fotso, Ezeh et al. 2009). Similar study conducted in Nepal also showed that involvement of women about the decision regarding the health care were weak for the utilization of maternal health services (Furuta and Salway 2006). In contrast the study done in north India among urban poor and middle income women showed that women's autonomy was the powerful factor of the utilization of the maternal health services (Bloom, Wypij et al. 2001).

All women who delivered in the hospital received first postnatal care in the hospital so probably rate of postnatal care after the child birth is very low in my study for those women who delivered in the hospital but those women who delivered in the home did not receive any kind of postnatal care.

Knowledge of the maternal health is very essential for the utilization of the maternal health service. The result of my study showed that women had only moderate level of knowledge while most of them had low level of knowledge. There was lack of good level of knowledge in the women regarding the different kinds of complication that can occur in the pregnancy, delivery and the post-delivery. Besides this, women also had low knowledge about postnatal visit after the child birth.Level of maternal health related knowledge was significant both in the bivariate and also positively

associated in the multivariable analysis with the ANC visits, postnatal visits and person assisting during delivery. It is obvious that women having the knowledge about the pregnancy, delivery complication prepare themselves to be far away from these complications and are more likely to visit the hospitals for the ANC, delivery and PNC which finally helps for the upliftment of the maternal health as well as the neonatal health. The study done in the urban squatter settlement of Karachi Pakistan also showed that the knowledge was found significantly associated with the utilization of ANC(Nisar and White 2003). Similarly a study in Nepal about the challenges facing in the maternal health also revealed that the least level of knowledge of the women related to the major obstetric complications were more less likely to seek and receive the maternal health services. Those who have less level of knowledge are also more likely to delay when they seek care(Simkhada, van Teijlingen et al. 2006). Study from the Indonesia also revealed that lack of knowledge about the obstetric complications hinders women for the use of maternal health services (Titaley, Dibley et al. 2010). Those women are less likely to use the service compared with the women who had good knowledge about the complications. Similarly the study conducted in one of the mountainous village of Nepal showed that level of knowledge was associated with ANC visits. The higher level of knowledge enables women to attend the service more frequently because she is aware of the importance. It is necessary to have focus in this issue in order to have further improvement of the maternal and neonatal health in the developing countries like Nepal

Availability and accessibility of the service is also one of the important and enabling factors for the women to utilize the maternal health service. Availability and accessibility of the maternal health information as well as transportation, companion, female health workers are equally important to enable women to go the health facility for receiving maternal health. The source of the maternal health information was only limited to FCHV in the village and few of them only had information from the health post in my study.A community based study from the Nepal showed that the proportion of the ANC visits was found higher in those women who were access to the convenient source of the transportation. Access to the transportation and the distance to the health service is the most hindrance factors for the women to reach the health facility to deliver the child. As my study setting is in the mountainous part of Nepal, the jeep is available

for only specific time as well as it is not easy to access the bamboo basket immediately and also the women believe in traditional birth attendance. Moreover distance to the health service is also one of the barriers for the women in the mountainous villages. Various studies have reported distance to the health facility is the significant determinants for utilization of the maternal health services for the women (Yanagisawa, Oum et al. 2006), (Palamuleni 2011). Because the health facility is far from the women's home and the transportation is not easily available they have to prepare to go near the health service before 2 or 3 days which is more costly and time consuming So, this may be reason that still 20% of the women delivered in the home without the help of SBA even though the free delivery is provided by the government of Nepal and also they do not visit the postnatal care after the child birth. Particularly in the developing countries like Nepal women cannot visit the health services without the permission of the husband, mother in law and the relatives and still this type of culture still exist in some rural and illiterate family. However, in my study all of the women had permission from the family member to use the maternal health service. Some of the husband do not like to send their wives in the health facility if the male doctors are available for their checkup (Shakya and McMURRAY 2001). Interestingly, there were available female doctors in the hospital to provide the maternal health service for almost all of the women in my research. So, this is also the good reason that women could easily get the permission to visit health service from the family members. From these results we can conclude that women do not have to face cultural barriers in that village from the family member to utilize the health services.

5.2 Conclusions

Cross sectional study was conducted among 200 participants between the age group of 15-49 years who gave birth within the last 2 years of survey in two mountainous villages (Dhampus and Dhital) in Kaski district of Western Nepal. Face to face interview was done with the help of structured questionnaire to collect the maternal health information related to ANC visits, person assisting during their delivery and postnatal visits after the child **b**irth from t the participants. Data analysis was done

by using chi-square test as well as binary logistic regression with statistical significance of each analysis against the p value of 0.05.

The result section showed that still there are more than half of the women who had not complete 4 ANC visits, about 80% of the respondents were delivered in the hospital by the SBA and only 24% of the respondents visits postnatal care after child birth. Interestingly those who were delivered in the hospital were all assisted by the skilled birth attendants in my study area. The finding of my study also highlights women's education as well as husband education also plays the critical role for the use of maternal health services.

After controlling all the variables Level of maternal health related knowledge and level of enabling factors as well as the age appeared as the major influencing factors for the utilization of ANC visits, delivery and PNC visits after child birth. Since the study area is mountainous village there is not good accessibility and availability of the transportation so it may have effect on the use of maternal health service of the women. The findings showed that the four ANC visits is less in the mountainous villages of Nepal compared with national report of the Nepal. In addition, the most women do not like to visit postnatal care after the child birth. In summary, this study just slightly highlights the factors associated with utilization of maternal health services in mountainous villages of Nepal. Further and deep investigation is necessary to go in the details by the concerned authority to find actual scenario of the mountainous part of Nepal in relation with the maternal health services. There is also need to evaluate the maternal health services provided by the government of Nepal in rural and mountainous village to find out the why women are less likely to use the services even though the services are provided with free of charge and in addition with the incentives.

5.3 Recommendations

- Maternal mobile clinics can be helpful as well as play important role in the mountainous villages of Nepal to receive the maternal health service for the women as the transportation is one of the barrier factor for them.

- The knowledge of obstetric complications should be provide through the media like local FM's as well as the FCHV should be actively involved to disseminate the information in the villages.
- Health post and hospitals should encourage as well as counsel women to visit the all postnatal care after the child birth.
- The policy of the incentives programs can be initiated from the ministry of health to the women those who complete the recommended postnatal care realizing its importance for the improvement of maternal health.
- As the transportation facility is one of the challenging factors in these villages there must be policy to provide 24 hrs. Jeep service especially for the pregnant women.

5.4 Future study

- A large population based research can be conducted to determine the factors associated with maternal health services covering all mountainous villages of Nepal.
- The qualitative study can be conducted in the reproductive age groups mothers to find out deeply associated factors related to ANC visits, SBA and PNC visits.
- The further research also can focus on the factors like the quality of the service provided by the health facilities regarding maternal health.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

REFERENCES

(2012/13). "Annual report." Ministry of Health and Population, Government of Nepal, Katmandu, Nepal.

A Glei, D. and N. Goldman (2000). "Understanding ethnic variation in pregnancy-related care in rural Guatemala." Ethnicity and health **5**(1): 5-22.

Acharya, P. P. and D. Rimal (2009). Pregnancy and Childbirth in Nepal: Women's Role and Decision-Making Power. Childbirth across Cultures, Springer**:** 137-144.

Acharya, S. R. and A. Pandey (2015). "Place of delivery and newborn care practices in Kaski district: a cross sectional study from Nepal." Journal of Biomedical Sciences **1**(2): 6-11.

Agha, S. and T. W. Carton (2011). "Determinants of institutional delivery in rural Jhang, Pakistan." Int J Equity Health **10**(1): 31.

Andersen, R. M. (1995). "Revisiting the behavioral model and access to medical care: does it matter?" Journal of health and social behavior: 1-10.

Belay, T. (1997). "Correlates of antenatal care attendance among women in Yirgalem town and surrounding peasant associations." Southern Ethiopia.

Bicego, G., et al. (1997). "Sumve Survey on Adult and Childhood Mortality Tanzania 1995. In-depth study on estimating adult and childhood mortality in settings of high adult mortality."

Bloom, e. a. (1956). The function of Executive. London, Oxford University Press.

Bloom, S. S., et al. (2001). "Dimensions of women's autonomy and the influence on maternal health care utilization in a north Indian city." Demography **38**(1): 67-78.

Celik, Y. and D. R. Hotchkiss (2000). "The socio-economic determinants of maternal health care utilization in Turkey." Social Science & Medicine **50**(12): 1797-1806.

Chowdhury, A. R., et al. (2003). Skilled attendance at delivery in Bangladesh: an ethnographic study, Research and Evaluation Division, BRAC.

Conveter, C. "XE, http://www.xe.com/currencyconverter/."

Chulalongkorn University

Dahal, R. K. "Utilization of Antenatal Care Services in Rural Area of Nepal."

Demographic, N. (2012). "Health Survey 2011 Population Division." Ministry of Health and Population, Government of Nepal, Katmandu, Nepal.

Department of Health Services, M. o. H. A. P. (2013/2014). Annual Report, Teku, Kathmandu

Erci, B. (2003). "Barriers to utilization of prenatal care services in Turkey." Journal of Nursing Scholarship **35**(3): 269-273.

Falkingham, J. (2003). "Inequality and changes in women's use of maternal Health-care services in tajikistan." Studies in family planning **34**(1): 32-43.

Fotso, J.-C., et al. (2009). "Maternal health in resource-poor urban settings: how does women's autonomy influence the utilization of obstetric care services." Reprod Health **6**(9): 1-8.

Furuta, M. and S. Salway (2006). "Women's position within the household as a determinant of maternal health care use in Nepal." International family planning perspectives: 17-27.

Ghebrehiwet, M. and R. Morrow (2010). "Determining the Level of Maternal Mortality in Eritrea using RAMOS (Reproductive Age Mortality Study)." Journal of the Eritrean Medical Association **1**(1).

Harrison, K. (2001). Poverty, deprivation and unsafe motherhood inLawson JB, Harrison KA and Bergstrom Seditors. Maternity Care in DevelopingCountries, London. RCOG Press.

Hussein, J., et al. (2011). "An appraisal of the maternal mortality decline in Nepal." PloS one **6**(5): e19898.

Jat, T. R., et al. (2011). "Factors affecting the use of maternal health services in Madhya Pradesh state of India: a multilevel analysis." Int J Equity Health **10**(1): 59.

Leslie, J. and G. R. Gupta (1989). Utilization of formal services for maternal nutrition and health care, International Center for Research on Women Washington, DC.

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Magadi, M. A., et al. (2000). "Frequency and timing of antenatal care in Kenya: explaining the variations between women of different communities." Social Science & Medicine **51**(4): 551-561.

Magoma, M., et al. (2010). "High ANC coverage and low skilled attendance in a rural Tanzanian district: a case for implementing a birth plan intervention." BMC Pregnancy and Childbirth **10**(1): 13.

Mathole, T., et al. (2004). "A qualitative study of women's perspectives of antenatal care in a rural area of Zimbabwe." Midwifery **20**(2): 122-132.

Matsumura, M. and B. Gubhaju (2001). "Women's Status, Household Structure and the Utilization of Maternal Health Services in Nepal: Even primary-leve1 education can significantly increase the chances of a woman using maternal health care from a modem health facility." Asia-Pacific Population Journal **16**(1): 23-44.

Matthews, Z., et al. (2001). "Antenatal care, care-seeking and morbidity in rural Karnataka, India: results of a prospective study." Asia Pacific Population Journal **16**(2): 11-28.

Mayhew, M., et al. (2008). "Determinants of skilled birth attendant utilization in Afghanistan: a cross-sectional study." American journal of public health **98**(10): 1849.

McCaw-Binns, A., et al. (1995). "Under-users of antenatal care: a comparison of non-attenders and late attenders for antenatal care, with early attenders." Social Science & Medicine **40**(7): 1003-1012.

Ministry of health and population, G. o. N., Kathmandu (2011). Nepal Demographic and Health Survey, Health survey population division.

National Planning Commission Secretariat, C. b. o. S. (2012). National Population and Housing Census,

.

Kathmandu, Nepal

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Navaneetham, K. and A. Dharmalingam (2002). "Utilization of maternal health care services in Southern India." Social Science & Medicine **55**(10): 1849-1869.

Nielsen, B. B., et al. (2001). "Characteristics of antenatal care attenders in a rural population in Tamil Nadu, South India: a community-based cross-sectional study." Health & Social Care in the community **9**(6): 327-333.

Nisar, N. and F. White (2003). "Factors affecting utilization of antenatal care among reproductive age group women (15-49 years) in an urban squatter settlement of Karachi." JOURNAL-PAKISTAN MEDICAL ASSOCIATION **53**(2): 47-53.

Ochako, R., et al. (2011). "Utilization of maternal health services among young women in Kenya: insights from the Kenya Demographic and Health Survey, 2003." BMC pregnancy and childbirth **11**(1): 1.

Organization, W. H. (2008). "Proportion of births attended by a skilled health worker: 2008 updates." Geneva: WHO.

Organization, W. H. (2009). World health report 2005: make every mother and child count. Geneva: WHO; 2005.

Palamuleni, M. (2011). "Determinants of non-institutional deliveries in Malawi." Malawi Medical Journal **23**(4): 104-108.

Pallikadavath, S., et al. (2004). "Antenatal care: provision and inequality in rural north India." Social Science & Medicine **59**(6): 1147-1158.

Pant, P. D., et al. (2008). "Improvements in maternal health in Nepal: Further analysis of the 2006 Nepal Demographic and Health Survey."

Pradhan, A., et al. (2010). "Nepal maternal mortality and morbidity study 2008/2009." Family Health Division, Department of Health Services, Ministry of Health and Population, Government of Nepal, Kathmandu, Nepal.

Pradhan, E. K., et al. (2002). "Risk of death following pregnancy in rural Nepal." Bull World Health Organ **80**(11): 887-891.

Rahman, M. M., et al. (2009). "Rural-urban differentials of utilization of ante-natal health-care services in Bangladesh."

Ram, F. and A. Singh (2006). "Is antenatal care effective in improving maternal health in rural Uttar Pradesh? Evidence from a district level household survey." Journal of Biosocial Science **38**(04): 433-448.

Regassa, N. (2011). "Antenatal and postnatal care service utilization in southern Ethiopia: a population-based study." African health sciences **11**(3).

Safer, M. P. (2004). "Making pregnancy safer: the critical role of the skilled attendant."

Shakya, K. and C. McMURRAY (2001). "Neonatal mortality and maternal health care in Nepal: searching for patterns of association." Journal of Biosocial Science **33**(01): 87-105.

Shrestha, N., et al. (2010). "Near miss maternal morbidity and maternal mortality at Kathmandu Medical College Teaching Hospital." Kathmandu University Medical Journal **8**(2): 222-226.

Simkhada, B., et al. (2006). "Major problems and key issues in Maternal Health in Nepal." Kathmandu University Medical Journal **4**(2 (Iss): 258-263.

Sreeramareddy, C. T., et al. (2006). "Home delivery and newborn care practices among urban women in western Nepal: a questionnaire survey." BMC pregnancy and childbirth **6**(1): 27.

Suvedi, B. K., et al. (2009). "Nepal maternal mortality and morbidity study 2008/2009: summary of preliminary findings." Kathmandu, Nepal: Family Health division, Department of Health Services, Ministry of Health, Government of Nepal.

Thatte, N., et al. (2009). "Traditional birth attendants in rural Nepal: Knowledge, attitudes and practices about maternal and newborn health." Global public health **4**(6): 600-617.

Titaley, C. R., et al. (2010). "Factors associated with underutilization of antenatal care services in Indonesia: results of Indonesia Demographic and Health Survey 2002/2003 and 2007." BMC Public Health **10**(1): 485.

Villar, J., et al. (2001). "WHO antenatal care randomised trial for the evaluation of a new model of routine antenatal care." The Lancet **357**(9268): 1551-1564.

Yanagisawa, S., et al. (2006). "Determinants of skilled birth attendance in rural Cambodia." Tropical Medicine & International Health **11**(2): 238-251.

Chulalongkorn University

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

APPENDICES

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

APPENDIX A

Informed Consent Form

Dear participants,

Please consider this information carefully before deciding whether to participate in this research

Objective of the research.

To identify the related maternal factors and their association with the utilization of the ANC visits, delivery and postnatal visits among the reproductive age of women in selected mountainous villages of Kaski district, western Nepal

Study population

The study will include women of age between 18-49 years who have delivered the baby within the 2 years of survey of Dhampus and Dhital villages. A total 213 women will participate in the study.

Role of participant in this research

Participant will respond to a questionnaire regarding socio-demographic factors, maternal health related knowledge, Enabling factors and maternal health service.

Time required:

Participant will take approx...15 minute to complete the interview.

Confidentiality

Your participation in this study is anonymous and will remain confidential. There will be no link between your response and your identity. Data will be presented in an aggregated way and there is no way to link the result with your identity

Participation and withdrawal: You participation in this study is completely voluntary and you may withdraw at any time as your wish.

Agreement

The nature and purpose of this research have been sufficiently explained and I agree to participate in this study. I understand that I am free to withdraw at any time without penalty .Participants Signature…….. Date……..

APPENDIX B

Questionnaire code No……

A. Socio-demographic Characteristics

NO	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
A1	How old were you at your last Birthday?	……..	
A2	What is the highest grade you completed?	a.No education b.Primary education c.Secondary d. higher education	
A3	What is your current marital status?	a.Married b.Divorced c.Widowed d.Never married	
A4	What is husband's education?	a.No education b.Primary education c.Secondary d. higher education	
A5	What is your religion?	a.Hindu b. Buddhist c.Muslim d. Kirat e.Christian	
A6	What is your caste/ Ethnicity?	a.lower caste b.upper caste	
A7	What is the income status of the family?	……..	
A8	What is the total number of children that you have?	……	
A9	What is your occupation?	a.Housewife b.Agriculture	

NO	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
		c.Service **d.Others(specify)**	
A10	**Who takes final decision about your health care in your home?**	**a. Myself Alone** **b.Myself with partner** **c.Partner alone** **d.Someoneelse**	
A11	**What is your husband's occupation?**	**a.Agriculture** **b.Labour** **c.Professional** **d.Others(specify)**	

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

B. Health related knowledge (Pre-disposing factors)

NO	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
B1	**Do you have knowledge where to seek maternal health service?**	**a. Yes** **b. No**	**If no skip to B3**
B2	**If yes where you seek maternal health service?**	**a.Health post** **b.FCHV** **c.Private hospital**	
B3	**Do you have knowledge of pregnancy complications?**	**a.Yes** **b.No**	**If no skip to B5**
B4	**If yes what are the pregnancy complication?**	**a.Anaemia** **b.Preeclampsia** **c.Gestational diabetes.** **d.Preterm birth** **e.Miscarriage** **f.Placenta previa** **g.Hypertension**	
B5	**Do you have knowledge of delivery complication?**	**a.Yes** **b.No**	**If no skip B7**
B6	**If yes what are the delivery complication?**	**a.Placental abruption** **b.Uterine rupture** **c.Inverted uterus** **d.Excessive bleeding**	
B7	**Do you have knowledge of post delivery complications?**	**a.Yes** **b.No**	**If no skip to B9**
B8	**If yes what are the post delivery complications?**	**a.Hemorrhage** **b.Hemorrhoid and constipation** **c.Postpartum depression** **d.Vaginal discharge**	

NO	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
		e.Problems in breastfeeding	
B9	**Do you have knowledge about ANC?**	**a.Yes** **b.No**	**If no skip to B11**
B10	**If yes, what are the service included in ANC?**	**a.Monitor blood pressure,** **b.Monitor weight** **c.Monitor fetal heart rate** **d.TT immunization** **e.Iron and deworming tablets**	
B11	**Do u have knowledge about PNC?**	**a.Yes** **b. No**	**If no skip to B13**
B12	**If yes, what are the service included in PNC?**	**a.Management of mothers** **b.Mannegement of newborn complication** **c.Postnatal Vit.A and Iron tablets** **d.Immunization of newborn** **e.Postnatal family planning**	
B13	**Do you have knowledge about the incentives given by government?**	**a.Yes** **b.No**	**If no skip to C1**
B14	**If yes what are the incentives you know?**	**a.Cash for 4ANC** **b.Cash for institutional delivery** **c.Free delivery in health facility** **d.Cash for caesarian**	

C. Accessibility and availability related factors (Enabling factors)

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
C1	Do you have available health information/education about maternal health service?	a.Yes b.No	If no skip to C3
C2	If yes, What are the source of information?	a.Information from FCHV b.Information from health facility c.Information in WG meeting d. Information from media	
C3	Do you have permission to visit the health service from your family?	a.Yes b.No	If yes skip c5
C4	If no who do not give you permission?	a.Husband b.Mother in law c.Relatives d.Other(specify)	
C5	Did you take less than 1 hour to reach the Health facility ?	a.Yes b.No	
C6	Did you have available transportation to go to the health facility?	a.Yes b.No	If no skip C8
C7	If yes what are the mode of transportation?	a.Hammock b.Bamboo basket c.Jeep d.Helicopter	

NO.	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
C8	Did you have available companion while visiting the health service?	a.Yes b.No	If no skip C10
C9	If yes who are the available companions with you?	a. Husband b.Mother in law c.Friends d.Realtives e.Other (specify)	
C10	Do you have availability of the service by female care providers in health post?	a.Yes b.No	If no skip to D1
C11	If yes what are the service provided by them?	a.Antenatal check up b.Delivery c.Postnatal care	

D. Information about Maternal Health Service

NO	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
D1	Did you visit health service for antenatal care for last pregnancy?	a.Yes b.No	If no skip to E4
D2	How many months pregnant were you when you first received antenatal care for the last pregnancy?	a.Early b.Late	
D3	How many times did you receive antenatal care during the pregnancy?	……..	
D4	Where did you deliver in your last pregnancy?	a. Health facility b. Non- health facility (home way)	

NO	QUESTIONS AND FILTERS	CODING CATEGORIES	SKIP
D5	**Who assisted for your last delivery?**	**a. SBA** **b. Traditional birth attendant** **c. Friends and relatives** **d .None**	
D6	**Did you receive your first PNC within 24 hours?**	**a. Yes** **b. No**	**If no skip**
D7	**Did you visit all recommended PNC after child birth?**	**a. Yes** **b. No**	

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

APPENDIX C

Sample of Nepali questions

प्रश्नपत्र कोड नं. .....

बाहिरी वातावरण

१. क्षेत्र..... २ बसोवासको प्रकार.....

ब सामाजिक तथा जनसंख्या सँग सम्बन्धि बिशेशताहरु

नं.	प्रश्न तथा छनौट	संकेत बिभाजन	फड्किनुहोस
ख१	तपाई अहिले कति बर्ष हुनुभयो ?	.....	
ख२	तपाइले कुन तह सम्म अध्ययन गर्नु भएको छ ?	क.निरक्षर ख.प्राथमिक शिक्षा ग.माध्यमिक शिक्षा /उच्च शिक्षा	
ख३	तपाईको बैवाहीक सम्वन्ध कस्तो छ?	क.बिवाहीत ख.सम्वन्ध बिच्छेद ग.बिधवा घ.अबिवाहीत	
ख४	तपाइको श्रीमानको शैक्षिक स्थिति कस्तो छ ?	क.निरक्षर ख.प्राथमिक शिक्षा ग.माध्यमिक शिक्षा /उच्च शिक्षा	
ख५	तपाइ कुन धर्म मान्नुहुन्छ ?	क. हिन्दु ख. बौद्ध ग. इस्लाम घ. किराँत ङ. किश्चियन	
ख६	तपाइ कुन जातजाति	क.माथिल्लो जात	

APPENDIX D

Female Population by Age group of Kaski district(National Planning Commission Secretariat 2012).

Total female=255713

Age group(female)	**Number**	**Percentage**
15-19 Yrs	**28,554**	**11.17**
20-24 Yrs	**28,570**	**11.17**
25-29 Yrs	**25,509**	**9.98**
30-34 Yrs	20,282	7.93
35-39 Yrs	17,454	6.83
40-44 Yrs	14,204	5.55
45-49 Yrs	11,691	4.57

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

APPENDIX E

Work Plan

S.N	Activities/ months	Oct. 2014	Nov. 2014	Dec. 2014	Jan. 2015	Feb. 2015	Mar. 2015	April 2015	May 2015	June 2015	July 2015
1	Selection of topics	■									
2	Literature review	■	■	■	■	■	■	■	■	■	■
3	Developme nt of Proposal		■	■	■	■					
4	Proposal exam					■					
5	Revision of proposal						■	■	■		
6	Submission to ethical review							■	■		
7	Data collection								■		
8	Data entry and analysis									■	
9	Draft report									■	
10	Final report									■	
11	Submission of final report										■

APPENDIX F

Budget

S.N	Activities	Total amount(in bhatt)
1	Literature review (Net search and information collection)	1000
2.	Ticket fare go and back to thailand	18000
3	Applying for ethical committee Nepal	3500
4.	(Printing) of questionnaires 250 sets	3000
5	Stationery - Copy - Pen	2000
6	Transportation to survey sites	5000
7	Daily wages to research assistants	10,000
8.	Accommodation in survey site	5000
9	Preparation and completion of thesis paper	5000
10	Soverniour to participant	6000
11.	Publish in the international journal	20,000
12.	Others	1500
	Total amount	80000 baht

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

VITA

A. Personal Details

Full name: Anu Koirala

Address: Ratnan Nagar Municipality, ward No.3,Shantichowk,Chitwan, Nepal

Phone:056561226

Email: sadhulila1996@gmail.com

Date of Birth: 19 November 1990

Nationality: Nepali

Sex: Female

B. Education/Qualifications

Course completed: Bachelor of public health

Institution: Shree medical and technical college, Chitwan, Nepal

Date of completion: 2013

Course completed: Class 12

Institution: Orchid science college, HSEB chitwan

Date of completion: 2009

Course completed: Class 10

Institution: Ekata shishu Niketan

Date of completion: 2006

C. Trainer in nutrition program Sarlahi and Mahottari district, from April to june 2014, Youth for world Nepal project

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University