FACTORS RELATED TO REGULAR USE OF ANTENATAL CARE SERVICES AMONG MOTHERS OF CHILDREN UNDER 1 YEAR OF AGE IN RURAL COMMUNITY OF BANKE DISTRICT, NEPAL

RAJ KUMAR PAUDEL

A THESIS SUBMITTED IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF PRIMARY HEALTH CARE MANAGEMENT
FACULTY OF GRADUATE STUDIES
MAHIDOL UNIVERSITY
2016

Thesis
entitled

FACTORS RELATED TO REGULAR USE OF ANTENATAL CARE SERVICES AMONG MOTHERS OF CHILDREN UNDER 1 YEAR OF AGE IN RURAL COMMUNITY OF BANKE DISTRICT, NEPAL

.....
Mr. Raj Kumar Paudel
Candidate

Bang-on Thepthien
.....
Lect. Bang-on Thepthien,
Ph.D. (Behavioral Science)
Major advisor

.....
Lect. Seo Ah Hong,
Ph.D. (Preventive Medicine)
Co-advisor

.....
Prof. Patcharee Lertrit,
M.D., Ph.D. (Biochemistry)
Dean
Faculty of Graduate Studies
Mahidol University

Aroonsri Mongkolchati
.....
Lect. Aroonsri Mongkolchati,
Ph.D. (Public Health)
Program Director
Master of Primary Health Care
Management
ASEAN Institute for Health Development
Mahidol University

Thesis
entitled

FACTORS RELATED TO REGULAR USE OF ANTENATAL CARE SERVICES AMONG MOTHERS OF CHILDREN UNDER 1 YEAR OF AGE IN RURAL COMMUNITY OF BANKE DISTRICT, NEPAL

was submitted to the Faculty of Graduate Studies, Mahidol University
for the degree of Master of Primary Health Care Management
on
July 15, 2016

.....
Mr. Raj Kumar Paudel
Candidate

Phusit Prakongsia
.....
Mr. Phusit Prakongsia,
M.D., Ph.D. (Public Health and Policy)
Ministry of Public Health
Chair

Bang-on Thepthien
.....
Lect. Bang-on Thepthien,
Ph.D. (Behavioral Science)
Member

.....
Lect. Seo Ah Hong,
Ph.D. (Preventive Medicine)
Member

.....
Prof. Patcharee Lertrit,
M.D., Ph.D. (Biochemistry)
Dean
Faculty of Graduate Studies
Mahidol University

.....
Prof. Supa Pengpid,
Dr.P.H. (Public Health)
Director
ASEAN Institute for Health Development
Mahidol University

ACKNOWLEDGEMENTS

The successful completion of this thesis would not have been possible without valuable help and support of many people.

First and foremost, I would like to thank my advisor, Lect. Dr. Bang-on Thepthein, for her excellent guidance, supervision, patience and encouragement in the process of completing this thesis. I greatly appreciate her time and effort. I am deeply thankful to my co-advisor Lect. Dr. Seo Ah Hong for valuable advices and suggestions throughout the study. I also express my sincere appreciation to my external examiner, Dr. Phusit Prakongsai, Director, Bureau of International Health, Office of the Permanent Secretary, Ministry of Public Health.

I would like to thanks ASEAN Institute for Health Development. I am sincerely thankful to all the professors, lecturers, librarian, administrative staffs and classmates of MPHM for their support.

I am very grateful to the District Public Health Office, Banke, Nepal for allowing me to conduct this research and Health Center In-charge for their guidance and assistance. I am very thankful to Female Community Health Volunteer for helping me throughout my data collection help me every day. Without whom the data collection was impossible. I would like to acknowledge all the participants in my study for their valuable responses, patience and co-operation throughout the interview. I would also like to thank my best teacher Mr. Jagat Man Shrestha, for her suggestion and valuable advice in this study period.

Finally, I would like to express my sincere appreciation to my father and mother. I would also like to thank my wife, who stand beside me all along the way, helping me, loving me, taking care of me and I would like to thanks her from the bottom of my heart.

Raj Kumar Paudel

FACTORS RELATED TO REGULAR USE OF ANTENATAL CARE SERVICES AMONG MOTHERS OF CHILDREN UNDER 1 YEAR OF AGE IN RURAL COMMUNITIES OF BANKE DISTRICT, NEPAL

RAJ KUMAR PAUDEL 5838385 ADPM/M

M.P.H.M.

THESIS ADVISORY COMMITTEE: BANG-ON THEPTHIEN, Ph.D., SEO AH HONG, Ph.D.

ABSTRACT

A community based cross-sectional study was conducted at six Village Development Committees (VDCs) in Banke district, Nepal to determine the factors related to regular use of antenatal care (ANC) services. A total of 364 women aged 18-49 years who had at least one child in the previous 1 year were randomly selected by proportional sampling. A 60-item questionnaire was developed by investigators and constituted four sections, such as socio-demographic, predisposing, enabling, and reinforcing factors, based on the Precede-Proceed Model. Data were collected from face to face interview in May 2016. Descriptive statistics, chi-square test and multiple logistic regressions were used to examine factors related to regular use of ANC.

The finding showed that 56% of women reported getting regular use of ANC services at least 4 times. Regular use of ANC services was significantly associated with husband's occupation, complication, perception, distance, travelling cost, waiting time, quality and satisfaction of ANC services, and information from TV and female community health volunteer (FCHV). In the multiple logistic regression, the factors related to regular use of ANC were perception (AOR = 1.838, 95% CI = 1.119-3.018), distance from resident to health center ≤ 2 KM (AOR = 2.197 , 95% CI = 1.165 – 4.144), travel cost (AOR = 1.946 , 95% CI = .844 – 4.484), waiting time (AOR =2.940, 95% CI =1.445-5.981), quality of service (AOR =2.099, 95% CI =1.247-3.536), satisfaction of ANC service (AOR = 1.942 , 95% CI = 1.212 – 3.110) and getting information from TV (AOR = 1.895, 95% CI = 1.181 – 3.042).

In conclusion, the results of this study showed that the utilization of ANC service was very low. In addition, quality and satisfaction of ANC service as well as accessibility were the main key constraints related to low utilization of regular ANC services at least four times during pregnancy among mothers in Banke district. Therefore, provision of ANC outreach can be a way to increase ANC coverage in rural area.

KEY WORDS: REGULAR USE / ANTENATAL CARE /RURAL COMMUNITIES / NEPAL

93 pages

CONTENTS

CONTENTS (cont.)

CONTENTS (cont.)

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

ANC	Antenatal care
VDCs	Village Development Committee
PPM	Precede-Proceed Model
WHO	World Health Organization
DPHO	District Public Health Office
LMICs	Low Middle Income Countries
UNICEF	United Nation Children's Fund
UNFPA	United Nations Found for Population Activities
MDG	Millennium Development Goal
MMR	Maternal Mortality Rate
MOHP	Ministry of Health and Population
NDHS	National Demographic Health Survey
SHP	Sub-Health Post
HP	Health Post
PHCC	Primary Health Care Center
DOHS	Department of Health Services

CHAPTER I
INTRODUCTION

1.1Rationale and justification of the study

According to World health organization (WHO) (2013) worldwide 292,982 women lost their lives due to complication related to pregnancy and child birth in a year. Which means around 830 women die each day because of this complication. Despite a 44% reduction in maternal deaths between 1990 and 2015(1), maternal mortality is currently a major health problem globally. In 2000, the United Nation adopted the Millennium Declaration, and set eight Millennium Development Goals (MDGs) (WHO 2005). The fifth MDG aimed to reduce the maternal mortality ratio (MMR) by three-quarters till 2015, by improving the proportion of births attended by skilled health personal and providing universal access to antenatal care (ANC)(2).

WHO has estimated that 90% of death related to pregnancy complication occurred in low and middle income countries and one third of them in south Asia. In developing countries, maternal mortality still remains as the leading cause of death among reproductive age group women (3). Most common cause of maternal death are several bleeding (haemorrhage), hypersensitivity (pre-ecalmpsia and ecalmpsia) disorder, infections and unsafe abortion (4). Despite moderate success in reducing MMRs and increasing antenatal care coverage, the global targets associated with MDG 5 seem unlikely to be obtained by 2015 particularly in low middle income countries (LMICs), where maternal mortality is high or very high. Maternal death are not uniformly distributed throughout the world, and it is the highest in sub-Saharan Africa and South Asia, it shows that developing countries share an unequal burden of maternal death (5, 6).

Interventions that can be routinely scheduled, such as immunization and antenatal care had much higher coverage than those that rely on functional health system such as 24 hour availability of clinical services, skilled or emergency care at

birth and care of ill newborn babies and children. Coverage of different interventions varied widely both between and within countries. Data for postnatal care were either unavailable or showed poor coverage in all 68 countries. The most rapid increase in coverage was seen for immunization, as it received significant investment during this period (7).

Antenatal care is one of the key preventive health services used to prevent maternal mortality and morbidity around the world. Therefore, to reduce maternal mortality and morbidity increasing use of reproductive and maternal health services are essential. Maternal health care means providing health care to women during their pregnancy, childbirth and immediately after birth which is necessary for the wellbeing of mother and new born baby. Further it includes antenatal care, delivery care and postnatal care (8). Antenatal care is important component of maternal health which helps to identify the complication and risks factors during pregnancy and also helps to plan a safe delivery. WHO recommends a minimum of four antenatal visits per pregnancy during 4th, 6th or 7th, 8th and 9th month of pregnancy. However, WHO figures shows that between 2005 and 2010 only 53% of pregnant women worldwide attendant the recommended four antenatal visit (9).In low-income countries the figure was disappointing 36%. Despite huge international effort to promote and provide antenatal care, there has been little improvement in these statistics over the past decade. Therefore, it leads to a need to investigate the factor related to poor antenatal attendance (10).

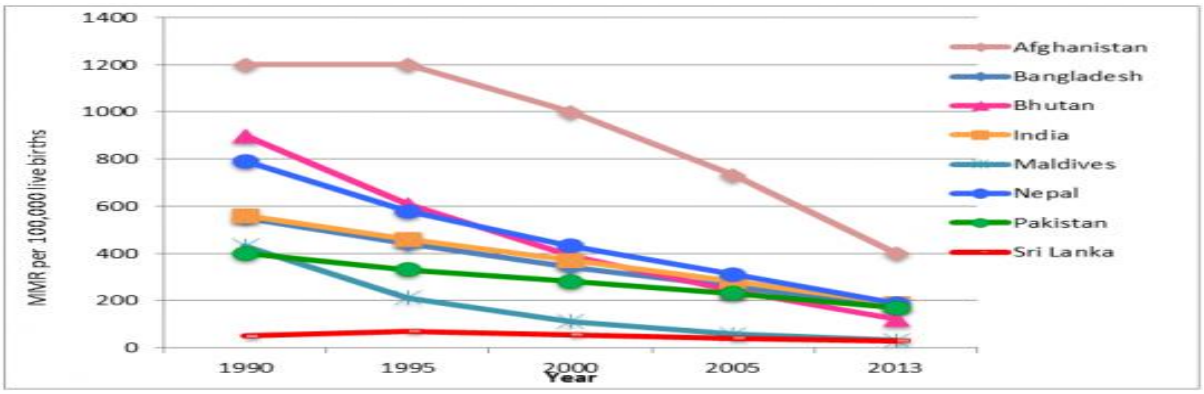


Figure 1.1 Trend maternal mortality rate in South Asia

Source: Trends in Maternal Mortality: 1990 to 2013.WHO, UNICEF, UNFPA and the World Bank estimates, 2014.

Federal democratic republic of Nepal is a developing country in South Asia with area of 147,181 square kilometers and population around 28 million. It is located in the lap of Himalayas border to China in north and India in south, east, and west by India (11). Nepal still lacks accurate data on maternal mortality however available data shows that Nepal have high maternal mortality. Civil registration system of all births and deaths are helpful but in the absence of active case finding may be misleading –e.g. if the death registration form does not include a specific identifier of maternal death, then maternal deaths may be missed or misclassified (12).

Nepal has a high maternal mortality (229 per 100000 live births) which is likely to be reduced with appropriate interventions(10). Under utilization of health services is one of factor contributing to this. Only one-third of births occur in health facilities and only 50 % women have minimum of four recommended antenatal visits (13). Nearly 47% of the delivery conducted at home by skill birth attendant and 33.6% women reached institution to delivery by skill birth attendant, around 20% of mother delivery at home without support health worker (14). In Nepal only 40 % women received any ANC from skilled professional's special training provider (NDHS 2011). According to NDHS 2001 survey, 65% women received ANC in the Terai zone while only 23% received ANC in the Hill and Mountain zone. Overall, in the NDHS 2011 survey, 80% women utilize ANC services in the Terai zone, only 50% received ANC services in Hill and Mountain zone. Socio-economic and demographic factors affecting utilization of antenatal services across the ecological zone is due to the differential in education, occupation, religion, wealth index, and access to media (15). Almost all 98 % pregnant urban women had made at least one antenatal care visit however only around 50% of rural woman had antenatal care visit. About 48% of women delivered within 5 hours of reaching a health care facility and 90% delivered within 25 hours of arrival(16).

Study conducted about ANC in Nepal found that attending 4 ANC visit have positively associated with SBA utilization (17), however those study have included women delivered in the last 24 month or more as study participates, rendering findings prone to recall bias (18, 19). In addition, attending 4 ANC visit was found to be positively associated with SBA utilization (17), investigating factor related to 4 ANC visit will provide evidence for promoting delivery by skill providers.

Therefore, this study aims to identify factors related with utilization of 4 ANC visits among women who delivered within last 12 months of preceding the survey from Village Development Community (VDC) of Banke district, Nepal.

According to statistics of the facial year 2014 of mid-western region shows that 69 % of the mother received first antenatal care service however, only half (39.4%) of them made fours ANC visits, indicating that less than half of the mother did complete recommended four ANC visits (13).

In Banke district of Nepal, ANC first visit was decreased to 90.3% compared to that of 2014 which was 93.5% in 2013. Among these woman who visited first time visited fourth time for only 51.76% in 2014 slightly higher compared to that of 47.7% 2013, (20). This shows that case load is decreasing trend but quality services of ANC visits is in increasing trend in Banke district of Nepal.

Many research suggest that along with supply-side and demand-side of health resources, individual and household factors, socio-cultural factor, such as women's autonomy (21), caste/ethnicity, religion and belief (22), women's media exposure regarding pregnancy and health care (23), influence health seeking behavior. For example some ethnicity group women are not allowed for ANC visit. Further socio-cultural factor are contextual and entrenched (24) and amplify geographical and financial barriers experienced by women to access maternal health services (25). Many studies have documented poor utilization of institution delivery by Terai's (plan region) Muslims and Dalit's society (26, 27). A qualitative study conducted in Nepal showed that pregnant women's heavy work-load, women in law's perception of benefit of ANC, her power and control over resources, and relationship between mother-in-law and pregnant women play vital role in pregnant women's utilization of ANC (28). However, role of socio-cultural factors including ethnicity, women's status, education, exposure to media and other in relation to demographic and economic factor in utilization of antenatal service remain under-investigated in rural community of Nepal.

1.2. Research Question:

The purpose of this study was to answer the following research question:

- What is the proportion of regular use of antenatal care (ANC) services among mothers of children under 1 year age in rural community Banke district, Nepal?
- What are the factors associated with regular use of ANC services among mothers of children under 1 year age in rural community of Banke district, Nepal?

1.3. Objectives of the study:

1.3.1 General objective

To identify the prevalence and the factors associated with regular use of ANC services among mothers of children under 1 year age in Rural community of Banke district, Nepal.

1.3.2 Specific objectives

- To determine the proportion of regular utilization of ANC services among mothers of children with under 1 year age in rural community of Banke district, Nepal.
- To determine the factors associated with regular uses of ANC services in rural community of Banke district, Nepal.

1.4. Conceptual Framework

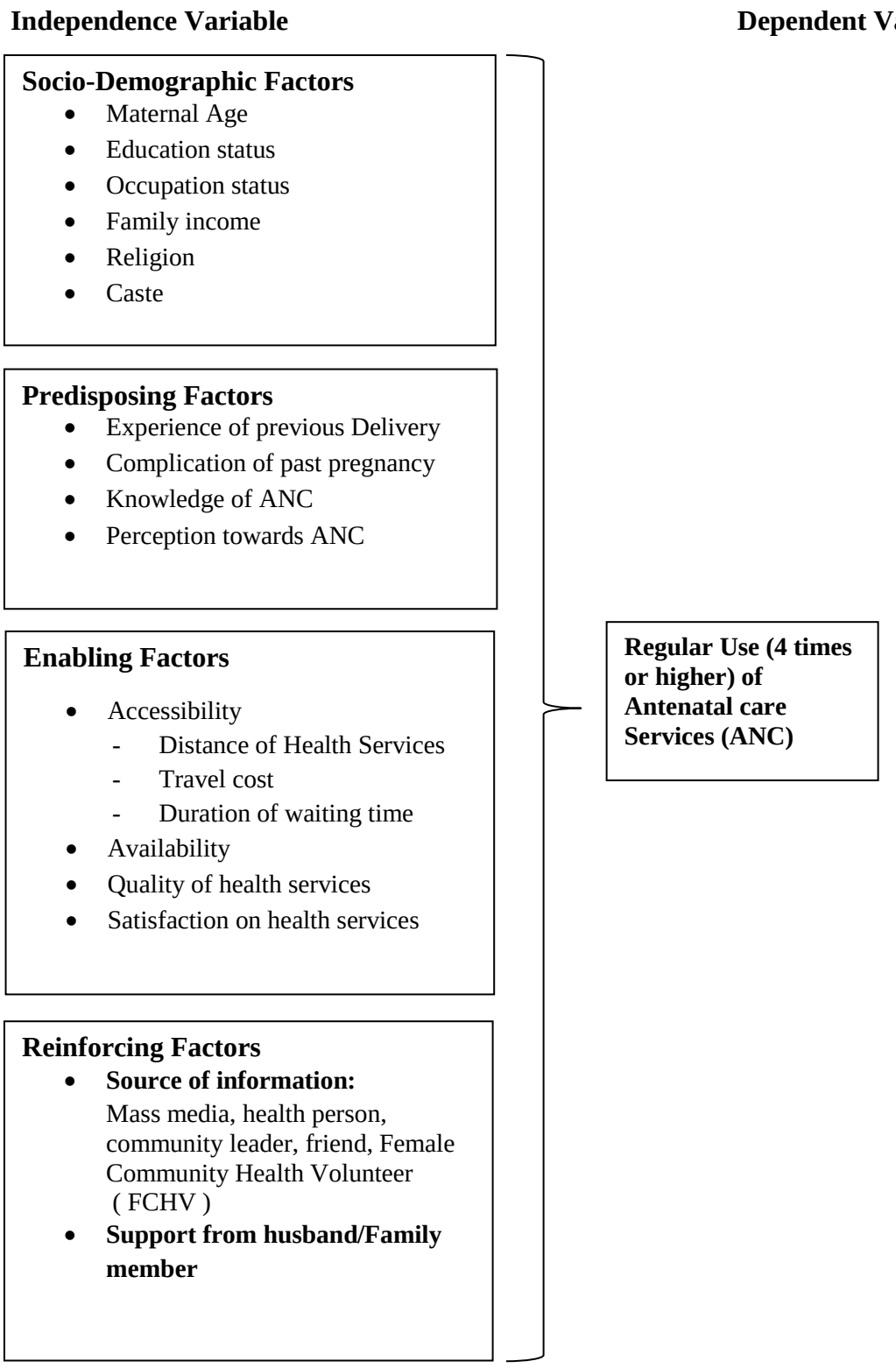


Figure: 1.2 Conceptual framework (Based on PRECEDE-PROCEED model)

1.5. Definitions variable of study

1.5.1 Dependent variable

Health Interview Surveys are used to determine the effects of the socio-demography, predisposing, enabling, and illness-morbidity characteristics on several measures of health service utilization (29). The regular visits for Antenatal care at least 4 times or more follow the guidelines of world health organization. The pregnant women should come to ANC services one time at first trimester, one time at second trimester, and two times at third trimester during the pregnancy. (First visit is within fourth month, second visit is between six to seven month, third visit is within eight month, and fourth visit in nine month (30). Regular used practices on antenatal care services obtained by postpartum women during pregnancy at least 4 times complete the guideline of world health organization.

1.5.2 Independent variable

Examples of the factor organized in the categories of the health care Utilization model (mainly following Weller et al 1997) are:

Maternal Age: Mother age referred to number of complete age of the respondents classified into three categories:

- ≥20 year old (younger, high risk)
- 20-35 year old (child bearing age)
- >35 year old (elder, high risk)

Education status: Refers to the level of education obtained by respondents, classified by: No schooling, primary school, secondary school, high secondary school, academy/ university, others.

Occupational status: Mother occupational status was defined as main type of work the woman as: housewife for women (unemployed for man), government office, and private job, labor, other. Husband occupational status was also defined as main type of work the father does to get income.

Monthly family income: refers to total income of husband and wife per-month. Family income was defined as total annual income in American dollar in the family.

Ethnicity: Ethnicity is other independent variables of the study. It is coded as following; 1 for people who are Hindu, 2 for people who are Buddhist, 3 for people who Muslim and 4 for people representing others.

Last delivery Child-birth: referred to birth rank of under-one child of the woman at the time of the interview.

Knowledge on ANC visit of postpartum women: means the information and understanding that experience about the concept of ANC, schedule of ANC, services in ANC. Knowledge of pregnancy complications was defined as level of knowledge mothers have on pregnancy-related complications, high fever, foul smelling, and vaginal discharge.

Health services: Distance from a residence to a health facility was referred to a number of kilometers from mother's home to the health facility. Frequency of antenatal visits was referred to a number of antenatal clinic sessions attended at the facility.

Satisfaction with health care: refers to mother satisfaction antenatal care services provider rapidly response heal care, provided antenatal care education, carefully examination, family counseling.

Quality of health services expose media: Numbers of hours spent at health facility before seen by the health worker); competence of health workers (technical knowledge, skills and behaviors); responsiveness to actual needs and expectations and availability of health workers all the time (opening hours, number of days in weeks). Health facility the health education messages can include.

Available of health worker: Health services provider health worker are sometime cannot available in health institution and also Maternal and Child Health Worker and Village health worker conduct health camp every 2 week alternative (PHC/ORC) primary health care outreach clinic in every cluster Village development community and involvement in Female Community Health Volunteer in this ANC checkup and iron tablet distribution program.

Family and community support: referral to the norm and culture of family and community support for mothers during antenatal and delivery period in terms of psychological support, funding, vehicle for referral and blood donors.

1.6 Limitations of the study

This study has small sample size. Further a researcher-developed questionnaire with minimal reliability and validity testing which may lead to selection bias. On the other hand, the ambiguous question whether available of ANC service, knowledge and perception needs to be a more clear statement if it is to be used for the next study. Based on our findings, Knowledge and perception of the questionnaire and increasing the sample size are needed to generalize findings.

Previous research has documented the need for increasing awareness of women's health especially increasing the number of ANC visits during pregnancy, intervention such as health education and health promotion. However, this research contributes to understand the determinants ANC visit among Nepalese woman and factors affecting their decision making for ANC visit in rural area of Nepal. This finding supposed to contribute for effective ANC visit.

CHAPTER II
LITERATURE REVIEW

This chapter reviews the literature and the research findings to provide the theoretical model regarding ANC services in the following areas:

2.1 Maternal Health Care Worldwide

Around 830 women die every day from pregnancy and childbirth related complications throughout the world in 2015. Estimated number is around 303,000 during that period. Almost all of these deaths occurred in low resource settings, and most could have been prevented. Reducing maternal mortality health was one of the eight Millennium Development Goals (MDGs) adopted by international community in 2000. Under MDG 5, reduction in maternal mortality by three quarters between 1990 and 2015 was aimed to be achieved by countries and community throughout the world. Since 1990, the maternal mortality worldwide has dropped by 43%. In sub-Saharan Africa, a number of countries halved their levels of maternal mortality since 1990. In other regions, including Asia and North Africa, even greater headway was made. Between 1990 and 2015, the global maternal mortality ratio declined by only 2.3% per

year between 1990 and 2015. However, increased rates of accelerated decline in maternal mortality were observed from 2000 onwards. In some countries, annual declines in maternal mortality between 2000 and 2010 were above 5.5%, (31, 32).

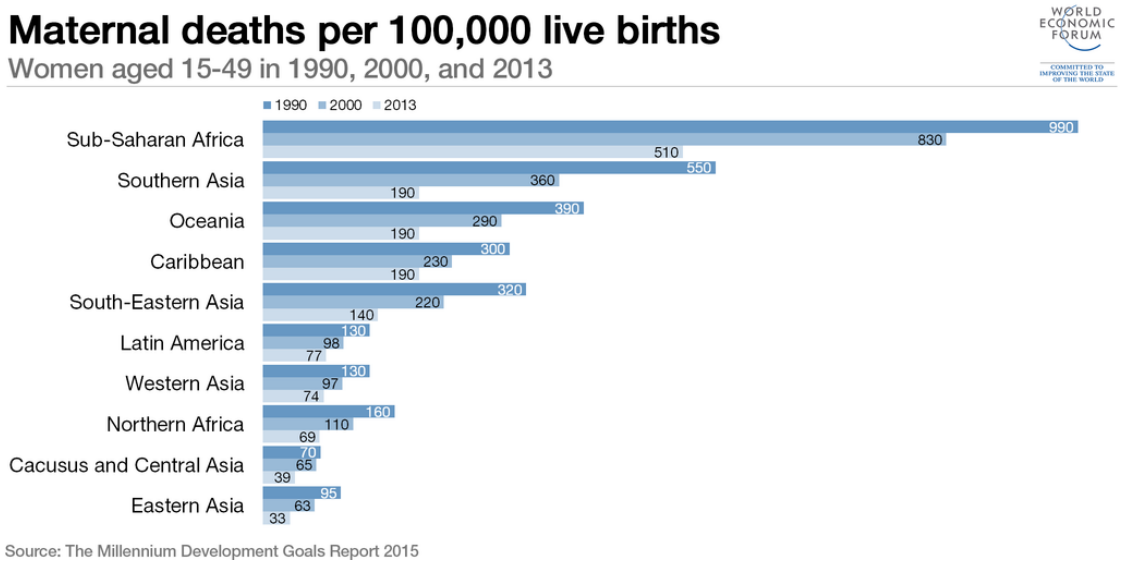


Figure 2.1 Number of maternal death in some areas of the world.

The high number of maternal deaths in some areas of the world reflects inequities in access to health services, and highlights the gap between rich and poor. Almost all maternal deaths (99%) occur in developing countries. More than half of these deaths occur in sub-Saharan Africa and almost one third occur in South Asia. The maternal mortality ratio in developing countries in 2015 is 239 per 100 000 live births versus 12 per 100 000 live births in developed countries. There are large disparities between countries, but also within countries, and between women with high and low income and those women living in rural versus urban area. The risk of maternal mortality is highest for adolescent girls under 15 years old and complications in pregnancy and childbirth is a leading cause of death among adolescent girls in developing countries (31, 32).

Women in developing countries have, on average, many more pregnancies than women in developed countries, and their lifetime risk of death due to pregnancy is higher. A woman's lifetime risk of maternal death the probability that a 15 year old

woman will eventually die from a maternal cause – is 1 in 4900 in developed countries, versus 1 in 180 in developing countries.

Women die as a result of complications during and following pregnancy and childbirth. Most of these complications develop during pregnancy and most are preventable or treatable. Other complications may exist before pregnancy but are worsened during pregnancy, especially if not managed as part of the woman's care. The major complications that account for nearly 75% of all maternal deaths are: Severe bleeding (mostly bleeding after childbirth), infections (usually after childbirth), high blood pressure during pregnancy (pre-eclampsia and eclampsia), complications from delivery, unsafe abortion and other associated with diseases such as malaria, and AIDS during pregnancy (33).

Most maternal deaths are preventable, as the health-care solutions to prevent or manage complications are well known. All women need access to antenatal care in pregnancy, skilled care during childbirth, and care and support in the weeks after childbirth. Maternal health and newborn health are closely linked. Approximately 2.7 million newborn babies die every year (34).

It is particularly important that all births are attended by skilled health professionals, as timely management and treatment can make the difference between life and death for both the mother and the baby. Poor women in remote areas are the least likely to receive adequate health care. This is especially true for regions with low numbers of skilled health workers, such as sub-Saharan Africa and South Asia. While levels of antenatal care have increased in many parts of the world during the past decade, only 51% of women in low-income countries benefit from skilled care during childbirth. This means that millions of births are not assisted by a midwife, a doctor or a trained nurse. In high-income countries, virtually all women have at least four antenatal care visits, are attended by a skilled health worker during childbirth and receive postpartum care. In low-income countries, only 40% of all pregnant women have the recommended antenatal care visits. Other associated factors are poverty, distance health institution, lack of information, in adequate services, cultural practices (35).

2.2 Maternal Health Care in Nepal

Maternal mortality ratio (MMR) in Nepal decreased substantially between 1990, 2006 and 2011, from 539, 281 to 229 deaths per 100,000 births. Improvement in maternal health service have been key in reducing the country MMR. The National Safe motherhood Program has made significant progress in term of development of policies and protocol as well as expansion of the role of service providers such as staff nurse and auxiliary nurse midwives. The National Safe Motherhood Program is a priority for the government of Nepal's Health sector strategy set out in the Millennium Development Goals (MDGs).

The target of maternal health is to reduce the MMR by three quarters between 1990 and 2015. The policy on skilled Birth Attendants, endorsed in 2006 by the MOHP, specifically identifies the importance of skilled birth attendants (SBAs) at every birth and embodies the government's commitment to training and deploying doctor, nurse and auxiliary midwives with the required skills across the country. In order to ensure focused and coordinated efforts among various stakeholders involved in safe motherhood and neonatal health programming, the National Safe Motherhood (2002-2007) Program has been revised with wider participation by the government and nongovernmental, national, and international institutions. By the end of 2008-2009, the birth preparedness package (BPP) had been rolled out in all 75 districts. Similarly, a maternity incentive scheme was adopted in 2005 to encourage women to use health facilities for maternity care and improve access to maternity care services (MOHP, 2011). The health care services that a woman receives during pregnancy, childbirth, and the immediate postnatal period are important for the survival and well-being of both the mother and the child. The 2011 NDHS collected information on the extent to which women in Nepal receive care during each of these stages. The findings can be used to identify subgroups of women at increased risk of mortality because of nonuse of maternal health services and to assist in the planning of appropriate improvements in services (13).

2.3 Antenatal Care

Antenatal care is one of the most important healthcare services provided for pregnant women around the world. In most Western countries, health care during pregnancy traditionally involves a schedule of one-to-one visits with amid wife, an obstetrician or a general practitioner (GP) in a hospital or clinic setting. A different way of providing pregnancy care involves use of a group model rather than a one-to-one approach. All pregnancy care is provided in this group setting by integrating the usual pregnancy health assessment with information, education and peer support (36). WHO advised new model of antenatal care for developing countries which are simple, cheaper and without unnecessary intervention. It reduced number of antenatal care visits of normal pregnancy from more the 12 times in standard model to only 4 times in the new WHO model with the same outcomes (37).

Definition: Maternal health is the death of a woman while pregnant or within 42 days of treatment of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes. To facilitate the identification of maternal health in circumstances in which cause of death attribution is inadequate, a new category has been introduced. Pregnancy –related death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the cause of death (2).

WHO tried to find out the cause by undertake a systematic review to determine the distribution of causes of maternal deaths. It found that hemorrhage was the leading cause of death in Africa (point estimate 33.9%, range 13.3-43.6; 8 datasets, 4,508 deaths) and In Asia (30.8%, 5.9-48.5; 11detasets, 16,089 deaths). In Latin America and the Caribbean, hypertensive disorders were responsible for the most deaths (25.7%, 7.9-52.4; 10 datasets, 11,777 deaths). Abortion deaths were the highest in Latin America and the Caribbean (12%), which can be as high as 30% of all deaths in some countries in this region. Deaths due to sepsis were high as 30% of all deaths in some countries in this region (4).

"WHO Antenatal Care Model"

Every pregnancy women will be screened by classifying form on antenatal care for the first time. Woman with history of any risk factors will be sent to doctors for diagnosis risk that has been detected. The appointment follows the pattern of the disease or the treatment of such facilities in clinics. The pregnancy women who were found any risks in histories will receive routine antenatal care (called the basic component). The Regular visit Antenatal care at list 4 Times or more than 4 times following the guidelines. The pregnant women should come to ANC services one time at first trimester, one time second trimester, and two times third trimester during the pregnancy. (First visit is within fourth month specially/ quality of antenatal within 12 weeks) second visit is between six to seven month third visit is within eight month and fourth visit in nine month. The activities included in the basic component fall within three general areas:

1. Screening for health and socio-economic conditions likely to increase the possibility of specific adverse outcomes.

2. Providing therapeutic interventions known to be beneficial.

3. Education pregnant women about planning for safe birth, emergencies during pregnancy and how to deal with them.

The activities distributed over the four visits are presented in the basic component check pregnancy mother content of the first visit (≤12 weeks)

1. General information: personal history taking, medical history, obstetric history.

2. Physical examination:

Check for signs of severe anemia: pale complication, fingernails, conjunctiva, oral mucosa, tip of tongue and shortness of birth.

Record of weight in kilogram and height in meter will be done to assess the mother nutritional status.

Measure blood pressure of mother.

Chest and heart auscultation of mother.

Measurement of uterine height will be done in centimeter. A chart should be used to determine uterine height.

Consider vaginal examination (using a speculum).

3. Laboratory examination:

Urine: multiple deistic test for bacteria and tests for proteinuria to all women.

Blood: syphilis (rapid tests)

Blood grouping typing (ABO and RH)

Hemoglobin (HB): only if there are signs of severe anemia.

4. Assess for referral

Determine the expected date of delivery based on LMP and all other relevant information. Use 280 day rule (LMP +280 days).

Determine whether the women are eligible for the basic component of the new WHO model or if she is in need of special care and referral to a specialized clinic or hospital. If the following conditions are diagnosed, proceed as recommended:

Diabetes: refer; must have continued medication.

Drug abuse: refer for specialized care.

Signs of severe anemia and HB<70 g/l: increase iron dose, or refer if shortness of birth.

HIV positive

Family history of genetic disease: refer.

Primigravida: give the advice on the benefit of institution delivery.

Previous stillbirth

Previous growth-related fetus

Hospital admission for eclampsia or pre-eclampsia

Previous caesarean section

Body Mass Index (BMI) refer for nutrition evaluation if BMI (weight in kg/ height m^2) :< 18.5 or >32.3 kg/m^2.

5. Implement the following intervention:

Iron and folate supplements to all women: one tablet of 60 mg elemental iron and 250 micrograms folate one-two times per day. If HB <70 g/l: double the dose

In malaria endemic areas: sufadoxine/pyrimethamine, three tablets once in second trimester and repeat in third trimester (37).

Tetanus toxoid injection: Tetanus toxoid (TT) vaccine is given to women during pregnancy to prevent infant deaths caused by neonatal tetanus, which can occur

when sterile procedures are not followed in cutting the umbilical cord after delivery. For full protection, women should receive at least two doses of TT vaccine during each pregnancy. If a woman has been vaccinated during a previous pregnancy or during maternal and neonatal tetanus vaccination campaigns, however, she may require only one dose for the current pregnancy. Five doses are considered to provide lifetime protection (38).

National Safe Motherhood Program: National Safe Motherhood Program is to improve the maternal and neonatal health through preventive and promotive activities as well as by addressing avoidable factors that causes complications of pregnancy and childbirth. Evidences suggested that three delays are of critical importance to the outcomes of an obstetric emergency in Nepal's context: (i) delay in seeking care, (ii) delay in reaching care, and (iii) delay in receiving care. To reduce the risks associated with pregnancy and childbirth and address factors associated with mortality and morbidity three major strategies have been adopted in Nepal.

2.4 Aama Program in Nepal

The revised Aama guideline has been implemented since the start of facial year 2013, (FY 2069/70). The *Aama* guideline specifies the services to be funded, the tariffs for reimbursement and the system for claiming and reporting on free deliveries each month.

After revision, *Aama* program has four components: (I) the Safe Delivery Incentive Program (SDIP), a cash incentive scheme, which was initiated in July 2005, (2) free institutional delivery care, which was launched in mid-January 2009, (3) incentive to health worker for home delivery and (4) incentive to women for 4ANC visits. The Aama program provisions are:

Aama Program utilization as percentage of live birth

Incentives to women on institutional delivery: A cash payment is made to women immediately following institutional delivery: NRs. 1,500 in mountain, NRs. 1,000 in hill and NRs. 500 in Terai region. Free institutional delivery services: A

payment to the health facility for the provision of free delivery care. For a normal delivery health facilities with less than 25 beds receive NRs. 1,000; health facilities with 25 or more beds receive NRs. 1,500. For complicated deliveries health facilities receive NRs. 3,000; for C-Sections NRs. 7,000.

Incentive to women for 4 ANC visits: A cash payment of NRs. 400 is made to women on completion of four ANC visits at the 4, 6, 8 and 9 months of pregnancy following institutional delivery.

Incentives to health workers for home deliveries: A cash payment of NRs. 100 is made to health worker for home deliveries (20, 38).

Government of Nepal implemented safe motherhood program since 1991 with the aim for reducing maternal and neonatal mortalities by addressing factors related to various morbidities, death and disability caused by complications of pregnancy and childbirth. The Iron Supplementation Program for pregnant women to prevent from Anemia was introduced as part of Ministry of Health and Population's (MOHP) nutrition program, covering all 75 districts of Nepal.

Table: 2.1 Utilization antenatal care services at least one time in Nepal.

Predictor	2006 (n=4,182)	2011 (n=4,079)	Predictor	2006 (n=4,182)	2011 (n=4,079)
Development region			Mountain	60.8*	79.0*
East	77.5	86.7	Hill	67.3	81.6
Central	74.1	83.3	Terai	79.9	91.0
West	69.9	88.3	**Total**	**72.2**	**85.0**
Mid-West	63.3*	79.8*	**Residence**		
Far-West	70.2	88.3	Urban	85.5	93.1
Total	**72.2**	**85.0**	Rural	68.1*	82.7*
			Total	**72.2**	**85.0**

Source: National Demography Health Survey 2011.

The program involved distributing iron-folate supplements to pregnant women through health facilities and outreach clinic. Female Community Health Volunteers (FCHVs) have also been mobilized to supply iron tablets to pregnant women under the Iron Supplementation Program (20) is still high among the South Asian Countries. Forty-two percent of pregnant women suffer from nutritional anemia . Twenty six percent mothers received no ANC services, 40 percent did not take iron tablets during pregnancy, and 37 percent did not complete 2 TT vaccines in their last pregnancy in Nepal. Moreover, the prevalence of received prenatal services among rural mothers (4 ANC visits: Rural-26%, Urban-51.9%; Iron tablets received: Rural-56.9%, Urban-74.9%; 2+ TT vaccine received: Rural-61.8%, Urban-72.4%) were lower than the urban7. Addressing maternal health requires the understanding of ANC services received by mothers during the designing and delivering of ANC Services to the rural mothers. Major three component of ANC services i.e. ANC visits with health personnel, receiving days of iron tablets & number of took TT vaccine are investigated. These 3 services of prenatal care were easily available in most of the rural area (39).

2.5 Antenatal care services in study area

In mid-western region of Nepal ANC services visits statistics of the facial year 2014 shows that 79.8% of the mother received first antenatal care services. However, only a more than half 39.4% of them made fours visits indicating that less than half of the mother did not complete the recommended four ANC visits, (13).

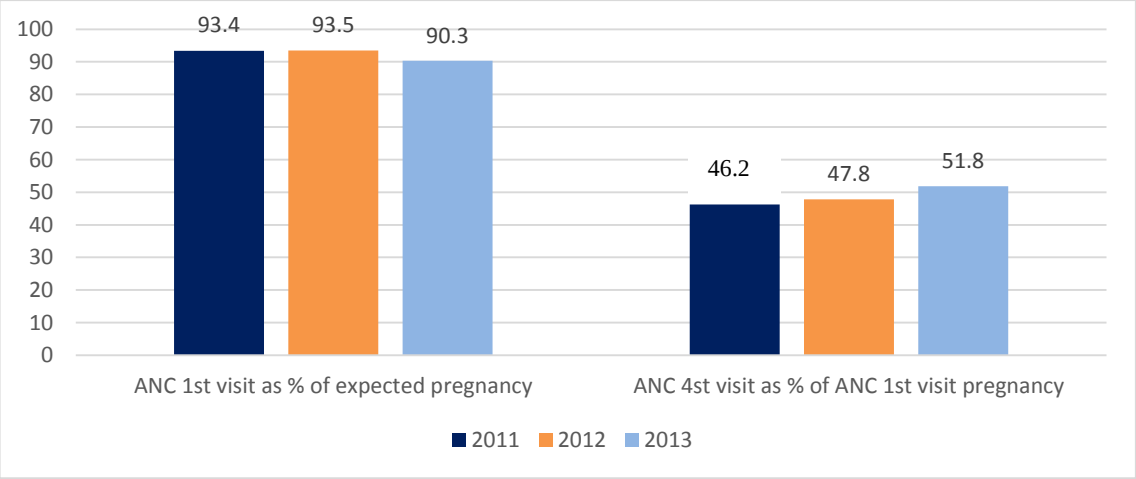


Figure: 2.2 Achievement on ANC by year in Banke district, Nepal

Source: District report 2011, 2012, and 2013 DPHO Banke, Nepal

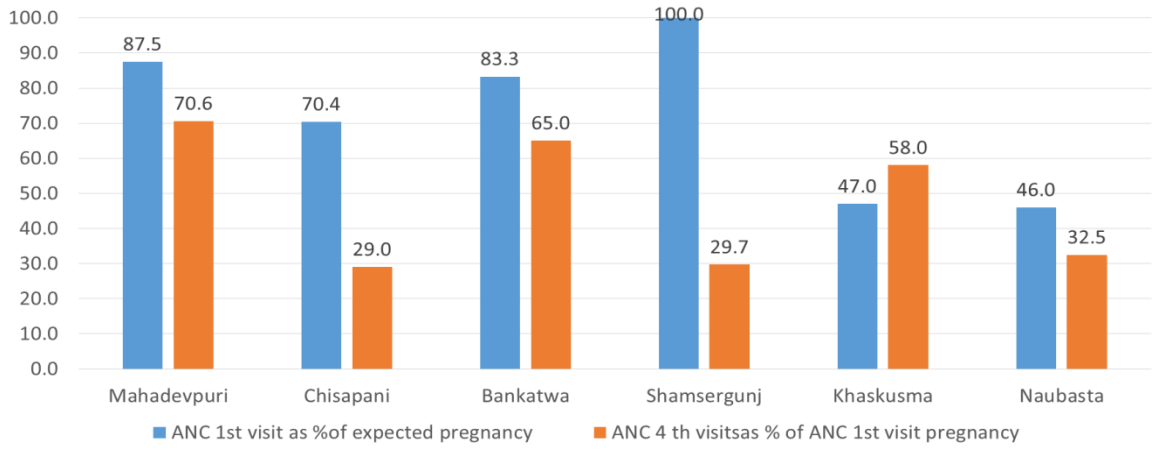


Figure: 2.3 Achievement on ANC by study area

Source: District annual report 2013 DPHO Banke, Nepal

Figure 2.2 shows that in Banke district of Nepal first visit to ANC are around 90 percent in all year 2011, 2012 and 2013. However ANC fourth visit

decrease to only around 50% in all 3 years 2011, 2012 and 2013. However in 2013 fourth ANC visit is slightly higher compared to that of previous year. Figure 2.3 shows that in some VDC ANC first and fourth visit are very low. For example in Chisapni VDC only 29 percent of woman have fourth ANC visit compared to 70% of fist ANV visit.

2.6 Health care Model

The original Andersen model included 'personal health practices', 'process of medical care' and 'use of personal health services' under the general category of 'health behaviors'. Andersen defined personal health practices as behaviors of the individual that influence their health status, and included lifestyle behaviors as well as adherence to health care (40).

2.7 Precede/Proceed Model

This chapter emphasizes the application of behaviors change theory to program planning. The precede-proceed model is used both for delivery programs in practice settings and when conducting behavior change interventions. The model offers a framework within which individual level theories, community level theories, interpersonal communication, interactive technologies media campaigns and grass roots organizing can be utilized. The precede-proceed model is a tool for designing, implementing, and evaluating health behavior change programs.

Originally developed in the 1970’s by Green and colleagues

When a problem affecting a particular population has been identified health, and the health professional must do something to fix the problem a planning model like Precede-Proceed, which has been the cornerstone of health promotion practice for more than three decades, can help guide this process.

Precede

Predisposing, Reinforcing, Enabling, Constructs In Educational/ Environmental Diagnosis, Evaluation:

Based on the premise that a medical diagnosis precedes a treatment, so should an educational diagnosis precede an intervention plan.

Criticism was that there was too much emphasis on implementing programs and too little on designing interventions to strategically meet needs.

2.7.1 The Precede model

The Precede model is a framework for the process of systematic development and evaluation of the education program by LW. Green and Marshall Kruder (1999). The precede model for health promotion and evaluation (41).

Phase 1: Social Assessment, participatory planning, and solution analysis:

Understanding the community (a geographic area or groups with shared characteristics, could also be a virtual community) though multiple data collection activities

Interviews, surveys, focus groups, observation

The social assessment – articulates the communities needs and desires while considering the communities problem solving capacity, strengths, and resources, and the readiness to change,

The focus is on strengths and gaps and seeking to establish partnerships with the goal of increased commitment to the program.

Program Planning committees, community forums, conducting focus groups, concept mapping

Community organizing theories and principles are relevant

Working with community groups to identify common problems, goals, mobilize resources, develop and implement strategies

Example of community mobilization – not as ‘process’ focused; but community driven, involves members in problem identification, needs assessment, and program design.

Phase 2: Epidemiological, Behavioral, and Environmental Assessments:

Identify the health priorities and their behavioral and environmental determinants.

- **Epidemiological Assessment:**

1. Identify health problems, issues or aspirations on which the program will focus.

2. Uncover behavioral and environmental factors most likely to influence identified priority health concerns

3. Translate those priorities into measurable objectives

Occasionally secondary data analysis is done using existing data sources such as vital statistics, and other data bases including National health information center and Canadian Communities Health Survey (CCHS).

The use of genetics – Can be helpful to identify high risk groups for intervention

- **Behavioral Determinants:**

These can be understood on 3 levels

A. Most proximal – behaviors or lifestyles that contribute to severity of a health problem – teen smokers tobacco use; Cardiac patient's poor diet

B. More distal determinant – behavior of others that can impact the behavior of those at risk, teen smokers parents keeping cigarettes in the house, spouse of cardiac patient buying bacon.

C. Most distal factor – action of discoing makers that may affect the social or physical environment influencing the individual at risk, action by police in enforcing laws that restrict teen smoking; food served at a seniors center or hospital.

Environmental Determinants:

Social and physical factors external to the individual – often beyond their control, that can be modified to support the behavior or influence the health outcome. This stage requires strategies other than education.

Phase 3: Educational and Ecological Assessment:

Once behavioral and environment factors have been selected for intervention the next step is to identify antecedent and reinforcing factors that need to be in place to initiate and sustain the change process. There are 3 specified:

1. ***Predisposing factors*** – antecedents to a behavior that provide rationale or motivation for that behavior A persons knowledge, attitudes, beliefs, skills, self-efficacy beliefs

2. *Reinforcing Factors* – factors that following a behavior provide continued reward or incentive for repetition of that behavior –social support, peer influence, family influence.

3. ***Enabling Factors*** - antecedents to behavioral or environmental change that allow a motivation or environmental policy to be realized. i.e. programs services and resources or development of new skills.

All 3 levels of change theories are useful at this stage-

Individual – most appropriate for addressing predisposing factors – how to communicate to individuals i.e. phone calls, mass media, social media?

Interpersonal – appropriate for reinforcing factors – indirect communication channels through friends family and methods such as train the trainer.

Community – enabling factors - environmental change - i.e. organizations delivery of services, policies, laws, and regulations

Organizational change theories - for example with the use of walking aids a campaign may be developed in the building that emphasis the benefits and advantages to utilizing walking aids. This would also draw on SGT looking further at the social influences. The HBM would also be useful - perceived susceptibility

Phase 4: Administrative and policy assessment and intervention alignment:

The planner will select and align the programs components; priority is the determinants of change previously identified.

Identify resources

Identify organization barrier and facilitations

Identify policies that are needed for program implementation

Macro level – organizational and environmental systems

Micro level – focus is on the individual, peer, family and others who can influence the desired change. Interventions at this level are directly aimed at predisposing, reinforcing, and enabling factors.

Phase 5-8 Implementation, Process, Impact, Outcome Evaluation:

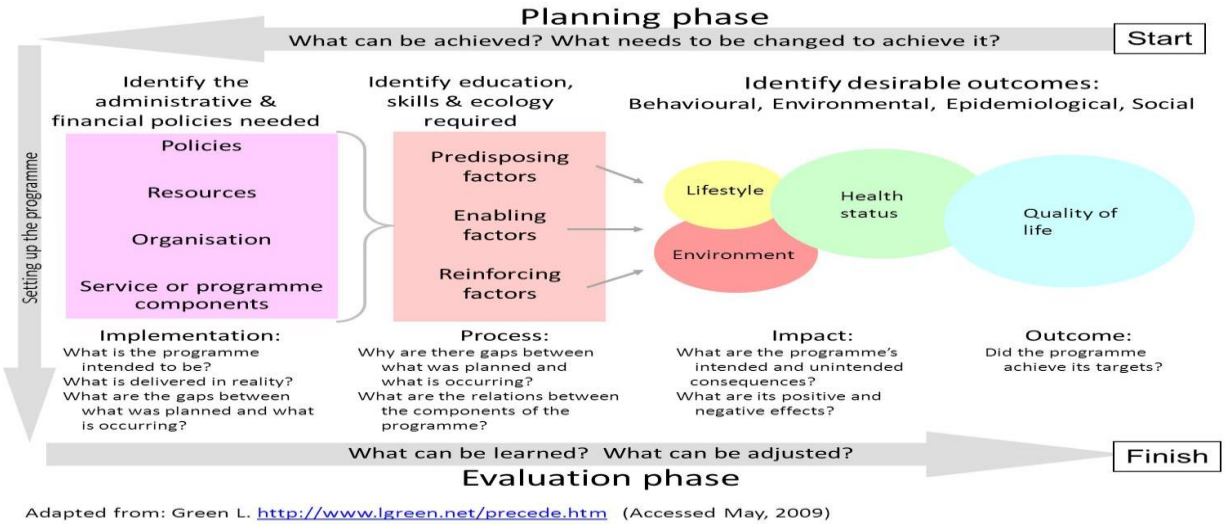
At this stage data collection plan should be in place for evaluation of the program's success by evaluating its process, impact, and outcome.

Process evaluation: evaluation of how the program was implemented according the protocol.

Impact evolution: assess change in predisposing, reinforcing and enabling factors as well as in behavioral and environmental factors

Outcome evaluation: determine the effect of the program on health and quality of life indicators.

Generally – measurable objectives should be written into the plan serving as milestones on which the plan is evaluated (42).



Adapted from: Green L. http://www.lgreen.net/precede.htm (Accessed May, 2009)

Figure 2.4 The Precede – proceed model

2.8 Factors related to regular use of ANC services

2.8.1 Socio-demographic factors

Attending antenatal care services of the 26,591 singleton live-born infants of the mothers' most recent birth within five years preceding each survey, 20% were born to mothers attending less than four antenatal care services and this included 7% of infants born to mothers who did not attend any services. Higher odds for not attending the services were found in rural than in urban areas. Among the socio-demographic factors, the odds for underutilizing antenatal care services increased significantly for mothers with low educational attainment and from households with a low wealth index. A significant interaction term was found between household wealth index and maternal education. The association between household wealth index and underutilization of antenatal care services was influenced by maternal education level. An increased education level has a greater effect for women from households with a low wealth index compared to those from the wealthiest households significant factors found included mothers less exposed to mass media, mothers reporting money to pay for health services as a major problem and mothers reporting distance to health facilities as a major problem. The identification of these factors is important to develop public health strategies that address key issues which hinder women from utilizing antenatal service (43).

Age of the pregnant women

One study found that the average 62 % Nepal women pregnant under 25 years old (44). Another study found out that low utilization rate of antenatal care services is noted among old women whose age is more than 30 years. This me be due to overconfidence and ignorance with increasing age and parity (45). Another study pointed out that young women are associated with late initiation of antenatal care and insufficient antenatal care utilization (46). Women in rural Nepal marry at an average age of 16, but often as young as 13. Newlyweds live with the husband's parent and about 25% of women give birth to their first child before they are 18 year (38).

Table: 2.2 Percentage of ANC services from skilled providers

Mother's age at	% of antenatal care from a skilled provider
<20	63.5
20-34	59.0
35-49	31.5

Source: NDHS-2011

Education of the pregnant women and the husband

Education is the major determent to increase the women's status and health. Education to woman helps them to choose right decision in seeking health care and identify danger signs during pregnancy (47). One of the Study in Nepal found that husband's education also have positive relationship in accessing antenatal care services utilization (15). Research in developing countries found that maternal education is like to be associated with utilization of antenatal care and postnatal care services strongly and positively (48, 49). A study showed that women's education status is related to attendance at antenatal services. Women with educational level of secondary or above were more likely to use antenatal care than women with low education or without education (50). Another multi central Uganda study found that empowerment of pregnant women and their husband helps to improve ANC attendant and utilization (51).

Occupation status /Income/Salary

Family income have positive impact in ANC visit it was found in study that woman with higher household income likely to visit ANC more compared to that of woman with low household income (52, 53). Another study in Nepal explored the economic factors poor and rural Nepali women burden as a barrier to up to take antenatal care services. Actual cost is a key factor preventing ANC uptake among poor and rural Nepalese women (54).

Ethnicity

In many societies, ethnicity and religion were closely linked to socioeconomic position and place of residence, mortality ethics or religious group were live in rural area with worse health infrastructure and transportation. Inadequate control for socioeconomic position, place of residence or access to services would lead to residual confounding (55).

2.8.2 Predisposing factor

Cultural belief

Cultural belief within the community may act as a barrier for seeking care (56). one of the study in Bangladesh showed that religious belief was barrier for antenatal utilization. Pregnant women may prefer consultation with local regions leader, traditional healers, and traditional birth attendants (TBA) over seeking care from qualified health providers. This most often leads to self-treatment practices (57).

Experience Complication of previous Delivery and pregnancy

One of the Zimbabwe study found that large number of reduction ANC visits, six visits in the control group to four visits in the intervention group, was achieved in the Munjanja trial professional in Zimbabwe. This study shows that woman with few ANC visits have following complications antepartum hemorrhage, postpartum hemorrhage, Pre-eclampsia, Urinary tract infection, maternal anemia and maternal mortality (58). According to another study in Nepal found that woman with few visits only 55% suffered from iron deficiency, vitamin –A deficiency (59).

Knowledge of ANC

A study in Health knowledge and practices in Nepali mother found that only 60% of women have knowledge regarding 4 or more ANC visit during pregnancy (60). Another study showed that women with little knowledge about antenatal care utilization were likely to attend less antenatal care. Among the antenatal service users, 33.7% had less than four antenatal visits (61).

Perception towards ANC

Attitude towards ANC is becoming positive due to better outcome in the health of baby and the mother; though some still consider home deliveries and traditional restriction and traditional behavior (51). Another study found that to be related to several factors, an important one being non-utilization or under-utilization of maternal health-care services, especially amongst the rural poor and urban slum population due to either lack of awareness or access to health-care services. Understanding of the knowledge, behavior perception and practices of the community regarding maternity care during pregnancy, delivery and postnatal period affects utilization maternal health care services (62).

2.8.3 Enabling Factor

Urban and wealthy women were more likely to delivery with assistance of health professional than rural and poor women. Previous studies on antenatal care services have shown that wealthier women are more likely to seen ANC services compared to the poor ones. Place of residence is another factor based on various studies which significantly influences the use of maternal health care services (63).

The inequities between the poor and the rich are necessary to be addressed through effective policy and programs (64). According to another study found that to the 41% of women reported having at least one problem in accessing a health care utilization. The most often cited problem was getting money of treatment 25%. Other concerns included distance to a health facility 15%, having to take transport 13% and concern that no female health provider would be available 11% (65).

Strategies to increase the accessibility and availability of health care services are important particularly for communities in rural areas. Financial support that enables mothers from poor households to use health services will be beneficial. Health promotion programs targeting mothers with low education are vital to increase their awareness about the importance of antenatal services (65).

2.8.4 Reinforcement factors

Household wealth, number of children, ethnicity, education, knowledge of danger sign during pregnancy, and husband’s decision making for seeking maternal

and child health care are crucial factors associated to maternal health service utilization. Higher ANC coverage predicts. Wealthier population is more concentrated to maternal health services (64). Nurses who work with low-income pregnant women in a variety of settings should assist partners in recognizing their potential positive contributions, teach women to communicate their expectations to their partners, acknowledge the importance of other family members as providers of social support, and when needed, refer women to programs that increase available social support Although payment for prenatal care services was available for most participants, nearly one third received inadequate care. Correlations of all partner social support dimensions were positively related to women's prenatal care use, but there were no significant relationships between social support from others and adequacy of care. Social support from others excluding the partner was significantly related to prenatal health behaviors. In contrast, social support dimensions provided by the partner had no significant relationships with prenatal health behaviors. Also, support from mothers only was not related significantly to women's (66).

Another study show that improving the status of women by expanding educational opportunities, strengthening promotion of antenatal and delivery care by enhancing community awareness about the importance of ANC and delivery care are recommended (61). According to another study found that majority of mothers were exposed to mass media. Radio was accessible to most (60.0 %) of the participants followed by television (43.41 %). Mothers exposed to mass media were more likely to attending antenatal visits. The study reported a positive influence of mass media on the utilization of antenatal care services in Nepal (67). Therefore, further emphasis should be given to increase awareness of women of rural Nepal through mass media to improve utilization of antenatal care services in Nepal.

2.9 Summary

The literature review about maternal health care found that many studies were done throughout the world both developed and in developing countries. Many study found that reduction of maternal mortality is great challenge worldwide however it is much worse in developing country from sub-Sahara Africa and south- Asia.

Literature found that improvement of maternal mortality is possible through increment of socio-demography, predisposing, enabling, and reinforcing factors throughout the world. Study also found that Nepal have higher maternal mortality rate, second after Afghanistan compared to other south-Asia region. This scenario is much worse in rural area and urban slumps of Nepal. For example mid-western region of Nepal have less antenatal care services utilization because of higher rural areas and difficult geographical condition like mountains and hills. Safe motherhood program implemented in Nepal include Aama program which work for the encouragement of the maternal health care services utilization, and to promote pregnancy mother group through money incentive. Aama program also focus rural community mainly for iron supplementation program, and TT vaccination program. However they are not highly successful to bring down maternal mortality in high rate.

CHAPTER III
MATERIALS AND METHODS

3.1 Study Design

The community based cross-sectional study is to determine factors related to regular use of antenatal care services in rural community Banke District, Nepal from April to May 2016. The dependent variable was the utilization of ANC services by mother who have children under 1 year and the independent variables were in relation with the determinant of ANC services in term of the predisposing, enabling and reinforcing factors adopted based on the Precede-Proceed model.

3.2. Study Area

Health Institutions at rural communities of Bank district were randomly selected. Banke district belongs to the Mid-Western Development Region one of the five development region of the country. The total area of the district is 2,337 square kilometer. District composed of 46 village development committees (VDC's) and 1 municipality with total population of 512,222 (11). This district borders with Surket, Salyan, and Dang to the north, Uttar Pradesh of India to the south and Bardiya district to the west. Bank district have expected pregnancy around 17,480 in a year (source: DPHO Banke 2014). It have 1 Government Health Institution, 1 Zonal hospital 3 Primary Health Center, 20 Health post, and 24 Sub-Health Post. PHCC, HP, SHP and PHC out rich clinic by trained middle level and grass root level health worker (68).

Figure: 3.1 Study Area (country)

Figure: 3.2 Map of Banke district, Nepal

3.3 Study Population

The target population of the study is married women of reproductive age (18-49 years) who had at least one child in a rural community of Banke, District, Nepal.

3.3.1 Inclusion criteria

Married women of reproductive age (18-49 years) who had at least one child aged under 1 year old. They can communicate to the researchers and are willing to participate in the study.

3.3.2 Exclusion criteria

Mothers who cannot speak and have a hearing impairment

3.4. Sample size estimation

The sample size required for this study was calculated by using from Krejcie and Morgan formula;

Estimate sample size, n

$$n = \frac{Z^2\, NP(1-P)}{Z^2\, P(1-P) + (N-1)d^2}$$

Where,

n= required sample size

Z= standard normal score at 95% of confidence interval = 1.96,

N= the population size =2425

p=Use of antenatal care service with ANC 4 times rural in Nepal = 48%

(Reference from NDHS 2011) (13).

d= the degree of accuracy expected as a proportion or acceptable error = 0.05.

So the required sample size was

On calculation,

$$n = \frac{(1.96)^2)(2425)(0.48)(1-0.48)}{(1.96^2\ (0.48)(1-0.48)+(2425-1)(0.05)^2} = \frac{2325.24}{7.019}$$

n=331

During data collection, the sample size is added by 10% of sample size to information loss due to incomplete data or withdrawal of participants. So, the final sample size 364.

3.5 Sampling technique

A multi-stage cluster sampling method was used in the sampling procedure in this study in order to obtain information about antenatal care services use at Banke District, Mid-western region of Nepal. Firstly, 6 VDCs were randomly selected out of 46 Village Development Committees in the Banke district on the basis of its low ANC coverage in that area. And then (Sub-Health Post/Health Post which are the government health institutions within the VDCs were consulted to get lists of mothers of children born and immunized during the last one year period). Lastly, women who had delivered within a one year period preceding this study and give informed consent were interviewed. Since, expected pregnancy 2,425 women in 6 VDCs 2014 record District Public Health Office (DPHO) Banke District, Nepal.

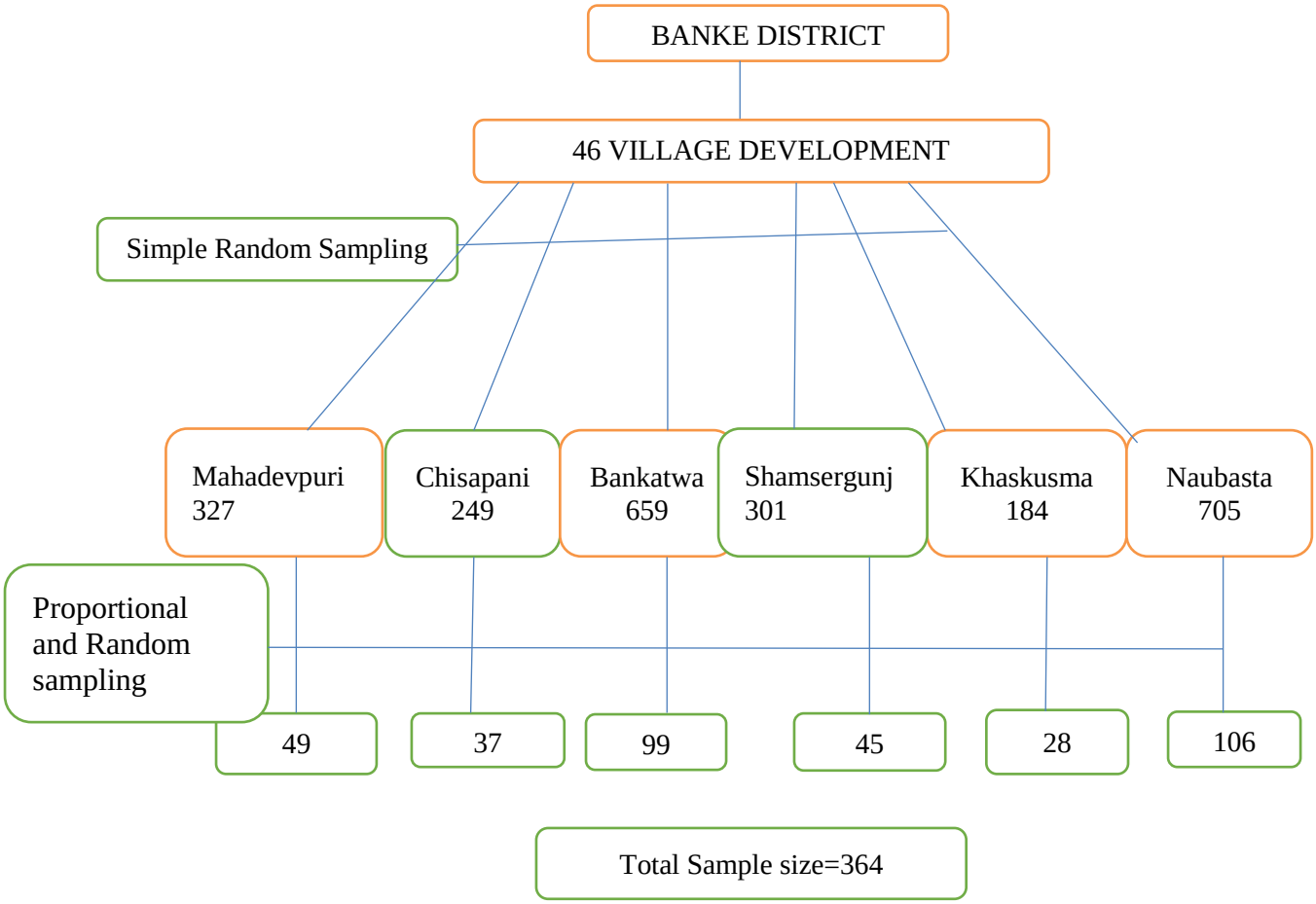


Figure 3.3 Sampling Frame

3.6 Data collection technique and tool

The questionnaire was developed by the researchers according to research objectives, literature review, theoretical framework of the study using precede-proceed Model. Data collection in mothers of children under 1 year old was done by fact to face interview by the researcher and interviewers using a structural questionnaire. Before obtaining the consent, the respondents were informed at least about the purpose of the study, procedure of maintaining confidentiality, the academic use of the findings. A structure questionnaire is developed based on the conceptual framework. The English version of the questionnaire was translated into Nepali language for ease of understanding and data collection.

The questionnaire consisted of following four parts:

A. **Part 1: Socio-demographic factors**

There were 10 questions of socio-demographic status of postpartum women such as: age, women's education, women's occupation, husband's education, husband's occupation, family income, ethnicity and caste.

Age of the women was grouped into three category according base on ministry health and population 18-20 year risk group, 20-35 years normal age group and 36 to 43 year risk group.

Education status of women and husband were categorized into six group no education, primary school, secondary school, higher secondary, university/college and vocational training.

Occupation status women and husband were categorized into five groups: job less, government job, private job, agriculture in male housewife in female.

Household income was categorized into four group: low income rs.500 to 10,000, medium income rs.11000 to 20,000, rs.21,000 to 30,000 and high income more than rs.31,000 i.e rs.108 =1$

Religion divided four categorized as Hindu, Buddhist, Muslim, Christian.

Caste was divided into five groups Brahmin, Chhetri, Janajati, Dalit, and other.

B. Part 2: Predisposing factors

This part consisted of 22 questions including cultural, experience of past delivery; obstruct complication past delivery and during pregnancy time, delivery status and family size.

Knowledge consisted 9 questions with based on score towards the maximum 9 and minimum 4 divided into mean value less than 7 poor knowledge and 7 or more than 7 good knowledge towards antenatal services. They include true, false and do not know responses.

Perception related 9 questions include of postpartum women towards antenatal services. There are three choices of answer in each sentence which were agree, undecided and disagree responses perception was divided into two part good perception and poor perception. Category was done base on mean value maximum and

mean value minimum considering less than 20 poor perceptions and 20 or more than 20 good perception.

C. Part 3: Enabling factors

This part consists of 10 questions including asking about accessibility to antenatal care services, time of first visit, services availability, environmental condition, quality of ANC services, satisfaction of ANC services was close ended question and distance health center to home , traveling cost, waiting time, and whole spent time in each visit was open ended questionnaire.

D. **Part 4: Reinforcing factors**

This part consists of 19 questions including

a) Source of information

Consisted question related to sources of information about antenatal care services from mass medias such as magazines, brochures, internet, television, radio, mobile, FCHV, friend, local leader, relative and health worker. Responses source of information was divided into three levels: personal, media and paper.

b) Support from husband/ family

This includes social support from husband or family about antenatal care services, in term of information, encouragement, advice, money and pre participation/help antenatal checkup. Responses family support was divided into two levels: good family support and poor family support

3.7 Method of data collection

After the proposal was approved by the ethical Review Committee of Mahidol University, the data collection was begun. Data collection was done through face to face interview among mothers with children under 1 year. Regarding the study, there are some steps for data collection method.

1. After receiving approval from the Mahidol Ethical Committee Board, the research had introduced a concept of the study to the head of District Public Health Office (DPHO), Banke district and got permission for the study.

2. The permission was taken from the health center of each VDCs by submitting an official latter from DPHO.

3. After getting the permission, the health center of each VDCs were requested to provided correct information according to the questionnaire.

4. No any respondents were forced to participate without their willing.

5. Data was collected among mother through structured question through face to face interview technique.

3.8 Validity and reliability

3.8.1 Validity

Validity of the instrument where maintenance by questionnaire was examined for the content validity by expert then translated to the Nepali language before running the pre-test.

3.8.2 Reliability

The questionnaire was pretested for the reliable 30 cases among other VDCs in Banke district among mother who have under 1 child. After that it was pretested and evaluated by interviewers. The reliability of the instrument was done through Kuder-Richardson formulae 21 and Cronbach's alpha coefficient for knowledge and perception respectively. Initially, KR 21 for knowledge was 0.82 and cronbach's alpha for perception was 0.87. After pretest, some changes were made in knowledge and perception part of questionnaires. The second pretest found that KR 21 and Coronbach's alpha were 0.83 and 0.90.

3.9 Data management and analysis

All the data were entered by using SPSS Software program 16 versions. Data were cleaned before analyzing. Data analysis was conducted to address the each specific objective of the research.

All the data concerning about the characteristics of respondents was shown by “Descriptive Statistics”. Frequency, percentage, median, mean and standard deviation was used for description of some variables. Information was summarized by using frequency tables and cross tabulations. Chi-square test was used for analysis of association between each independent variable and dependent variable. Multiple logistic regression statistical significance was set up at p value < 0.05.

3.10 Ethical consideration

The protocol was submitted for approval to Ethical Committee of Mahidol University and the District Public Health office Banke, Nepal. After that permission was guaranteed for this study. Informed consent was obtained from each participant before the interview. All of the information from the study was kept confidential in order to protect their right of privacy.

CHAPTER IV
RESULTS

This research aimed to identify factors determining regular use of ANC services in rural communities in Banke district, Nepal. The data collection was conducted from April 26th to May 18th, 2016. The target population was pregnant women residing in the study communities. The data was collected from 364 women of reproductive age group (18-49 years) who had at least one child within the previous 12 month through face to face interview using questionnaires in rural communities in Banke District, Nepal.

4.1 The regular use of antenatal care services

Table 4.1 shows that out of 364 women in this study, almost all women got antenatal care services during their last pregnancy. Around 60% mother 4 ANC only includes at least visit. However, regarding number of ANC visit, 55.8% mother reported they had at least four antenatal care visits.

Table 4.1 Percentage of respondent visit ANC services

Antenatal care services Utilization	Frequency	Percentage
ANC visit during the last pregnancy		
- Yes	344	94.5
- No	20	5.5
Number of ANC visits (n=344)		
- <4 time	141	40.9
- ≥4 time	203	59.1
Regular visits of ANC services (n=364)		
- Yes	203	55.8
- No	161	44.2

4.2 Frequency and percentage of socio demographic factors

Of the 364 pregnant women, around 80% mothers were between normal age group 21 to 35 years and the rest (high risk group) were more than 36 years (7%) or age 18 to 20 years (13%) (Table 4.2).

With regard to education, around half percentage of pregnant women had primary school education while 12 % had no schooling and 13% had high school or higher education. For husband education level, about 40% completed secondary school and 46% graduated high school or higher education, while those graduating primary school or no school were 13.5% and 1.6%, respectively.

Regarding occupation, while almost 80% of pregnant women are housewife, around 60% of pregnant women reported their husbands are involved agriculture.

For family income, about 3/4 of the family had low income per month. When the pregnant women were asked about the caste, nearly 50% responded either Chhetri. Most of the respondents were Hindu around 83% followed by Buddhist 9.6%.

Table 4.2 Frequency and percentage of respondents by socio-demographic characteristics

Socio-demographic characteristics	Frequency	Percentage
Age Group		
- 18 to 20	46	12.6
- 21 to 35	291	79.9
- 36 to 43	27	7.4
Mean = 26.9, SD = 5.6, Min = 18, Max = 43		
Education of pregnant women		
- No schooling	44	12.1
- Primary school	181	49.7
- Secondary school	87	23.9
- High school	37	10.2
- University	11	3.0
- Vocational training	4	1.1

Table 4.2 Frequency and percentage of respondents by socio-demographic characteristics (cont.)

Socio-demographic characteristics	Frequency	Percentage
Husband Education		
- No schooling	6	1.6
- Primary school	49	13.5
- Secondary school	145	39.8
- High school	131	36.0
- University	30	8.2
- Vocational training	3	0.9
Occupation of mothers		
- Job less	1	0.3
- Government	13	3.6
- Private	40	11.0
- Housewife	291	79.9
- Agriculture	19	5.2
Occupation of husbands		
- Government job	16	4.4
- Private job	74	20.3
- Agriculture	212	58.2
- Labour	61	16.8
- Jobless	1	0.3
Monthly income		
- Rs.500 to Rs.10,000	245	67.3
- Rs.11,000 to Rs20,000	88	24.2
- Rs.21,000 to Rs.30,000	27	7.4
- Rs.31,000 to Rs.35,000	4	1.1
Mean= 9,549 SD = 6,570 Min = 500 Max = 35,000		

Table 4.2 Frequency and percentage of respondents by socio-demographic characteristics (cont.)

Socio-demographic characteristics	Frequency	Percentage
Caste		
- Brahmin	30	8.2
- Chhetri	173	47.6
- Dalit	52	14.3
- Janajati	95	26.1
- Other (Kumal	14	3.8
Religion		
- Hindu	302	83.0
- Buddha	35	9.6
- Muslim	22	6.O
- Other (Christian)	5	1.4

4.3 Descriptive of predisposing factors

Table 4.3 shows that around half of the mothers have first visit for ANC services during last pregnancy within 12 weeks. Almost 3/4 percentage of mothers have delivered babies in last 12 month. Regarding the place for the first and last delivery, around half percentage of mothers reported that they delivered the first baby in a health institution and 3/5 percentage of mothers reported the last delivery was done in a health institution.

Table 4.3 The number of deliveries and places for the first and the last delivery

Predisposing factors	Frequency	Percentage
Regular visit of ANC services		
- <12 weeks	171	49.7
- ≥12 weeks	141	41.0
- do not know	32	9.3

Table 4.3 The number of deliveries and places for the first and the last delivery (cont.)

Predisposing factors	Frequency	Percentage
Number of deliveries		
- ≤2 child	269	73.9
- >2 child	95	26.1
Mean=2.07, SD=0.95, Min=1, Max=6		
Place of the first delivery		
- At home	179	49.2
- At a health institution	185	50.8
Place of the last delivery		
- At home	141	38.7
- At health institution	223	61.3

Table 4.4 shows the types of complications among pregnant mothers. Around 70% of pregnant women had no complication, while 30% of mothers had at least one complication.

Table 4.4 The types and number of complication of pregnant women

Complication	Yes		No	
	n	(%)	n	(%)
Type complication of pregnant women(multiple answers)				
1. Premature delivery	8	2.2	356	97.8
2. Abortion	36	9.9	328	90.1
3. Stillbirth	12	3.3	352	96.7
4. Bleeding per vagina	40	11.0	324	89.0
5. Neonatal death	13	3.6	351	96.4
6. Other complications	15	4.1	349	95.9

Number of complications	Frequency	Percentage
- No complication	249	68.4
- Complication	115	31.6

Knowledge about pregnancy

Table 4.5 shows that 90% of pregnant woman gave correct answer regarding knowledge about level of ANC services. Level of ANC services includes 5 question about provision of health services to pregnant women by doctor, nurse, midwives, Skill Birth Attendant (SBA) trainer health person, and pregnant women should visit ANC services clinic at least four time. Further ANC consists of regular examination about mother blood pressure, weight, fetal heartbeat, tetanus immunization, iron supplementation and risk factor to smoke and consume alcohol during ANC. Similarly about more than 80% mother gave correct answer about two question (asking about only pregnant women with complication should go to ANC and uncomplicated pregnancy women do not need for ANC) and (asking about another two question pregnant women should visit ANC for the first time when they feel fetal movement and ANC is an opportunity to inform pregnant women about danger sign and symptom that is poor knowledge).

Table 4.5 Question items of knowledge regarding antenatal care services in pregnant women (correct answer)

Knowledge antenatal care services	Frequency	Percentage
1. ANC is the provision of health services to pregnant women by professional (doctor, nurse, midwives, and SBA trainer health person)	326	89.6
2. Pregnant women should visit ANC for the first time when they feel fetal movement †	244	67.0
3. Pregnant women should visit ANC services clinic at least 4 time	341	93.7
4. Only pregnant women with complication should go to ANC †	323	88.7
5. ANC consists of regular examination to check the include mother's blood pressure, weight, fetal heartbeat, tetanus immunization, iron and folic supplementation.	333	91.5
6. ANC is an opportunity to inform pregnant women about danger sign and symptom.	198	54.4

Table 4.5 Question items of knowledge regarding antenatal care services in pregnant women (correct answer) (cont.)

7. Blood and Urine testing during ANC is infection status during pregnancy.	326	89.6
8. necessary to access the anaemia and vaginal Uncomplicated pregnant women do not need for ANC †	308	84.6
9. Risk factor to smoke and consume alcohol during ANC period	333	91.5

† Negative questions were reverse coded.

Finally, the women knowledge was categorized into two levels score of knowledge minimum 4 and maximum 9, More than 7 or more than 7 score base on mean value was considered good and score within less than 7 was considered poor knowledge. Table 4.6 shows that 88.2% mothers had good level of knowledge, while only 11.8% of mothers showed poor level of knowledge.

Table 4.6 Knowledge level of pregnant women

Knowledge about antenatal care service utilization	Frequency	Percentage
- Good knowledge (≥ 7 score)	321	88.2
- Poor knowledge (< 7 score)	43	11.8
Mean = 7.5, SD =0.9, Minimum = 4, Maximum =9		

Perception about antenatal care service utilization

Perception about antenatal care service utilization asking about 9 positive and negative questions find out that the perception level of pregnant mother showed more than 60 to 66% mother was agree in 6 question i.e. i receive good services during ANC, I felt peaceful when I visited ANC with my husband or my family at the first time, i feel tired of waiting during ANC, I am afraid of blood testing at ANC, I receive good rapport from health personal during ANC, and I feel comfortable when I meet other pregnant women during ANC visits that is good perception of ANC services and less than 60% mother was agree three question i.e. I receive useful information from ANC visit, I feel safe when I go for an ANC as appointment and if I have no

complication during pregnancy I will not go to ANC that is poor perception of ANC services.

Table 4.7 Percentage of perceptions toward antenatal care services their responses in pregnant women

Perceptions toward antenatal care services	Agree (%)	Undecided (%)	Disagree (%)
1. I receive good services during ANC	64.0	17.3	18.7
2. I felt peaceful when I visited ANC with my husband or my family at the first time	62.6	17.6	19.8
3. I feel tired of waiting during ANC†	65.1	16.5	18.4
4. I am afraid of blood testing at ANC†	64.0	17.0	19.0
5. I receive good rapport from health personal during ANC	65.9	15.4	18.7
6. I feel comfortable when I meet other pregnant women during ANC visits	60.4	17.0	22.5
7. I feel I receive useful information from ANC visit	57.4	19.0	23.6
8. I feel safe when I go for an ANC as appointment	55.5	20.1	24.5
9. If I have no complication during pregnancy. I will not go to ANC †	45.3	17.9	36.8

† Negative questions were reverse coded.

Finally, the women perception was categorized into two levels. The total score of perception more than 20 or more than 20 was considered good and score within less than 20 was considered poor perception base on mean value. Table 4.8 show that 2/3 mothers had good level of perception, while only 1/3 mothers had poor level of perception**.**

Table 4.8 Perception level of pregnant women

Perception about antenatal care service utilization	Frequency	Percent
- Good perception (20 or more than 20)	247	67.9
- Poor perception (less than 20)	117	32.1
Mean = 20, SD =2.38, Minimum = 13, Maximum =26		

4.4 Descriptive of enabling factors

Table 4.9 shows that almost of the (99.5%) health institution available antenatal care services and (72.8%) health institution available services provider visit time health institution and (67.9%) health institution environment is well.

Table 4.9 Availability of ANC services

Enabling factors	Frequency	Percent
ANC services available		
- Yes	362	99.5
- No	2	0.5
ANC services provider available		
- Yes	265	72.8
- No	99	27.2
ANC clinic environment is good		
- Yes	247	67.9
- No	117	32.1

Table 4.10 shows that more than half percentage (52.2%) health institution less than 2 kilometer and (70%) mother are travelling costs 1 to 50 rupees spent home to health institution and waiting time spent see the health worker less than 20 minutes (87%) and (61%) spent time each visit as a whole time less than 2 hours.

Table 4.10 Descriptive statistics of Accessibility to ANC services

Accessibility	Frequency	Percent
Distance to Health institution for ANC services		
- ≤ 2 km	190	52.2
- 2 to 5 km	108	29.7
- >5 km	66	18.1
Travel costs from home to health institution		
- No travel costs	40	11.0
- Rs.1 to 50	251	69.0
- > Rs.50	73	20.0
Mean = 30, SD = 2.33, Minimum=0,Maximum =100		
Waiting time to see health workers		
- <20 minutes	317	87.1
- ≥20 minutes	47	12.9
Time spent for each ANC visit (including travel time)		
- ≤2 hour.	222	61.0
- >2 hour.	142	39.0

Table 4.11 shows that 73.6% of mothers reported the quality of ANC services were fair or good and 64% said they are satisfied with ANC service.

Table 4.11 Quality of ANC and satisfaction on ANC services

Quality and satisfaction	Frequency	Percent
Quality of ANC services		
- Good	268	73.6
- Poor	96	26.4
Satisfaction of ANC services		
- Yes	233	64.0
- No	131	36.0

4.5 Descriptive of reinforcing factors

Source of Information

For the source of social support asking about information 11 questions divided 3 group personal, printed media and broadcast media. It was found that more than 77% of personal get information from FCHV, 62% health worker, 64% relative and only less than 44% are local leader and friend. So result showed that most of the women get information from FCHV and then printing media nearly half percentage get information from poster and 1/3 was get information through magazines and only ¼ get through internet, similarly broadcast media around 69% of gate information radio, around 60% TV and only around 25% are gate information mobile.

Table 4.12 Frequency and percentage by source of information

Source of information	Yes		Rank	No	
	n	(%)		n	(%)
1. Magazines	134	36.8	8	230	63.2
2. Poster or brochures	161	44.2	6	203	55.8
3. Internet or Facebook	99	27.2	9	265	72.8
4. TV	213	58.5	5	151	41.5
5. Radio	250	68.7	2	114	31.3
6. Mobile	95	26.1	10	269	73.9
7. Female Community Health Volunteers (FCHV)	280	76.9	1	84	23.1
8. Friends	161	44.2	6	203	55.8
9. Local leaders	94	25.8	11	270	74.2
10. Relatives	233	64.0	3	131	36.0
11. Health workers	225	61.8	4	139	38.2

Study find out 5 Personal were source of information i.e. female community health volunteer, friend, health worker, local leader and relative. Further study finds out 3 printing media as source of information question magazines, poster,

and internet. Similarly 3 question broadcast media i.e. tv, radio and mobile at least one media get the information was yes if no get the information no. So around 90% of mother gets the information personal and around 60% mother gate the information printed media and broadcast media. Table 4.13 show that around 90% mothers reported the source of information personal and around 60% mother group are source printed media and broadcast media.

Table 4.13 Frequency and percentage by source of information

Source of information	Yes		No	
	n	(%)	n	(%)
1. Personnel	323	88.7	41	11.3
2. Print media	231	63.5	133	36.5
3. Broadcast media	227	62.4	137	37.6

Family support

Asking 8 question family support result found that around 90% was yes i.e. Do your husband given information about ANC, Does your husband encourage you to follow ANC guidelines, Does your husband advise you to use ANC for regular check-up, Does your husband accompany you to visit ANC, Do you share the information you get at ANC with your husband, Do you have relatives with whom you can talk about your pregnancy, Do your relatives encourage you to receive ANC only around 10% are no family support and around ¾ was yes Does your husband participate in the training organized by hospital about ANC and ¼ mother are no.

Table 4.14 Percentages of respondents by family support toward antenatal care services

No. Statement	A lot (%)	Moderate (%)	A few (%)	Never (%)
1. Do your husband given information about ANC?	5.8	51.6	33.2	9.3
2. Does your husband encourage you to follow ANC guidelines?	3.6	47.8	36.0	12.6
3. Does your husband advise you to use ANC for regular check-up?	3.8	49.7	33.2	13.2
4. Does your husband accompany you to visit ANC?	4.1	49.5	34.3	12.1
5. Do you share the information you get at ANC with your husband?	4.7	50.3	34.3	10.7
6. Do you have relatives with whom you can talk about your pregnancy?	4.1	48.4	34.9	12.6
7. Do your relatives encourage you to receive ANC?	4.1	50.6	32.4	12.9
8. Does your husband participate in the training organized by hospital about ANC?	2.8	41.5	30.5	25.3

Finally, the women family support was categorized into two levels. The total score base on mean value. Family support 11 or more than11 was considered good and score within less than 11 was considered poor. Family support divided into two group good and poor family support. Table 4.15 shows that 57% mothers reported the good level of family support.

Table 4.15 Level of family support of pregnant women

family support	Frequency	Percent
- Good family support (≥ 11)	206	56.6
- Poor family support (< 11)	158	43.4
Mean = 11.77, SD =1.77, Minimum = 8, Maximum = 16		

4.6 Association between the various independent variables and regular use of antenatal care services

In table 4.16 We present only a significant related between independence variable and regular use of antenatal care such as socio-demographic factors: husband occupation, and predisposing factors: complication, perception and enabling factor: distance home to health center, traveling cost, waiting time, quality of ANC services, satisfaction of antenatal care services and reinforcing factors: information get about TV, FCHV, were regrouped in order to get enough respondents for statistical analysis. Chi-squire test was used to determine the association between regular visit of antenatal care services, a dependent variable and independent variables.

Socio-demographic factor

The result shows that husband occupation around 53% working in agriculture and around 47% husbands working outside took the regular use of antenatal care regularly. By comparison between those groups the women having the husband occupation agriculture took the antenatal care regularly. The value shows this table indicated that there was a significant relation between husband occupation and regular use of antenatal care.

Predisposing Factors

The result also complication of pregnancy women showed that 74% mother having no any complication and 26% mother having at list one complication. So no complication mother groups are comparatively between group high levels of

regular use of ANC services. So the value shows this table indicated that there was a significant related between complication and regular use of antenatal care.

The result of perception showed that around 64% of mother good perception and 36% of mother are poor perception. The result showed between perception good perception mother groups was high level of regular use of ANC services. So the value shows this table indicated that there was a significant related between perception and regular use of antenatal care.

Enabling Factors

Regarding to enabling factor, distance of health center within two kilometer distance mother group more than 50% regular use of ANC services, around 35% mother was three to five kilometer and only 14% of mother was greater than six kilometer. So result showed that less distance mother was more regular use ANC services. There was also significant between distance of health center and regular use of ANC services.

Regarding to the traveling cost result showed that around 80% of mother travelling cost was 1 to 50 rupees and only 20 % of mother group less tha1 and more than 50 rupees so result showed that less traveling cost was more regular use of antenatal care services. There was significant between traveling cost and regular use antenatal care services.

Regarding to waiting time, where was also a statistically significant relation between waiting time and regular use ANC services. Result showed that more than 4/5 women are less than within 20 minute and less than 1/5 women are more than 20 minute. So result showed that less tome waiting mother more use antenatal care services.

78% of mother was showed good quality health service and only 22% of mother was told poor quality of ANC services. So, between Quality of ANC services and regular use of antenatal care services are also signification. Result showed that if good quality health services are more regular use ANC services.

Satisfaction of ANC services also significant of regular use of antenatal care, around ¾ mothers was good satisfy of ANC services and only ¼ mothers was

poor satisfy, so high satisfy level mother high level of use ANC services and low satisfy mother low level of use antenatal care services.

Reinforcing factors

Regarding the reinforcing factor, more than 3/5 mothers gate the information TV and less than 2/5 mothers was gate information TV, so result showed that high level of watching TV mother was more level of regular use ANC services. Between information TV and regular use of ANC services are also statistical significant.

Similarly female community health volunteer provided the information mother group was more than 80% and not provided information FCHV only less than 20% so result showed that get information FCHV more regular use ANC. Information FCHV and regular use ANC services was signification regular use ANC services.

Table 4.16 Association between Independence variable and time visit ANC Services

Factors	Non-regular		Regular		Chi-squire	P-value
	n	(%)	n	(%)		
Socio-demographic factors						
Husband occupation						
- Agriculture	105	65.2	107	52.7	5.776	**.016***
- Work outside place	56	34.8	96	47.3		
Predisposing Factors						
Number of complications						
- No any complication	99	61.5	150	73.9	6.389	**011***
- Complication (≥1)	62	38.5	53	26.1		
Perception						
- Good	118	73.3	129	63.5	3.909	**.048***
- Poor	43	26.7	74	36.5		

***Significant at p-value <0.05**

Table 4.16 Association between Independence variable and time visit ANC Services (cont.)

Factors	Non-regular		Regular		Chi-squire	P-value
	n	(%)	n	(%)		
Enabling Factors						
Distance of health center						
- ≤2 km	86	53.4	104	51.2	7.409	**.025***
- >2 km to ≤5 km	38	23.6	70	34.5		
- >5 km	37	23.0	29	14.3		
Traveling costs						
- No costs	29	18.0	11	5.4	25.332	**<.001**
- Rs.1 to 50	90	55.9	161	79.3		*
- More than Rs.50	42	26.1	31	15.3		
Waiting time						
- Less than 20 minute	150	93.2	167	82.3	9.490	
- More than 20 minute	11	6.8	36	17.7		**.002***
Quality of services						
- Good	110	68.3	158	77.8	4.182	
- Poor	51	31.7	45	22.2		**.041***
Service satisfaction						
- Yes	89	55.3	144	70.9	9.554	
- No	72	44.7	59	29.1		**.002***
Reinforcing Factor						
Information about TV						
Yes	84	52.2	129	63.5	4.784	**.029***
No	77	47.8	74	36.5		
Information about FCHV						
Yes	116	72.0	164	80.8	3.862	**.049***
No	45	28.0	39	19.2		

***Significant at p-value <0.05**

4.7 Predictor for regular use of antenatal care services

In this part, multiple logistic regression use to determine significant predictor related to regular use of antenatal care services. Multiple logistic regression analysis was used to identify the association between the independent factors (husband occupation, complication, perception of ANC, distance of health center, traveling cost, waiting time, quality of ANC services, satisfaction ANC services provider and

information TV, female community health volunteer) and regular use of antenatal care services which found statistical signification in chi-square test.

Table 4.17 Complication of pregnant mother, perception of ANC services, distance of ANC health center, traveling cost, weighting time, quality of ANC services, satisfaction level of ANC services provider, and information get TV were significantly associated with regular use of antenatal care services (p-value .016, .012, .001, .001, .005, .006, and .008), although husband occupation, complication, information of FCHV were not significantly associated with regular use of antenatal care services.

The find model in table 4.13 illustrated that seven selected factor each had a signification with regular use of antenatal care services. The respondents was good perception almost 2 time more likely to be poor perception regular taken antenatal care, less within 2 kilometer distance also more like 3 time and 3 to 5 kilometer more than 2 time likely 6 kilometer, traveling cost was almost 5 time less than 1 rupees than and 2 time 1 to 50 rupees more than 50 rupees more likely regular use of antenatal care use, waiting time and quality of ANC services between were more likely less than 20 minute, good quality regular use of antenatal care than respondents who has more than 20 minute, poor quality. And then satisfaction level, information TV, was more than 2 times yes than no women regular use antenatal care.

Table 4.17 The multiple logistic regression to predict determinants of regular visits of antenatal care services (≥ 4 times)

Factors	Adj. OR	95% CI		P-value
		Lower	Upper	
Socio-demographic factor				
Husband occupation				
- Agriculture	1.502	.919	2.457	.105
- Work about outside	1			

***Significant at p-value <0.05**

Table 4.17 The multiple logistic regression to predict determinants of regular visits of antenatal care services (≥ 4 times) (cont.)

Factors	Adj. OR	95% CI		P-value
		Lower	Upper	
Predisposing Factors				
Number of complications				
- No any complication	1.558	.932	2.603	.090
- Complication	1			
Perception				
- Good	1.838	1.119	3.018	**.016***
- Poor	1			
Enabling factors				
Distance Heath center				
- ≤2 km	2.197	1.165	4.144	**.015***
- >2 km to ≤5 km	1.484	.838	2.627	.175
- >5 km	1			
Traveling cost				
- Less than Rs.1	1.946	.844	4.484	**.001***
- Rs.1 to 50	.413	.243	.702	.118
- More than Rs.50	1			
Waiting time				
- Less than 20 minute	2.940	1.445	5.981	**.001***
- More than 20 minute	1			
Quality of health services				
- Good	2.099	1.247	3.536	**.005***
- Poor	1			
Satisfaction on health services				
- Yes	1.942	1.212	3.110	**.006***
- No	1			

***Significant at p-value <0.05**

Table 4.17 The multiple logistic regression to predict determinants of regular visits of antenatal care services (≥ 4 times) (cont.)

Reinforcing factors				
Information from TV				
- Yes	1.895	1.181	3.042	**.008***
- No	1			
Information from FCHV				
- Yes	1.406	.830	2.380	.205
- No	1			

***Significant at p-value <0.05**

CHAPTER V
DISCUSSION

Cross-sectional descriptive study was conducted in married women of reproductive age group (18-49 years), who had at least one child within previous 1 year at rural community of Banke District, Nepal. Total of 364 pregnant women participated in the study which was carried out by face to face interview with structural questionnaire. The data were collected from April 26 to May 18, 2016. Maternal mortality rate is higher in rural areas compared to urban area in Nepal. The aim of this study was to identify factors related to the regular use of antenatal care in Banke District, of Nepal.

5.1 Regular use of antenatal care services

Study find out that 94.5% of participants utilize ANC services. This result is a little higher than a study from Nigeria which has 90.7% of women utilize ANC services and received care from skilled ANC providers (69). This study found that there are 56% of women who use regular antenatal care for four times or more. This result is a 10% lower than a study from Indonesia which has 66% of women had four recommended antenatal care services visit (70). The finding also similar to Cambodia which has 95% of women used antenatal care services and 59% of women have attendant antenatal care services health clinic four or more than four time (71). Ministry of health and population report of Nepal shows that 98.1% women use ANC services throughout the country however in Terai region 95.5 % of women use at least one visit of ANC services (72).

Similar study in Nepal related to antenatal care shows that women receive antenatal care in hospital, primary health care canter, Heath post, sub health post and outreach clinics is between 67% and 71%. However, skilled birth attendant antenatal care is highest in the central and mid-western Terai sub-region. Further there are

disparities in ANC utilization between rural and urban area 64% and 38% respectively (73).

5.2 Socio-demographic characteristics

This study shows that majority of women were between normal pregnancy age group (21-35 year) . This result is similar to study in Ghana which also shows that about 80% of women were between normal pregnancy age group (21-35 years (74). The majority (60.3%) were aged between 20 and 34 years and 3/4 (75.3%) of them resided in rural areas which is similar to that of Timor-Lested demography study (75). The result of this study showed that education level of the study women was low compared to that of husband education. Further study show that 63 % of mother do not have no education and primary education. This result was supported by similar study in Nepal which also found that 64 % mother do not have any education or primary level education. Further it was found that majority of the woman were housewife and majority of their husband were in agriculture sectors 79.9% and 58.2% respectively. This finding was supported by similar study in Nepal which found that occupation of women 78% (76). Study found that most of the women were Hindu 83.0%. Further majority of the respondent's caste was Chhetri 47.6% which is one of the upper castes in Nepal. This result was supported by similar study in Nepal which shows 83% of respondents Hindu and majority from upper (77). Further most of the participants have low income both at individual and household level and this result was also similar to study from \Nepal and study from India where most of the respondents were from low and middle income family (60, 78). Most of the above findings were supported by similar study from South-Sudan which shows 72% of the participants were age group between 20 and 34 years, further 78% women do not have formal education.

Concerning about caste and culture belief, there is signification association between caste and regular use of antenatal care services. This may be due to the fact that lower caste people have lower education with poor income and less access to media. There is a significant association between husband occupation and regular use of antenatal care services. Those women who have husband working in agriculture are more likely to visit ANC services because they stay together in home.

5.3 Predisposing factors

This study found that pregnancy, delivery and post-delivery complication was around 30% which was higher than similar study in Indonesia which have only complication of less than 30% (70). Regular visit of ANC services within 12 weeks was around 50%. Further 3/4 of the respondents have less than 2 child and 3/5 pregnant mother was last delivery in health centre. National survey data revealed that majority of Nepali mothers did not prepare any of the four activities and only half of the women made the recommended four or more antenatal care visits. Even though birth preparedness being incorporated into the national safe motherhood programme. Further particular, women who made five or more antenatal care visits were almost five times more likely to deliver at a health facility compared to those who paid no visit prior to delivery (80).

Knowledge on antenatal care services

Study found that 88% of the respondent said that level of knowledge is good. However, those mothers with little education level and whose partners had no education were less likely to attend the recommended four antenatal visits. In general, educated parents have better knowledge on the importance of antenatal care services (81). However, it was not significant association between regular antenatal cares. This result was similarity of previous study in Nepal and India (60, 82).

Perception on antenatal care services

Perception towards antenatal care was found to be significantly association with time of visit and regular use of antenatal care services. Women who had negative perception towards the antenatal care services were more likely to use irregular and late antenatal care than women with positive perception. This result was similar to the previous study in Nepal (83).

5.4 Enabling factors/ accessibility of antenatal care services

Most (99.5%) of the health institution provides antenatal care services and one third percentage of health institution provides health services in good environment. Result showed that 52.5% of the health centres are less than 2 kilometres

from respondents' house. Study found that 69% of the respondents spend less than 50 rupees, around 2/3 traveling cost, 87% less than 20 minute weighting time, around one third found that quality of health service, 61% mother spent time of each ANC visit less than 3 hour and 64% mother are satisfaction of ANC services. Distance of health centre, Traveling cost, weighting time, quality of health services and satisfaction of ANC services towards antenatal care was found to be significantly association with time of visit regular use of antenatal care at p value from 0.025, <0.001, <0.002, .0041 and 0.002 respectively. Similar study Pregnant Women in Tanzania and South- Sahara Africa 93% of pregnant women attended the same type of health facility in the same sector (public or private) for all their antenatal visits and reported long distance to health facility, first ANC visit after four months of pregnancy and woman's desire to avoid pregnancy. The exploration of these factors is important to develop public health strategies that address key issues that hinder women from attending four or more antenatal visits (ANC 4) in Tanzania. All other geographic zones were associated with lower attendance of four or more ANC visits might be associated with higher availability of good quality ANC services. A number of studies have reported the positive association between higher quality of services and higher rates of utilization of maternal health services, including antenatal care in 2010 (81, 84).

The extra costs required in seeking care discouraged some rural women from going to ANC services. The existing health facilities in rural areas do not have laboratory facilities required to be able to do the basic ANC tests. Therefore, ANC services should be made easily accessible to rural women. Expansion of such facilities may help to reduce travel distances that ultimately reduces travel time and opportunity cost for the services. It could be dealt with by running free transportation service to the ANC clinic for pregnant women in rural settings. It can be easily done through collaboration with local transportation services. Furthermore running regular mobile ANC clinic in very rural settings where the road is inaccessible for motor vehicles is another option to help women to access ANC. The opportunity costs are very high for rural women. These include time spent on travel and waiting to see service providers, often amounting to the loss of a day's wage, and can be a significant proportion of the total ANC costs. The opportunity costs may be an important determinant of ANC uptake in rural Nepal and too high for the poorest families. Travelling was several

kilometres away, meaning they had to spend a considerable amount on transport, food and accompanying people. The Government of Nepal's current initiative to provide a maternity allowance of 500 to 1,500 NRs and free delivery are positive actions which may improve this situation (85). The majority of poor women did not attend ANC because of its perceived unaffordability. Spending scarce resources even for basic ANC was seen as inappropriate among poor women who lacked resources to pay back money borrowed for this purpose. Poor mother generally having less access to health services similarly, women from lower economic status and from less advantaged areas used less delivery care in Bangladesh as well as had fewer antenatal visits in Ghana 2012. This paper has explored the effects of cost on ANC among user and non-user women in rural community, whereas previous studies in Nepal 2012. As this is a qualitative study we have not quantified the actual cost involved. This study is small scale, covering a particular geographical community and findings might not be transferable; although similarities with other studies in South Asia suggest that our result have wider relevance (11. 13).

5.5 Reinforcing/ family support of antenatal care services

Most (88.7%) of the study women information gate personnel, 63.5% of the women gate the information printed media and 62.4% of the women are gate information broadcast media. Most (77%) of the pregnant women gate the information female community health volunteers and radio 69%, television around 59%, health worker 62%, relative 64%, poster and friend 44% one of the study in Nepal 2015 showed the result 60% of the respondent were expose radio, 43.1% followed television, 29.7% printed media, 28.8% health worker, and around 17% of the mother was newspaper. ANC utilization figure are relatively high compared to this study and also national figure by national demographic health survey 2011 (38, 43).

In this study, information gate TV and female community Health volunteer the chai-square test (p-value=0.029, 0.049) received the information with TV, FCHV association with the regular use of antenatal care services. When testing this association using multiple logistic regression analysis, it was found that FCHV was not association with irregular antenatal care. Around 60% mother gate information TV

and 77% of mother gate information FCHV. (67) This study related Nepal mass media related antenatal care previous research.

CHAPTER VI
CONCLUSION

6.1 Conclusion

Aim of this community based cross-sectional descriptive study was to identify the prevalence and factor associated with regular use of antenatal care (ANC) services among Nepal women. Further to determine the promotion and factor association of regular use of antenatal care services. The conceptual framework of this study was based on literature review in previous studies and Precede-proceed model was used. Dependent variable of the study was regular used of ANC services and independent variable of the study was socio-demography, predisposing, enabling and reinforcing factor.

The data collection was done after approvel from Mahidol University Ethical Committee in April 26 to May 18, 2015. Respondeents were married women of the reproductive age (18-49 years) who had at least one child within previous 12 months in rural communities Banke district, Nepal.

The result showed that 94.5% mother use ANC services during their last pregnancy and follow World health organization recommended to attend at least four ANC visit during pregnancy within 4th, 6th or 7th, 8th and 9th month. “WHO Antenatal Care Model” The Regular visit Antenatal care at least 4 Times or more than 4 times following the guidelines. The pregnant women should come to ANC services one time at first trimester, one time second trimester, and two times third trimester. Only 56% of mother follow WHO guidelines and have regular visit. Similarly low education, housewife was majority in women but in husband majority of occupation agriculture and education was secondary school. Knowledge, perception and family support from 88%, 68%, and 61%.One third percentage mother use quality and satisfaction of ANC health services.

ANC visit increases with decreases in distance of health care centres, decrees in travelling cost, decrees in waiting time to see the health person, increase

quality of ANC services and increase satisfaction levels of services utilization. Further woman with husband occupation as farmer increases ANC visits compared to woman husband working outside place. Further woman with more complication are likely to visit ANC more often. Furthermore increasing the positive perception about ANC also increase the ANC visit. Further information from FCHV and TV helps to increase ANC visit. Demographic factors husband occupation helps to increase ANC visit as it was statistically significant and other factors like complication, perception, distance health centre, traveling cast, weighting time, quality of ANC services, satisfaction of ANC services and information gate about TV, FCHV through (0.016, 0.011, 0.048, 0.025, <0.001, 0.002, 0.0041, 0.002, 0.029 and 0.049). This study found that family how had occupation agriculture level of education are also low so direct or indirect effect of regular use of ANC services use.

Actual traveling cost, waiting time and satisfaction level is a key factor preventing ANC uptake among poor and rural Nepalese women. However, it is not the only factors as perceptions also play a key role Policy makers have to consider when planning appropriate maternity services whether these are affordable and available to rural and poor Nepalese women.

6.2 Recommendations

6.2.1 Recommendations for implementation

To increase the ANC visit distance between health centres and household of the pregnant woman should be decrease. Further travelling cost to health centre, quality of ANC services and waiting time to see personal should be decreased. Furthermore ANC services should advertise through FCHV, health professionals and mass media. Further husband should be encouraged to stay with wife during her pregnancy.

ANC visit increases with decreases in distance of health care centres, decrees in travelling cost, decrees in waiting time to see the health person, increase quality of ANC services and increase satisfaction levels of services utilization. Further woman with husband occupation as farmer increases ANC visits compared to woman husband working outside place. Further woman with more complication are likely to visit ANC more often. Furthermore increasing the positive perception about ANC also increase the ANC visit. Further information from FCHV and TV helps to increase ANC visits

Needed to improve health centre quality health services, centralization health centre was development decentralization. So conduct the outreach clinic frequently communities and cluster level.

Improvement services provide very quickly, waiting time ate make less time, provided well knowledge health services provider through training, improve the satisfaction of client.

Improvement of government health policy provided transportation incentive pregnant mother.

Based on these finding it is recommended that more efficient and effective health education programmes should be improve awareness program conduct related ANC services, through health education, TV program and health promotion.

Female community health volunteer was very close in community mother group so provided the health education and awareness program community based play vital role for more regular use of ANC services.

Being from disadvantaged occupation, perception, time of use health services, quality of health services, satisfaction level of health services and information FCHV and TV exposure related to maternal health service.

6.2.2 Recommendations for future study

This study was conducted using a cross sectional study therefore longitudinal study or cohort study to capture the timing between measuring women’s problem and regular use quality antenatal care services

Regular use of antenatal care assessed in term of only mother group, therefore further study should also focus on services providers' point of view.

This study was conducted only in rural communities of Banke District, Nepal. The result cannot present of whole pregnant mothers in rural communities. Therefore, target population for next study should induce women from urban area and different socio-demographic factor and health status like geography, lifestyle, belief, education income.

REFERENCES

1. WHO. SAVING MOTHERS LIVES: WORLD HEALTH ORGANIZATION http://www.who.int/reproductivehealth/publications/monitoring/Full-infographic.pdf?ua=1. 2015.
2. WHO U, UNFPA AND THE WORLD BANK. Maternal Mortalityin 2005 Estimates developed by WHO, UNICEF, UNFPA and The World Bank. 2007
3. Walvekar V VA. Christopher, B., ed. A textbook of postpartum hemorrhage: a comprehensive guide to evaluation, management and surgical intervention. JAYPEE BROTHERS PUBLISHERS, 2006: 372-5.
4. Khan KS, Wojdyla D, Say L, Gülmezoglu AM, Van Look PFA. WHO analysis of causes of maternal death: a systematic review. The Lancet. 2006;367(9516):1066-74.
5. Nicholas J Kassebaum* AB-V, Megan S Coggeshall, Katya A Shackelford, Caitlyn Steiner, . Global, regional, and national levels and causes of maternal. 2014;Vol 384
6. WHO U, UNFPA, The World Bank. Trends in maternal mortality 1990 to 2013. Estimates by WHO, UNICEF, UNFPA, The World Bank and the. 2013.
7. Countdown Coverage Writing Group obotCtCG. Countdown to 2015 for maternal, newborn, and child survival: the 2008 report on tracking coverage of interventions. The Lancet. 2008;371(9620):1247-58.
8. Tucker J, Hall M, Howie P, Reid M, Barbour R, du V Florey C, et al. Should obstetricians see women with normal pregnancies? A multicentre randomised controlled trial of routine antenatal care by general practitioners and midwives compared with shared care led by obstetricians. BMJ. 1996;312(7030):554-9.
9. Ornella Lincetto SM -A PG, Stephen Munjanja. Opportunities for Africa's Newborns: World Health Organization. . 2010: 246.

10. Kenneth Finlayson SD. Why do women not use antenatal services in low and middle-income country. Research into Childbirth and Health Unit, School of Health, University of Central Lancashire, Preston, United Kingdompmed1001373. 2013.
11. Government of Nepal National Planning Commission Secretarial Central Bureau of Statistics Kathamandu N. National Population and Housing Census (National Report). 2011.
12. Falconer‡ NRvdBaAD. Maternal mortality and Millennium Development Goal 5. 2011.
13. International MEaI. Nepal Demographic and Health Survey: Key Findings 2011, Ministry of Health and Population, New ERA, and ICF International Inc.,Kathmandu. 2012.
14. PMS Pradhan SB, IS Paudel, K Gaurav, PK Pokharel P. Factors Contributing to Antenatal Care and Delivery Practices in Village Development Committees of Ilam District, Nepal. Kathmandu University Medical Journal,Vol 11, No 1 (2013) 2013.
15. Ripathi V, Singh R. Ecological and socio-demographic differences in maternal care services in Nepal. PeerJ. 2015;3:e1215.
16. Rajendra Karkee1* CWBaAHL. Determinants of facility delivery after implementation of safer mother programme in Nepal: a prospective cohort study. BMC Pregnancy and Childbirth 2013, 13:193. 2013.
17. Bishnu Choulagai1, Sharad Onta2, Narayan Subedi3, Suresh Mehata3, Gajananda P Bhandari3, Amod Poudyal2,, Binjwala Shrestha2 MM, Max Petzold5 and Alexandra Krettek1,6. Barriers to using skilled birth attendants' services in mid-and far-western Nepal: a cross-sectional study. BMC International Health and Human Rights http://wwwbiomedcentralcom /1472-698X/13/49. 2013.
18. B MSG. Contextual influences on the use of antenatal care in Nepal. Calverton, Maryland, ORC Macro, MEASURE 2004:[61] p. (DHS Geographic.
19. PMS Pradhan SB, IS Paudel, K Gaurav, PK Pokharel P. Factors Contributing to Antenatal Care and Delivery Practices in Village Development

Committees of Ilam District, Nepal Kathmandu University Medical Journal. 2013;11 No 1.

20. NEPAL GO, POPULATION MOHA. Annual_Report Department of Health Services, Teku ,Kathamandu, Nepal. 2014.
21. Pallikadavath S, Foss M, Stones RW. Antenatal care: provision and inequality in rural north India. Soc Sci Med. 2004;59(6):1147-58.
22. Sharma B. Utilisation of antenatal care services in Nepal. Nepal Population Journal 2004;11(10):79-97.
23. K. Navaneethama, A. Dharmalingamb. Utilization of maternal health care services in Southern India. Asian MetaCentre for Population and Sustainable Development Analysis, Institute for Asian Research, National University of Singapore, AS7 Shaw Foundation Building,117570 Singapore, Department of Sociology and Social Policy (Population Studies Programme), University of Waikato, Hamilton, New Zealand 2002. 2002.
24. Okolocha CC, Jasper;Suleiman Braimoh;Unuigbe, Jacob;Olumeko, Patience. Socio-cultural factors in maternal morbidity and mortality: A study of a semi-uraban community in southern Nigeria pg. of Epidemiology and Community Health; ProQuest Nursing & Allied Health Source. 1998: 293.
25. Hodge A, Byrne A, Morgan A, Jimenez-Soto E. Utilisation of health services and geography: deconstructing regional differences in barriers to facility-based delivery in Nepal. Matern Child Health J. 2014;19(3):566-77.
26. Sharma SK, Sawangdee Y, Sirirassamee B. Access to health: women's status and utilization of maternal health services in Nepal. J Biosoc Sci. 2007;39(5):671-92.
27. Furuta M. SSS. Women’s position within the household as a determinant of maternal health care use in Nepal. Department of Community Health Nursing, St Mary’s College, Japan, Department of Community, Ageing and Rehabilitation, School of Nursing and Midwifery, University of Sheffield, Sheffield, UK 2006.
28. Simkhada B, Porter MA, van Teijlingen ER. The role of mothers-in-law in antenatal care decision-making in Nepal: a qualitative study. BMC Pregnancy Childbirth. 2010;10:34.

29. Wolinsky FD. ASSESSING THE EFFECTS OF PREDISPOSING, ENABLING, AND Reinforcing Journal Health and social behavior. 2015.
30. Organization WH. World Health Organization (WHO). Integrated Management of pregnancy and Child birth: Standard of Maternal and Neonatal Care. Geneva: Department of Making Pregnancy Safer; 2007. 2007
31. Conde-Agudelo A, Belizan JM, Lammers C. Maternal-perinatal morbidity and mortality associated with adolescent pregnancy in Latin America: Cross-sectional study. Am J Obstet Gynecol. 2005;192(2):342-9.
32. George C Patton CCe, Susan M Sawyer, Russell M Viner, Dagmar M Haller, Krishna Bose, Theo Vos, Jane Ferguson, Colin D Mathers. Global patterns of mortality in young people: a systematic analysis of population health data. 2009;374:881–892.
33. Say L, Chou D, Gemmill A, Tunçalp Ö, Moller A-B, Daniels J, et al. Global causes of maternal death: a WHO systematic analysis. The Lancet Global Health. 2014;2(6):e323-e33.
34. UNICEF W, The World Bank Group and United Nations Population Division. Trends in Maternal Mortality: 1990 to 2015 2015.
35. New York UN. GLOBAL STRATEGY FOR WOMEN'S, CHILDREN'S AND ADOLESCENTS' HEALTH (2016-2030). 2015.
36. Ingegerd Hildingsson IR. Swedish women's satisfaction with medical and emotional aspects of antenatal care. Ingegerd Hildingsson, Department of Health Sciences, Mid-Sweden University, Sundsvall S-85170,. 2005(ISSUES AND INNOVATIONS IN NURSING PRACTICE).
37. P VJB. WHO antenatal care randomized trial: Manual for the implementation of the new model. [Estudio clínico aleatorizado de control prenatal de la OMS: Manual para la puesta en práctica del nuevo modelo - See more at: http://www.popline.org/node/195203#sthash.HM9Jj2jn.dpuf. Geneva, Switzerland, World Health Organization 2002.
38. MOHP. Demographic and Health Survey 2011.
39. Dahal Rk. Utilization of Antenatal Care Services in Rural Area of Nepal. 2015.

40. Rebhan DP. Health Care Utilization: Understanding and applying theories and models of health care seeking behavio. Case Western Reserve University. 2008.
41. Green LW, Ottoson JM. A Framework for Planning and Evaluation: PRECEDE-PROCEED Evolution and Application of the Model. 10es ans journees de sante publique Montreal, Quebec. 2006.
42. Lawrence W. Green MWK. HEALTH PROMOTION PLANNING An Educational and Environmental Approach: THE PRECEDE-PROCEED MODEL. 2000.
43. Christiana R Titaley1* MJD, Christine L Roberts2. Factors associated with underutilization of antenatal care services in Indonesia: results of Indonesia Demographic and Health Survey 2002/2003 and 2007. 2010.
44. Karkee R, Binns CW, Lee AH. Determinants of facility delivery after implementation of safer mother programme in Nepal: a prospective cohort study. BMC pregnancy and childbirth. 2013;13(1):193.
45. *V. O. Awusi EBA, **V. Okeleke. Determinants of antenatal care services utilization in Emevor village, Nigeria. *Department of Family Medicine, College of Medical Sciences, Delta State University, Abraka, Delta State, Nigeria **Central Hospital, Oleh, Isoko South Local Government Area, Delta State, Nigeriaalphamedicalcentre@yahoocom. 2009.
46. He B, Fan J, Liu N, Li H, Wang Y, Williams J, et al. Depression risk of 'left-behind children' in rural China. Psychiatry Res. 2012;200(2-3):306-12.
47. Yalem Tsegay1† TG, Isabel Goicolea3, Kerstin Edin4, Hailemariam Lemma2, Sebastian3 aMS. Determinants of antenatal and delivery care utilization in Tigray region, Ethiopia: a cross-sectional study. Tsegay et al International Journal for Equity in Health http://wwwequityhealthjcom/content/12/1/30. 2013.
48. Fotso JC, Ezeh AC, Essendi H. Maternal health in resource-poor urban settings: how does women's autonomy influence the utilization of obstetric care services? Reprod Health. 2009.
49. Ahmed MM AAaKK. Relationship Between Educational Attainment and Maternal Health CareUtilization in Bangladesh Evidence from the 2005 Bangladesh

Household Income and Expenditure Survey. Research jurnal of Medical Science, Tokyo Medical and Dental University, Tokyo, Japan. 2010:33-7.

50. UNIVERSITY S, Dept of Sociology DUwsss. Do Women with Higher Autonomy Seek More Maternal and Child Health-Care? Evidence from Ethiopia and Eritrea.GebremariamWoldemicael.gebremariamwoldemicael@sociologysuse. 2007.
51. Kawungezi PC, AkiiBua D, Aleni C, Chitayi M, Niwaha A, Kazibwe A, et al. Attendance and Utilization of Antenatal Care (ANC) Services: Multi-Center Study in Upcountry Areas of Uganda. Open J Prev Med. 2015;5(3):132-42.
52. Bhatta DN, Aryal UR. Paternal Factors and Inequity Associated with Access to Maternal Health Care Service Utilization in Nepal: A Community Based Cross-Sectional Study. PloS one. 2015;10(6):e0130380.
53. CA Iyaniwura QY. Utilization of Antenatal Care and Delivery Services in Sagamu, SouthWestern Nigeria. African Journal of Reproductive Health. 2009.
54. Bibha simkhada ERvTMPPSSPWwecafmi. Why do costs act as barrier in maternal mortality are. "Poverty and deprivation of immigrants vs natives in Italy", International Journal of Social Economics. 2013;41.
55. Gabrysch S, Campbell OMR. Still too far to walk: Literature review of the determinants of delivery service use. BMC pregnancy and childbirth. 2009;9(1):34.
56. J Yousuf MA, F Seid Maternal health beliefs, attitudes and practices among Ethiopian Afar. By Jemal Yousuf, Mazengia Ayalew and Fentaw Seid. 2011;1:12:3.
57. Alam MA, Ali NA, Sultana N, Mullany LC, Teela KC, Khan NU, et al. Newborn umbilical cord and skin care in Sylhet District, Bangladesh: implications for the promotion of umbilical cord cleansing with topical chlorhexidine. J Perinatol. 2008;28 Suppl 2:S61-8.
58. Carroli G, Villar J, Piaggio G, Khan-Neelofur D, Gülmezoglu M, Mugford M, et al. WHO systematic review of randomised controlled trials of routine antenatal care. The Lancet. 2001;357(9268):1565-70.

59. GT Bondevik BE, RJ Ulvik, M Ulstein.. .Anaemia in pregnancy: possible causes and risk factors in Nepali women, . European Journal of clinical Nutrition. 2000;54, .

60. Paneru D, Gyawali K, Jnawali B, Jnawali K. Knowledge and practices on maternal health care among mothers: A Cross sectional study from rural areas of mid-western development region Nepal. Journal of the Scientific Society. 2015;40(1):9.

61. Kidist Birmeta1* YDaDW. Determinants of maternal health care utilization in Holeta town, central eithopia. BMC Health Services Research 2013,. 2013.

62. Paras Agarwal MS, Suneela Garg. Maternal health-care utilization among women in an urban slum in Delhi. Department of Community Medicine, Maulana Azad Medical College, New Delhi, India. 2007;32(3):203-5.

63. Say L, Raine R. A systematic review of inequalities in the use of maternal health care in developing countries: examining the scale of the problem and the importance of context. Bulletin of the World Health Organization. 2007;85(10):812-9.

64. Dharma Nand Bhatta1, Umesh Raj Aryal3. Paternal Factors and Inequity Associated with Access to Maternal Health Care Service Utilization in Nepal: A Community Based Cross-Sectional Study. 2015,.

65. Christiana R Titaley1* MJD, Christine L Roberts2. Factors associated with underutilization of antenatal care services in Indonesia: results ofIndonesia Demographic and Health Survey 2002/2003 and 2007. BMC Public Health 2010, 10:485 http://wwwbiomedcentralcom/1471-2458/10/485. 2010.

66. Marjorie A. Schaffer R, PhD, Betty Lia-Hoagberg, RN, PhD. Effects of Social Support on Prenatal Care and Health Behaviors of Low-Income Women. JOGNN. 1997;26(4):440-3.

67. Acharya D, Khanal V, Singh JK, Adhikari M, Gautam S. Impact of mass media on the utilization of antenatal care services among women of rural community in Nepal. BMC research notes. 2015;8(1):345.

68. Directorate M-WRH. ANNUAL Report: Government od Nepal Ministry of Health and Population MID WESTERN REGIONAL HEALTH DIRECTORATE 2014.

69. Adeniyi Francis Fagbamigbe1 aESI. Assessment of quality of antenatal care services in Nigeria: evidence from a population-based survey. Fagbamigbe and Idemudia Reproductive Health DOI 101186/s12978-015-0081-0. 2015.
70. Christiana R Titaley MJD, Christine L Roberts. Factors associated with underutilization of antenatal care services in Indonesia results of Indonesia Demographic and Health Survey. 2010;1471-2458/10.
71. Jerker Liljestrand MRS. Socio-economic improvement and health system strengthening of maternity care are contributing to maternal mortality reducing Cambodia. 2012.
72. GON M. Nepal health facility survey 2015. Governmental of Nepal Ministry of Health 2015.
73. DS Malla KG, C Karki, P Chaudhary. Achieving Millennium Development Goals 4 and 5 in Nepal. 2011;03113.
74. David Doku SN, and Narh Doku. Factors associated with reproductive health care utilization among Ghanaian women. 2012.
75. Vishnu Khanal AHL, Jonia Lourenca da Cruz, Rajendra Karkee. Factors associated with non-utilisation of health service for childbirth in Timor-Leste: evidence from the 2009-2010 demographic and health survey. 2015(1472-698X).
76. Priti Upadhyay, Tippawan Liabsuetrakul ABS, Pradhan N. Influence of family members on utilization of maternal health care services among teen and adult pregnant women in Kathmandu, Nepal: a cross sectional study. Reproductive Health 2014, 11:92 doi:101186/1742-4755-11-92. 2014.
77. Shrestha S, Bell JS, Marais D. An analysis of factors linked to the decline in maternal mortality in Nepal. PloS one. 2014;9(4):e93029.
78. Mili Dutta CS, Lokender Prashad. Level, Trend and Correlates of Mistimed and Unwanted Pregnancies among Currently Pregnant Ever Married Women in India. University of Rochester, UNITED STATES. 2015.
79. Ngatho S Mugo MJDaKEA. Prevalence and risk factors for non-use of antenatal care visits: analysis of the 2010 South Sudan household survey. 2015;12884-015-0491-6.

80. Rajendra Karkee AHL, 2 Vishnu Khanal3. Need factors for utilisation of institutional delivery services in Nepal: an analysis from Nepal Demographic and Health Survey, 2011. Karkee R, Lee AH, Khanal V BMJ Open 2014;4:e004372 doi:101136/bmjopen-2013-004372. 2011.

81. Shiva Gupta GY, Rose Mpembeni, Gasto Frumence, Jennifer A. Callaghan-Koru, Raz Stevenson, Neal Brands, Abdullah H. Baqui. Factors associated with four or more antenatal care Visits and Its Decline among Pregnant Women in Tanzania Between 1999 and 2010. 2014.

82. P. Padmanaban PSR, and Dileep V. Mavalankar. Innovations and Challenges in Reducing Maternal Mortality in Tamil Nadu, India. 2009.

83. Deo KK, Paudel YR, Khatri RB, Bhaskar RK, Paudel R, Mehata S, et al. Barriers to Utilization of Antenatal Care Services in Eastern Nepal. Frontiers in public health. 2015;3.

84. Renee Y Haia NAM, Sarah Macfarane, and Margaret E Kruk. Access to emergency and surgical care in sun-Sahara Africa: the infrastructure gap. 2011;234-244.

85. MOHP. Annual_Report Department of Health services, Ministry of Health and Population, Kathmandu, Nepal. Report. 2014.

APPENDICES

APPENDIX A
QUESTIONNAIRES

FACTORS RELATED TO REGULAR USE OF ANTENATAL CARE SERVICES AMONG MOTHERS OF CHILDREN UNDER 1 YEAR OF AGE IN RURAL COMMUNITY OF BANKE DISTRICT, NEPAL.

The objective of this study

This questionnaire will be used to study the factors related to regular use of ANC services among mothers of children under 1 year of age in rural communities Banke district, Nepal. This study aims to improve the quality of life of mothers and children and make antenatal care (ANC) services more efficient.

Name of respondent…….

Address of respondent……

PART 1 Socio-demographic Factors:

This part includes question to obtain the socio-demographic factor of mother with child 1 years such as socio economic status: age, education, occupation and family income.

1. Age of least delivery time?.....
2. What is your education level
   - ( ) 1. No schooling ( ) 2. Primary school
   - ( ) 3. Secondary school ( ) 4. High school +2 Level
   - ( ) 5. Academic/University ( ) 6. Other (specify)…
3. What is your husband's education level?
   - ( ) 1. No schooling ( ) 2. Primary school
   - ( ) 3. Secondary school ( ) 4. High school +2 Level
   - ( ) 5. Academic/University ( ) 6. Other (specify)…

4. What is your occupation?

( ) 1. Jobless ( ) 2. Government job

( ) 3. Private job ( ) 4. Housewife

( ) 5. Agriculture

( ) 6. Others (specify)…….....……

5. What is your husband's occupation?

( ) 1. Jobless ( ) 2. Government job

( ) 3. Private job ( ) 4. Labor

( ) 5. Agriculture

( ) 6. Others (specify)…….....……

6. What is your family income?.....Rs. per month

7. What about your Caste?

( ) 1.Brahmin ( ) 2. Chhetri

( ) 3. Dalit ( ) 4. Janajati

( ) 5. other (specific) .....

8. What about your ethnicity?

( ) 1.Hindu ( ) 2. Buddhist

( ) 3. Muslim ( ) 4. other (specific) .....….

9. Do you visit last pregnancy for ANC services?

( ) 1. Yes ( ) 2. No (if no skip to part 2)

9. **If Yes** , How many time visit ANC health institution? .....time

10. First ANC visit How long pregnancy?.....weeks

PART 2: Predisposing Factors

1. How many times have you delivery baby?.....times

2. Where first delivery?

( ) 1. At home ( ) 2. At Health institution

3.Where last delivery?

( ) 1. At home ( ) 2. At Health institution

4. Did you ever have any the following past pregnancy complication?

4.1 Premature delivery ( ) 1.Yes ( ) 2. No

4.2 Abortion ( ) 1.Yes ( ) 2. No

4.3 Stillbirth ( ) 1.Yes ( ) 2. No

4.4 Bleeding per vagina ( ) 1.Yes ( ) 2. No

4.5 Neonatal death ( ) 1.Yes ( ) 2. No

4.6 Others (specify) ( ) 1.Yes ( ) 2. No

Knowledge ANC services: Please select only one appropriate answer according to your understanding.

No	STATEMENT	True	False	Do not know
5.	ANC is the provision of health services to pregnant women by professional (doctor , nurse, midwives and SBA trainer health person)			
6.	Pregnant women should visit ANC for the first time when they feel fetal movement			
7.	Pregnant women should visit ANC services clinic at least 4 time			
8.	Only pregnant women with complication should go to ANC			
9.	ANC consists of regular examination to check the expected mother's blood pressure, weight, fetal heartbeat, tetanus immunization, iron and folic supplementation.			
10.	ANC is an opportunity to inform pregnant women about danger sign and symptom			
11.	Blood and Urine testing during ANC is necessary to access the anemia and vaginal infection status during pregnancy			
12.	Uncomplicated pregnant women do not needed for ANC			
13.	Risk factor to smoke and consume alcohol during ANC period			

Perception toward ANC: please select only one answer that corresponds with your feeling

No	STATEMENT	Agree	Undecided	Disagree
14.	I receive good services during ANC			
15.	I felt peaceful when I visited ANC with my husband or my family at the first time			
16.	I feel tired of waiting during ANC			
17.	I am afraid of blood testing at ANC			
18.	I receive good rapport from health personal during ANC			
19.	I feel comfortable when I meet other pregnant women during ANC visits			
20.	I feel I receive useful information from ANC visit			
21.	I feel safe when I go for an ANC as appointment			
22.	If I have no complication during pregnancy I will not go to ANC			

Part 3. Enabling Factors:

1. When was first visit of ANC services?

( ) 1. < 12 weeks ( ) 2. > 12 weeks ( ) 3. Do not know

2. ANC Health institution service is available.

( ) 1. Yes ( ) 2. No

3. ANC Health institution provider is available.

( ) 1. Yes ( ) 2. No

4. ANC Health institution environment is good.

( ) 1. Yes ( ) 2. No

5. How far is your house from Health Institution? …….. KM.

6. Is the travel cost from your house to hospital? Rs……

7. How long have you been waiting for see health worker? .....Minute.

8. How long have you spent time in each visit? .....hr. (including travel time)

9. In your opinion do you think health institution services are quality?

( ) 1. Good ( ) 2. Soso ( ) 2. Bad

10. Do you satisfaction on health services

( ) 1. Yes ( ) 2. No

Part 4 Reinforcing Factor

1. Do you get any information about ANC service from health magazines?

( ) 1. Yes ( ) 2. No

2. Do you get any information about ANC service from the posters or Brochures?

( ) 1. Yes ( ) 2. No

3. Do you get any information about ANC service from health internet/ Facebook?

( ) 1. Yes ( ) 2. No

4. Do you get any information about ANC service from the TV?

( ) 1. Yes ( ) 2. No

5. Do you get any information about ANC service from the Radio?

( ) 1. Yes ( ) 2. No

6. Do you get any information about ANC service from the Mobile?

( ) 1. Yes ( ) 2. No

7. Do you get any information about ANC service from Female Community Health Volunteer (FCHV)? ( ) 1. Yes ( ) 2. No

8. Do you get any information about ANC service from Friend?

( ) 1. Yes ( ) 2. No

9. Do you get any information about ANC service from local Leader?

( ) 1. Yes ( ) 2. No

10. Do you get any information about ANC service from relative?

( ) 1. Yes ( ) 2. No

11. Do you get any information about ANC service from health worker?

( ) 1. Yes ( ) 2. No

Family/ Husband support:

Please select one answer that the most closely corresponds to your opinion.

No	STATEMENT	A lot	Moderate	A few	Never
12.	Do your husband given information about ANC?				
13.	Does your husband encourage you to follow ANC guidelines?				
14.	Does your husband advise you to use ANC for regular check-up?				
15.	Does your husband accompany you to visit ANC?				
16.	Do you share the information you get at ANC with your husband?				
17.	Do you have relatives with whom you can talk about your pregnancy?				
18.	Do your relatives encourage you to receive ANC?				
19.	Does your husband participate in the training organized by hospital about ANC?				

APPENDIX B

CHI-SAUARE TEST

Table 1Association between Independence variable and time visit ANC services

Factors	Non-regular		Regular		Chi-squire	P-value
	N	(%)	n	(%)		
Socio-demographic factor						
Age group (years)						
- 18 to 20	18	11.2	28	13.8	1.896	.388
- 21 to 35	128	79.5	163	80.3		
- 36 to 43	15	9.3	12	5.9		
Women education						
- No schooling	24	14.9	20	9.9	4.097	.535
- Primary school	74	46.0	107	52.6		
- Secondary school	36	23.6	49	24.1		
- Higher school	19	11.8	18	8.9		
- University	5	3.1	6	3.0		
- Vocational training	1	0.6	3	1.5		
Husband education						
- No schooling	4	2.5	2	1.0	2.967	.705
- Primary school	18	11.2	31	15.2		
- Secondary school	67	41.6	78	38.4		
- Higher school	59	36.6	72	35.5		
- University	12	7.5	18	8.9		
- Vocational training	1	0.6	2	1.0		

***Significant at p-value <0.05**

Table 1Association between Independence variable and time visit ANC services (cont.)

Factors	Non-regular		Regular		Chi-squire	P-value
	n	(%)	n	(%)		
Women occupation						
- Jobless	1	0.6	0	0.0	3.702	.448
- Government	5	3.1	8	3.9		
- Private	22	13.7	18	8.9		
- Housewife	124	77.0	167	82.3		
- Agriculture	9	5.6	10	4.9		
Family income						
- 500 to 10,000	112	69.6	133	65.5	4.598	.204
- 11,000 to 20,000	32	19.9	56	27.6		
- 21,000 to 30,000	14	8.7	13	6.4		
- 31,000 to 35,000	3	1.9	1	0.5		
Religion						
- Hindu	131	81.4	171	84.2	7.613	.055
- Buddhist	6	3.7	16	7.9		
- Muslim	22	13.7	13	6.4		
- Christen	2	1.2	3	1.5		
Caste						
- Brahmin	16	9.9	14	6.9	2.238	.692
- Chhetri	79	49.1	94	46.3		
- Dalit	23	14.3	29	14.3		
- Janajati	37	23.0	58	28.6		
- Kumal	6	3.7	8	3.9		

***Significant at p-value <0.05**

Table 2 Association between levels of complication, knowledge, perception, family support and the regular ANC visits

Variables	Non-regular		Regular		Chi-squire	P-value
	n	(%)	n	(%)		
Knowledge						
- Good	96	59.6	129	63.5	.584	.445
- Poor	65	40.4	74	36.5		
Family support						
- Good	145	90.1	185	91.1	.122	.727
- Poor	16	9.9	18	8.9		

***Significant at p-value <0.05**

Table 3 Association between health services and time of visit ANC services

Variables	Non-regular		Regular		Chi-squire	P-value
	N	(%)	n	(%)		
ANC Services Available						
Yes	160	99.4	202	89.5	.027	.869
No	1	0.6	1	0.5		
ANC Services provider available						
Yes	116	72.0	149	73.4	.083	.774
No	45	28.0	54	26.6		
ANC Service environmental is good						
Yes	105	65.2	142	70.0	.992	.337
No	58	34.8	61	30.0		
First Visit of ANC Services						
≤ 12 weeks	68	48.2	103	50.7	.568	.753
> 12 weeks	61	43.3	80	39.4		
Don’t know	12	8.5	20	9.9		

***Significant at p-value <0.05**

Table 4 Association between social support and visit of antenatal care services

Variable of information	Non-regular		Regular		Chi-squire	P-value
	n	(%)	n	(%)		
Personnel						
- Yes	141	87.6	182	89.7	.388	.533
- No	20	12.4	21	10.3		
Print media						
- Yes	96	59.6	135	66.5	1.830	.176
- No	65	40.4	68	335		
Broadcast media						
- Yes	95	59.0	132	65.0	1.386	.239
- No	66	41.0	71	35.0		

Table 5 Association between family support and visit of antenatal care services

Variables	Non-regular		Regular		Chi-squire	P-value
	N	(%)	n	(%)		
Husband information						
Ever	145	90.1	185	91.1	.122	.727
Never	16	9.9	18	8.9		
Husband encouragement						
Ever	145	90.1	173	85.2	1.905	.167
Never	16	9.9	30	14.8		
Husband advices						
Ever	141	87.6	175	86.2	.147	.701
Never	20	12.4	28	13.8		

***Significant at p-value <0.05**

Table 5 Association between family support and visit of antenatal care services (cont.)

Variable of information	Non-regular		Regular		Chi-squire	P-value
	N	(%)	n	(%)		
Husband accompany						
Ever	145	90.1	175	86.2	1.256	.262
Never	16	9.9	28	13.8		
Sharing information						
Ever	148	91.9	177	87.2	2.103	.147
Never	13	8.1	26	12.8		
Talk relative						
Ever	139	86.3	179	88.2	.276	.599
Never	22	13.7	24	11.8		
Relative encouragement						
Ever	143	88.8	174	85.7	.770	.380
Never	18	11.2	29	14.3		
Husband information						
Ever	118	73.3	154	75.9	.314	.575
Never	43	26.7	49	24.1		

***Significant at p-value <0.05**

APPENDIX C
ETHICAL DOCUMENT

Certificate of MU-SSIRB Approval

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

Certificate of Approval No.:	2016/156.2604
MU-SSIRB No.:	2016/184 (B1)
Student ID:	5838385 ADPM/M
Title of Project:	FACTORS RELATED TO REGULAR USE OF ANTENATAL CARE (ANC) SERVICES AMONG MOTHERS OF CHILDREN UNDER 1 YEAR OLD IN RURAL COMMUNITY OF BANKE DISTRICT, NEPAL
Principal Investigator:	Mr. Raj kumar Paudel
Major Advisor:	Lect.Dr.Bang-On Thepthien
Name of Institution:	ASEAN Institute for Health Development
Approval includes:	1) MU-SSIRB Submission form version received date 3 March 2016 2) Participant Information sheet version date 22 April 2016 3) Informed consent form version 22 April 2016

The Committee for Research Ethics (Social Sciences) is in full compliance with International Guidelines of Human Research Protection such as Declaration of Helsinki, The Belmont Report, and CIOMS Guidelines.

Date of Approval: April 26, 2016
Date of Expiration: April 25, 2017

Chairman — Head of the Institute

(Emeritus Professor Dr.Santhat Sermsri)

(Assoc.Prof.Dr.Wariya Chinwanno)
Dean of Faculty of Social Sciences and Humanities

Office of The Committee for Research Ethics (Social Sciences), Faculty of Social Sciences and Humanities, Mahidol University
Phuttamonthon 4 Rd., Salaya, Phuttamonthon District, Nakhon Pathom 73170. Tel.(662) 441 9180 Fax.(662) 441 9181
Website: www.mussirb.com ; e-mail: mussirb310@gmail.com

BIOGRAPHY

NAME	Raj Kumar Paudel
DATE OF BIRTH	27, Jan, 1986
PLACE OF BIRTH	Purandhara VDCs – 4 Dang, Nepal
INSTITUTIONS ATTENDED	National Academy for Medical Science, Nepal 2005 – 2008 General Medicine
	Little Buddha College of Health Science, Nepal 2009 – 2012 Bachelor of Public Health
	Mahidol University, 2015 – 2016 Master of Primary Health Care Management
SCHOLARSHIP RECEIVED	ASEAN Institute for Health Development 30th Anniversary Scholarship
HOME ADDRESS	Purandhara VDCs -4 Dang Nepal, +977-9841565832 E. Mail: rajpaudel86@gmail.com
AWARD RECIVED	Nepal Health Research Council 2012.