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WOMAN'S AUTONOMY AND HUSBAND'S INVOLVEMENT IN MATERNAL HEALTH CARE UTILIZATION IN NEPAL

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Summary

Introduction

Giving childbirth is a natural phenomenon, still around a half million women die every year due to pregnancy and childbearing related causes and millions of other suffer from lifelong complications. Low utilization of maternal health services during pregnancy, at delivery and in the post natal period is one of the major factors contributing to high maternal mortality and morbidity. Nepalese women have considerably little power and autonomy than their male counterparts in making household decisions and even decisions concerning their own health care. There is a wide recognition that women's inferior status in society limits their decision making to utilize health services, and different international conferences and treaties like CEDAW and ICPD have clearly advocated for improving woman's autonomy. Furthermore, reproductive health interventions targeted to couples are found to be more effective as involvement of husbands may improve communication with service providers and support women to utilize health services. But men are traditionally considered an extrinsic factor in maternal health in many societies. Making women more autonomous and fostering husband's involvement in maternal health are considered as the two promising strategies for improving maternal health. However, these two concepts; women's autonomy and husband's involvement may be potentially opposing, as women enjoying more autonomy may seek no involvement of husbands. This study was conducted to explore the different dimensions of woman's autonomy that influence maternal health care utilization, and investigate how woman's autonomy is related with husband's involvement in maternal health care utilization.

Methodology

The study design was cross-sectional, using both quantitative and qualitative methods. The quantitative aspect of the study tried to assess the relationship of woman's autonomy with maternal health care utilization and husband's involvement, while the qualitative aspect of the study was concerned with exploring the husband's supportive involvement in maternal health.

Quantitative data was collected from 341 randomly selected women from four VDCs of Kailali district in Nepal who delivered a live birth during the one year prior to the research, entailing the period of 1 October 2010 to 30 September 2011. Field work of the study was carried out in October and November 2011. Data was collected by face-to-face interview using structured questionnaire. Women were asked about their socio-demographic characteristics, utilization of maternal health services during the most recent pregnancy and child birth, husband's involvement in maternal health care utilization and woman's autonomy related questions. Four enumerators and one field supervisors were assigned for data collection. Field staffs were well oriented for the survey and the questionnaire was pre-tested among 15 recently delivered women in Seti Zonal Hospital in Kailali. Woman's autonomy was measured into four dimensions; economic autonomy, domestic decision-making autonomy, movement autonomy, and intra-spousal communication. Maternal health care utilization was measured as sufficiency of antenatal care and place of delivery, while husband's presence in antenatal care visit and delivery at health facility were the two outcome measures representing husband's involvement. A range of socio-economic, demographic and health risk related characteristics of women and household were also measured. Bivariate analysis was carried out by t-test for continuous chi-square analysis for categorical data. Variables associated with outcome measures at 10% level of significance ($p < 0.1$) in bivariate analysis were furthermore analyzed by bivariate and multivariate binary logistic regression, and the association was estimated by odds ratios. Women who reported their husbands as frequent migrants and the spousal separation for more than three months prior to the survey period were excluded from the analysis.

Qualitative data were collected by focus group discussion and in-depth interviews using guidelines and checklists. Two focus group discussions were conducted each for husbands and women separately, and

a total of 16 in-depth interviews (six with women, five with husbands, two with mothers-in law, two with service providers and one with FCHV) were also carried out. Data collected from focus group discussions and interviews were coded under the main themes/topics which included forms of husband's involvement; advice given to the women; care and support to the women; knowledge of husband's on maternal health; and socio-cultural beliefs on husband's involvement in maternal health. The description of findings on these topic lists with key illustrative verbatim narratives is presented in this report.

Ethical considerations were covered by getting approval from Wageningen University and District Public Health Office, Kailali. Verbal informed consent was established with the participants before the interview and no important ethical dilemmas were observed in the study that required serious attention.

Results

Out of 341 women who participated in the survey, 66 women reported spousal separation for more than three months. The mean age of women and husbands were 23.6 and 26.6 years respectively. Women had on average two surviving children. The majority of the women were from disadvantaged ethnic groups, resided in joint family, were housewife or agricultural worker, and exposed to media at least once a week. Women scored relatively high on intra-spousal communication, followed by domestic decision making autonomy, movement autonomy and economic autonomy. Around three quarters of the women had made sufficient ANC visits and two-thirds of the women delivered in a health facility. Less than half (40.7%) of the husbands accompanied their wife in antenatal care visits, while three out of four husbands were present at the delivery. The proportion of husbands who were present at health facility delivery was 59.3 percent.

In the multivariate logistic regression model, movement autonomy and intra-spousal communication were found to be positively associated with ANC sufficiency. After adjustment for other covariates, each additional place where women can visit without permission of husband or other senior members of the family was associated with a significantly higher likelihood of making sufficient ANC visit (OR = 1.45, $p < 0.01$). Similarly, for each additional issues in which woman had made discussion with her husband was associated with significantly higher likelihood of making sufficient ANC visit (OR = 1.55, $p < 0.01$). Woman's occupation and exposure to media were also found to be associated with husband's presence at ANC. None of the measures of autonomy was found to be associated with place of delivery in the multivariate analysis, while husband's education, woman's age, husband's age, woman's experience of complaints during pregnancy and sufficiency of ANC visit remained the significant predictors of health facility delivery.

Movement autonomy was the only autonomy measure found to be associated with husband's presence at ANC in the final multivariate logistic regression model. Women who did not need any permission to visit each additional place were less likely to be accompanied by the husband at ANC visit (OR = 0.59, $p < 0.001$). Wealth quintile, husband's education and number of surviving children woman had were the other variables associated with husband's presence at ANC. Intra-spousal communication was again found to be associated with husband's presence at health facility delivery, together with husband's education, woman's experience of complaints during pregnancy and sufficiency of ANC visit in the final model. Each one unit increase in intra-spousal communication score increased the likelihood of husband's presence at delivery by 38 percent (OR = 1.38, $p < 0.05$).

The qualitative data indicated that there is a substantial involvement of husbands in maternal health. Most of the FGD and IDI participants described supportive role of husbands largely in the form of giving advice, making financial arrangements, and supporting woman to reduce the household work burden. The traditional belief that excludes the husbands away from maternal health involvement is changing, as Nepalese society is modernizing.

Conclusion

Movement autonomy and intra-spousal communication were positively associated with ANC sufficiency, movement autonomy was negatively associated with husband's presence at ANC and intra-spousal communication was positively associated with husband's presence at health facility delivery. This study tries to extend our understanding about the relationship of woman's autonomy with maternal health care utilization and husband's involvement in maternal health. This study emphasized the importance of movement autonomy and intra-spousal communication over domestic decision making autonomy to influence maternal health care utilization and husband's involvement. Despite the traditional cultural beliefs that prohibit husbands from involvement in maternal health, Nepalese husbands are increasingly entering into the area of maternal health which was traditionally considered 'extrinsic' to men.

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List of abbreviations

AHW	Auxiliary Health Worker
ANC	Antenatal Care
ANM	Auxiliary Nurse Midwife
ARI	Acute Respiratory Illness
CBS	Central Bureau of Statistics
CI	Confidence Interval
CRADLE	Community Responsive Antenatal, Delivery and Life Essential Support project
DoHS	Department of Health Service
EOC	Essential Obstetric Care
FAYA	Forum for Awareness and Youth Activities
FGD	Focus Group Discussion
FCHV	Female Community Health Volunteer
HA	Health Assistant
HF	Health Facility
HIV	Human Immunodeficiency Virus
HP	Health Post
ICPD	International Conference on Population and Development
IDI	In-depth Interview
IUD	Intra-uterine device
MCHW	Maternal and Child Health Worker
MoHP	Ministry of Health and Population
MMR	Maternal Mortality Ratio
NDHS	Nepal Demographic and Health Survey
NGO	Non-Governmental Organization
NPC	National Planning Commission
OR	Odds Ratio
PHCC	Primary Health Care Center
PNC	Postnatal Care
SBA	Skilled Birth Attendance
SCL	School Leaving Certificate
SD	Standard Deviation
SHP	Sub-Health Post
SPSS	Statistical Package for Social Sciences
TT	Tetanus Toxoid
UNDP	United Nations Development Project
UNFPA	United Nations Family Planning Association
VDC	Village Development Committee
WHO	World Health Organization

SECTION I

INTRODUCTION

The first section of this report consists of two chapters. Chapter I starts with an introduction of the importance of women's autonomy and husband's involvement in maternal health care utilization. It presents the problem statement and develops research questions. The last section of chapter I gives a brief description of the study site. In chapter II, efforts are made to review the related literature on women's autonomy on domestic spheres and husband's involvement in maternal health. The research questions formulated in chapter one guides the overall process of the study and the literature review presented in chapter II are used to develop measurement scales as well as to compare the findings of this study in discussion section.

CHAPTER I

INTRODUCTION

1.1 Background

Globally, over a half million women die every year due to pregnancy and childbearing causes (WHO, 2007). Virtually all (99%) of these maternal deaths occur in low-income countries (Clarke, 2008, Powell et al., 2003, Hogan et al., 2010). Improving maternal health is the fifth Millennium Development Goal (MDG), aiming to reduce the maternal mortality ratio (MMR) by three quarters between 1990 and 2015 (United Nations, 2000). Despite a decline in the MMR of 2.5 percent globally from 1990 to 2005 and a slight drop in every region of the world (Hill et al., 2007), the gains are still too little.

There is wide recognition that one of the major factors contributing to high maternal mortality and morbidity is the low use of maternal health services during pregnancy, at delivery and in the post natal period. In seeking to explain these low levels of health care utilization in developing countries, most studies have focused on provision and geographic accessibility of services, and relatively very few have looked at how factors such as woman's autonomy influence utilization of health services. International Conference on Population and Development (ICPD) Programme of Action noted that "improving the status of women also enhances their decision-making capacity at all levels in all spheres of life, especially in the area of sexuality and reproduction" (United Nations, 1994 paragraph 4.1).

Reproductive health interventions that target couples are found to be more effective than those directed to only one sex (Becker, 1996). Increased involvement of husband in maternal health has been sought during the last decades. But evidence on how maternal health care utilization is affected by their husbands is lacking in both developing and developed countries. Traditionally, men are kept outside maternal health issues in many societies.

1.2 Problem Statement and rationale of the study

It is widely asserted that increased gender equality is a prerequisite for achieving improvements in maternal health. Women in many developing countries including Nepal suffer from poverty, illiteracy and poor health outcomes. In Nepal, the low social status of women has been identified as a hindrance to progress toward national health and population policy targets (Tuladher, 1997). Nepalese women have considerably less power and autonomy than their male counterparts in making household decisions and even decisions concerning their own health care. Women at all ages, have unequal access to food and education, have limited opportunities to employment, and have little access to/and control over resources (Morgan and Niraula, 1995). Currently, Nepal is ranked 113th (out of 187 countries in the world) on the Gender Inequality Index (UNDP, 2011).

Maternal health is a national health priority and improving maternal health is a major focus of the current national development plan in Nepal (NPC, 2007). However, there are several challenges including high maternal morbidity and mortality, underutilization of maternal health services, political instability, limited health infrastructure, lack of resources and shortage of trained health professional, woman's position in the society and woman's vulnerability (Simkhada et al., 2006). There is wide recognition that one of the major factors contributing to high maternal mortality and morbidity is the low utilization of maternal health services during pregnancy, at delivery and in the post natal period. There is no uniformity in the estimation of maternal mortality ratio (MMR) in Nepal. MMR was estimated to be 380 per 100,000 live births by UNFPA (UNFPA, 2011), 240 by Hogan et al. (2010) and it was found to be 229 in a study conducted by New Era (MoHP and New Era, 2009). In Nepal, maternal health care utilization is too low: only 58.3 percent of women receive any antenatal care from skilled birth attendants (SBAs) and an overwhelming majority (64.7 %) of births still take place in home (MoHP

and New Era, 2011). Furthermore, women in Nepalese society have an inferior position and household decision making power is unequally distributed, at the disadvantage of the female members of the family (Bennett, 1983, Furr and Das, 2006, Morgan and Niraula, 1995). Women have to rely on their husbands for decisions that affect their health and well-being. Despite these facts, the roles of husbands in woman's reproductive, and more specifically, maternal health was largely ignored.

The literature suggests that initiatives that promote women's status within the household may be the prerequisite to increase health seeking behaviour among women (Allendorf, 2007, Acharya et al., 2010, Dyson and Moore, 1983) and that involvement of male partners may contribute the service utilization (Becker and Robinson, 1998, Carter, 2002b, Dudgeon and Inhorn, 2004, Mullany et al., 2007). However, the two concepts woman's autonomy and husband's involvement seem antagonistic. Mullany et al. (2005) showed that higher woman's autonomy measured by her decision-making power was associated with significantly lower male involvement in pregnancy health. This study aims to explore the different dimensions of woman's autonomy within the household that influence maternal health care utilization and then investigate how woman's autonomy is related with husband's involvement in maternal health care. The findings generated from this study will help to get a clear picture on how these two concepts are interrelated, and it will help to suggest health interventions that will give equal emphasis on both empowering women and involving men.

1.3 Research questions

The study is guided by the following research questions:

- What is the relationship between woman's autonomy within the household and maternal health care utilization in Nepal?
- What is the extent of husband's involvement in maternal health care utilization?
- What is the relationship between woman's autonomy and husband's involvement in maternal health care utilization?

1.4 Definition of the key concepts

This section described the operational definition of the key concepts of this study.

1.4.1 Woman's autonomy

Woman's autonomy, in this study, is considered in terms of their domestic decision-making power. It has been measured in four dimensions: (1) economic autonomy, (2) domestic decision making autonomy (both referring to the different types of decisions at household level in which woman has a final say), (3) movement autonomy (woman's freedom of movement) and (4) intra-spousal communication (the communication pattern between spouses about the different domestic affairs).

1.4.2 Maternal health care utilization

Maternal health care utilization refers to the different aspects of maternal health care utilization from modern health care services. More specifically, the number of ANC visit and timing of ANC fist visit during the most recent pregnancy, and place of delivery of the most recent birth were considered.

1.4.3 Husband's involvement in maternal health

Husband's involvement in maternal health has been operationalized as the presence of husbands at ANC visit (women accompanied by husbands at ANC visit) and the presence of husbands at health facility delivery (women accompanied by husbands at health facility delivery) of the most recent birth. Other aspects of husband's involvement have been also explored by qualitative methods.

1.5 Description of the study site (Settings)

This study was conducted in Kailali district of Nepal. This section gives an overview of some of the background information about Nepal and the study site, Kailali district.

Map showing the position of Nepal in the Globe

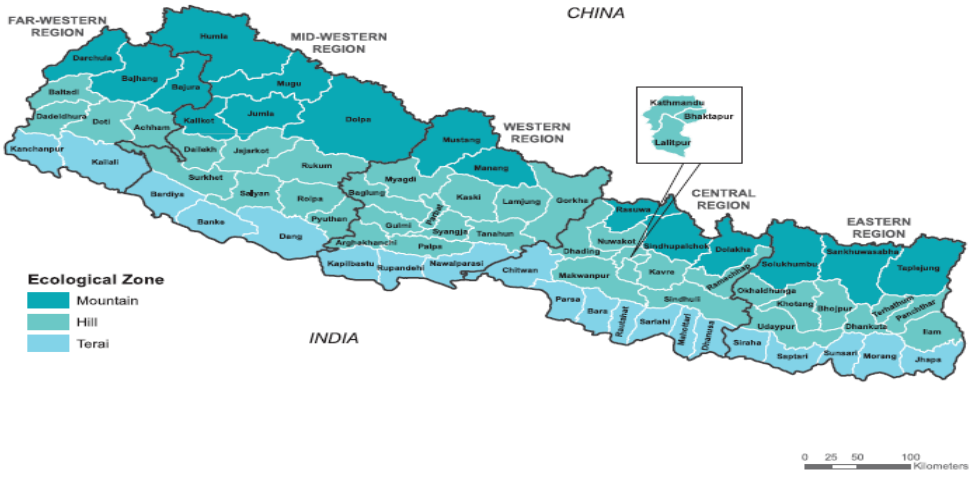
1.5.1 Geo-political history of Nepal

Nepal is a small Himalayan country with the total area of 147,181 square kilometers. It is bordered by the Tibetan Autonomous Region of the People's Republic of China to the north and by India to the east, south and west. Nepal is famous for the highest peak of the world 'the mt. Everest' and the birth place of Lord Buddha, 'the light of Asia'. Nepal is divided into three horizontal ecological zones; mountain, hill, and terai. It is very rich in its cultural, geographical and also biological diversity. The country is predominantly agricultural, with a large proportion of the population engaged in agriculture. Nepal is divided into 75 districts, which are further divided into VDCs and municipalities. The VDCs and municipalities, in turn, constitute smaller wards. According to census data of 2011, the total population of Nepal is 26,620,809 with population density of 181 per square kilometre (CBS Nepal, 2012).

Nepal in Asia

Historically, Nepal was a monarchy where Shah Kings ruled for about 250 years. Despite the richness of natural and cultural heritage, Nepal is among the poorest country around the world, due to depraved political leaders, abuse of power, irresponsible governance, nepotism and corruption. Nepal witnessed more than a decade of armed conflict from 1996 when the Maoist insurgence began. Around 13,000

security personnel, civilians and insurgents lost their lives in the conflict. In 2006, the great people's movement started in Nepal when all political parties, professional organizations and civil society inspired people. The massive and spontaneous demonstrations of people against King Gynendra ended the autocratic monarchism and Nepal was declared a federal republic. Now Nepal is in a transitional phase towards the construction of a new people-friendly constitution, but still chaotic situations prevail and the transition from war to peace is not easily happening.



Map of Nepal showing ecological and district wise division

1.5.3 Health service delivery system in Nepal and in the study district

Ministry of Health and Population (MoHP) is the primary organization responsible of health care delivery in Nepal. MoHP has three departments specific to health; the Department of Health Services, the Department of Drug Administration and the Department of Ayurveda. Public health system of Nepal is characterized by a five-tier system at different levels within the Department of Health Services. They include; a) Sub-health post, health post and outreach clinics at community level, b)Primary Health Care Center at electoral constituency level, c) District Hospital, d) Zonal and Regional Hospital, and e) National Hospital. Sub-health post, health post and primary health care centre are the institutions that provide primary health care at community level; the district hospital is the first level of referral care; the zonal and regional hospitals are the secondary referral units; while the national hospitals are the tertiary level of health care. During 20010-2011, there were 95 hospitals, 209 Primary Health Care Centers, 676 Health Posts, and 3,129 Sub-Health Posts involved in the delivery of health services in Nepal. Additionally, 48,680 Female Community Health Volunteers (FCHV) were mobilized and 12,790 Primary Health Care Outreach clinics provided services (DoHS Nepal, 2011). Furthermore, there are also different private organizations involved in providing health services in Nepal.

The government of Nepal issued national health policy in 1991, which emphasized the importance of achieving access to basic primary health care services for all segments of the population. In 1997, the second long term health plan (1997-2017) was developed with the aim of improving health status of the people, particularly those whose health needs are often not met; the most vulnerable groups, women and children, the rural population, the poor, the under-privileged and the marginalized. It emphasized on assuring equitable access of quality essential health care services with full community

participation and gender sensitivity by technically competent and socially responsible health personnel throughout the country.

Maternal health is one of the priority areas of the policies of the government of Nepal. During the last decade, there are significant progress in terms of development of policies, strategies and protocols for safe motherhood. Nepal endorsed Safe Motherhood Policy in 1998, National Reproductive Health Strategy in 2004, and Skilled Birth Attendants Policy in 2006. The birth preparedness package program has also been implemented nationwide since 2008 to ensure that every birth is planned. Similarly, Safe Delivery Incentive Program was also adopted in 2005 to encourage women to use health facilities for maternity care and improve access to maternity care services (DoHS Nepal, 2011).

Table 1. Reproductive, maternal and newborn health services available at each level of the health care system

Level of care	Type of health facility	Reproductive, maternal, newborn and child health services available
Primary health care level	Sub-health post/Health post	ANC, PNC, Delivery in select health posts, Emergency Obstetric First Aid; Family Planning (Condom, Pills and Injectables), Immunizations; ARI and Diarrhoeal disease treatment and referral.
	Primary Health Care Center	ANC, PNC, Delivery, Emergency Obstetric First Aid Service and in select centers Basic EOC services are available, Family Planning (Condom, Pills, Injectables, and in selected centers IUD & Norplant services are available), Immunizations, ARI and Diarrhoeal disease treatment and referral.
First referral level	District Hospital	ANC, PNC, Delivery, and in select hospitals Basic EOC services are available; Family Planning (Condom, Pills, Injectables, and in select hospitals IUD, Norplant and Voluntary Surgical Contraception services are available); Immunizations, ARI and Diarrhoeal disease treatment and referral. Management of neonatal complications and reproductive morbidities.
Second and third referral levels	Zonal/sub-regional/regional Hospital	ANC, PNC, Delivery, and Comprehensive EOC services are available, Family Planning (Condom, Pills, Injectables, and in select hospitals IUD, Norplant and Voluntary Surgical Contraception services are available); Immunizations, ARI and Diarrhoeal disease treatment and referral. Management of neonatal complications and reproductive morbidities.
Specialized	National level hospital	ANC, PNC, Delivery, and Comprehensive EOC services are available; Family Planning (Condom, Pills, Injectables, and in select hospitals IUD, Norplant and Voluntary Surgical Contraception services are available); Immunizations; Management of neonatal complications including intensive care; Management and treatment of reproductive morbidities including cancers.

Source: National Reproductive Health Strategy (2004)

Kailali is one of the districts in Far-West region of Nepal. It covers an area of 3,235 square kilometres. There are 42 VDCs, two municipalities and 6 electoral constituencies in Kailali. It one of the densely populated district of Nepal with total population of 7,70,279 and population density of 238 person per square kilometre (CBS Nepal, 2012). The public health system of Kailali district consists of District Public Health Office, under which there is one 15-beded hospital, five primary health care centers, seven health posts, and 30 sub-health posts (DPHO Kailali, 2010/11). Two of the study VDCs, Malakheti and Chaumala have a PHCC in each and the other two VDCs, Ramshikharjhala and Thapapur, have a SHP in each. PHCC has posting of medical officer (physician) and nurse (midwife), and are considered the first level emergency obstetric care center at the community level.

Malakheti PHCC, Kailali

1.6 Structure of the report

This report is the summary of the work conducted to investigate the relationship between woman's autonomy and husband's involvement in maternal health care utilization. The research is presented in five sections and the main body of the report consists six chapters. The first chapter begins with the background and introduction of the study topic, followed by rationale of the study and the research questions. In addition, it covers the analytical framework of the study. In chapter two, a brief summary of the literatures related to woman's autonomy within the household level, maternal health care utilization, and husband's involvement in maternal health was presented. Efforts were made to conceptualize woman's autonomy at household level as measured by other authors, and the relationship between woman's autonomy and husband's involvement were sought. Chapter three gives the overall process and methodology of study. In chapter four, results of the analysis were described. Chapter five consists of the explanation of the discussions and limitations of the study, followed by conclusion.

CHAPTER II

LITERATURE REVIEW

2.1 Conceptualizing Woman's Autonomy

Autonomy is the ability to obtain information and make decisions about one's own concerns (Dyson and Moore, 1983). Autonomy is related to self-governing, self-determination and independence. Early literature on woman's autonomy focussed on education, occupation, and age differences between spouses as proxy measures of woman's autonomy (Dharmalingam and Morgan, 1996, Dyson and Moore, 1983). For example, Abadian (1996) used three measures to operationalize female autonomy: female age at marriage, age difference between spouses, and female secondary school education. Woman's levels of education and economic activity were the most commonly used measures of autonomy. Later on woman's autonomy has been defined as their ability to influence decisions about themselves or close household members, their ability to control economic resources, and their ability to move freely (Bloom et al., 2001, Jejeebhoy, 2002). For Dyson and Moore (1983) autonomy is the capacity to manipulate one's personal environment. They defined autonomy as *"the ability – technical, social, and psychological – to obtain information and to use it as the basis for making decisions about one's private concerns and those of one's intimates"* (page 45).

Table 2. The concept of women's autonomy as measured by others

Authors and Country of study	Operationalization of the concept of autonomy
Bloom, Wypig and Gupta (2001) India	control over finances, decision-making power, and extent of freedom of movement
Rani and Bonu (2003) India	health care decision-making
Rayman and Rao (2004) India	household decision-making; freedom of mobility
Furr and Das (2006) Nepal	economic autonomy(income paid in cash and household income contributed women); physical autonomy (freedom of movement); decision making autonomy (freedom to seek medical care and household decision-making); knowledge autonomy (literacy level and formal education)
Saleem and Bobak (2005) Pakistan	household decision-making; freedom of movement autonomy
Haq and Ali (2006) Pakistan	education; decision-making; going out behaviour; assets
Haile and Enqueselassie (2006) Ethiopia	financial autonomy; household decision-making; and husband's gender attitude
Acharya, Simkhada et al. (2010) Nepal	woman's decision making on own health care; major household purchases; daily household purchases and visits to family and friends
Jejeebhoy and Sathar (2001) India and Pakistan	economic decision-making; mobility; freedom from threat from husband; and access to and control over economic resources
Mullany, Hindin et al. (2005) Nepal	domestic decision-making
Senarath, U., and Gunawardena N. (2009) Nepal, Bangladesh and India	decision-making on woman's own health care
Allendorf, K. (2007) Nepal	household decision-making

Woman's autonomy is a multidimensional concept and therefore difficult to quantify. The literature on autonomy, and specifically woman's autonomy, lacks consistency in defining the concept. Table 2 shows how autonomy has been operationalized in a number of ways and illustrates the considerable variation in its conceptualization.

The separate but interdependent components of woman's autonomy include knowledge autonomy, or the education and exposure to outside world; household decision-making authority, or the extent to which women have a final say in decisions and concerning themselves and their family; physical autonomy, or the extent to which women are free of constraints on their physical mobility and right to interact with others; emotional autonomy, or the extent to which women enjoy close bonds with spouses and are free from the threat of violence and abuse; and economic and social autonomy and self-reliance, namely the extent to which women have access to and control over their own and their household's economic resources (Caldwell et al., 1982, Jejeebhoy, 1995). Some authors also suggested other demographic measures of woman's autonomy like age at marriage and age difference between spouses (Cain et al., 1979, Abadian, 1996).

2.2 Woman's autonomy and its influence on maternal health care utilization

Female members of the household are relatively disadvantaged in many low-income countries with regard to health and well-being (Santow, 1995a). Both women and female children suffer from poor health status in relation to their male counterparts in areas where patriarchal kinship and economic systems limit woman's autonomy (Caldwell, 1986).

The extent of woman's autonomy has considerable impact on reproductive behaviour. Higher levels of woman's autonomy were found to be associated with delayed age at marriage, use of contraceptive methods, and finally fertility control (Al Riyami et al., 2004, Jejeebhoy, 1995, McDonald, 2000). Lower levels of woman's autonomy were found to be associated with woman's lower body mass index (Furr and Das, 2006, Pryer et al., 2003) and under nutrition (Bindon and Vitzthum, 2002, Hindin, 2000). Lower rates of child mortality were observed in households where women are more independent (Castle 1993, Miles-Doan and Bisharat 1990) and where women have more decision-making power (Gupta, 1990).

According to Gupta (1995), woman's autonomy is at its lowest point during the peak of childbearing years, which has negative implications for health and overall development outcomes in terms of poorer child survival, slower fertility decline, and poorer reproductive health. Women with a low status are less likely to use modern facilities, whereas women with a higher status take the initiative in seeking care for themselves and their children. Ahmed et al. (2010) also found that women with the highest empowerment score are more likely to use modern contraceptive methods, attend four or more ANC visits and have a skilled birth attendant.

Most of the literature suggests that woman's autonomy, measured as the degree of their final say in household decision-making, is closely related to the health and welfare of women and children. Still women typically have relatively very little power over household decision-making in many developing countries (Smith et al., 2003, Shen and Williamson, 1999). Women have considerable lower social status and autonomy than men in several parts of South Asia (Dyson and Moore, 1983, Jejeebhoy, 1995, Jejeebhoy and Sathar, 2001) including Nepal (Niraula and Morgan, 1996, Bennett, 1983). Recognizing the significant and positive relationship between woman's autonomy and maternal health service utilization, several studies have highlighted the importance of enhancing woman's autonomy to improve maternal health service utilization in developing countries (Ahmed et al., 2010, Dyson and Moore, 1983, Furuta and Salway, 2006).

2.3 Husband's involvement in maternal health care

The International Conference on Population and Development (ICPD) has recognized the role of male partners in reproductive health explicitly in the Program of Action. Chapter IV of the report of the ICPD is concerned with 'Gender equality, equity and empowerment of women'. It contains a section entitled 'Male responsibilities and participation', stating that the objective of male involvement is: "*……..to promote gender equality in all spheres of life, including family and community life, and to encourage and enable men to take responsibility for their sexual and reproductive behavior and their social and family roles*" (United Nations, 1994 paragraph 4.25).

The new reproductive health paradigm since ICPD has pointed attention to men who were absent from previous reproductive health programs and increasing literature has demonstrated the need to incorporate men in health initiatives (Hawkes, 1998, Carter, 2002a, Mundigo et al., 2000). The idea of increasing men's participation in reproductive health has received much attention since late nineties (Bankole and Singh, 1998, Greene and Biddlecom, 2000), but there is no generally accepted understanding of what men's involvement actually means (Frye Helmer, 1996).

Much of the work on male involvement in reproductive health decisions and practice has been shown to be considerable, particularly in issues like family planning (Mbizvo and Adamchak, 1991, Goldscheider and Kaufman, 1996, Isiugo-Abanihe, 1994), abortion (Johansson et al., 1998, Kero et al., 1999, Rasch and Lyaruu, 2005), sexually transmitted diseases/HIV (Farquhar et al., 2004, Brewer, 2005), and breast-feeding (Earle, 2000, Ekström et al., 2003, Stremler and Lovera, 2004, Thea et al., 2004). However, comparatively few studies have been conducted on male involvement in maternal health (Bloom et al., 2000, Carter, 2002a, Mullany, 2006, Mullany et al., 2007).

Pregnancy care and childbirth are the most important issues of reproductive health affected by male partners. However, the influence of male partners in pregnancy care and childbirth is not well understood (Dudgeon and Inhorn, 2004). Although pregnancy and childbirth have been studied by medical anthropologists in a variety of contexts, men's influence on conception, pregnancy, and childbirth outcomes have been less focused (Dudgeon and Inhorn, 2004). Studies conducted in the US showed that husband's intentions have a considerable effect on pregnancy, desired family size and women's fertility (Montgomery, 1996, Santelli et al., 2003). Zabin et al. (2000) found that women often define pregnancy intention as influenced by their relationship to their partners and their partners' desires.

Despite this limited attention for male's involvement in maternal health care, some studies have demonstrated their influential role in pregnancy and child-birth (Santow, 1995b). A study in Thailand (Jirojwong et al., 1999) found that husbands were the primary sources of social support during pregnancy. Involving husbands in health education programs enhances communication between partners and promotes health-seeking behaviors (Turan et al., 2001, Westney et al., 1988) such as antenatal care, safe delivery and child immunizations. In South Asian countries husbands are the main actors in deciding about health care utilization, but they have a very little knowledge about pregnancy and pregnancy care (Singh et al., 1998, Bloom et al., 2000). A study by Wang et al. (1998) in China found that family planning interventions involving husbands may reduce unwanted pregnancy and abortion rates.

The study by Carter (2002b) in Guatemala showed a different story regarding men's involvement in maternal health and helped to amend stereotypes about male partners role in maternal health. In her study, male involvement in maternal health is relatively high, desirable and unique in both men and women's opinion and it is affected by factors like love, men's work demands, economic concerns and men's knowledge. Feldman et al. (2000) demonstrated that social support during pregnancy especially

by husbands or partners predicts better foetal growth and birth weights. Husbands support is found to be more beneficial to the health and psychological well-being of pregnant women than other family support. Women's ability to seek health care and practice health promotional interventions are also determined by the head of household, usually the husband (Beegle et al., 2001, Dudgeon and Inhorn, 2004). An unmatched case control study on contraceptive use conducted in Ethiopia (Haile and Enqueselassie, 2006) found a very interesting result, suggesting that woman's autonomy does not have a significant effect on couple's contraceptive use but that husband's involvement was the most important determinant of a couple's contraception use.

2.4 Woman's autonomy and husband's involvement

Interventions aiming women's empowerment focus primarily on giving women the power of decision-making over their own life choices while male partners' involvement emphasizes communication and negotiation between partners in making decisions (Becker and Robinson, 1998). The ultimate aim of both interventions is to empower women and improve their health and well-being. Though these two concepts are inherently related, they may be potentially opposing, as the more autonomous women may not seek involvement of their male partners in the issues of maternal health. A study conducted by Mullany et al. (2005) in Nepal yielded the interesting findings that higher woman's autonomy measured by sole final decision-making power was associated with significantly lower male involvement in pregnancy health. A similar study conducted in Guatemala found no association between gender dynamics measured in terms of husband's authority index and husband's attendance at birth (Carter, 2001). The roles of husbands might change when women become more autonomous and empowered. The relationship between woman's status and husband's involvement remains largely unexamined.

SECTION II

METHODOLOGY

Section II of this report describes the methodology of the study. Both quantitative and qualitative methods were used to answer the research questions. Chapter III describes the study designs, study sample, methods of data collection and organization of field work. Furthermore, it presents the measurement of the concepts and variables used in this study. Finally it gives an explanation on how the collected data were analyzed.

CHAPTER III

METHODOLOGY

3.1 Study design

The study design was cross sectional, using both qualitative and quantitative methods. The qualitative part of the study was more concerned with exploring husband's supportive involvement in maternal health, while the quantitative part tried to assess the relationship between woman's autonomy and husband's involvement.

3.2 Data collection tools and techniques

For the quantitative survey, data were collected from women who had a live birth in the year prior to the survey by face-to-face interviews using a structured questionnaire. The questionnaire was at first developed in English and then translated into Nepali. Pretesting of the questionnaire was carried out as described below (section 3.2.3).

For qualitative data collection, in-depth interviews and focus group discussions were conducted using topic list and guidelines.

3.3 Organization of the field work

The study was conducted in Kailali district of Nepal. The field work was carried out in close coordination with the Forum for Awareness and Youth Activities (FAYA) Nepal, which is a community-based NGO in Kailali district. FAYA Nepal had a maternal and neonatal health project (Community Responsive Antenatal, Delivery and Life Essential Support project, CRADLE) in Kailali district and the field workers of this project were recruited as enumerators for this study. The project officer acted as the local supervisor for the data collection process. The field work was carried out from 15th September to 30th November 2011, with a three-week break in October for the Dashain and Tihar holiday.

3.3.1 Study site and sampling

Kailali district consists of 42 VDCs and two municipalities. Four VDCs (Village Development Committee, a small administrative area in rural Nepal) in Kailali district were selected purposively based on the preference of FAYA Nepal and the enumerators. The selected VDCs were Malakheti, Chaumala, Ramshikharjhala and Thapapur.

Sample size calculation

CI= p ± 1.96 *S.E. of p……(i)

CI= p ± 1.96 √ (p q/N)

Where,

CI = confidence interval of the proportion

P = proportion of women who delivered in health facility (16%)

q = 1-p = 84%

N = sample size

From the equation (i), 'N' can be derived as:

$N = \frac{(1.96)2 * p\ q}{E\ 2}$ Where, E = error term

Taking 5 % marginal error, sample size can be calculated as:

$N = \frac{(1.96)2X0.16X0.84}{(0.05)\ 2} = 206.5 \approx 207$

Taking 5 % non-response rate, the final sample size is 232.

Box 1. Sample size calculation

At first the women who gave live birth during the year prior to the survey, which entailed the period of 1 October 2010 to 30 September 2011, were listed. The list was made by reviewing health facility registers, consulting FCHV (Female Community Health Volunteers) and house-to-house visits. There were 302, 445, 276 and 266 women listed in the Malakheti, Chaumala, Ramshikharjhala and Thapapur VDCs, respectively, who have live births during the past year. From this sampling frame 82, 109, 75 and 75 women from the Malakheti, Chaumala, Ramshikharjhala and Thapapur VDCs,

respectively, were sampled using random number method. Hence, the total sample size for quantitative survey was 341 women which are more than the calculated sample size in Box 1.

3.3.2 Selection and training of the enumerators

Four enumerators from the CRADLE support project were selected for the data collection. The Project Officer of FAYA Nepal acted as field supervisor. The enumerators and supervisor were trained about the study, questionnaire and qualitative tools for two days (18 and 19 September 2011).

3.3.3 Pretesting of the questionnaire

During the second day of the training, the pre-testing of the questionnaire was conducted, involving the enumerators. The questionnaire was tested on 15 recently delivered women in Seti Zonal Hospital, Kailali. The respondents were women with children under 1 years of age and were present for immunizing their children. Based on the findings and feedback obtained from the pre-testing process, the questionnaire was updated and refined. Pre-testing helped to rephrase the wording of the questions, ensure the flow of questions and appropriate skipping pattern, and also gave experience to the enumerators for conducting the interviews for data collection.

3.3.4 Data collection

Data collection was carried out in October and November 2011. Each enumerator was assigned to one VDC. As the enumerators were already familiar with the community, no specific problems were encountered during the data collection process. Supervision of data collection was done by the field supervisor and researcher himself. After the first week of data collection, a review and feedback session was organized to share initial experiences and difficulties during the data collection process. The filled-in questionnaires were checked by the field supervisor and then by the researcher.

Information on aspects of husband's involvement on maternal health care utilization was also obtained by qualitative methods. A total of 16 in depth interviews (six with women, five with husbands, two with mothers-in law, two with service providers and one with FCHV) were carried out. All the women and husbands interviewed had their last child born within the duration of last one year. Out of the six women, two women had labour migrant husbands. Two focus group discussions (FGD) were conducted, one for husbands (eight participants) and one for women (ten participants). Participants for the interviews and FGDs were invited by field workers, together with the FCHV. All the interviews with women and husbands were carried out in their home and community settings. The FGD with women was conducted in mother's group meeting, while the FGD with husbands was conducted in a school. Most of the interviews and both FGDs were recorded while in non-recorded cases (interviews), extensive notes were taken. The researcher himself had developed the interview guideline, which was tested in one interview with women who were attended an immunization session in Seti Zonal Hospital. The qualitative aspect of the study was largely intended towards exploring husband's involvement and supportive role towards women during pregnancy, at delivery and in the post partum period. Advice and care or support during pregnancy, delivery and post natal period and preparations for birth were discussed with the participants. Each interview took 40 min to 1 hour, and each FGD took one hour 30 minutes to two hours. Participants of the quantitative survey were not included in the in-depth interviews and FGDs.

3.4 Exclusion criteria

Woman's autonomy and partner's involvement related variables were analyzed only from the women whose husbands were present during her pregnancy and delivery, and during the survey period. It is difficult to measure husband's involvement in maternal care when the male partner is not living together during pregnancy, at delivery and in the post-natal period. Many studies suggest that migration of men has major implications on women's status, as women take on increased responsibilities for the household, and even for the management of money and property (Gartaula et al., 2011, Gulati, 1993). So, the exclusion criteria apply to women whose husband were not living with them since last three months preceding the survey time.

Table 3. Summary of methodology

Study method	Variables measured	Sampling	Informants/respondents	Survey methods	Instruments	Data analysis
Quantitative	**Independent variables:** woman's autonomy measures **Dependent variables:** maternal health care utilization; husband's involvement in maternal health care utilization **Covariates:** Age, education and occupation of both woman and husband; caste; wealth index of the household; type of marriage; type of family; number of surviving children; woman's exposure to media; woman's experience of complaints during pregnancy and at delivery	simple random sampling	women who delivered a live birth during the period of one year prior to the survey	face to face interview	questionnaire	descriptive measures; Chi-square; logistic regression
Qualitative	maternal health care utilization- household decision making process; husband's support during pregnancy, delivery and post-natal period; husband's involvement in maternal health care utilization	purposive	Service providers (ANM, staff nurse, SBAs); volunteers (FCHV); recently delivered women and husbands	in-depth interview; focus group discussion	guidelines; checklists	Qualitative thematic analysis

3.5 Operationalization of the concepts

3.5.1 Independent variables: Measures of woman's autonomy

Woman's autonomy was measured in four components: economic autonomy, domestic decision making autonomy, physical autonomy, and intra-spousal communication. Women in the survey were asked different questions related to their status within household and their decision making power in these four components. In case of economic and domestic decision making autonomy, women were considered to involve in decision making if they made decisions alone or jointly with their husbands. These and similar other measures have been used elsewhere by different authors (Jejeebhoy and Sathar, 2001, Bloom et al., 2001, Dyson and Moore, 1983, Acharya et al., 2010, Allendorf, 2007, Furr and Das, 2006, Furuta and Salway, 2006, Mullany et al., 2005) to assess woman's autonomy at household level.

Economic autonomy

Economic autonomy refers to economic decision-making authority and was measured by whether or not women has final say on financial decisions on household purchases, on decisions about woman's work outside home, on deciding how to spent her income, etc. Five questions related to economic decision-making were asked. The responses included: 'women herself', 'husband', 'jointly (involving women)', and 'other'. Responses were coded as 1 if the answer is women herself and jointly, otherwise 0. Hence, the economic-decision making autonomy score ranged from 0 to 5.

Domestic decision making autonomy

Domestic decision-making autonomy measures the freedom of women to use or manage household resources and the extent to which they have independent control over any resource. Five questions were asked to assess whether they have a final say on: 1) what to do when a child is sick; 2) whether to have another child; 3) schooling of the children; 4) buy foods for family meals; 5) use of family planning method). The responses included: 'women herself', 'husband', 'jointly', and 'others', and responses were coded as 1 if the answer was women herself and jointly, otherwise 0. Hence, the domestic decision-making autonomy score ranged from 0 to 5.

Physical (movement) autonomy

Physical autonomy was measured by freedom for movement. Women were asked whether they have to ask permission from their husbands of or other senior member of the family to go five different places: local market, local health facility, mothers-group meeting, relatives or friends and nearby temple/church or other religious place. The responses included were 'yes' if permission is required (coded as 0) and 'no' if permission is not required (coded as 1). The score of physical autonomy also ranged from 0 to 5.

Intra-spousal communication

Intra-spousal communication was measured by five questions to assess whether women communicate with their husbands regarding community affairs, money matters, number of children to have, use of family planning methods and health of the woman. The responses included were 'yes' if she discussed with husband (coded as 1) and 'no' if she did not discussed (coded as 0). This score also ranged from 0 to 5.

3.5.2 Other predictor variables (Covariates)

The survey measured economic and demographic characteristics both at individual and household levels. At the household level we consider the following variables: caste, structure of the household, and wealth index. Though different studies suggest religion as an important factor to influence both

woman's autonomy and maternal health care utilization, it was not considered in the study as almost all of the study population were Hindu. For the caste variable, there were six categories (based on National Planning Commission, Nepal): 1) Dalit (untouchable lower caste); 2) disadvantaged Janajatis (ethnic groups); 3) disadvantaged non Dalit Terai caste group; 4) religious minorities; 5) relatively advantaged Janajatis; and 6) upper caste groups. The survey also asked a multitude of questions about the ownerships of assets like a cycle, radio, television, electricity, computer, refrigerator, availability of water tap and toilet, etc. and a wealth index was created by principle component analysis (PCA) method. The items are similar to those used in Nepal Demographic and Health Survey (NDHS, 2012). Wealth index were categorized into five groups (quintiles): lowest, second, middle, fourth and highest. Household structure was measured as nuclear if only couple with or without their (unmarried) children was residing or joint if included other members also.

Variables which are considered at the individual level are type of marriage (love or arranged), age of both women and husband, educational level of women and their husbands, age of women at first marriage, woman's employment status, husband's occupation, woman's exposure to media, the number of surviving children woman had, and woman's experience of complaints during pregnancy and at delivery. Education level of both woman and husband was measured into six categories: 'illiterate', 'can read and write', 'primary (1-5 grade)', 'middle (6-8 grade)', 'secondary (9-10 grade)' and SCL or above (higher secondary or university)'. During data analysis, only three categories have been made: 'low education' including illiterate and can read and write, 'middle education' including primary and middle level, and 'higher education' including secondary and higher secondary or above. Occupation of both woman and husband was measured into five categories: agriculture, labour, business, service and others, with additional one category for women; the housewife. Most of the women in this study reported their occupation either housewife or agriculture. In Nepalese society, most of the women who are housewives also work in agriculture and vice versa, so woman's employment status was during the data analysis was categorized into only two levels: women working in agriculture or as housewife and women employed in occupation other than agriculture and housewife. Woman's exposure to media was assessed by asking whether they were exposed to three types of mass media: radio, television and printed media (newspaper and magazines). Woman was coded as exposed to media if she was exposed to any of the three types of media during last week. Woman's experiences of complaints during pregnancy and at delivery were measured as health risk related factors.

3.5.3 Outcome Variables/ Dependent Variables

Maternal health care utilization itself and husband's involvement in utilizing maternal health care are the outcome variables.

Maternal health care utilization

Maternal health care utilization was measured in terms of different types of maternal health service utilization during pregnancy and at delivery of the most recent child birth.

Antenatal care

Variables considered in antenatal care utilization were number of times woman received antenatal care from skilled provider, number of months pregnant at the time of first ANC visit, consumption of iron and folic acid tablets, received two or more TT injections, and consumption of intestinal parasite drugs during the most recent pregnancy.

WHO recommends at least 4 visits for pregnant women to a trained professional and the first visit should be within four months of pregnancy. So combining the duration of first visit and number of ANC visits, a new variable ANC sufficiency was created. ANC sufficiency was coded as 1 if a woman had made

four or more ANC visits and the first visit was within first four months of pregnancy, otherwise coded as 0.

Delivery care

Delivery assisted by skilled provider, place of delivery, and number of PNC visits were considered as delivery care utilization. Assistance during delivery indicates whether the delivery was conducted by skilled birth attendants (SBAs) which include medical doctors, nurse/midwives or other health workers trained in SBA (coded as 1). Assistance received from a traditional birth attendant, or a relative/friend and no help are considered as non skilled assistance (coded as 0). For place of delivery, woman who delivered in institutions (health facilities) was coded as 1 and woman who delivered at home was coded as 0. Institutional delivery includes all types of deliveries conducted in health facilities such as government hospitals, health centres, health posts, birthing centres, private hospitals, clinics and nursing homes. For PNC service, women who received at least one PNC after delivery, women receiving first PNC within 24 hours of delivery and women receiving three or more PNC were measured.

ANC sufficiency (sufficient or not sufficient) and place of delivery (health facility or home) were used as the primary outcome variables representing maternal health care utilization because ANC sufficiency captures both number and timing of ANC visits while women who delivered in health facility are more likely to utilize other delivery and post natal health services.

Husband's involvement in maternal health care utilization

Husband's involvement was measured by the presence of husbands at ANC visits and at delivery conducted at health facility.

Husband's presence at ANC

Husband's involvement in antenatal care was measured by the presence of husband in any one of the ante natal care visits. If a woman is accompanied by her husband in any one of the ANC visits then the response was coded as 1, if not then coded as 0.

Husband's presence at delivery

Similarly, husband's involvement during delivery was measured by husband's presence at health facility delivery. Husband's present during institutional delivery was coded as 1. If delivery was not conducted in health institution or delivery was institutional but not accompanied by her husband then, it was coded as 0.

All the outcome variables were binary. Furthermore, the extent of partner's involvement in maternal health care during pregnancy and delivery was described based on qualitative findings from in-depth interviews and focus group discussions.

3.6 Data analysis

Quantitative data

At first, descriptive measures of study population and its socio-economic and demographic characteristics, extent of maternal health service utilization, woman's autonomy and husband's involvement were described. For continuous study variables, means and standard deviations were calculated and for categorical study variables, proportions were computed. Bivariate association between socio-demographic characteristics and outcome variables of interest were assessed by t-test for continuous and chi-square test for categorical variables. Variables found to be significantly associated (at 10% level; $p < 0.1$) with outcome variables were then used in bivariate and multivariate

logistic regression models. The measure of association (effect measure) was calculated generating odds ratios (ORs) and confidence intervals (95% CIs). Data was analyzed by SPSS (17 V).

Qualitative data

The information collected from in-depth interviews and FGDs was systematically analyzed to explore the roles that husbands play during the childbearing period of their wife. At first the recordings were transcribed and all the transcripts were read several times by the researcher. All the data were collected in Nepali language and the English translations were also made by researcher himself. As the guideline for qualitative data collection was developed focusing on the different topic lists describing the involvement of husbands in woman's maternal health, the data was also coded into respective topic lists by top-down coding to reduce the data making clustering into major themes. The main themes/topics included forms of husband's involvement; advice given to the women; care and support given at during pregnancy, at delivery and in post natal period; birth preparations made by the couples during the most recent birth; knowledge of husband's on maternal health; and socio-cultural norms on husband's involvement in maternal health. The description of findings on these topic lists with key illustrative verbatim narratives is presented in this report.

3.7 Ethical consideration

Ethical considerations were covered by getting approval from the ethical review board of Wageningen University and the District Public Health Office (DPHO), Kailali. Verbal informed consent was established with the participants before each interview and objectives of the research were clarified to them. Participants were assured that their privacy and confidentiality would be highly respected. No other important ethical dilemmas requiring serious attention were observed in the study.

3.8 Validity and reliability

The questionnaire was translated into the local language (Nepali) and pretested for refinements. Enumerators were well oriented about the data collection procedure and a manual for data collection was developed and distributed to the enumerators and field supervisor. The filled-in questionnaire were checked and edited each day by field supervisor and the researcher. The researcher himself was involved in the data collection and analysis procedure to minimize the error. Expert opinions were taken from time to time as per need of the research process.

SECTION III

ANALYSIS & RESULTS

Section III of this report includes results of the study. At first descriptive characteristics of the study sample are presented. Then after, the report presents the results of different types of analysis including bivariate t-test and chi-square analysis, and multivariate logistic regression analysis. This section also includes the results of qualitative findings.

CHAPTER IV

RESULTS

This chapter begins with the description of spousal separation among the study samples (section 4.1), as it has to do with the inclusion criteria of the sample in analysis. Then after, the results of both quantitative and qualitative data analysis are presented. Section 4.2 consists of the descriptive of the study variables including socio-demographic characteristics, woman's autonomy, maternal health care utilization and finally husband's involvement. Section 4.3 presents the results of bivariate analysis of the association between socio-demographic characteristics and outcome variables of interest. Bivariate analysis is furthermore explained by logistic regression analysis in section 4.4. The final section of quantitative results (section 4.5) presents the results of multivariate analysis predicting the association between woman's autonomy and outcome variables. Section 4.6 presents the summary of qualitative findings.

4.1 Spousal separation and its impact on analytical sample size

The primary objective of this study was to assess the relationship between woman's autonomy and husband's involvement in maternal health care utilization. As discussed elsewhere in this report, both woman and her husband living together in the same household is a prerequisite for husband's involvement. The proportion of women whose husbands are living away from home for considerable period may have implications on reproductive behaviour and health of the family including women. However the full explanation of these aspects lies beyond the scope of this study. The concern of spousal separation in this case is because the definition of husband's involvement used in this study (husband's presence at ANC and health facility delivery) were not applicable to those women whose husbands were frequent migrants and not living in the same household with their wife during the time of pregnancy and delivery. Furthermore, the absence of husbands may affect the degree of woman's autonomy in the household, as we considered woman's autonomy as the decision-making power in the domestic sphere as compared to other household members, primarily the husband.

Nepal has become a labour exporting country during last decade. In the study also, income from migrant labour, especially to big cities of India, is the main source of livelihood for many households. Women were asked whether their husband was present (living in the same household) at the time of survey and if no, what the duration was during which he was living out of the household.

Table 4. Spousal separation

	n	%
Living with husband at the time of survey (N = 341)		
Yes	239	70.1
No	102	29.9
Spousal separation duration (N=102)		
Up to 3 months	37	36.3
4 to 12 months	53	52.0
More than one year	12	11.8

Table 4 shows that out of 341 women who completed the survey, 239 (70.1%) had their husbands living with them or were not frequent migrants, while 102 (29.9%) women reported that their husbands live away from home. Out of the women who reported spousal separation, 37 (36.3%) reported spousal

separation of less than three months, 53 (52.0%) reported spousal separation of three to 12 months, and 12 (11.8%) reported of more than 12 months. The responses on woman's autonomy and husband's involvement in the questionnaire were recorded for those women whose husbands were not frequent migrants (n = 239) and are living together at the time of survey, and also women whose husbands were migrated for no more than three months (n = 37). This limited the initial sample size of 341 to 276 for bivariate and multivariate analysis to predict the association between woman's autonomy and husband's involvement. One woman was further dropped out because her husband died two months prior to the survey.

4.2 Descriptives of the study sample

4.2.1 Socio-demographic characteristics

The following section presents the socio-demographic characteristics of the study sample. The tables in this section consist of statistics for total sample to which the questionnaires were filled-in, and also the comparison between final realized and excluded (dropped out) case.

Demographic characteristics of study sample

Three hundred and forty one questionnaires were administered to the women who have given birth during last one year. Table 5 shows the demographic characteristics of study samples. Mean age of the respondents was 23.65 (SD = 4.45) years (age range 15 - 45 years). Out of these women, 45 (13.2%) were younger than 20 years, 170 (49.9%) were in 20 to 24 years age group, 100 (29.3%) were in 25 to 30 years age group and 26 (7.6%) were 30 years or older (not shown in table). Mean age of respondent's husbands was 26.6 (SD = 4.9) years (age range 18 - 50 years). Higher proportion of the husbands (40.9%, n = 139) were between 20 to 24 years age, 124 (36.5%) were below 24 years while 77 (22.7%) were 30 years or older (not shown in the table). Similarly, Table 5 also shows that the mean age of first marriage and mean age of first pregnancy were 18.5 (SD = 2.9) and 19.8 (SD = 2.7) years respectively.

Table 5. Demographic characteristics of study sample

Characteristics	Total sample (N = 341)			Realized sample (N = 275)		Excluded sample (N = 66)		p (2-tailed t-test)
	Mean	SD	Range	Mean	SD	Mean	SD	
Age of women (Years at last birth day)	23.6	4.3	15 - 40	23.4	4.1	24.2	4.9	n.s.
Age of husbands (Years at last birth day)	26.6	4.9	18 - 50	26.6	4.9	26.7	5.0	n.s.
Woman's age at marriage	18.5	2.8	13 - 30	18.4	2.8	18.8	2.7	n.s.
Woman's age at first pregnancy	19.8	2.6	14 - 35	19.7	2.6	20.3	2.4	n.s.
Family size	8.1	4.0	1 - 28	8.3	4.2	7.0	3.2	0.006
Number of surviving children	1.9	1.0	1 - 7	1.9	1.0	1.8	1.0	n.s.
Age of last child (months)	5.8	3.4	1 - 12	5.8	3.4	5.6	3.1	n.s.

A women had around two surviving children (SD = 1.1) in average. The number of surviving children to the women ranges from one to eight. Majority of the women (44.6%, n = 152) had one child while 34.9 percent (n = 119) and 20.5 percent (n = 70) of women had two and three or more children respectively (Table 5). Mean age of the last child was 6.1 months (SD = 3.8). Average number of the members living in a family was 8.1 (SD = 4.03), indicating that majority of the sample resided in joint family. Table 4 also shows the means and SDs of realized (operational) and excluded sample and the p-values of the difference in means by 2-tailed t-test. The realized sample has higher mean score of family size than the excluded sample ($p < 0.01$).

Social and reproductive characteristics of study sample

As shown in Table 6, majority of the women (46.3%, n = 158) were from disadvantaged ethnic caste groups followed by upper caste groups (31.7%, n = 108), relatively advantaged ethnic groups (8.5 %, n = 29), untouchable lower caste (8.2%, n = 28) and disadvantaged non-Dalit Terai caste groups by their ethnicity. More than half (53.9 %, n = 180) of the women reported their marriage type as love marriage and around three-fourth (73.5%, n = 350) of the women lived in joint family. Similarly, sex of last child in more than half (55.1%, n = 188) of the women was male (not shown in table).

Education and occupation of study samples

More than one forth (26.1%) of the women had a low educational level (either illiterate, had not been to school or could not complete primary education), 42.8 percent had middle level education (completed primary education), and 31.1 percent had a higher level education (secondary or higher education), while for men the percentages were 11.7, 39.3 and 49.0 respectively.

The majority of the women were housewives and/or engaged in agriculture. A very low proportion of the women reported their occupation as labourer or working in services or business. The occupation of women was categorized into two types; working as housewife and/or agriculture and other occupations other than the first category. Most of the women (86.8%) work in agriculture and as housewives. Among husbands, the main occupation was labour (46.9%), followed by service (20.8%), business (14.8%), agriculture (12.2%) and others (5.4%).

Media exposure

Women were also asked whether they were exposed at least once to three major types of mass media; newspaper, television and radio/FM. Among the three, the radio was the most popular among the women (73.6%), followed by television (69.2%). The percentage of women who read newspapers and magazine was much lower (18.8%). The majority of the women (88.8%, n = 302) women had exposure to any form of media at least once a week, while 39 (11.4%) of women reported that they were not exposed to any of the three media (Table 6).

Table 6. Socio-economic and reproductive characteristics of study sample

Characteristics	Total sample (N = 341)		Realized sample (N = 275)		Excluded sample (N = 66)		χ^2	Sig.
	n	%	n	%	n	%		
Ethnicity (caste)							23.990**	<0.001
Untouchable lower caste	28	8.2	20	7.3	8	12.1		
Disadvantaged ethnic groups	158	46.3	145	52.7	13	19.7		
Disadvantaged non-Dalit Terai caste	18	5.3	14	5.1	4	6.1		
Relatively advantaged ethnic groups	29	8.5	20	7.3	9	13.6		
Upper caste groups	108	31.7	76	27.6	32	48.5		
Type of marriage							0.053	n.s.
Love marriage	180	52.8	146	53.1	34	51.5		
Arrange marriage	161	47.2	129	46.9	32	48.5		
Type of family							1.848	n.s.
Nuclear Family	91	26.7	69	25.1	22	33.3		
Joint Family	250	73.5	206	74.9	44	66.7		
Woman's education							5.107	n.s.
No schooling or incomplete primary	89	26.1	79	28.7	10	15.2		
Completed primary education	146	42.8	114	41.5	32	48.5		
Secondary or higher	106	31.1	82	29.8	24	36.4		
Husband's education							8.571*	0.014
No schooling or incomplete primary	40	11.7	39	14.2	1	1.5		
Completed primary education	134	39.3	107	38.9	27	40.9		
Secondary or higher	167	49.0	129	46.9	38	57.6		
Woman's occupation							1.122	n.s.
Working as housewife/agriculture	295	86.8	236	85.8	59	90.8		
Other than housewife and agriculture	45	13.2	39	14.2	6	13.3		
Husband's occupation							18.06**	0.001
Agriculture	41	12.2	40	14.7	1	1.5		
Labour	158	46.9	117	43.0	41	63.1		
Business	50	14.8	45	16.5	5	7.7		
Service	70	20.8	53	19.5	17	26.2		
Others	18	5.3	17	6.3	1	1.5		
Number of surviving children							0.408	n.s.
1	152	44.6	121	44.0	31	47.0		
2	120	35.2	99	36.0	21	31.8		
2+	69	20.2	55	20.0	14	21.2		
Woman's exposure to media							0.445	n.s.
Yes	302	88.6	242	88.0	60	90.9		
No	39	11.4	33	12.0	6	9.1		

Chi-square statistics in Table 6 shows that the operational and excluded sample differed from each other in ethnicity ($p < 0.001$), husband's education ($p < 0.05$) and husband's occupation ($p < 0.01$).

4.2.2 Woman's autonomy

The distribution of women with respect to the four dimensions of autonomy and subsequent items are shown in tables 7 and 8.

The general pattern of woman's final say in decisions at household level was quite low in this study. Very low proportions of women were sole decision makers in economic and domestic decisions (Table 7). Women alone were least likely to have final say in decisions related to making large household purchases, schooling of children, whether to have another child and use of family planning. A substantially large percentage of economic decisions were made by members other than women and their husbands (usually fathers-in-law and mothers-in-law). Decisions about family planning use, having another child and schooling of children were most frequently cited joint decisions by women and husbands.

Table 7. Distribution of economic and domestic decision making autonomy (N = 275)

Autonomy measures	Final say in decisions (%)			
	Wife alone	Husband alone	Wife and husband jointly	Others
Economic autonomy				
Whether women should work outside the home?	6.9	30.2	21.1	41.8
How money that the women earned will be spent?	11.6	18.2	30.9	39.3
Making large household purchases e.g. jewellery, land, etc.?	4.4	20.4	26.9	48.4
Making household purchases for daily needs?	19.3	12.4	22.9	45.5
Changing make up of household spending?	4.4	23.3	24.7	47.3
Domestic decision making autonomy				
Health care for children?	19.6	7.6	48.0	24.7
Whether to have another child?	3.6	3.3	91.6	1.5
Schooling for children?	1.1	15.3	80.0	3.6
Foods to buy for family meals?	15.3	9.1	52.0	23.6
Use of family planning method?	3.3	4.0	91.3	1.5

Table 8 shows that only one forth (24.7%) of the women require no permission from husbands or other senior members of the family to go the local market while the same proportion for visiting local health facility was 39.3 percent. Around half of the women can go to community centre or mother's group meeting, relatives or friends in the village and nearby religious place without any permission from others. The proportion of women who discussed with husbands in this study was quite high as compared to other autonomy measures. More than 90 percent of the women used to discuss money matters of the family, the number of children to have, use of family planning and woman's health (Table 8).

Table 8. Distribution of movement autonomy and intra-spousal communication (N = 275)

Autonomy measures	%
Movement autonomy (freedom for movement)	
Women do not require permission from husbands or other senior members to go to:	
The local market	24.7
The local health facility	39.3
Community centre, mother group meeting	44.4
Relatives or friends in the village	50.6
Nearby temple/church or other religious place	56.4
Intra-spousal communication	
Women discussed with husband about:	
Community affairs	70.2
Money matters of the family	94.2
The number of children to have	96.0
Whether to use family planning methods	95.3
Health of woman	90.9

Composite measures of each dimensions of woman's autonomy were created based on the responses of women in different items of autonomy measures. In traditional societies like Nepal, very few young women have sole decision making power in domestic spheres. In this dataset also, a substantially lower proportion of women had final say in decisions. Hence, for economic and domestic decision making autonomy, women were considered to involve in decision making if they had made decisions alone or jointly with their husbands. Women were scored 1 for responses to each item that included her (along or jointly) in final say in decisions, otherwise they are scored 0. For movement autonomy women were scored 1 to each item if they do not require permission from others. Similarly, for intra-spousal communication autonomy, responses were scored 1 if women discussed about the items presented with their husbands, otherwise 0.

As each of the dimensions of autonomy has five items, the composite autonomy score for each dimension ranges from 0 to 5. Table 9 presents the mean autonomy scores of each autonomy dimensions and its standard deviation. Intra-spousal communication has higher mean score (4.47, D = 1.02), followed by domestic decision making autonomy (3.95, SD = 1.08), movement autonomy (2.29, SD = 1.66) and economic autonomy (1.73, SD = 2.02).

Table 9. Mean autonomy scores

Autonomy measures (N=275)	Mean score	SD
Economic autonomy	1.73	2.02
Domestic decision making autonomy	3.95	1.08
Movement autonomy	2.29	1.66
Intra-spousal communication	4.47	1.02

Women in this study scored relatively higher mean score in intra-spousal communication, followed by domestic decision making autonomy, movement autonomy and economic autonomy scores.

4.2.3 Maternal health care utilization

The survey asked several questions related to utilization maternal health care services during pregnancy and at delivery to women who gave live birth within the last one year prior to the survey period. Questions included were whether they had obtained antenatal care during pregnancy, consumed iron and folic acid tablets and received tetanus toxoid injections. Women were also asked where the delivery took place and who assisted their last delivery.

Ante natal care

Antenatal care (ANC) refers to "care during pregnancy", and includes education, screening and treatment to promote the health and well-being of mother and foetus. ANC constitutes both educational and therapeutic interventions about planning for safe birth and emergencies during pregnancy (Chalmers et al., 2001). ANC service should help families and parents in transiting toward responsible parenthood. WHO recommends at least four visits to skilled health attendant for antenatal care in each normal pregnancy, including the first visit within four months of pregnancy (WHO, 2001).

The proportion of women who received skilled antenatal care during the pregnancy of most recent birth was 96.5 percent. Average number of ANC visit made during the most recent pregnancy was 3.8. Most women (75.1%) had four or more ANC visits during their last pregnancy and 84.2 percent had their first ANC visit within the first four months of pregnancy. A new measure of ANC utilization, 'ANC sufficiency', was created. ANC was termed sufficient if the women had made four or more ANC visits during last pregnancy and the first visit was made within first four months of pregnancy. Table 10 shows that 72.7 percent of the women received sufficient ANC during their last pregnancy. Similarly, 94.4 percent took iron and folic acid tablets, 64.2 percent of the births were protected against neonatal tetanus, and 94.7 percent of the women were treated by ante-helminthic drugs.

Table 10. ANC service utilization by women during last pregnancy

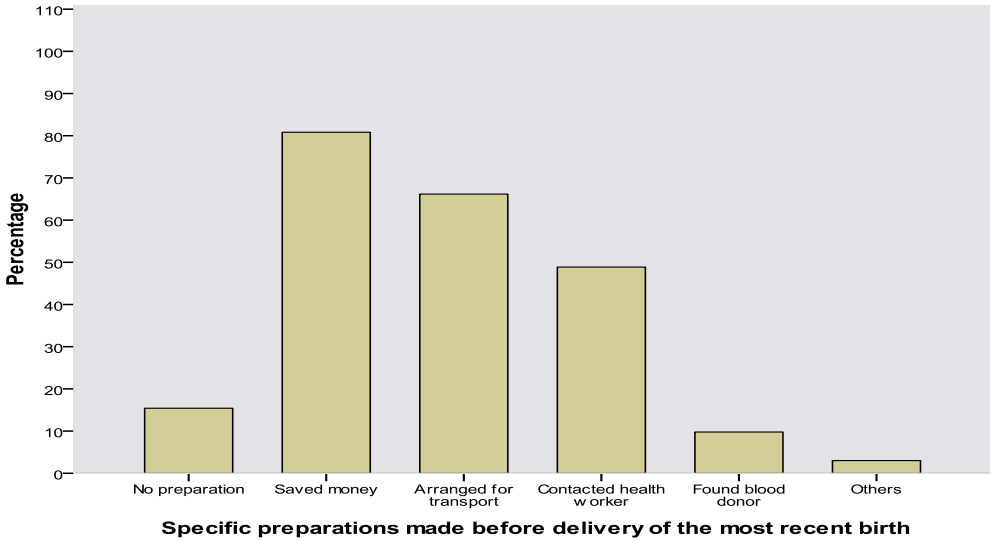
Variables	Total (N = 341)		Realized sample (N = 275)		Excluded sample (N = 66)		χ^2	p-value
	n	%	n	%	n	%		
Women receiving antenatal care from skilled provider[a]	329	96.5	266	96.7	63	95.5	0.254	n.s.
Number of ANC visit							11.581**	0.003
None	12	3.5	9	3.3	3	4.5		
1 to 3	73	21.4	49	17.8	24	36.4		
4 +	256	75.1	217	78.9	39	59.1		
Number of months pregnant at time of first ANC visit							2.993	n.s.
No ANC	12	3.5	9	3.3	3	4.5		
< 4 months	287	84.2	236	85.8	51	77.3		
4 months +	42	12.3	30	10.9	12	18.2		
Women who had sufficient ANC visit	248	72.7	212	77.1	36	54.5	13.64**	<0.001
Iron and folic acid tablet consumption	321	94.4	262	95.6	59	89.4	2.817	n.s.
Received two or more TT injections during last pregnancy	219	64.2	179	65.1	40	60.6	0.466	n.s.
Took intestinal parasite drugs	320	94.7	259	94.5	61	95.3	0.064	n.s.

[a] skilled provider refers to doctor, nurse or midwife

The excluded sample differed with respect to the number of ANC visits and ANC sufficiency. Women whose husbands were frequent labour migrants (excluded sample) had visited less often as compared to women whose husbands were not frequent migrants. For example, woman who had four or more ANC visit during the most recent pregnancy was 78.9 percent in operational sample while in the excluded sample it was only 59.1 percent. Similarly, higher proportion of woman from operational sample (77.1%) had sufficient ANC visit as compared to excluded sample (54.5%).

Birth preparedness

Nepal government has recently implemented the birth preparedness program which outlines the different preparations mothers and families should make for a safe birth. The birth preparedness program recommends families to save money for emergencies, arrange transportation facility before-hand based on local conditions, identify persons who can and are eligible to donate blood if required, and identify and contact health workers who can assist delivery and provide services (JHPIEGO, 2004).



Women were asked whether they or their husbands had made any of the four birth preparedness arrangements before the delivery of the most recent birth. About 80 percent of the women reported saving money, two-thirds arranged for transportation, nearly half of the women identified and contacted a health worker. Less than ten percent identified a person who could donate blood if required. Some of the women also reported that they had bought safe delivery kit and arranged food and clothing. Overall, 82.6 percent of women reported that the couple had made at least one of the arrangements for birth preparation (Table 12).

Delivery and post natal care

The national health policy of Nepal promotes delivery at a health facility by a skilled birth attendant to ensure appropriate medical attention and hygienic conditions at delivery whereby reducing the complications and serious illness of the mother and baby.

In this study, 70.1 percent of the women were assisted by skilled birth attendant (SBA), which includes doctor, nurses and midwifes. FCHVs assisted in 4.7 percent, and traditional birth attendants assisted in 12.4 percent. In one in ten (10.9 %) cases, the birth was attended by a relative or another person.

Two-third (66.9%) of the women delivered their last birth in health facility. Similarly, 73.0 percent of the women had received at least one post natal care service, but only 15.0 percent of the women received the recommended three or more PNC services. Most of the women (93.8%) also received vitamin A capsule within 45 days of delivery.

Table 11. Delivery and PNC service utilization by women

	Total (N=341)		Realized sample (N=275)		Excluded sample (N=66)		χ^2	p-value
Delivery and PNC services	n	%	n	%	n	%		
Persons providing assistance at delivery[a]								
Doctor	13	3.8	8	2.9	5	7.6		
Nurse/midwife	226	66.3	192	69.8	34	51.5		
Other health workers[b]	5	1.5	3	1.1	2	3.0		
FCHV	16	4.7	11	4.0	5	7.6		
Traditional birth attendant	42	12.4	34	12.5	8	12.1		
Relatives and other	37	10.9	25	9.1	12	18.2		
No one	2	0.6	2	0.7	0	0.0		
Delivery assisted by skilled provider	239	70.1	198	72.3	39	59.1	4.370*	0.037
Delivery at health facility	228	66.9	190	69.1	38	57.6	3.185	n.s.
Women receiving at least one PNC after delivery	249	73.0	209	76.0	40	60.6	6.402*	0.011
Women receiving first PNC within 24 hours	241	70.7	202	73.5	39	59.1	5.298*	0.021
Women received 3 or more PNC	51	15.0	46	16.8	5	7.6	3.541	n.s.
Received vitamin A capsule within 45 days of delivery	320	93.8	257	93.5	63	95.5	0.368	n.s.

[a] $\chi 2$ statistic could not be calculated because more than 20% of the cells have frequency less than 5.

[b] Other health workers include Health Assistant, Auxiliary Health Worker, Village Health worker and Maternal and Child Health worker.

Women from the operational sample tended to have more skilled birth assistance at the most recent birth (72.3% as compared to 59.1%), at least one PNC after delivery (76.0% as compared to 60.6%) and first PNC within 24 hours of delivery (73.5% as compared to 59.1%) than those of the excluded sample. Two variables from maternal health care utilization: ANC sufficiency and place of delivery were used for further bivariate and multivariate analysis.

4.2.4 Husband's involvement in maternal health care utilization

The levels of husband's involvement outcomes in maternal health care were found quite high in this study (Table 12). More than 80 percent of the women discussed about their health with their husbands during last pregnancy. Women were asked whether they and their husbands made any arrangements for birth preparedness and the responses included were financial arrangements, transportation during emergency to reach the health facility, whom to approach for delivery and arrangement for a person who could donate blood in case of emergency. A substantial proportion (82.6%) of women said to have arranged any of the four preparations for delivery together with the husband. Furthermore, 40.7 percent of the women were accompanied by their husbands at ANC visit and husbands were present for three or more times in one third of the cases. Husbands were present at delivery in 78.2 percent of the cases, while this percentage was 59.3 for health facility deliveries.

Table 12. Distribution of husband's involvement outcomes (N=275 otherwise indicated)

Male involvement outcomes	n	%
Discussed with husband about health during pregnancy	225	81.8
Birth preparedness arranged by women or husband (n = 270)	223	82.6
Husband present at ANC visit	112	40.7
Number of times husband present at ANC (n =112)		
1	42	37.5
2	36	32.1
3 or more	34	30.4
Husband present at delivery	215	78.2
Husband present at health facility delivery	163	59.3

The two variables; husband's presence at ANC visit during pregnancy and husband's presence at delivery at health facility were used as the measures of husband's involvement outcomes for further analysis.

4.3 Association of socio-demographic characteristics with maternal health care utilization and husband's involvement

This section presents the results of the bivariate analysis of the relationship between socio-economic and demographic characteristics and outcome variables. The socio-economic and demographic characteristics included ethnicity, wealth, woman's and husband's education, woman's and husband's occupation, type of marriage, type of family, woman's exposure to media, woman's and husband's age, and number of surviving children. Woman's experience of health complaints during pregnancy and at delivery, and ANC sufficiency were also included. Outcome variables consisted of two variables measuring maternal health care utilization and two variables measuring husband's involvement in maternal health care utilization. This section also presents the results of t-test or chi-square test for association with corresponding p-value estimating the relationship between the independent variables and outcome variables.

4.3.1 Maternal health care utilization

Maternal health care utilization was measured by ANC sufficiency and place of delivery.

ANC sufficiency

ANC sufficiency was measured as sufficient if the woman had made four or more ANC visit during the most recent pregnancy and the first ANC visit was made within four months of pregnancy. The mean age of husbands was significantly lower among women who had made sufficient ANC visit as compared to women who had not made sufficient ANC visit. The number of surviving children the woman had was also associated with ANC sufficiency. The mean number of surviving children was significantly higher among women who had not made sufficient ANC visit, although this reflects the age effect on parity.

Table 13. Bivariate association of maternal health care utilization with demographic characteristics (N = 275)

Demographic Characteristics	ANC sufficiency (mean)			Delivery at HF (mean)		
	Yes	No	p-value (2-tailed t-test)	Yes	No	p-value (2-tailed t-test)
Woman's age	23.2	24.1	n.s.	23.1	24.3	0.024
Husband's age	26.3	27.7	0.042	26.4	27.1	n.s.
woman's age at first marriage	18.4	18.4	n.s.	18.3	18.6	n.s.
Woman's age at first pregnancy	19.8	19.3	n.s.	19.6	20.0	n.s.
Family size	8.3	8.4	n.s.	8.4	8.1	n.s.
Number of surviving children	1.8	2.2	0.019	1.8	2.1	0.051

As shown in Table 14, the proportion of women who made sufficient ANC visits during the most recent pregnancy was highest in disadvantaged ethnic groups (82.8%), followed by disadvantaged non-Dalit terai caste groups (78.6%), upper caste groups (73.7%) and relatively advantaged ethnic groups (70.0%). The proportion of women was lowest in the untouchable lower caste groups (55.0%). Low proportions of women making sufficient ANC visits were also found in the lowest wealth quintile (64.9%), among women with low education (69.6%) and women having a husband with low education (59.0%). Women employed in occupation other than agriculture and housewife made more sufficient ANC visits than those working in agriculture and as housewife.

Women who reported their marriage as arranged had a higher proportion of making sufficient ANC visits (79.0%) than women who reported their marriage as a love marriage (68.3%). Women who were exposed to any of the three mass media (radio, television and magazines) at least once a week were also found to have made sufficient ANC visits (81.4%). Not surprisingly, greater proportion of women who had experienced complaints during pregnancy had made sufficient ANC visits.

Characteristics found to be significantly associated with ANC sufficiency (at 1% level of significance) were ethnicity, woman's education, husband's education, woman's occupation, type of marriage, woman's exposure to media, husband's age, number of surviving children, and woman's experience of complaints during pregnancy.

Table 14. Bivariate association (chi-square) of maternal health care utilization with socio-economic characteristics (N = 275)

Characteristics	ANC sufficient				Delivery at HF			
	n	%	χ2	P	N	%	χ2	P
Socio-economic characteristics								
Ethnicity			9.25ᵗ	0.055			4.452	n.s.
Untouchable lower caste	11	55.0			15	75.0		
Disadvantaged ethnic groups	120	82.8			102	70.3		
Disadvantaged non-Dalit terai caste	11	78.6			11	78.6		
Relatively advantaged ethnic groups	14	70.0			10	50.0		
Upper caste groups	56	73.7			52	68.4		
Wealth quintile			5.752	n.s.			8.428ᵗ	0.077
Lowest	24	64.9			23	62.2		
Second	34	70.8			27	56.3		
Middle	54	81.8			46	69.7		
Fourth	51	79.7			45	70.3		
Highest	47	81.0			47	81.0		
Woman's education			5.715ᵗ	0.057			6.427*	0.040
Low education	55	69.6			46	58.2		
Middle education	87	76.3			82	71.9		
High education	70	85.4			62	75.6		
Husband's education			10.58**	0.005			9.83**	0.007
Low education	23	59.0			19	48.7		
Middle education	81	75.7			74	69.2		
High education	108	83.7			97	75.2		
Woman's occupation			5.958*	0.015			1.305	n.s.
Housewife and agriculture	176	74.6			160	67.8		
Other	36	92.3			30	76.9		
Husband's occupation (n = 272)			7.405	n.s.			3.917	n.s.
Agriculture	32	80.0			25	62.5		
Labour	86	73.5			82	70.1		
Business	31	68.9			31	68.9		
Service	45	84.9			40	75.5		
Others	16	94.1			9	52.9		
Type of marriage			4.857*	0.028			2.358	n.s.
Love	123	68.3			95	65.1		
Arrange	124	79.0			95	73.6		
Type of family			0.527	n.s.			0.253	n.s.
Nuclear	51	73.9			46	66.7		
Joint	161	75.9			144	69.9		
Woman's exposure to media			21.25**	<0.001			9.81**	0.002
Yes	197	81.4			175	72.3		
No	15	45.5			15	45.5		
Health risk								
Experienced complaints during pregnancy			3.408ᵗ	0.065			10.971**	0.001
Yes	163	80.3			152	74.9		
No	48	69.6			37	53.6		
Experienced complaints at delivery							7.127**	0.008
Yes					129	75.4		
No					60	60.0		
Antenatal care service							17.643**	<0..001
Sufficient					160	75.5		
Not sufficient					30	47.6		

Delivery at health facility

Tables 13 and 14 revealed a similar pattern of relationship between socio-economic and demographic characteristics and delivery of most recent child at a health facility. Wealth quintile of the household, woman's age, woman's education, husband's education, woman's exposure to media, number of surviving children and woman's experience of complaints during pregnancy were found to be significantly associated with delivery at a health facility. The relationship of delivery at health facility with woman's experience of complaints during pregnancy, at delivery and ANC sufficiency was also found significant (Table 14).

4.3.2 Husband's involvement in maternal health care utilization

This section presents the bivariate analysis of the relationship of socio-demographic and health risk related characteristics with husband's involvement in maternal health care utilization. Table 15 and 16 presents the association between socio-demographic and health risk related characteristics with the two outcome variables of interest; husband's presence at ANC and husband's presence at health facility delivery, representing husband's involvement.

Husband's presence at ANC

Table 15 shows that woman's age, husband's age and number of surviving children were the three demographic characteristics associated with husband's presence at ANC visits. The mean age of both women and husbands was significantly lower among women whose husbands were present. The mean number of surviving children the woman had was also significantly lower among women whose husbands were present at ANC visits compared to women whose husbands were not present.

Table 15. Bivariate association of husband's involvement with demographic and health risk related variables (N = 275)

Demographic Characteristics	Husband present at ANC (mean)			Husband present at HF delivery (mean)		
	Yes	No	p-value (2-tailed t-test)	Yes	No	p-value (2-tailed t-test)
Woman's age	22.6	24.0	0.009	23.1	24.0	0.085
Husband's age	26.0	27.1	0.075	26.5	26.8	n.s.
woman's age at first marriage	18.5	18.3	n.s.	18.2	18.7	n.s.
Woman's age at first pregnancy	20.0	19.6	n.s.	19.6	19.9	n.s.
Family size (Number of family member)	8.0	8.6	n.s.	8.2	8.5	n.s.
Number of surviving children	1.6	2.1	<0.001	1.8	2.0	n.s.

The proportion of women who reported that their husbands were present in health facility at ANC visits was highest in the relatively advantaged ethnic groups (60.0%) and lowest among the untouchable lower caste (25.0%). Women from lowest wealth quintile households were least likely to be accompanied by their husbands (21.6%), but the association between wealth quintile and husband's presence at ANC visits did not show any specific trend; the proportion of women whose husbands accompanied them was 54.4 percent in the second quintile while it was only 31.3 percent in the fourth quintile, and again increased to 51.7 percent in the highest quintile. Both woman's education and husband's education were positively associated with husband's presence at ANC visits, with higher levels of education showed higher involvement of husband.

Table 16. Bivariate association (chi-square) of husband's involvement with socio-economic characteristics (N = 275)

Characteristics	Husband present at ANC				Husband present at HF delivery			
	n	%	χ2	P	n	%	χ2	P
Socio-economic characteristics								
Ethnicity			9.769*	0.045			6.121	n.s.
Untouchable lower caste	5	25.0			11	55.0		
Disadvantaged ethnic groups	63	43.4			94	64.8		
Disadvantaged non-Dalit terai caste	8	57.1			9	64.3		
Relatively advantaged ethnic groups	12	60.0			8	40.0		
Upper caste groups	24	31.6			41	53.9		
Wealth quintile			14.509**	0.006			9.97*	0.041
Lowest	8	21.6			21	56.8		
Second	26	54.2			26	54.2		
Middle	28	42.4			37	56.1		
Fourth	20	31.3			34	53.1		
Highest	30	51.7			45	77.6		
Woman's education			9.932**	0.007			3.257	n.s.
Low education	21	26.6			41	51.9		
Middle education	50	43.9			68	59.6		
High education	41	50.0			54	65.9		
Husband's education			8.165*	0.017			7.798*	0.020
Low education	9	23.1			16	41.0		
Middle education	41	38.3			62	57.9		
High education	62	48.1			85	65.9		
Woman's occupation			0.554	n.s.			5.865*	0.015
Housewife and agriculture	94	39.8			133	56.4		
Other	18	46.2			30	76.9		
Husband's occupation (n = 272)			5.953	n.s.			3.842	n.s.
Agriculture	23	57.5			24	60.0		
Labour	45	38.5			64	54.7		
Business	15	33.3			28	62.2		
Service	21	39.6			36	67.9		
Others	7	41.2			8	47.1		
Type of marriage			0.129	n.s.			1.246	n.s.
Love	58	39.7			82	56.2		
Arrange	54	41.9			81	62.8		
Type of family			2.984ᵗ	0.084			0.771	n.s.
Nuclear	22	31.9			44	63.8		
Joint	90	43.7			119	57.8		
Woman's exposure to media			4.221*	0.040			6.139*	0.013
Yes	104	43.0			150	62		
No	8	34.2			13	39.4		
Health risk								
Experienced complaints during pregnancy			4.404*	0.036			23.563**	<0.001
Yes	91	44.8			138	68.0		
No	21	30.4			24	34.8		
Experienced complaints at delivery							3.029ᵗ	0.0820
Yes					109	63.7		
No					53	53.0		
ANC sufficiency							15.183**	<0.001
Sufficient					139	65.6		
Not sufficient					24	38.1		

The proportion of husband's presence at ANC visits was lower among women who were employed in agriculture and as housewife than among women employed in other occupations (39.8% and 46.2%, respectively). Women with husbands working in agriculture were most likely to have their husbands accompanying them (57.5%), while husbands working in the business sector were least likely to accompany their wives (33.3%). The proportion of women accompanied by their husbands at ANC visits was also positively associated with media exposure. The same applies to the variable of having experienced complaints during pregnancy.

Variables found to be significantly associated with husband's presence at ANC visit (at 1% level) were ethnicity, wealth, woman's age, husband's age, woman's education, husband's education, type of family, woman's exposure to media, number of surviving children, and woman's experience of complaints during pregnancy.

Husband's presence at health facility delivery

Tables 15 and 16 revealed similar patterns of relationship between socio-demographic characteristics and husband's presence at a health facility delivery of the most recent child. Variables significantly associated with husband's presence at health facility delivery were wealth of the household, woman's age, husband's education, woman's occupation, woman's exposure to media, number of surviving children, woman's experience of complaints during pregnancy and at delivery, and ANC sufficiency.

4.4 Woman's autonomy and outcome variables

The analysis in this section focuses on the relationship between woman's autonomy and two sets of outcome measures: maternal health care utilization and husband's involvement in maternal health care utilization. Each set of outcome measures consisted of two variables: ANC sufficiency and delivery at a health facility in the former, and husband's presence at ANC visit and at the delivery in the health facility in case of latter The four measures of woman's autonomy included economic autonomy, domestic decision-making autonomy, movement autonomy and intra-spousal communication; all measured on a continuous scale. Other covariates considered for adjustment included socio-demographic and health risk related variables as shown in Table 17, which gives an overview of the variables used in logistic regression analysis and their respective codes.

Table 17. List of variables used in logistic regression and their codes

Variables	Codes
Dependent variables	
Maternal health care utilization	
Antenatal care during pregnancy	0 = not sufficient, 1 = sufficient
Place of delivery	0 = home and others, 1 = health facility
Husband's involvement in maternal health care utilization	
Husband's presence at ANC visit	0 = no, 1 = yes
Husband's presence at health facility delivery	0 = no, 1 = yes
Independent variables- woman's autonomy	
Economic autonomy	continuous (range 0-5)
Domestic decision making autonomy	continuous (range 0-5)
Movement autonomy	continuous (range 0-5)
Intra-spousal communication	continuous (range 0-5)
Other covariates	
Socio-demographic characteristics	
Ethnicity	0 = upper caste 1 = untouchable lower caste 2 = disadvantaged ethnic groups 3 = disadvantaged non-Dalit terai caste 4 = relatively advantaged ethnic groups
Wealth index (rank)	0 = lowest quintile 1 = second quintile 2 = middle quintile 3 = fourth quintile 4 = highest quintile
Woman's educational level/ Husband's educational level	0 = no schooling or incomplete primary education 1 = completed primary education 2 = secondary or higher
Woman's age (current completed age in years)	Continuous
Husband's age (current completed age in years)	Continuous
Woman's occupation	0 = household and agriculture 1 = other than household and agriculture
Husband's occupation	0 = agriculture 1 = Labour 2 = business 3 = Service 4 = Others
Type of family	0 = nuclear family, 1 = joint family
Type of marriage	0 = love marriage, 1 = arrange marriage
Woman's exposure to media (at least once a week)	0 = no, 1 = yes
Number of surviving children	Continuous
Health risk	
Woman's experience of complaints during pregnancy	0 = no, 1 = yes
Woman's experience of complaints at delivery	0 = no, 1 = yes

The analysis in this section is aimed to estimate measures of the association (the odds ratios) by binary logistic regression models. The analysis was carried out in three steps. First, the association between each independent variables and outcome variables was studied by bivariate analysis. Second, all variables found to be significantly associated (at 1% level) with outcome variables were included, together with woman's autonomy measures in the multivariate models (Annex IV). Finally, models were developed including variables that were significantly associated in multivariate models in step two (section 4.5).

4.4.1 Bivariate analysis of the association between woman's autonomy and maternal health service utilization

Woman's autonomy and ANC sufficiency

Movement autonomy and intra-spousal communication were the two autonomy measures that had a significant positive relationship with ANC sufficiency in the unadjusted models (Table 18). Each one unit increase in the movement autonomy score (which can be interpreted as each additional place where the woman can go without taking permission of husbands or other senior members of the family) increased the odds of making sufficient ANC visit by 43 percent (OR = 1.43, $p < 0.001$). Similarly, each additional issue a woman discussed with her husband increased the odds of making sufficient ANC visits by 68 percent (OR = 1.68, $p < 0.001$).

Higher wealth was associated with the higher odds of receiving sufficient ANC services among women. Women from the middle, fourth and highest quintiles were more than two times likely to receive sufficient ANC. Women with high education (secondary or above) were more likely to receive sufficient ANC (OR = 2.55, $p < 0.05$), as were women with better educated husbands (OR = 3.58, $p <0.01$). Women who were employed in occupations other than housewife and agriculture were more likely to receive sufficient ANC (OR= 4.09, $p <0.05$). Husband's age was negatively associated with ANC sufficiency (OR = 0.95, $p <0.05$). The odds of making sufficient ANC visit among women who had an arranged marriage was twice that of women who had a love marriage (OR = 1.90, $p <0.05$). Similarly, women with media exposure were more than five times likely to receive sufficient ANC (OR = 5.25, $p < 0.01$). The number of living children was negatively associated with receiving sufficient ANC (OR = 0.72, $p < 0.05$).

In the bivariate analysis, socio-demographic and health risk related characteristics which were significantly associated with ANC sufficiency include woman's education, husband's education, woman's occupation, husband's age, type of marriage, woman's exposure to media, number of surviving children and woman's experience of complaints during pregnancy.

Table 18. Bivariate association of maternal health care utilization and independent variables[a]

	ANC sufficiency			Delivery at HF		
	OR	95%CI	P	OR	95%CI	p
Autonomy measures						
Economic autonomy	0.93	1.81 - 1.06	n.s.	1.05	0.92 – 1.20	n.s.
Domestic decision making autonomy	1.09	0.85 - 1.41	n.s.	1.12	0.89 – 1.42	n.s.
Movement autonomy	1.43**	1.18 - 1.73	<0.001	1.13	0.97 - 1.33	n.s.
Intra-spousal communication	1.68**	1.29 - 2.18	<0.001	1.39**	1.09 – 1.78	0.008
Socio-demographic characteristics						
Ethnicity *(Upper caste groups)*						
Untouchable lower caste	0.44	0.16 - 1.21	n.s.	1.38	0.45 - 4.25	n.s.
Disadvantaged ethnic groups	1.71	0.88 - 3.34	n.s.	1.09	0.60 - 2.00	n.s.
Disadvantaged non-Dalit terai caste	1.31	0.33 - 5.18	n.s.	1.69	0.43 - 6.63	n.s.
Relatively advantaged ethnic groups	0.83	0.28 - 2.46	n.s.	0.46	0.17 - 1.26	n.s.
Wealth quintile *(Lowest)*						
Second	1.32	0.53 - 3.30	n.s.	0.78	0.33 - 1.88	n.s.
Middle	2.44†	0.97 - 6.12	0.058	1.40	0.60 - 3.27	n.s.
Fourth	2.12	0.86 - 5.27	n.s.	1.44	0.61 - 3.39	n.s.
Highest	2.31†	0.90 - 5.93	0.081	2.60*	1.02 - 6.62	0.045
Woman's education *(Low education)*						
Middle education	1.41	0.74 - 2.68	n.s.	1.84*	1.00 - 3.37	0.049
High education	2.55*	1.17 - 5.54	0.019	2.22*	1.13 - 4.36	0.020
Husband's education *(Low education)*						
Middle education	2.17†	1.00 - 4.71	0.051	2.36*	1.12 - 5.00	0.025
High education	3.58**	1.62 - 7.89	0.002	3.19**	1.52 - 6.72	0.002
Women employed in occupation other than agriculture and housewife	4.09*	1.22 - 13.77	0.023			
Woman's age	0.95	0.89 - 1.02	n.s.	0.93*	0.88 - 0.99	0.026
Husband's age	0.95*	0.90 - 1.00	0.045	0.97	0.93 - 1.03	n.s.
Arrange marriage *(Love marriage)*	1.90*	1.06 - 3.41	0.031	1.50	0.89 - 2.52	n.s.
Women exposed to media[b]	5.25**	2.46 - 11.21	<0.001	3.13**	1.49 - 6.58	0.003
Number of surviving children	0.72*	0.56 - 0.93	0.011	0.79	0.62 - 1.01	0.054
Health risk						
Experienced complaints during pregnancy[c]	1.78†	0.96 - 3.31	0.067	2.58**	1.46 - 4.56	0.001
Experienced complaints at delivery				2.05**	1.21 - 3.48	0.008
Sufficient ANC visit				3.39**	1.89 - 6.08	<0.001

† $p < 0.1$; * $p < 0.05$; ** $p < 0.01$.

[a] Sample size ranges from 272 to 275.

[b] Women who exposed to any of the three media (radio, television and magazines/newspaper) at least once a week.

[c] Women who experienced any danger signs or complications during pregnancy. The most common complications reported include high fever, persistent vomiting, swelling of limbs and face, failure to gain weight, vaginal bleeding, hypertension, severe lower abdominal pain, etc.

Woman's autonomy and delivery at health facility

Intra-spousal communication was the only autonomy measure found to be significantly associated with health facility delivery. The odds of a health facility delivery increased by 39 percent for every one unit increase in intra-spousal communication score (OR = 1.39, $p < 0.01$).

Ethnicity was not found to be associated with health facility delivery. The odds of a health facility delivery among women from the highest wealth quintile households were more than two-and-a-half times (OR = 2.60, $p < 0.05$) those of women from the lowest wealth quintile households. Education of both women and husbands were significantly associated with delivery at a health facility in the crude models (see Table 18). Woman's age was found to be negatively associated with health facility delivery, as the odds of health facility delivery decreased by 7 percent (OR = 0.93, $p < 0.05$) when woman's age increased by one year. Women who were exposed to mass media at least once a week were more likely to deliver at a health facility (OR = 3.13, $p < 0.01$). Women who experienced complaints during pregnancy were more likely to deliver at a health facility (OR = 2.58, $p < 0.001$) as compared to women who did not experience any complaints. Similarly, woman's experience of complaints at delivery was also associated with health facility delivery (OR = 2.05, $p < 0.01$). Women who had received sufficient ANC had significantly higher odds (OR = 3.39, $p < 0.001$) of delivering at a health facility.

4.4.2 Woman's autonomy and husband's involvement

This section presents the estimates of the association between woman's autonomy and husband's involvement in maternal health care utilization.

Woman's autonomy and husband's presence at ANC

The unadjusted model in Table 19 shows that domestic decision-making autonomy and movement autonomy were associated with significantly lower likelihood of husband's presence at ANC. Woman's involvement in each additional domestic decisions where they have final saying was associated with a 23 percent decrease (OR = 0.77, $p < 0.05$) and each additional place where women can go without permission was associated with a 33 percent decrease (OR = 0.67, $p < 0.001$) in husband's presence at ANC.

Husbands from relatively advantaged ethnic groups were more likely to be present at ANC (OR = 3.25, OR < 0.05) than those of upper caste groups. Wealth was also significantly associated with husband's ANC presence in the crude model. Woman's education was positively associated with husband's ANC presence (OR = 2.16, $p < 0.05$ in middle education and OR = 2.76, $p < 0.001$ in high education). Husbands with high education were more likely to accompany the women at ANC visits (OR = 3.08, $p < 0.01$). Similarly, the odds of husband's ANC presence were lower among women whose husbands worked as a labourer (OR = 0.46, $p < 0.05$) and in business (OR = 0.37, $p < 0.05$) than among women with husbands in agriculture. Woman's age was associated with significantly lower likelihood of husband's presence at ANC (OR = 0.92, $p < 0.05$), as was the number of surviving children (OR = 0.67, $p < 0.001$). Woman's exposure to media was positively associated with presence of husbands at ANC (OR = 2.36, $p < 0.05$). Women who experienced any complaints at pregnancy were more likely to be accompanied by their husbands at pregnancy (OR = 1.86, $p < 0.05$).

The results of the bivariate analysis showed that domestic decision-making autonomy and movement autonomy together with ethnicity, wealth, woman's education, husband's education, husband's occupation, woman's exposure to media, woman's age, parity, and woman's experience of complaints during pregnancy were associated with husband's ANC presence.

Table 19. Bivariate association of husband's involvement and independent variables[a]

Husband present at ANC (N = 267)	Husband's presence at ANC			Husband's presence at HF delivery		
	OR	95%CI	P	OR	95%CI	p
Autonomy measures						
Economic autonomy	0.94	0.84 - 1.07	n.s.	1.08	0.96 - 1.22	n.s.
Domestic decision making autonomy	0.77*	0.62 - 0.97	0.026	1.28*	1.02 - 1.60	0.035
Movement autonomy	0.67**	0.57 - 0.79	<0.001	1.07	0.93 - 1.24	n.s.
Intra-spousal communication	1.09	0.86 - 1.40	n.s.	1.57**	1.20 - 2.04	0.001
Socio-demographic characteristics						
Ethnicity *(Upper caste groups)*						
Untouchable lower caste	0.72	0.24 - 2.22	n.s.	1.04	0.39 - 2.81	n.s.
Disadvantaged ethnic groups	1.66ᵗ	0.93 - 2.99	0.088	1.57	0.89 - 2.77	n.s.
Disadvantaged non-Dalit terai caste	2.89ᵗ	0.90 - 9.25	0.074	1.54	0.47 - 5.01	n.s.
Relatively advantaged ethnic groups	3.25*	1.18 - 8.99	0.023	0.57	0.21 - 1.55	n.s.
Wealth quintile *(Lowest)*						
Second	4.28**	1.63 - 11.27	0.003	0.90	0.38 - 2.14	n.s.
Middle	2.67*	1.06 - 6.72	0.037	0.97	0.43 - 2.19	n.s.
Fourth	1.65	0.64 - 4.24	n.s.	0.86	0.38 - 1.95	n.s.
Highest	3.88**	1.52 - 9.91	0.005	2.64*	1.08 - 6.47	0.034
Woman's education *(Low education)*						
Middle education	2.16ᵗ	1.16 - 4.02	0.015	1.37	0.77 - 2.44	n.s.
High education	2.76**	1.43 - 5.35	0.003	1.79ᵗ	0.95 - 3.37	0.073
Husband's education *(Low education)*						
Middle education	2.07ᵗ	0.89 - 4.80	0.090	1.98	0.94 - 4.17	0.072
High education	3.08**	1.36 - 7.01	0.007	2.78**	1.33 - 5.79	0.006
Husband's occupation (Agriculture)						
Labour	0.46*	0.22 - 0.96	0.038	0.81	0.39 - 1.67	n.s.
Business	0.37*	0.15 - 0.89	0.027	1.10	0.46 - 2.63	n.s.
Service	0.49ᵗ	0.21 - 1.12	0.089	1.41	0.60 - 3.32	n.s.
Others	0.52	0.16 - 1.16	n.s.	0.59	0.19 - 1.86	n.s.
Woman's age	0.92*	0.87 - 0.98	0.010	0.95ᵗ	0.90 - 1.01	0.087
Husband's age	0.95ᵗ	0.91 - 1.01	0.077	0.99	0.94 - 1.04	n.s.
Women residing in joint family *(Nuclear)*	1.66ᵗ	0.93 - 2.95	0.086	0.78	0.44 - 1.37	n.s.
Women exposed to media	2.36*	1.02 - 5.43	0.045	2.51*	1.19 - 5.28	0.016
Number of surviving children	0.60**	0.45 - 0.79	<0.001	0.83	0.65 - 1.04	0.105
Health risk						
Experienced complaints during pregnancy	1.86*	1.04 - 3.33	0.037	3.98**	2.24 - 7.09	<0.001
Experienced complaints at delivery				1.56ᵗ	0.94 - 2.57	0.083
Sufficient ANC visit				3.09**	1.73 - 5.54	<0.001

[a] Sample size ranges from 271 to 275.

ᵗ p < 0.1*; p < 0.05; ** p < 0.01.

Woman's autonomy and husband's presence at health facility delivery

Table 19 depicts that domestic decision-making autonomy and intra-spousal communication were associated with higher likelihood of husband's presence at a health facility delivery. The odds of husband's present at health facility delivery were 1.28 ($p < 0.05$) and 1.57 ($p < 0.01$) for each one unit increase in domestic decision making autonomy and intra-spousal communication scores respectively.

Husbands from highest wealth quintile households were more likely to be present (OR = 2.64, $p < 0.05$) than husbands from the lowest wealth quintile households in the unadjusted model. Ethnicity and woman's education were not found to be associated. Husband's with a high education were more likely to accompany their wives at a health facility delivery (OR = 2.78, $P < 0.01$) than husbands with a low education. Women employed in occupations other than housewife and agriculture were more likely to be accompanied by their husband in a health facility delivery (OR = 2.50, $p < 0.05$). Woman's exposure to media was positively associated with their husband's presence at a health facility delivery (OR = 2.51, $p < 0.05$). Women who experienced any complaints during pregnancy were more likely to be accompanied by their husband at a health facility delivery (OR = 3.98, $p < 0.001$) and the husband's presence at health facility delivery was higher among women with sufficient ANC (OR = 3.00, $p < 0.001$).

Domestic decision-making autonomy and intra-spousal communication together with wealth, husband's education, woman's occupation, woman's exposure to media, woman's experience of complaints during pregnancy, and sufficiency of ANC service were found to be significant predictors of husband's presence in a health facility delivery in the crude model.

4.5 Multivariate analysis of association between woman's autonomy and outcome variables

This section presents the results of the multivariate analysis. As discussed earlier, all the variables found to be associated with outcome variables of interest were included to run the multivariate logistic regression models. From each of these significant associations, variables were identified by log likelihood ratio tests. Tables 20 and 21 present the final model in which the addition of each variable in the model increased model fits in log likelihood test.

4.5.1 Woman's autonomy and maternal health care utilization

Woman's autonomy and ANC sufficiency

In the final adjusted model (Table 20) both the movement autonomy and intra-spousal communication remained significant. After adjustment for other covariates, each one unit increase in movement autonomy was associated with a significantly higher likelihood of making sufficient ANC visits (OR = 1.45, $p < 0.01$). Similarly, each additional issue women discussed with their husband was associated with significantly higher likelihood of making sufficient ANC visits (OR = 1.55, $p < 0.01$).

Other variables that remained significant in the final model were woman's occupation and woman's exposure to media. Women employed in occupations other than agriculture and as housewife had a higher likelihood of receiving sufficient ANC (OR = 5.50, $p < 0.05$). Woman's exposure to media was also associated with a significantly higher likelihood of making sufficient ANC visits (OR = 5.72, $p < 0.001$).

Woman's autonomy and delivery at health facility

None of the autonomy measures was found significant to predict delivery at a health facility in the final adjusted model. The association between intra-spousal communication and health facility delivery found in unadjusted model was no longer significant in the adjusted one.

Table 20. Multivariate analysis of the association predicting maternal health care utilization

	ANC sufficiency (N = 270)			Delivery at HF (N = 267)		
	OR	95%CI	p	OR	95%CI	p
Autonomy measures						
Movement autonomy	1.45**	1.17 - 1.78	0.001			
Intra-spousal communication	1.55**	1.16 - 2.07	0.003			
Socio-demographic characteristics						
Husband's education *(Low education)*						
Middle education				2.85*	1.18 - 6.09	0.020
High education				3.66**	1.53- 8.78	0.004
Women employed in occupation other than agriculture and housewife	5.50*	1.37 - 22.13	0.016			
Woman's age				0.80**	0.70 - 0.92	0.002
Husband's age				1.17*	1.03 - 1.32	0.014
Women exposed to media[b]	5.72**	2.39 - 13.72	<0.001			
Health risk						
Experienced complaints during pregnancy[c]				3.65**	1.91 - 6.98	<0.001
Sufficient ANC visit				2.57**	1.33 - 4.96	0.005
Negelkerke R square	0.259			0.215		
Hosmer and Lemeshow Chi-square	4.448 (p = 0.815) df = 8			14.94 (p = 0.060) df = 8		

$^{+}$ p < 0.1; * p < 0.05; ** p < 0.01.

[b] Women who exposed to any of the three media (radio, television and magazines/newspaper) at least once a week.

[c] Women who experienced any danger signs or complications during pregnancy. The most common complications reported include high fever, persistent vomiting, swelling of limbs and face, failure to gain weight, vaginal bleeding, hypertension, severe lower abdominal pain, etc.

Other variables that remained significant in the final adjusted model were husband's education, woman's age, husband's age, woman's experience of complaints during pregnancy, and ANC sufficiency. The odds of a health facility delivery was significantly higher for women whose husband had middle level education (OR = 2.85, p < 0.05) and high level education (OR = 3.66, p < 0.01) than for women with husbands with low-level education. The odds of health facility delivery decreased significantly for each one year increase in woman's age (OR = 0.80, p < 0.01), but increased with increase in husband's age (OR = 1.17, p < 0.05). Women who experienced complaints during pregnancy had the odds of more than three-and-a-half times (OR = 3.65, p < 0.01) those of women who had not experienced any complaints during pregnancy. Similarly, the odds of a health facility delivery were around two-and-a-half times (OR = 2.57, p < 0.01) for women who had made sufficient ANC visit during pregnancy as compared to those who had not made sufficient ANC visit.

4.5.2 Woman's autonomy and husband's involvement

Woman's autonomy and husband's presence at ANC

Movement autonomy was the only autonomy measure found to be associated with husband's ANC presence in the final model. Women who did not need any permission to visit each additional place were less likely to be accompanied by their husbands at ANC visits (OR = 0.59, p < 0.001) after adjustment for other covariates (Table 21). The other predictors of husband's ANC presence in the final adjusted model were wealth, woman's education, husband's education and number of living children. Husband's ANC presence was significantly higher in the second and the highest wealth quintile households as compared to the lowest. Husbands with middle and high level education were significantly more likely to be present at a health facility delivery (odds ratios; 2.27, p <0.05 and 3.21, p

<0.01 respectively) than husbands with low-level education. Husband's with high-level education were around four times more likely to be involved in ANC (OR = 3.95, p <0.05) than husbands with low-level education. Each additional number of surviving child the women had was associated with a 35.0 percent lower likelihood of husband's ANC presence (OR = 0.65, p < 0.05).

Woman's autonomy and husband's presence at health facility delivery

Intra-spousal communication was again found to be associated with husband's presence at health facility delivery. Each one unit increase in intra-spousal communication score increased the likelihood of husband's presence at delivery by 38 percent. (OR = 1.38, p < 0.05).

In the final model, husband's education, woman's experience of complaints during pregnancy, and ANC sufficiency remained significant to predict husband's presence at a health facility delivery. Husbands with high-level education were more likely to be present (OR = 2.82, p < 0.05) than husbands with low-level education. Woman's experience of complains during pregnancy remained a significant predictor of husbands presence (OR = 4.31, p < 0.001). Women who had made sufficient ANC visits were also associated with around two times increase of the husband's presence at delivery (OR = 1.98, p < 0.05).

Table 21. Multivariate analysis predicting husband's involvement

	Husband's presence at ANC (N = 267)			Husband's presence at HF delivery (N = 272)		
	OR	95%CI	p	OR	95%CI	p
Autonomy measures						
Movement autonomy	0.59**	0.49 - 0.71	<0.0.01			
Intra-spousal communication				1.38*	1.03 - 1.85	0.030
Socio-demographic characteristics						
Wealth quintile *(Lowest)*						
Second	3.53*	1.23 - 10.17	0.019			
Middle	1.95	0.70 - 5.46	n.s.			
Fourth	1.12	0.39 - 3.23	n.s.			
Highest	4.01**	1.41 - 11.38	0.009			
Husband's education *(Low education)*						
Middle education	2.27*	1.07 - 4.82	0.033	2.04	0.90 - 4.63	n.s.
High education	3.21**	1.39 - 7.45	0.007	2.82*	1.25 - 6.35	0.012
Number of surviving children	0.65*	0.46 - 0.92	0.014			
Health risk						
Experienced complaints during pregnancy				4.31**	2.35 - 7.92	<0.001
Sufficient ANC visit				1.98*	1.03 - 3.78	0.040
Nagelkerke R square	0.293			0.214		
Hosmer and Lemeshow chi square	12.029 (p = 0.150) df = 8			1.898 (p = 0.965) df = 7		

ᵗ p < 0.1*; p < 0.05; ** p < 0.01.

Summary of the results of quantitative analysis

- Movement autonomy and intra-spousal communication were significantly associated with ANC sufficiency. The odds of making sufficient ANC visits increased by 45 and 55 percent, respectively, for each one unit increase in movement autonomy and intra-spousal communication scores respectively. Woman's occupation and media exposure were other significant predictors of ANC sufficiency.
- None of the autonomy measures were found significantly associated with a health facility delivery. Woman's age, husband's age, husband's education, woman's experience of complaints during pregnancy and ANC sufficiency were found to be associated in the final adjusted model.
- Movement autonomy was found to be negatively associated with husband's ANC presence. Women who did not need any permission to visit each additional place were less likely to be accompanied by their husbands at ANC visits (OR = 0.59, $p < 0.001$). Wealth, husband's education, and number of surviving children remained significant in the final model.
- Intra-spousal communication was found to be significantly associated with husband's presence at a health facility delivery. Husband's education, woman's experience of complaints during pregnancy and ANC sufficiency were the variables associated with husband's presence at a health facility delivery in the final model.

4.6 Qualitative findings: Husband's involvement in maternal health care

Besides the quantitative survey part of the study, information husband's involvement in maternal health care utilization was also obtained by qualitative methods. The qualitative part of the study aimed at exploring the household decision-making process about maternal health service utilization and involvement of husbands. Advice and care or support during pregnancy, delivery and the post natal period and preparations for birth were discussed with the participants.

Most of the qualitative data was collected by the researcher himself. The information was systematically analyzed to explore the roles that husbands play during the childbearing period of their wife. All transcripts were in Nepali language and the researcher himself did the English translation. The data gathered were coded based on the topic list, which include forms of husband's involvement; advice given to the women; care and support given during pregnancy, at delivery and in the post natal period; birth preparations made by the couple during the most recent birth; knowledge of husband's on maternal health; and socio-cultural norms on husband's involvement in maternal health. In this section, FGD-A refers to the FGD conducted with husbands and FGD-B refers to the FGD conducted with women.

The qualitative data indicate that there is a substantial involvement of husbands in maternal health care. Most of the FGD and IDI participants described supportive roles of husbands in the form of giving advice, making financial arrangements, and supporting woman to reduce the household work burden.

Giving advice to women during pregnancy

Both in interviews and FGDs, the participants mentioned receiving pregnancy advice primarily from the mother-in-law, husband and female community health volunteers. Almost all participants mentioned that they had discussed the woman's health with their spouses during the most recent pregnancy.

> *"We frequently discuss my own and the baby's health, and most of the time my husband initiates the discussion. He is very enthusiastic to know about our (woman and infant) health."* (23 year old recently delivered women in IDI)

A number of husbands and women reported that husbands give advice about which provider to see and when. It was found that in most of the cases, husbands advised to visit the health centre and see a

medical service provider while mothers-in-law, in some cases, preferred to ask TBAs. Husbands advised their wives to see a modern health service provider more often than other female family members. Other advice given to women by husbands was about taking rest, be careful, not to lift heavy loads, eat nutritious foods frequently, take iron tablets, and to visit to the health facility.

Support given to women during pregnancy and the post natal period

The most common support husbands provided during pregnancy and post-partum included cooking, cleaning, making necessary arrangements for older children, providing nutritious foods and doing other domestic chores. Husbands also reported doing household work that required lifting of heavy weights.

During the FGD some women also reported cases of other women where husbands were unsympathetic and did not really care for their wives. According to the FGD participants there were husbands who did not care for their wives during pregnancy and the post natal period, but none of the women reported their own husband being unsympathetic in their specific case.

Mothers and mothers-in-law were also noted as an important source of advice and support during pregnancy and delivery. Reportedly, mothers-in-law also advise on a range of things to do or not to do and foods to eat or not to eat.

Support given specific to births at a health facility

During the time of delivery, husbands were the ones who arranged for transportation to reach the health facility and make the necessary communication with the service provider. As compared to other family members, husbands often went to call the FCHV and midwife, managed vehicles to take the women to a health facility, and made financial arrangements.

Husbands accompanied to their wives to the health facility

Although the husbands were found to support women during pregnancy and preparing for birth (see above), very few of them accompany their wives to the health facility for ante natal visits. Very few of the participants from interviews and FGDs reported husbands accompanying their wives to the health facility for ANC visits, though most of them agreed on the importance of husbands attending health facility together with their wife. Women said it would be easier to communicate with the health worker when their husbands were there.

> *"My husband frequently suggested me to visit the midwife when I was pregnant, but neither did I ask him to go with me nor did he go. When I returned from the visit, my husband used to ask me what happened and what the midwife told me. Sometimes, there were so many things that it was hard to remember everything she [midwife] suggested. It would be better if my husband was there to talk with the midwife……."* (26 year-old housewife in in-depth interview)

Interviews with the service provider revealed that it is generally the young and educated husbands who accompany their wives during ANC visits. These young and educated husbands also involve in active interaction with the midwife to discuss the health of their wives and up-coming child.

Though a very few husbands reported that they had accompanied their wives while visiting health facility for ante natal care, more husbands accompanied their wife at the time of delivery. Interviews with the service provider showed that husbands usually do not accompany women during her ante-natal visits to the health facility, but they use to do so at delivery. Furthermore, service providers also reported that that husband's involvement was higher when there were possible complications. Husband's involvement in terms of presence in the health facility was found to be high among women with danger signs and obstetric complications, as illustrated by statements of two husbands who were present at the health facility delivery:

"I sent her to health post in the village for delivery soon after labour pain started. Later, when I heard that they referred her to the district hospital, I took my wife to the hospital……. " (24 year- old farmer in FGD-A)

"My wife had bleeding and swelling of legs during the eighth month of pregnancy and I was very worried. I took her to the health post near our village. They asked me to take her in hospital and I did same. I stayed in the hospital all the time when she had delivery." (A participant in FGD-A)

In most cases, husbands were the ones to make financial and other necessary arrangements for taking their wife to health facility during emergency. Husbands, at the hospital, used to wait for information about the health of mother and child, and they also used to get things that their wife or baby needed (e.g. medicine, foods, baby clothes) from pharmacies nearby.

FGD (both A and B) participants also described how household composition (type of household) whether nuclear or joint, influences the husband's involvement in maternal health care. In joint households the mother-in-law or another senior female member accompanies the women during birth and ANC visits, while in case of nuclear families the husband is the one who is primarily responsible for taking care of his wife. Many of the women in the FGD and in-depth interviews also mentioned that they used to go to the health facility for ANC with other pregnant woman from the village. More than one pregnant woman tried to make arrangement for ANC visit at the same time, so that they could share each other's stories.

Birth preparedness

FGD participants were also asked about the birth preparedness they have made for planning a healthy pregnancy outcome. Most of the husbands reported that they have made arrangements for extra money that may require. Preparation for transportation during emergency and planning for where to deliver were other frequently mentioned birth preparations by husbands.

Knowledge of husbands about risk during pregnancy and at delivery

When the husbands were asked about the knowledge on danger signs during pregnancy, delivery and post-partum, only about half of the respondents could list three or more signs. Community health workers and woman's previous pregnancy experience were the main sources of knowledge for husbands about danger signs during pregnancy and delivery.

"I am very much influenced by the community health workers who frequently visit our community and make us aware about the importance of taking care of a pregnant wife. I became aware of danger signs like lower abdominal pain, excessive bleeding, high blood pressure, etc. during pregnancy and delivery, which require immediate attention. Though I had never been with my wife to the health facility, I encouraged her to go for regular health check-ups." (29 year-old service worker in FGD-A)

"Many of the husbands lack knowledge and skills to support their wives during pregnancy, delivery and the post-partum period. As husbands are the ones who have a final say in decisions related to health care utilization, they must be approached by health educational interventions." （A midwife in in-depth interview)

Husbands in the FGD expressed their enthusiasm and willingness to improve their knowledge and skills so that they can be involved in the health of woman and children. For example, a husband said:

"I decide for the health matters of my family and children so I want to know about the way by which I can be pro-active for the health of my wife and children." (A husband in FGD-A)

But at the same time, the FCHV expressed the reluctance of husbands to participate in health education programs aiming to improve the health of women and children.

> *"Last time when the field workers of community based organization had a discussion session with husbands or pregnant and recently delivered women. I invited around 20 husbands for the session but I could gather only five."* FCHV in an interview

Woman's perception of husband's support

Women during the FGD emphasized the importance of social support, especially by husbands during pregnancy and delivery.

> *"There are many things which a woman can only share with her husband. My husband was always interested in my health during pregnancy and helped me in domestic work. He was also present in the health post where I gave birth to my daughter."* (28 year-old service worker in FGD-B)

Women also appreciated the support given by their husbands at delivery. In case of emergency, husbands usually accompanied women to the referral hospital.

> *"…….that was my first birth. I don't know what the actual problem was but I was almost dying of the labour pain for several hours. The doctor from Ronal hospital referred us to Nepalgunj [a city situated at about 200 kilometers east of the study site that has a medical college and teaching hospital with sophisticated care]. But my husband decided to take me to Paliya (a city in India). He was in the hospital all the time and busy buying medicines and arranging other necessities. He spent almost three days without having a single nap and I could imagine the hard time he had in managing the money for our travel and paying hospital fees."* (24 year-old housewife in FGD-B)

Husbands love and emotional support were expected by women during pregnancy and delivery. Women may be seeking the advice and care of their closest confidants, including the husband, but some women also mentioned that they were sometime not at ease to share everything with their husband and rather preferred some close females.

An assumed prerequisite for male involvement is that husband and wife live in the same household. One of the important reasons for husbands not to accompany their wife at ANC visits and delivery was their absence from home. A substantial number of husbands were away from home for work which kept them from accompanying their wives. Even when the husband is away from home, he is keen to know about the health and wellbeing of his wife and child.

> *"Most of the time my husband is in India for work. And even he is far from home; we use to talk about family matters and health of our children and myself via mobile phone. When he is back to home, he is very interested to know about my and our child's health and wellbeing*." (30 year-old housewife in in-depth interview)

Socio-cultural norms preventing husband's involvement

Some participants also expressed the feelings of shame and social stigma for supporting their women. Some of the FGD and IDI participants elaborated on the traditional cultural norms and values that stigmatize husbands who play a supportive role during their wife's maternity period.

> *"I could hear people criticizing me when I helped my wife during pregnancy. I use to take care of the older children, do all the household work, like cooking, taking care of animals and carrying*

water, and I enjoyed doing all these things. But other people made fun of me saying that I am a servant of woman." (A husband in FGD-A)

During the in-depth interview an FCHV pointed out the difficult situation that husbands face due to traditional cultural beliefs that prohibit their involvement in maternal health. On the one hand, husbands want to be involved and be supportive to their wives, but on the other hand they are afraid of being ridiculed.

"I have seen many husbands who are very supportive to their women and help them with all the domestic work. And I have also seen same husbands gossiping about other husbands in the tea-shop for being supportive to women." (FCHV in in-depth interview)

Shyness and feelings of uneasiness of women were also reported by husbands in FGD-A. Some women do not want their husband to accompany them during ANV visits as it makes them feel uncomfortable in society. For instance, one husband explained:

"I went twice to the health post with my wife when she was pregnant, but I could feel her embarrassment visiting the health post with me. She preferred to be alone while she was being checked up by the midwife and I stayed outside." (26 year-old businessman in FGD-A)

Changing social norms and increasing husband's involvement in maternal health

Most of the participants believe that Nepalese society is becoming modern and the supportive roles that husbands play towards their wives during pregnancy, delivery and post-partum period are increasingly being accepted. A mother-in-law explained the changing role of husbands in maternal health by saying:

"Things have been changing during past few decades. It was very difficult to talk for us (women and husband) in front of other family members. Issues related to maternity were considered a woman's domain and male's advice and support were rarely sought. But nowadays, husbands also help their wife in doing domestic work and they go to the health post together with their wives." (56 year-old mother-in-law in in-depth interview)

In the interviews and FGDs women also expressed their dependencies on men's consent for the use of particular medical service. Husbands or senior family members in case of joint households largely control the resources needed to access modern health care. Also the husbands in FGDs expressed a sense of responsibility to be involved in care and support for their wives and children, and also in health care decisions.

Overall, the qualitative data suggested that husbands were often involved in all three aspects of maternal health: pregnancy, delivery and the post-partum period. Most of the time, husbands were involved in giving advices for care during the maternity period, supporting by reducing the household work burden and by giving money to the women for pregnancy care visits to health facility.

SECTION IV

DISCUSSION & CONCLUSION

Section IV of this report includes discussion of the results and conclusion of the study. At first results of the study are discussed in light of other relevant studies. Then after, discussions on methodological issues of the study are presented followed by further research and policy implication of the study. Finally, this section concludes the study.

CHAPTER V

DISCUSSION AND CONCLUSION

This chapter describes the discussion of the results in light of some of the other relevant literatures cited in literature review, and the conclusion of the study. At first discussion of the major findings will be made, followed by discussion on some of the methodological issues, and a description of further research and policy implications of the study. The final section in discussion consists of the limitation of the study Discussion section is followed by conclusion of the study.

5.1 Discussion

5.1.1 Discussion on major findings

The study site consisted of predominantly disadvantaged ethnic groups (the Tharu) followed by upper caste groups. Higher proportion migrant husbands were observed in higher caste groups as compared to other ethnicity. Most of the women in the sample were working in agriculture or as housewives while husband's primary occupation was labour work. Husband's education and occupation were associated with husband's migration status. Radio was the most popular media among the women, followed by television.

In excluded cases, the proportion of woman from upper caste groups; husbands with a high level of education; and husbands working in labour and service were higher as compared to operational sample. These findings suggested that migration of husbands was more prevalent among relatively advantaged and higher caste groups. Not surprisingly, educated husbands might have sought means of livelihood outside the place of their origin and when they sought occupation in foreign land, they were no more working in agriculture.

Very low proportion of women alone had final saying in economic and domestic decision making. Furthermore, majority of decisions concerning economic spheres were conducted by other senior members of the family excluding woman and husband. Higher proportion of joint decisions made by woman and husband was reported in items like whether to have another child, use of family planning and schooling of children. These findings were similar with a hospital based study conducted by Mullany et al. (2005) in urban Nepal. Around half of the women reported that they need permission from husbands or senior members of the family to visit on the mentioned place. Movement autonomy of the women was very low as compared to a study conducted in a North Indian city (Bloom et al. 2001) where more than 80 percent of the women reported that they did not need permission to make visits. Women scored highest mean autonomy score in intra-spousal communication and lowest in economic autonomy. The comparison of level of woman's autonomy found in this study with other studies is limited because most of the other studies measured woman's autonomy by including all items of the autonomy together and there is also some variation in the items and questions phrased to measure woman's autonomy. NDHS 2011 collected information on woman's involvement in three types of decisions: their own health care, making major household purchases, and visits to family or relatives, to assess woman's decision making autonomy. Two-thirds (65%) of women were involved in making decisions about their own health, 57.2 percent were involved alone of jointly in making decisions about major household purchases and 28 percent of women decide on their own regarding visit to their families and relatives. The general pattern of woman's involvement in household decision making in this study was consistent with the overall low level of woman's involvement in Nepal Demographic health survey 2011.

The study found better maternal health care utilization pattern in terms of service utilization indicators as compared to national figures of Nepal. For example, Nepal Demographic and Health Survey (NDHS)

found that 58.3 percent of women received at least one skilled ANC during pregnancy and 35.5 percent of the women delivered their most recent baby at health facility (MoHP and New Era, 2011), which was 96.5 percent and 66.9 percent respectively in this study sample. The reason for such huge difference may be that Kailali district is one of the districts with better service utilization in Nepal and the study sample of NDHS was women who delivered live birth during the last five years preceding the survey, while this study was conducted among women who delivered live birth during the last one year preceding the survey.

Women from untouchable lower caste groups were less likely to receive ANC service, but more likely to deliver at health facility as compared to upper caste groups. Higher proportion of women delivering at health facility from lower caste group may be due to the government policy of providing delivery incentive to women who delivered at health facility through national safe delivery incentive program. Higher levels of education of both women and husband were associated with women receiving sufficient ANC visit and delivery at health facility indicating the importance of education among both women and husbands in utilizing maternal health services. Women who were employed in occupation other than agriculture and housewife were more likely to receive sufficient ANC visit as compared to women who were primarily working in agriculture and as housewives. Woman's age was negatively associated with delivery at health facility while husband's age was negatively associated with woman receiving sufficient ANC. Women who reported their marriage type as arrange marriage were more likely to make sufficient ANC visit as compared to women who reported their marriage as love marriage. Women who were exposed to mass media at least once a week was associated with significantly higher level of maternal health care utilization in bivariate analysis. Number of surviving children a woman had was negatively associated with making sufficient ANC visit. Women who experienced obstetric complaints during pregnancy were more likely to receive ANC service and deliver at health facility. Women with complaints at delivery were also associated with increased likelihood of health facility delivery. These findings suggest that increased risk perception of women and families among those women who had experienced complaints may be the reason behind utilizing maternal health services. Women who had made sufficient ANC visit were more likely to deliver at health facility.

After adjustment for socio-demographic and health risk related characteristics, both movement autonomy and intra-spousal communication remained significantly associated with ANC sufficiency, while none of the autonomy measures remained significant in case of delivery at health facility. This indicates that women who are free to visit without permission of senior members of the family were more likely to make sufficient ANC visit, and higher levels of spousal communication also promoted better maternal health care utilization during pregnancy. In the final models, woman's employment status and woman's exposure to media remained strong and consistent to predict ANC sufficiency. While variables remained significantly associated with health facility delivery were husband's education, woman's age, husband's age, woman's experience of complaints during pregnancy and ANC sufficiency.

Nepal Demographic and Health survey (NDHS) 2011 reported that number of decisions in which women were involved was positively associated with woman's access to antenatal care, delivery assistance from a skilled provider, and postnatal care within the first two days of delivery. In this study, woman's autonomy was positively associated with woman's utilization of skilled antenatal care but delivery at health facility could not be attributed to woman's autonomy. The findings of this study is similar with a study in slum population in India (Matthews et al., 2003) which found that antenatal care was associated with woman's access to resources, but none of the measures of woman's autonomy were associated with delivery care. No association found between woman's autonomy and health facility delivery was probably due to the fact that delivery care was considered with more importance over antenatal care. So, regardless the autonomy status of women, they were delivered at health facility.

Furthermore, the safe delivery incentive program launched by government of Nepal has scheme of providing certain financial incentive to woman who deliver in health facility. Women might have visited health facility for their delivery of the baby to get this incentive.

A very high proportion of women discussed with husband about the health of women during most recent pregnancy. Women reported making at least one fixed arrangement for birth with their husband was 82.2 percent which is higher than what Mullany et al. (2005) reported (74.0%). The proportion of husbands who were present at ANC visit in this study was very similar (40.7% versus 40%) with that of Mullany et al but similar study in Northern Uganda found that 65.4 percent of male partners attended at least one skilled ANC visit (Tweheyo et al., 2010). More than three-fourth (78.2%) of the husbands was present at delivery (either home or health facility) of the most recent child. Similar study in rural Guatemala found that 73.0 percent of husbands were present at delivery (Carter, 2002a). Husband who accompanied the woman at health facility delivery was only 59.3 percent.

In bivariate analysis, younger husbands were more likely to present at ANC visit. Proportion of husband's presence in ANC was higher in disadvantaged non-Dalit terai caste and relatively advantaged ethnic groups as compared to upper and lower caste groups. This result can be attributed to the more rigid cultural beliefs prohibiting husband's involvement in upper and lower caste Hindu society. Household wealth index was also associated with husband's presence in both ANC and delivery at health facility. Both woman and husband's education were positively associated with husband's involvement in maternal health acre utilization. Husband's presence in delivery was found higher among women employed in occupation other than agriculture and as housewife. Though, some of the participants in FGD mentioned the reason for husbands not being present was due to their business in employment, husband's occupation was not found to be associated with presence in ANC or delivery. Woman's exposure to media was associated with higher proportion of husband's presence in ANC and delivery. Number of surviving children the couple had was negatively associated with husband's presence in ANC but not at health facility delivery. Women who experienced complaints during pregnancy were more likely to be accompanied by their husbands at ANC and delivery. Husband's presence at health facility delivery was found higher among women who had made sufficient ANC visit during pregnancy.

In the final models, movement autonomy was found to be negatively associated with husband's presence at ANC, while intra-spousal communication was positively associated with husband's presence at health facility delivery. These findings imply that women who have freedom to visit places like health facility, market, friends and relatives without permission from husbands and senior members of the family had significantly less involved husbands in ANC. Those women who frequently communicate with husbands were more likely to be accompanied by their husbands in health facility delivery. A study conducted by Mullany et al. (2005) in Nepal found that higher woman's autonomy measured by sole final decision-making power was associated with significantly lower male involvement in pregnancy health, but in this study domestic decision-making was not found to be associated with husband's involvement.

Wealth quintile, husband's education and number of surviving children remained significant in predicting husband's presence at ANC visit, while husband's education, woman's experience of complaints during pregnancy and ANC sufficiency remained significant in predicting husband's presence at health facility delivery. Husband's presence at ANC was significantly higher among women from second wealth quintile and highest wealth quintile, but not among women from middle and fourth wealth quintile, which shows that though husband's involvement in ANC was associated with wealth of the household, but no specific trend with respect to wealth quintiles were found. Higher educated husbands were more likely to present in both ANC visit and health facility delivery. Husband's presence in ANC was found to be lower if the number of surviving children the couple had was higher, suggesting

that husband's involvement decreases as the number of pregnancy and birth increases. Husbands were more than four times likely to be present at health facility delivery among the women who had experienced complaints during pregnancy which is consistent with the qualitative findings where many of the participants mentioned that a husband was more likely to take the woman to health facility if she presented danger signs and complaints during pregnancy. Woman's experience of complaints at delivery was not found to be associated with husband's presence at delivery in the multivariate model. Furthermore, women who had made sufficient ANC visit during her pregnancy were more likely to be accompanied by husbands at health facility delivery which suggests that maternal health services received during pregnancy is important factor to influence husband's involvement.

Participants of FGDs and IDIs described that supportive role of husbands were largely in the form of giving advice, making financial arrangements, managing transportation to reach health facility for delivery and supporting woman to reduce household work burden. Husband's advice differed from other members of the family particularly in recommending woman to visit type of health provider. Husbands used to advice their wives to visit modern health service provider more often as compared to other female members of the family. Husbands were also found to support women in doing household chores like cooking food, taking care of older children, giving nutritious food to women, including others. Qualitative data revealed that husband's presence at ANC and delivery was quite low as very few of the FGD participants reported the presence of their husbands. A similar study conducted in Sweden found that husbands were present in both pre-natal care and delivery at health facility in most of the cases (Ny et al. 2007), but one of the similarity between the mentioned study in Sweden and this study was that in both cases participants reported that husbands involvement were in the form of caring for older children and carrying out household chores. Husband's presence at health facility delivery was higher as compared to ANC visit. Husband's presence at ANC and delivery was also influenced by the availability of other female members in the household, as husband's presence was higher in case of nuclear family where husbands were the only one to accompany women while visiting health facility. Husbands had limited knowledge about the danger signs during pregnancy and delivery. Service providers also mentioned the lack of sufficient knowledge and skills among husbands for supporting women during pregnancy, at delivery and post-partum period. Though, many of the husbands were found to be enthusiastic to get more knowledge by which they can support their wives' maternal health. Qualitative data also revealed that women appreciate the involvement and support of husbands. The qualitative findings also revealed that woman appreciate the emotional support given by husband even when he is not living together. Furthermore, the traditional socio-cultural beliefs and norms prevalent in Nepalese society prohibited husband's involvement in maternal health. Shyness and feelings of uncomfortable were found among both women and husbands. But husbands were increasingly involved in more constructive ways and the traditional beliefs that's systematically place the husbands away from maternal health is changing as Nepalese society is modernizing day by day.

5.1.2 Discussions of some of the methodological issues

The dynamics of husband's involvement and woman's autonomy changed when husbands are migrants and the spouses are living in separation. The criteria set in this study for measuring husband's involvement in maternal health care utilization as husband's presence in ANC and health facility delivery cannot be applied to women whose husbands are living far from the household. Furthermore, migration of husbands may affect the equation of decision making power distribution among the household members. In this case, women living in a joint family have to share the power with other senior members of the family, usually mother-in-laws, while women from nuclear family may increase her autonomy as she now has to take over all the responsibilities of household in absence of her male counterpart. In this study also, there was no way of measuring husband's involvement in terms of

presence in ANC and delivery for husbands who were not living together with women at the same household during pregnancy and at delivery. Furthermore, woman's autonomy was not measured for women whose husbands were not living with them because we defined autonomy as the distribution of decision making power among family members; most importantly between husband and wife. So, the final realized sample of this study consisted only those women whose husbands were not frequent labour migrants and were living together at the same household and also women whose husbands were migrated for less than three months prior to the survey.

As the participants of the survey were selected randomly from the list of women who delivered live birth during the period of last one year preceding the survey and the women whose husbands were frequent migrants were excluded from the analysis, the findings of the study can be generalized to all women whose husbands were not frequent labour migrants.

Studies conducted on woman's autonomy and maternal health service utilization largely came from secondary data; primarily from large scale demographic health survey. This study was conducted in community setting with randomly selected woman's who delivered live birth within the last one year prior to the survey. Consideration of different dimensions of woman's autonomy can be the other strength of this study. Furthermore, efforts were also made to supplement quantitative findings related to husband's involvement by qualitative findings.

The utilization of maternal health care services and involvement of husbands in maternal health care utilization occurred anytime during the last year preceding the survey, but measures of socio-demographic, household composition and woman's autonomy largely yield conditions present at the time of survey. The underlying assumption of this study is that the socio-demographic and autonomy related characteristics do not change rapidly.

5.1.3 Research implication

There are some studies which indicate the importance of variables like cost of maternal health services, quality of services and distance to health facility to influence maternal health care utilization. However, information on these variables was not collected in this study. It would be worthwhile to consider these variables in the future studies. Post partum haemorrhage is one of the most important causes of maternal mortality (Li et al., 1996, MoHP and New Era, 2009) and skilled care during post partum period is necessary for timely management of post partum haemorrhage, but this study has not considered the utilization pattern of post natal care among women.

Information on woman's autonomy, though rigorously collected into different dimensions of autonomy within household level, was not collected in qualitative way. Some authors also argue that the concept of autonomy can be problematic in developing countries and especially in Asia where relationships are strongly rooted in family context and the extent of individual sayings in final decision making in almost impossible (Basu, 1999).The concept of woman's autonomy is originated from the Western feminist movement and is largely based on an individualistic ideal, which may not be applicable in traditional societies. Jeferry (in Basu 1999) furthermore argues that the meaning of the word autonomy is difficult to understand for women interviewed in large scale surveys and the translations of the word often carry a negative connotation. So, it is recommended to conduct detailed qualitative study to investigate the level of woman's autonomy, with especial focus on the concept of woman's embedment into the family (Mumtaz and Salway, 2009).

The quantitative survey measured husband's involvement in terms of mere presence or absence of husband's at ANC and health facility delivery, but the study lacked information on quality of the involvement in terms of what roles did the husbands played while accompanying women. Furthermore, this study also found scope of studying husband's involvement among women whose husbands are not

living together during the time of pregnancy and delivery. It is recommended to explore involvement of husbands among couples with spousal separation.

5.1.4 Policy implication

The bivariate analysis suggested that there was a relatively lower utilization of maternal health services, especially among women with low education and women with low educated husbands, women from least wealth quintile households, older age group women, women with higher number of surviving children and women who are not working in occupation other than agriculture. These findings imply that providing health education and information on maternal health care is essential to these women. Health workers and FCHVs should emphasize to motivate women in these categories for utilization of maternal health care services. Moreover, as women with less exposure to mass media were less likely to use maternal health services, mass media campaigns promoting safer motherhood should be intensified.

The bivariate analysis also showed that husband's presence at ANC and delivery at health facility was lower among women from untouchable lower caste ethnic groups, women from low income families, women with low educated husbands, older age group women, women with less exposure to media and women with higher number of surviving children. If husband's involvement in maternal health is to be sought, especial attention should be given to the women and their husbands of these categories. The qualitative findings also revealed the readiness of husbands to gain detailed knowledge about the care and support they can provide to their wives during pregnancy, delivery and post partum period. Programs designed for promoting husband's involvement in maternal health should strike the traditional beliefs that prohibit husbands away from involvement.

Furthermore, the multivariate analysis revealed that movement autonomy and intra-spousal communication were positively associated with ANC sufficiency which signifies the importance of programs that foster woman's autonomy to increase antenatal care visits. In the multivariate analysis movement autonomy was found to be negatively associated with husband's presence at ANC, which suggest that programs aimed to promote woman's autonomy and husband's involvement in maternal health should be thoroughly planned to improve woman's autonomy at the same time increasing husband's involvement. The positive influence of intra-spousal communication in making sufficient ANC visit and husband's presence at health facility delivery pointed towards the importance of promoting discussions and communication between the spouses.

5.2 Limitation of the study

Being a cross-sectional design could be one of the main weaknesses of this study, which limits the establishment of causality and temporality of the effects. For example, it is difficult to say whether higher levels woman's autonomy restricts husband's involvement or lower levels of husband's involvement fosters woman's autonomy. But woman's autonomy is very unlikely to be affected by maternal health care utilization. Many studies suggest that the extent of woman's autonomy is differently perceived by husbands and women themselves (Blanc, 2001, Ghuman et al., 2006, Allendorf, 2007). In this study, perspectives of husbands on woman's autonomy were not considered. Similarly, husband's involvement in maternal health care in quantitative survey was characterized by woman's report and not directly from the male partners which may be the limitation of the study. Lack of previous quantitative studies related to husband's involvement in maternal health care also constrained to compare the results. Furthermore, this study was carried out within time and financial limitation.

5.3 Conclusion

The importance of husband's influence in utilizing maternal health care and there by healthy outcome of pregnancy is reported in different studies (Dudgeon and Inhorn, 2004, Mullany et al., 2007). This study tries to assess the relationship of woman's autonomy with maternal health care utilization and husband's involvement in maternal health care utilization. We hypothesized that higher level of woman's autonomy would be associated positively with utilization of maternal health services and negatively with husband's involvement in maternal health care utilization. Out of the 341 women who were interviewed to fill the questionnaire, the analytic sample was restricted to all women who were living with their husband or the duration of spousal separation was less than three months. Movement autonomy and intra-spousal communication were positively associated with ANC sufficiency; movement autonomy was negatively associated with husband's presence at ANC and intra-spousal communication was positively associated with husband's presence at health facility delivery. This study emphasized the importance of movement autonomy and intra-spousal communication over domestic decision making autonomy to influence maternal health care utilization and husband's involvement.

This study found low level of woman's autonomy except intra-spousal communication and intra-spousal communication was found to be associated with maternal health care utilization and husband's presence at health facility delivery. This study produced the evidence on the importance of open communication between spouses for maternal health care utilization and involvement of husbands. The qualitative findings revealed that husbands wanted to involve in maternal health because they are the one who have major sayings in making decisions for health care utilization. From woman's perspective, husband's involvement was not only sought because of the fact that husbands possessed the decision making power. Women need the care and support, both emotional and material, and they perceive husbands as the one who can provide such care and support. Husband's involvement in maternal health care utilization enhances communication with service providers and increases husband's support for women during pregnancy, delivery and postpartum period (Carter, 2002a, Molzan et al., 2001). Despite of the traditional cultural beliefs that prohibit husbands from involving in maternal health, Nepalese husbands are increasingly entering into the area of maternal health which was traditionally considered 'extrinsic' to men.

Overall, this research contributes to the literature of the relationship between woman's autonomy and husband's involvement. The results provide an expanded understanding on the association of woman's autonomy with maternal health care utilization and husband's involvement.

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SECTION V

ANNEXES

Section V consists of annexes and includes the tools (questionnaire and FGD/IDI guidelines) used for data collection, informed consent (cover letter), and the extra tables of the analysis not included in main body of the report.

ANNEX I

Questionnaire

Form No.: House No.:
Interview Date: Name of the interviewer:
VDC: Ward No.:
Name of supervisor: Date of supervision:

(A) Respondent (Woman) and her husband's general characteristics

QN	Questions	QN	Questions	QN	Questions
1.	Woman's name: …… Ethnicity:……	2.	Woman's age: ……	3.	Husband's age: ……
4	Age at (first) marriage: ……	5.	Type of marriage: 1. Arrange 2. Love	6.	Age at first pregnancy: ……..
7.	Family type: 1. Single 2. Joint	8.	Family size: ……	9.	Is your husband is with you now (living together)? 1. Yes 0. No If no, since how long he is out of home? ……

QN	Questions	Coding	Women	Husband	QN	Questions	Coding	Women	Husband
10.	Education	1. Illiterate 2. Can read and write 3. Primary (1-5 Class) 4. Middle(6-8) 5. Secondary(9-10) 6. SLC or above			11.	Occupation	1.Housewife(W) 2.Agriculture 3.Service 4.Business 5.Labour 6.Others…..		

Q.n.	Question	Newspaper/magazines	Television	Radio/FM
12.	Do you read, see and listen the following types of media at least once a week?	1. Read 2. Do not read	1. See 2. No	1. Listen 2. No

(B) Information about the children

Q.n.	Questions	Coding	Answer	Skip
13.	How many children do you have? (that you gave birth)	Number of children: …… Son: …… Daughter:……	……..	
14.	Age and sex of the youngest child	Name: …… Age in months: …….. Sex: ……..		
15.	Have you ever breast fed your youngest child?	1. Yes 0. No		***If No, go to qsn no. 19***

16.	When did you first breast fed your child after birth?	1. Within 1 hour 2. Within 1- 8 hours 3. After 8 hours 4. Don't know 8. Others……..		

17.	Are you also breastfeeding him/her now?	1. Yes 0. No		***If Yes, go to qsn no. 19***
18.	For how long did you breast fed your child?	…… months (Write 0 for less than 1 month)		
19.	What was the age of child when you first introduced complementary feeding?	…….. months	…… months	

(C) Maternal care

20.	Did you see anyone for ANC (antenatal care) while you were pregnant last time?	1. Yes 0. No		***If No, go to qsn no. 22***
21.	Whom did you see? **(Only one answer** **Probe for most qualified person)**	1. Doctor 2. ANM/Nurse 3. MCHW 4. Relatives 5. TBA 8. Other……..		
22.	Do you have a maternal health card?	1. Yes 0. No		***If No, go to qsn no. 24***
23.	Write the following information from the card Number of ANC visit TT vaccination times	No. of ANC: …… No. of TT vaccination: ……..		
24.	How many times have you been for ANC? ***(for women who don't have ANC card)***	…….. times		
25.	At which month of pregnancy, have you gone for first ANC care?	…….. months		
26.	Did you take TT vaccination during pregnancy? (ask the injection that you take in your arm)	1. Yes 0. No 9. Don't know		***If no or don't know go to qsn no. 28***
27.	How many times did you take TT vaccination?	1. 1 2. 2 3. More than 2 9. Don't know		
28.	Was your husband present with you/to accompany you during any of your ANC visit?	1. Yes 0. No		***If no, go to qsn no. 30***
29	How many times was he present with you in your visit to health facility?	Number of times……		
30	Have you discussed about your health with your husband during the most recent pregnancy?	1. Yes 0. No		
31	During pregnancy did you consume iron /folic acid tablets?	1. Yes 0. No 9. Do not know		***If no, go to qsn number 33***
32.	For how long did you consume iron tablets/folic acid?	During Pregnancy: ____days After delivery: ____days		
33.	Did you take Vitamin A capsule after the birth of your child?	1. Yes 0. No 9. Do not know		
34.	During pregnancy did you receive anti-helminthic treatment?	1. Yes 0. No 9. Do not know		***If no, go to qsn number 36***

35.	If yes, at what time of pregnancy did you take anti-helminthic drugs?	…… Months of pregnancy		
36.	What are the things that you and your husband have prepared during pregnancy (birth preparedness)? ***(Multiple answer possible)***	O. Don't know A. Arrangement of money for normal and special circumstances B. Preparation for people who can donate blood during emergency C. Birth attendant D. Transportation X. Others (specify) ……..		
37.	During pregnancy, did you consume as usual, more or less foods?	1. As usual 2. More 3. Less 8. Others……		
38.	Have you faced any of the danger signs during pregnancy? ***(Read the options)*** ***(Multiple answers possible)***	O. Don't know A. Difficulty in breathing B. Vaginal bleeding C. Swelling of face and limbs D. High fever E. Increased blood pressure F. Blurred vision G. Anaemia H. Continues vomiting I. No weight gain J. Severe pain in lower abdomen for long time K. Convulsions X. Others (Specify)……		
39.	Where did you give birth to the child?	1. Home 2. Health facility 8. Other (Specify)……		
40	Who helped you during the delivery? (Birth attendant) ***(only one answer)***	1. Doctor 2. ANM/Nurse 3. MCHW 4. Relatives 5. TBA 8. Other (specify)……		
41	Was your husband present with you during the delivery?	1. Yes 0. No		
42.	If the delivery was in health facility, was your husband with you to the health facility?	1. Yes 0. No		
43.	Have you heard about safe delivery incentives?	1. Yes 0. No 9. Don't know		
44.	Did somebody examine your health after delivery? (Do not ask if the delivery was in health facility)	1. Yes 0. No		***If no, go to qsn no 46***
45.	If yes who checked your health?	1. Doctor 2. ANM/Nurse (midwife) 3. MCHW 8. Other (specify)……		

46.	At which day of delivery did you check your health?	1. Within 3 days 2. 4 to 7 days 3. After 7 days 9. Don't know		
47.	How many times did you check your health after delivery?	0. No Post natal care 1. 1 time 2. 2 times 3. 3 or more		
48.	Was your baby also examined at that time?	1. Yes 0. No		
49.	Do you have any of the following danger signs during delivery? ***(Multiple answer possible)***	O. Don't know A. Severe headache and fever B. Excessive bleeding C. Vaginal discharge with bad smell D. Lower abdominal pain E. Convulsions F. Frequent vomiting X. Others (Specify)……..		
51.	Are you (or your husband) using any family planning methods	1. Yes 0. No		***If No, go to qsn. No. 52***
51.	If yes, what was the age of your child during which you started using family planning methods?	…….. months		

(D) Questions Pertaining Woman's Autonomy

52. Economic autonomy

52.1	Who, in your family, usually has the greatest say in this decision whether you (a woman) should work outside the home?	1 Respondent 2 Husband 3 Jointly 4 Someone else		
52.2	If you have ever earned money from paid employment, who mainly decides how the money you earn will be spent?	1 Respondent 2 Husband 3 Jointly 4 Someone else		
52.3	Who in your family usually has the final say on the decisions for making large household purchases like house, land, jewellery?	1 Respondent 2 Husband 3 Jointly 4 Someone else		
52.4	Who in your family usually has the final say on the decision making household purchases for daily needs?	1 Respondent 2 Husband 3 Jointly 4 Someone else		
52.5	Who have the last word on the issues like changing the make-up of household spending?	1 Respondent 2 Husband 3 Jointly 4 Someone else		

53. Domestic decision making

53	Please tell me who in your family decides the following:			
53.1	What to do when a child falls sick?	1 Respondent 2 Husband 3 Jointly 4 Someone else		
53.2	Whether to have another child	1 Respondent 2 Husband 3 Jointly 4 Someone else		
53.3	How much schooling to give to your children?	1 Respondent 2 Husband 3 Jointly 4 Someone else		
53.4	What food to buy for family meals?	1 Respondent 2 Husband 3 Jointly 4 Someone else		
53.5	Whether to use a particular family planning method?	1 Respondent 2 Husband 3 Jointly 4 Someone else		

54. Freedom for movement

54	Do you have to ask your husband or a senior family member for permission to go to the following:			
54.1	The local market	1 Yes 0 No		
54.2	The local health facility	1 Yes 0 No		
54.3	A community center, mothers group meeting	1 Yes 0 No		
54.4	The home of relatives or friends in the village	1 Yes 0 No		
54.5	The nearby temple/church or other religious place	1 Yes 0 No		

55. Attitude towards domestic violence

55	In your opinion, is a husband justified in hitting or beating his wife in the following situations?			
55.1	If she goes out without informing him?	1 Yes 0 No		
55.2	If she argues with him?	1 Yes 0 No		
55.3	If she neglects the children?	1 Yes 0 No		
55.4	If she refuses to have sex with him?	1 Yes 0 No		
55.5	If she burns the food?	1 Yes 0 No		

56. Intra spousal communication

56	Do you speak or discuss with your husband on the following?			
56.1	Community affairs	1 Yes 0 No		
56.2	Money matters	1 Yes 0 No		
56.3	Number of children to have	1 Yes 0 No		
56.4	Whether to use which family planning methods	1 Yes 0 No		
54.5	Your own health	1 Yes 0 No		

57. Observation form

SN	**Questions**	Coding	Answer
1.	What is the material with which the roof of the house is made up?	1. Tayal 2. Tin 2. Cemented/ plastered 4. Grass/straw	
2.	Floor of the house is made up of	1. Marble or chips 2. Tin 3. Cemented/plastered 4. Mud 5. Others……..	
3.	Wall of the house is made up of	1. Wood or bamboo 2. Bricks, stone and mud 3. Brick, stone and cement 4. No wall 5. Others……..	
4.	Toilet available	1 Yes 0 No	
4.1	If yes, which type of toilet??	1. Sanitary, flushable 2. Unsanitary, un-flushable	
5.	Which fuel do you usually use to cook foods?	1. Boi-gas 2. LPG gas 3. Kerosene 4. Electricity 5. Wood 6. Animal dung 7. Others……..	
6	Do you have following things in your household (Observe as far as possible)		
	Water tap	1 Yes 0 No	
	Radio	1 Yes 0 No	
	Electricity	1 Yes 0 No	
	LAN phone	1 Yes 0 No	
	Television	1 Yes 0 No	
	Mobile phone	1 Yes 0 No	
	Cycle	1 Yes 0 No	
	Motorbike	1 Yes 0 No	
	Refrigerator	1 Yes 0 No	
	Computer	1 Yes 0 No	
	Heavy vehicle (Truck, tractor, bus)	1 Yes 0 No	

Review if you missed any questions.

Thank you for giving the interview!!

Annex II

FGD/Interview Guideline for women

Age: Number of surviving children:

Education: Occupation:

1. Did you visit any health facility when you were pregnant with your last child?
2. If yes, how many times did you make visit?
3. Did you face any health problems during your last pregnancy?
4. If yes, what were the problems?
5. Was your husband living with you while you were pregnant?
6. Did you ever discussed about your health with your husband during your pregnancy?
7. Did your husband accompany you during your antenatal care visit to health facility?
8. Did your husband give you some money while you were going to health facility for ANC visit (for transportation, medicine or for other purposes)?
9. Who supported you to reduce your household work burden during pregnancy?
10. How much concerned was your husband about the health of you and your baby during pregnancy, delivery and post natal period?
11. What were the preparations did your husband make during your pregnancy for the safe delivery outcome, if any?
12. What were the advices your husband gave you while you were pregnant, if any?
13. Where the delivery was took place and who assisted the delivery?
14. Was your husband present during your delivery?
15. If your husband was present, what support did he give what were the roles he played?
16. Who decided in your family whether you should go for examining pregnancy and where to deliver the child?
17. What are the supports a woman expects during the maternity period from her husband? Was your expectation fulfilled by your husband?
18. Can you describe the process of decision making in your household for utilizing maternal health care services in your case?

Note: The discussion topics in FGD and in-depth interview were not markedly different, so not included differently.

FGD/interview guidelines for husbands

Age: Number of surviving children:

Education: Occupation:

1. How much concerned were you for the health of your wife and child during pregnancy and delivery of your wife?
2. Did your wife make any visits to health facility for regular check up during pregnancy?
3. Do you know how many times a woman should visit health facility for normal examination during pregnancy?
4. What are the danger signs during pregnancy that require immediate attention and that threaten the life of woman and baby?
5. Did you accompany your wife while she was going to health facility for ANC visit?
6. What are the supports that a woman requires during her pregnancy from her husband (probing: financial, emotional, reducing domestic word burden, etc.)?
7. What were the supports that you gave to your wife while she was pregnant?
8. Did you ever discussed with your wife about her health during pregnancy and post natal period?
9. Had you made any arrangements/preparations for the safe delivery of your wife (probing: like financial arrangements, where to deliver the child, who will be the birth attendant, etc.)?
10. What are the danger signs during delivery that require immediate attention?
11. Where the delivery was took place? Were you present with your wife during delivery?
12. What are the different supportive roles that husband can play for the woman during her pregnancy, delivery and post-partum period?
13. What are the factors that influence husband's involvement in maternal health?
14. What are the barriers or husband's involvement?
15. Can you tell any incidents that were worthwhile to remember about pregnancy, delivery and post natal period of your wife?
16. Who in your family decides whether to utilize any health services by a woman during pregnancy, delivery and post natal period?
17. Can you describe more about the decision making process about maternal health care utilization?

ANNEX III

Cover letter

Respected Madam,

Namaskar.

My name is Deependra Kaji Thapa. I am a student of MSc in Health and Society from Wageningen University, Netherlands. I am doing an academic study on "Woman's autonomy and husband's involvement in maternal health care utilization" as partial fulfilment of my MSc degree. The study is being conducted among women who delivered live birth during last one year in Kailali district. You are one of the randomly selected participants for this study. So I am requesting you to give your valuable time to participate in this study. You will be asked you and your husband's socio-demographic characteristics, your practice of maternal health care utilization during your most recent pregnancy and delivery, and some of the questions related to decision making of your household affairs. It will take 30 to 40 minutes to complete the interview.

Only those directly involved with this study will have access to the data and your personal information recorded will be treated with high confidentiality. Though the study will not give you any direct benefit but this research may help to understand woman's autonomy influence maternal health care utilization and husband's involvement in maternal health. Your participation is voluntary and you may withdraw from this study at any time.

Do you want to participate in this study?

Can we precede the interview?

Thank you for taking part in this study.

Deependra Kaji Thapa

MSc Health and Society

Wageningen University

ANNEX IV

Tables

Table 22. Distribution of woman's exposure to media (N = 341)

Media exposure	n	%
Reads newspaper or magazine at least once a week		
Yes	64	18.8
No	277	81.2
Watches television at least once a week		
Yes	236	69.2
No	105	30.8
Listens to radio at least once a week		
Yes	251	73.6
No	90	26.4
Exposure to any media (Newspaper, TV or radio) once a week		
Yes	302	88.6
No	39	11.4

Table 23. Distribution of women who experienced complaints during pregnancy and delivery[a]

	n	%
Women experienced complaints during pregnancy (N = 335)		
Yes	243	72.4
No	92	27.5
Women experienced complaints at delivery (N = 334)		
Yes	205	61.4
No	129	38.6

[a] Women who responded 'don't know' were considered as missing so not included in the table.

Table 24. Multivariate (logistic regression) analysis predicting maternal health care utilization

Characteristics	Sufficient ANC[a] (N = 271)			Delivery at Health Falicity[b] (N = 267)		
	OR	95%CI	p	OR	95%CI	p
Autonomy measures						
Economic autonomy	0.96	0.79 - 1.17	n.s.	1.19ᵗ	1.00 - 1.41	0.056
Domestic decision making autonomy	1.06	0.76 - 1.48	n.s.	1.13	0.83 - 1.53	n.s.
Movement autonomy	1.61**	1.26 - 2.06	<0.001	1.06	0.86 - 1.29	n.s.
Intra-spousal communication	1.49*	1.08 - 2.07	0.016	0.98	0.71 - 1.36	n.s.
Socio-demographic characteristics						
Ethnicity *(Upper caste groups)*						
Untouchable lower caste	0.92	0.23 - 3.64	n.s.	2.59	0.64 - 10.53	n.s.
Disadvantaged ethnic groups	3.10*	1.12 - 8.55	0.029	0.91	0.40 - 2.08	n.s.
Disadvantaged non-Dalit terai caste	1.17	0.25 - 5.58	n.s.	0.91	0.19 - 4.31	n.s.
Relatively advantaged ethnic groups	0.79	0.21 - 2.92	n.s.	0.31ᵗ	0.09 - 1.07	0.064
Wealth quintile *(Lowest)*						
Second	0.83	0.24 - 2.88	n.s.	0.60	0.21 - 1.75	n.s.
Middle	2.60	0.73 - 9.22	n.s.	1.12	0.38 - 3.26	n.s.
Fourth	1.72	0.49 - 6.02	n.s.	1.48	0.50 - 4.36	n.s.
Highest	0.96	0.26 - 3.57	n.s.	2.41	0.73 - 7.95	n.s.
Woman's education *(Low education)*						
Middle education	0.87	0.32 - 2.39	n.s.	1.28	0.54 - 3.05	n.s.
High education	1.34	0.37 - 4.83	n.s.	1.63	0.57 - 4.71	n.s.
Husband's education *(Low education)*						
Middle education	1.96	0.62 - 6.14	n.s.	1.87	0.71 - 4.93	n.s.
High education	3.45*	1.02 - 11.65	0.046	2.39	0.84 - 6.82	n.s.
Women employed in occupation other than agriculture and housewife	4.82*	1.10 - 21.10	0.037			
Woman's age	0.99	0.83 - 1.18	n.s.	0.91*	0.83 - 0.99	0.03
Husband's age	1.03	0.91 - 1.18	n.s.			
Arrange marriage *(Love marriage)*	1.80	0.79 - 4.12	n.s.			
Number of living children	0.99	0.62 - 1.57	n.s.			
Women exposed to media[c]	3.86*	1.28 - 11.63	0.016	1.49	0.55 - 4.02	n.s.
Health risk						
Experienced complaints during pregnancy	1.44	0.65 - 3.19	n.s.	3.50**	1.71 - 7.19	0.001
Experienced complaints at delivery				1.94*	1.04 - 3.63	0.038
Sufficient ANC visit				2.10ᵗ	0.98 - 4.49	0.055

ᵗ $p < 0.1$; * $p < 0.05$; ** $p < 0.01$.

[a] Variables included in the model are autonomy measures, ethnicity, wealth quintile, women and husband's education, woman's employment, woman's age, husband's age, type of marriage, number of surviving children, media exposure, and complaints during pregnancy. Where reference categories are not clear, they are given in parentheses and italics.

[b] Variables included in the model are autonomy measures, ethnicity, wealth quintile, women and husband's education, woman's employment, woman's age, media exposure, complaints during pregnancy and delivery, and ANC sufficiency.

[c] Women who exposed to any of the three media (radio, television and magazines/newspaper) at least once a week.

Table 25. Multivariate (logistic regression) analysis predicting husband's involvement

Characteristics	Husband present at ANC[a] (N = 270)			Husband present at HF delivery[b] (N = 267)		
	OR	95%CI	p	OR	95%CI	p
Autonomy measures						
Economic autonomy	1.09	0.89 - 1.33	n.s.	1.16ᵗ	0.98 - 1.37	0.080
Domestic decision making autonomy	0.73*	0.54 - 0.99	0.043	1.29	0.95 - 1.75	n.s.
Movement autonomy	0.56**	0.45 - 0.70	<0.001	0.98	8.81 - 1.19	n.s.
Intra-spousal communication	0.97	0.71 - 1.34	n.s.	1.20	0.86 - 1.68	n.s.
Socio-demographic characteristics						
Ethnicity *(Upper caste groups)*						
Untouchable lower caste	1.08	0.24 - 4.78	n.s.	1.00	0.26 - 3.76	n.s.
Disadvantaged ethnic groups	2.18ᵗ	0.92 - 5.15	0.075	1.43	0.63 - 3.27	n.s.
Disadvantaged non-Dalit Terai caste	6.00*	1.26 - 28.64	0.025	1.00	0.25 - 4.05	n.s.
Relatively advantaged ethnic groups	6.12*	1.77 - 21.20	0.004	0.31ᵗ	0.09 - 1.08	0.066
Wealth quintile *(Lowest)*						
Second	3.40*	1.04 - 11.09	0.043	0.60	0.20 - 1.77	n.s.
Middle	1.64	0.53 - 5.13	n.s.	0.74	0.25 - 2.18	n.s.
Fourth	1.04	0.32 - 3.40	n.s.	0.70	0.24 - 2.07	n.s.
Highest	3.36*	1.02 - 11.10	0.046	1.99	0.60 - 6.59	n.s.
Woman's education *(Low education)*						
Middle education	2.72*	1.08 - 6.85	0.033	1.20	0.51 - 2.82	n.s.
High education	3.22*	1.11 - 9.30	0.031	1.63	0.56 - 4.70	n.s.
Husband's education *(Low education)*						
Middle education	2.24	0.69 - 7.28	n.s.	2.01	0.73 - 5.55	n.s.
High education	3.95*	1.14 - 13.71	0.031	2.87ᵗ	0.98 - 8.37	0.054
Women employed in occupation other than agriculture and housewife				2.94*	1.09 - 7.93	0.034
Husband's occupation *(Agriculture)*						
Labour	0.66	0.26 - 1.72	n.s.			
Business	0.16**	0.05 - 0.51	0.002			
Service	0.39ᵗ	0.13 - 1.16	0.091			
Others	0.38	0.09 - 1.54	n.s.			
Women residing in joint family *(Nuclear family)*	1.05	0.43 - 2.60	n.s.			
Woman's age	0.95	0.81 - 1.11	n.s.	0.74**	0.63 - 0.88	0.001
Husband's age	1.08	0.95 - 1.23	n.s.	1.19*	1.04 - 1.36	0.015
Number of living children	0.69	0.44 - 1.11	n.s.	1.34	0.89 - 2.03	n.s.
Women exposed to media	1.39	0.43 - 4.57	n.s.	2.09	0.71 - 6.16	n.s.
Health risk						
Experienced complaints during pregnancy	1.80	0.84 - 3.87	n.s.	6.02**	2.86 - 12.67	<0.001
Experienced complaints during delivery				1.03	0.55 - 1.92	n.s.
Sufficient ANC visit				1.94ᵗ	0.90 - 4.20	0.093

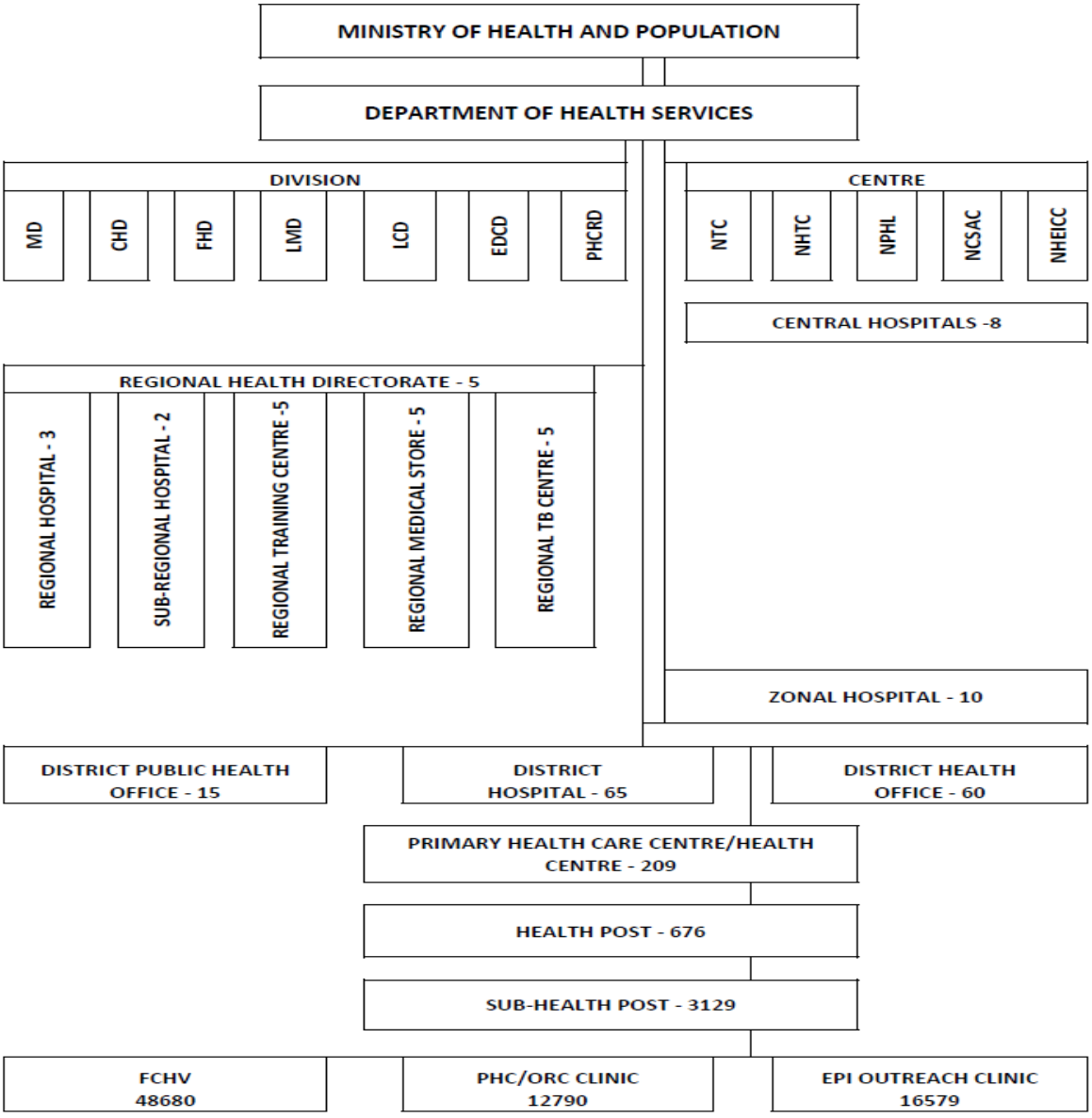
ᵗ p < 0.1*; p < 0.05; ** p < 0.01.

[a] Variables included in the model are autonomy measures, ethnicity, wealth quintile, women and husband's education, husband's occupation, type of family, woman's age, husband's age, number of surviving children, media exposure, and complaints during pregnancy. Where reference categories are not clear, they are given in parentheses and italics.

[b] Variables included in the model are autonomy measures, ethnicity, wealth quintile, women and husband's education, woman's employment, woman's age, husband's age, number of surviving children, media exposure, complaints during pregnancy and delivery, and ANC sufficiency.

ANNEX V

Organizational structure of health service delivery system of Nepal



Source: Annual report, DoHS 2010/2011

CHD	Child Health Division
EDCD	Epidemiology and Disease Control Division
FCHV	Female Community Health Volunteer
FHD	Family Health Division
LCD	Leprosy Control Division
LMD	Logistics Management Division
MD	Management Division
NCASC	National Centre for AIDS and STD Control
NHEICC	National Health Education, Information and Communication Centre
NHTC	National Health Training Centre
NPHL	National Public Health Laboratory
NTC	National Tuberculosis Centre
PHC/ORC	Primary Health Care Outreach Clinic

ANNEX VI

Map of Kailali District showing VDCs