

# Postnatal care service utilization and its determinants in Ramechhap district, Nepal: A community-based cross-sectional study

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## Abstract

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Nepal is one of the 10 countries worldwide that have reduced maternal mortality rate during 1990-2013 by 75% due to programs aiming to improve utilization of maternal care services. Nevertheless, the national utilization rate of postnatal care is very low as only half of women uptaking postnatal care services at least one time within 42 days after delivery. Therefore, this study was to identify factors affecting postnatal care utilization in Ramechhap district, Nepal, where is one of the districts with lower postnatal care rate.

A community-based cross-sectional study was conducted from March to April 2017. A two-stage cluster sampling technique was used to draw a sample of 380 mothers who gave birth in the last 1 year from four village development committees. Descriptive statistics, Chi-square test and multiple logistic regression were used to determine the predictors of postnatal care uptake.

This study showed utilization of postnatal care services at least one time within 42 days after delivery was only 28.4%. Among predisposing factors, mother's age < 30 (Adj OR=3.35, 95% CI=1.48-7.60), higher husband's education (Adj OR=3.42, 95% CI=1.53-7.68), husband's occupation like officers (Adj OR=2.60, 95% CI=1.21-5.98), nuclear family (Adj OR=3.03, 95% CI=1.40-6.56), and higher level of awareness on postnatal complication (Adj OR=7.23, 95% CI=3.33-15.67). Among enabling factors, experience of antenatal care (Adj OR= 4.47, 95% CI=2.12-9.41), satisfactions to quality of health services (Adj OR=3.01, 95% CI=1.38-6.54), longer spending time for travel and waiting for postnatal care (Adj OR=8.48, 95% CI=3.66-19.68) and among need factors, postpartum depression of mothers (Adj OR=4.13, 95% CI=1.37-12.43) were significantly associated with postnatal care services uptake.

Postnatal care service use was relatively low in the district. Raising awareness on postpartum complications and importance of postnatal care service, and strengthening the capacity of health facilities and outreach clinics should be promoted for improving postnatal healthcare service uptake.

**Keywords:** Determinants, Postnatal care utilization, Awareness on postnatal complication, Nepal

# การใช้บริการสุขภาพหลังคลอดบุตรและปัจจัยกำหนด ในอำเภอรามิخاب ประเทศเนปาล : การศึกษาแบบภาค ตัดขวางโดยใช้ชุมชนเป็นฐาน

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## บทคัดย่อ

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การใช้บริการสุขภาพหลังคลอดบุตรและปัจจัยกำหนดในอำเภอรามิخاب ประเทศเนปาล:

การศึกษาแบบภาคตัดขวางโดยใช้ชุมชนเป็นฐาน

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ประเทศเนปาลเป็นหนึ่งในสิบของประเทศในทั่วโลกที่สามารถลดอัตราการตายของมารดาในช่วงปี 2533-2556 ลงได้ร้อยละ 75 เนื่องจากมีโครงการที่มุ่งพัฒนาให้มารดาได้รับบริการตรวจสุขภาพแม่และเด็ก อย่างไรก็ตามในระดับประเทศอัตราการให้บริการสุขภาพของมารดาหลังคลอดยังคงต่ำมาก โดยมีเพียงครึ่งหนึ่งของมารดาที่รับบริการตรวจสุขภาพหลังจากคลอดบุตรอย่างน้อยหนึ่งครั้งภายใน 42 วัน ดังนั้นการศึกษานี้มีวัตถุประสงค์เพื่อศึกษาปัจจัยที่ส่งผลต่อการให้บริการตรวจสุขภาพหลังจากคลอดบุตรในอำเภอรามิخاب ประเทศเนปาลที่เป็นอำเภอหนึ่งที่มีอัตราการให้บริการตรวจสุขภาพหลังคลอดบุตรต่ำกว่าระดับประเทศ

การศึกษาแบบภาคตัดขวางโดยใช้ชุมชนเป็นฐานครั้งนี้ ดำเนินการในช่วงเดือนมีนาคม ถึง เมษายน 2560 ใช้เทคนิคการสุ่มตัวอย่างแบบกลุ่มในสองขั้นตอน กลุ่มตัวอย่างเป็นมารดาหลังคลอดบุตรในช่วง 1 ปีที่ผ่านมา จำนวนทั้งหมด 380 ราย โดยได้รายชื่อมาจากคณะกรรมการพัฒนาการชุมชน 4 แห่ง ใช้สถิติพรรณนา การทดสอบความสัมพันธ์ไคกำลังสอง และสถิติการถดถอยลอจิสติกพหุคูณ ถูกนำมาใช้ในการหาปัจจัยพยากรณ์การให้บริการหลังคลอดของมารดา

การศึกษานี้แสดงให้เห็นว่ามารดาใช้บริการหลังคลอดอย่างน้อยหนึ่งครั้งภายใน 42 วันหลังคลอดเพียงร้อยละ 28.4 เท่านั้น ปัจจัยนำที่กำหนดให้มารดาใช้บริการหลังคลอดได้แก่อายุของมารดามากกว่า 30 ปี (Adj OR: 3.35, 95% CI: 1.48-7.60), มารดาที่มีสามีมีการศึกษาสูง (Adj OR: 3.42, 95% CI: 1.53-7.68) อาชีพการงานของสามีเช่นเจ้าหน้าที่ในสำนักงาน (Adj OR: 2.60, 95% CI: 1.21-5.98) ครอบครัวยุติ (Adj OR: 3.03, 95% CI: 1.40-6.56) มีความตระหนักเกี่ยวกับภาวะแทรกซ้อนหลังคลอดสูง (Adj OR: 7.23, 95% CI: 3.33-15.67), ปัจจัยเอื้อที่กำหนดให้มารดาใช้บริการหลังคลอดได้แก่ ประสบการณ์การฝากครรภ์ (Adj OR: 4.47, 95% CI: 2.12-9.41) ความพึงพอใจต่อคุณภาพของบริการสุขภาพ (Adj OR: 3.01, 95% CI: 1.38-6.54) การใช้เวลาในการเดินทางและรอรับบริการหลังคลอด (Adj OR: 8.48, 95% CI: 3.66-19.68) และปัจจัยเสริมที่กำหนดให้มารดาใช้บริการหลังคลอดได้แก่ มารดาที่มีภาวะซึมเศร้าหลังคลอด (Adj OR: 4.13, 95% CI: 1.37-12.43) มีความสัมพันธ์กับการมารับบริการหลังคลอดของมารดาอย่างมีนัยสำคัญ

การใช้บริการสุขภาพหลังคลอดบุตรของมารดายังมีสัดส่วนที่ต่ำ การเสริมสร้างความตระหนักเกี่ยวกับภาวะแทรกซ้อนหลังคลอดและความสำคัญของการบริการหลังคลอด และการเสริมสร้างขีดความสามารถของสิ่งอำนวยความสะดวกด้านสุขภาพและการขยายบริการโดยเปิดคลินิกในท้องถิ่นกันควรได้รับการส่งเสริมเพื่อเพิ่มการใช้บริการด้านสุขภาพหลังคลอด

**คำสำคัญ:** ปัจจัยกำหนด, การใช้บริการสุขภาพหลังคลอด, ความตระหนักในปัจจัยแทรกซ้อนหลังคลอด, ประเทศเนปาล

## Introduction

Global attention has been paid to reduction of the burden of maternal and neonatal mortality. The mortality can be reduced by the utilization of maternal health care services<sup>1</sup>. The postnatal period, the time from delivery up to 6 weeks postpartum is the most susceptible period in the reproductive life cycle of mothers<sup>2</sup>. Over two-thirds of neonatal deaths occur within 1 week after birth, half of neonatal deaths occur within the first 24 hours and about six million child deaths occur in the postneonatal period annually<sup>3</sup>.

Globally, out of eight million pregnant women who suffer from pregnancy-related complications, over 50% die due to complications<sup>4</sup>. The WHO estimates that worldwide, each year at least 0.3 million women die as a result of pregnancy and childbirth, and almost 99% of these deaths occur in the developing world<sup>5</sup>. Maternal deaths in Southeast Asian region account for about 40% of the total global maternal deaths<sup>5</sup>. According to WHO and World Bank estimate, Nepal has a highest maternal mortality rate, 258 per 100,000 live births in Southeast Asian Region<sup>6</sup>. According to the Nepal Demographic Health Survey report 2011, only 45% of women uptake postnatal care services, which is defined at least one time within 42 days after delivery, and only 20% of women took postnatal care service at least three times according to protocol of ministry of health<sup>7</sup>. Furthermore, the uptake shows great disparity across states. Nevertheless, studies on postnatal care utilization, particularly in districts which showed poor PNC rate like Ramechhap district have rarely been done.

This study included three parts of variables based on Anderson's Health belief model<sup>8</sup>; predisposing, enabling and need factors. Predisposing factors

prompt mothers to use postnatal care service. Factors which were associated with postnatal care use in previous studies are the mother's age<sup>9</sup>, the educational status of the mother and father<sup>10</sup>, the mother's and father's occupational status<sup>11</sup>, marital status<sup>9</sup>, type of family<sup>12</sup>, religion/ethnicity<sup>13-14</sup>, birth order<sup>12-13</sup>, awareness on complications<sup>3</sup> and on postnatal care<sup>15-16</sup>, and perception on postnatal care<sup>16</sup>. Predisposing factors are facilitated by enabling factors. These are place of delivery<sup>17</sup>, family income<sup>18</sup>, the frequency of antenatal care visits<sup>3</sup>, quality of health services<sup>15,19</sup>, residential area<sup>20</sup>, ability to make decision<sup>19</sup>, exposure to postnatal care information<sup>21</sup>, accessibility and availability of service<sup>22</sup>. Lastly, several studies<sup>4,8,23-24</sup> have shown that need factors such as occurrence of complications, and postpartum depression among mothers necessitate the utilization of postnatal care. However, little studies considering all those factors to predict postnatal care utilization have not been done. Therefore, this study aimed to identify predisposing, enabling, and need factors affecting the utilization of postnatal service among mothers in Ramechhap district, Nepal.

## Methods

A community-based cross-sectional study was conducted in Ramechhap district, Nepal during March to April 2017. The sample size (n=380) was calculated based on Krejcie and Morgan formula margin of error of 10% with 95% confidence<sup>25</sup>. One of two municipalities in Ramechhap district were purposively selected. Then, four of seven village development committees (VDCs) were selected using simple random sampling: namely Manthali, Bhatauli, Bhaluwajor and Kathajor. Further, a systematic random



sampling technique was used to select mothers from the selected 4 VDCs. Data were collected from mothers, who had at least one child under one year old and finished the postnatal period of 6 weeks after delivery. Mothers who could not speak and who had a hearing impairment, who were migrants, and who were not willing to participate were excluded. The response rate was 100%.

Before the main data collection procedure, pre-testing was done. Some changes were made to suit the local setting. The questionnaire was administered by trained researchers. The data were collected by face to face interview and the antenatal and postnatal care visits was verified by the mother's health passport. Similarly, data on complications were collected by asking if a mother had been admitted in the health facility after delivery with verification of dates of delivery and discharge from the mother's health passport. Ethical approval was obtained from the Mahidol University Ethical Committee (2017/058.1403), and the District Health Office of Ramechhap. Approval was also obtained from VDCs and verbal consent was obtained from study participants before the interview.

The questionnaire had three parts, namely predisposing, enabling and needs variables. The questionnaire was developed by reviewing the literature and consulting a panel of research experts from Mahidol University and experts from the District Health Office in Ramechhap district, Nepal. It was translated into the local language, Nepali, and then pre-tested by interviewing 30 postnatal mothers to check its acceptability, validity and reliability at Dolakha District, Nepal, where was not included in the main study. Awareness on postpartum complication was

measured with twenty questions. The questions had three response options: true, false and not sure. The questions of Knowledge on complication was adapted from maternal and child health handbook<sup>26</sup>. The questions included danger signs in postnatal period, such as swelling of body parts such as face, mouth, hands, legs, severe nausea and vomiting, abdominal pain, visual disturbance, vaginal bleeding, flu symptoms, severe headache so on. Each question items were summed. Knowledge towards PNC was measured with sixteen questions. The questions had three options of answers: true, false and not sure. The questions of Knowledge on postnatal care was adapted from maternal and child health (MCH) handbook<sup>26</sup>. The questions included knowledge about postnatal care: for example, i) postnatal care is provision of health services to delivered mothers by health professionals, ii) postnatal care is important for mother and child to prevent from any health complication so on. Perception towards postnatal care had fourteen questions. The questions had three options of answers: agree, disagree and do not know. The questions included about mothers perception towards postnatal care: for example, i) if I have no complication during postnatal period, I will not go to postnatal care visit, ii) I feel safe when I go for postnatal care, iii) I can receive useful information during postnatal care visit so on. Their reliabilities were estimated using KR20 for awareness and knowledge, and Cronbach's alpha ( $\alpha$ ) for perception. In this study, the reliabilities were good (KR20 = 0.74 for awareness on complication, KR20 = 0.65 for knowledge on postnatal care, and  $\alpha$  = 0.77 for perception). Satisfaction on quality of health services was measured with four questions. The questions had three options of answers:

agree (score 1), neutral (score 2) and disagree (score 3). Then, for data analysis groups were categorized into two groups: yes and no. Depression was asked with the Patient Health Questionnaire-2 (PHQ-2) which performed well in primary care centers with large samples for identifying depression<sup>27</sup>. The PHQ-2 consists of two items. The mothers were asked with two questions, “Over the past 2 weeks, how often have you been bothered by any of the following problems? 1) Little interest or pleasure in doing; 2) things Feeling down, depressed or hopeless” (the response options were i) not at all, ii) several days, iii) more than the half day, and iv) nearly every day). Each question item has a score ranging from 0 to 3. Thus, the total score can range from 0 to 6. The mothers with a score of 3 or higher were considered as the optimal cut point for screening purposes.

Data were entered and analyzed in SPSS (version 21). The VDCs was not included as a variable in the analysis because they have similar background factors. Variables, such as antenatal care visits and distance to health facilities were pre-categorized based on government standards. Dependent variable was the use of postnatal care at least one time within 42 days after delivery. Descriptive Statistics (number and percentage) were used to determine the prevalence of postnatal care use and all independent

variables. Number and percentages of all variables were presented. Then, Chi-square tests and univariate logistic regression were used to determine the bivariate association between utilization of postnatal care and independent variables based on a set level of significance of 0.05. Finally, at the significance level of 0.05, a stepwise multiple logistic regression model including all significant variables from the bivariate analyses was fitted to determine significant predictors for the utilization of postnatal service among mothers within 42 days after delivery.

## Results

Of a total of 380 postnatal mothers, only 28.4% of postnatal mothers utilized postnatal care at least one time within six weeks after delivery. Around half of the participants were below 30 years. Over half mothers reached primary educational level, lived in joint or extended family, and were farmers and housewives. The majority of mothers had low knowledge level on complications during postnatal period and postnatal care services. As shown in Table 2, almost half of the mothers had antenatal visits of at least one time, resided in rural area, had low monthly family income (< 30,000 rupees), and was autonomous in seeking health services. About 14% respondents had depression after delivery.

**Table 1** Number and percentage of respondents who participated in the study by predisposing factors

Predisposing factors	Number	Percentage
<b>Current mother's age</b>		
<30 years	207	54.5
≥30 years	173	45.5
<b>Mother education</b>		
Secondary or above	141	37.1
Primary or below	239	62.9
<b>Husband education</b>		
Secondary or above	184	48.4
Primary or below	196	51.6
<b>Mother occupation</b>		
Agriculture/housewife/labor	283	74.5
Government/private/tourism/business	97	25.5
<b>Husband occupation</b>		
Agriculture/labor	244	64.2
Government/private/tourism/business	136	35.8
<b>Type of family</b>		
Nuclear	126	33.2
Joint	254	66.8
<b>Birth order</b>		
3rd or above	221	58.2
1st or second	159	41.8
<b>Awareness on complication</b>		
Low (<7 score) <sup>1</sup>	260	68.4
High (≥7 score)	120	31.6
<b>Knowledge on postnatal care service</b>		
Low (<6 score) <sup>1</sup>	284	74.7
High (≥6 score)	96	25.3
<b>Mother's perception on postnatal care</b>		
Low (<5 score) <sup>1</sup>	292	76.8
High (≥5 score)	88	23.2

<sup>1</sup> It was categorized into two groups based on the value of 75<sup>th</sup> centile

**Table 2** Number and percentage of respondents who participated in the study by enabling and need factors

	Number	Percentage
<b>Enabling factors</b>		
<b>Place of delivery</b>		
Institutional	249	65.5
Home	131	34.5
<b>Family income</b>		
< 30,000 rupee <sup>1</sup>	240	63.2
≥ 30,000 rupee	140	36.8
<b>Utilization of antenatal care <sup>2</sup></b>		
No	201	52.9
Yes	179	47.1
<b>Quality of Health facilities and service</b>		
Low (<7 score) <sup>3</sup>	282	74.2
High (≥7 score)	98	25.8
<b>Residence</b>		
Urban	122	32.1
Rural	258	67.9
<b>Ability to make decision</b>		
No	153	40.3
Yes	227	59.7
<b>Exposure to postnatal care information</b>		
No	152	40.0
Yes	228	60.0
<b>Spent time (Travel and waiting)</b>		
< 4 hours	186	48.9
≥ 4 hours	194	51.1
<b>Travel cost</b>		
≥ 100 rupee <sup>1</sup>	83	21.8
< 100 rupee	297	78.2
<b>Need factors</b>		
<b>Complication during postpartum</b>		
No	253	66.6
Yes	127	33.4
<b>Postpartum depression</b>		
No	328	86.3
Yes	52	13.7

<sup>1</sup> 1 US dollar = 102.5 rupee

<sup>2</sup> At least one time visit antenatal care service

<sup>3</sup> It was categorized into two groups based on the value of 75th centile



The associations between postnatal care service use and all predisposing factors were significant (P-value < 0.001) (Table 3). In particular, younger mothers, mothers or their husbands having an occupation of government or private sectors, mothers with higher level of awareness on complications were more likely to use postnatal care service, compared to their counterparts (P-value < 0.001). Furthermore, use of postnatal service was also significantly linked to all enabling factors (P-value <0.001) (Table 4). Mothers delivering at institutions, ever utilization of antenatal care, high level of perceived quality of health facilities and service, and exposure to postnatal care information were strongly associated with postnatal care utilization in the study (P-value <0.001). In addition, among need factors, mothers with experience of postpartum depression and postpartum complications were around 2 times more likely to utilize postnatal care (P-value=0.017 and P-value <0.001, respectively).

In a multivariate logistic regression analysis, nine variables were significant to predict determinants for the utilization of postnatal service (Table 5). Among

predisposing factors, factors significantly associated with postnatal care use were mothers aged less than 30 years (Adj. OR= 3.35, 95% CI=1.48-7.60), having husbands with higher education of secondary school or above (Adj. OR= 3.42, 95% CI=1.53-7.68) and being employees of government or private sector (Adj. OR= 2.60, 95% CI=1.21-5.98), from nuclear family (Adj. OR= 3.03, 95% CI=1.40-6.56), and with high level of awareness on postpartum complications (Adj. OR= 7.23, 95% CI=3.33-15.7). In addition, among enabling factors, mothers ever utilizing antenatal care (Adj. OR= 4.47, 95% CI=2.12-9.41), with high level of perceived quality of health facilities and services (Adj. OR= 3.01, 95% CI=1.38-6.54), and spending more time during postnatal care visits (Adj. OR= 8.48, 95% CI=3.66-19.7) were more likely to use of postnatal care services than their counterparts. In particular, mothers experiencing postpartum depressions among need factors were 4 times more likely to use postnatal care than those not experiencing the depression (Adj. OR=4.13, 95% CI=1.37-12.43).



**Table 3** Association between postnatal service utilization and predisposing factors

	Utilization of PNC				Crude	(95% CI)	p-value
	No		Yes				
	n	%	n	%			
<b>Predisposing factors</b>							
<b>Current mother's age</b>							
<30 years	117	56.5	90	43.5	6.62	(3.78-11.60)	<0.001
≥30 years	155	89.6	18	10.4	1		
<b>Mother education</b>							
Secondary or above	75	53.2	66	46.8	4.13	(2.58-6.60)	<0.001
Primary or below	197	82.4	42	17.6	1		
<b>Husband education</b>							
Secondary or above	101	54.9	83	45.1	5.62	(3.37-9.36)	<0.001
Primary or below	171	87.2	25	12.8	1		
<b>Mother occupation</b>							
Agriculture/housewife/labor	240	84.8	43	15.2	1		
Government/private/tourism/business	32	33.0	65	67.0	11.34	(6.65-19.33)	<0.001
<b>Husband occupation</b>							
Agriculture/labor	213	87.3	31	12.7	1		
Government/private/tourism/business	59	43.4	77	56.6	8.97	(5.40-14.89)	<0.001
<b>Types of family</b>							
Nuclear	59	46.8	67	53.2	5.9	(3.64-9.57)	<0.001
Joint	213	83.9	41	16.1	1		
<b>Birth order</b>							
3rd or above	183	82.8	38	17.2	1		
1st or second	89	56.0	70	44.0	3.79	(2.37-6.06)	<0.001
<b>Awareness on complication</b>							
Low (<7 score) <sup>1</sup>	224	86.2	36	13.8	1		
High (≥7 score)	48	40.0	72	60.0	9.33	(5.62-15.50)	<0.001
<b>Knowledge on postnatal care</b>							
Low (>6 score) <sup>1</sup>	228	80.3	56	19.7	1		
High (≥6 score)	44	45.8	52	54.2	4.81	(2.93-7.91)	<0.001
<b>Mother's perception on postnatal care</b>							
Low (<5 score) <sup>1</sup>	230	78.8	62	21.2	1		
High (≥5 score)	42	47.7	46	52.3	4.06	(2.46-6.72)	<0.001

<sup>1</sup> It was categorized into two groups based on the value of 75<sup>th</sup> centile

**Table 4** Association between postnatal care service utilization and enabling and need factors

	Utilization of PNC				Crude	(95% CI)	p-value
	No		Yes				
	n	%	n	%			
<b>Enabling factors</b>							
<b>Place of delivery</b>							
Institutional	157	63.1	92	36.9	4.21	(2.35-7.54)	<0.001
Home	115	87.8	16	12.2	1		
<b>Family income</b>							
< 30,000 rupee <sup>1</sup>	197	82.1	43	17.9	1		
≥ 30,000 rupee	75	53.6	65	46.4	3.97	(2.49-6.34)	<0.001
<b>Utilization of antenatal care (≥ once)</b>							
No	174	86.6	27	13.4	1		
Yes	98	54.7	81	45.3	5.33	(3.23-8.79)	<0.001
<b>Quality of HFs and service</b>							
Low (<7 score) <sup>2</sup>	231	81.9	51	18.1	1		
High (≥7 score)	41	41.8	57	58.2	6.3	(3.81-10.41)	<0.001
<b>Residence</b>							
Urban	63	51.6	59	48.4	3.99	(2.49-6.40)	<0.001
Rural	209	81.0	49	19.0	1		
<b>Ability to make decision</b>							
No	90	58.8	63	41.2	1		
Yes	182	80.2	45	19.8	2.83	(1.79-4.48)	<0.001
<b>Exposure to postnatal care information</b>							
No	134	88.2	18	11.8	1		
Yes	138	60.5	90	39.5	4.86	(2.78-8.49)	<0.001
<b>Spent time (Travel and waiting)</b>							
< 4 hours	105	56.5	81	43.5	3.32	(1.80-6.14)	<0.001
≥ 4 hours	167	86.1	27	13.9	1		
<b>Travel cost</b>							
≥100 rupee <sup>1</sup>	66	79.5	17	20.5	1		
<100 rupee	206	69.4	91	30.6	2.22	(1.06-4.65)	0.040
<b>Need factors</b>							
<b>Complication during postpartum</b>							
No	197	72.4	75	27.6	1		
Yes	56	51.9	52	48.1	2.43	(1.53-3.87)	<0.001
<b>Postpartum depression</b>							
No	242	73.8	86	26.2	1		
Yes	30	57.7	22	42.3	2.06	(1.13-3.77)	0.017

<sup>1</sup> 1 US dollar = 102.5 rupee

<sup>2</sup> It was categorized into two groups based on the value of 75<sup>th</sup> centile

**Table 5** Stepwise model of multiple logistic regression of predictors for the utilization of postnatal service among mothers

Factors	Adj. OR	(95% CI)	p-value
<b>Predisposing factors</b>			
<b>Current mother's age</b>			
< 30 years	3.35	(1.48-7.60)	0.004
≥ 30 years	1		
<b>Husband education</b>			
Secondary or above	3.42	(1.53-7.68)	0.003
Primary or below	1		
<b>Husband occupation</b>			
Agriculture/labor	1		
Government or private/business	2.60	(1.21-5.98)	0.010
<b>Type of family</b>			
Nuclear	3.03	(1.40-6.56)	0.005
Joint	1		
<b>Awareness on complication</b>			
Low (<7 score) <sup>1</sup>	1		
High (≥7 score)	7.23	(3.33-15.67)	<0.001
<b>Enabling factors</b>			
<b>Utilization of antenatal care (at least one time)</b>			
No	1		
Yes	4.47	(2.12-9.41)	<0.001
<b>Quality of health facilities and service</b>			
Low (<7 score) <sup>1</sup>	1		
High (≥7 score)	3.01	(1.38-6.54)	0.005
<b>Spent time (Travel and waiting)</b>			
< 4 hours	8.48	(3.66-19.68)	<0.001
≥ 4 hours	1		
<b>Need factors</b>			
<b>Postpartum depression</b>			
No	1		
Yes	4.13	(1.37-12.43)	0.010

<sup>1</sup> It was categorized into two groups based on the value of 75<sup>th</sup> centile

## Discussion

This community-based cross-sectional study examined predisposing, enabling and need factors that were associated with the utilization of postnatal care among mothers in Ramechhap district, Nepal. This study showed that proportion of poor utilization of postnatal services among 380 mothers was only 28.4%, in consistent with previous studies (around 25-35%)<sup>28-29</sup>. In addition, our study showed that mothers aged 30 years or higher and in joint families were less likely to use postnatal services than the counterparts. This could be linked to mother's workload. For example, mothers having two or more children, many family members, and with husbands working as laborer or farmers would have more works to do and further if they resides in local area, they would be less likely to visit for maternal care<sup>3</sup>. Also, they would have less decision-making power in their home, which may lead to less postnatal care utilization.

These findings in accordance with earlier studies revealed that husband education is more influential than mother's education as low education level of women's husband was inversely associated with utilization of maternal care services<sup>13</sup>. Another study also supports by showing that women whose husbands work at higher levels such as professional work tend to be more likely to use maternal care<sup>10</sup>. It can be linked to the finding that mothers who were highly aware of postnatal danger signs and symptoms were more likely to use postnatal care service as compared to those who had low awareness. Other studies support our study by showing that knowledge of complications during postnatal period affected use of maternal care service among mothers<sup>10,30-32</sup>. Mothers with low knowledge may not try to receive health

education after delivery in a health facility. This can be justified that awareness on complication during postnatal period is an important factor in motivating mothers to attend postnatal care service at the earliest opportunity with the intention of prevention, early detection and getting managed their complications.

One of the encouraging findings of this study is the impact of antenatal care attendance on postnatal care attendance. This study found that the mothers who attended at least one antenatal care visits were more likely to attend postnatal care. The possible explanation for the positive association between antenatal care visit and postnatal care service utilization might be that mothers receive health education and counseling during antenatal care visits and thus get access to learn about the benefits of postnatal care services follow up in health care facilities. The findings of the current study are also consistent with previous studies<sup>4,14-15,33</sup> showing that frequency of antenatal care visit mothers contributes to utilize postnatal care among mothers and also increase knowledge on postnatal care service. A study in Myanmar found that mothers with four time antenatal care service were more likely to use maternal services compared with women less than four antenatal care service visits<sup>4</sup>.

The quality of health facilities and services may encourage women to utilize postnatal care services. This study supports the results of previous studies<sup>19</sup> that satisfaction on service and quality of health services lead to postnatal care uptake among mothers. A study in Palestine found that women who delivered in private hospital were more likely to utilize postnatal care services than those who delivered in public hospitals<sup>34</sup>. It shows that the



quality of services in private hospital generally can be better than public hospitals<sup>34</sup>. In Nepal, despite a focus on community-based services through health institutions or outreach clinics, there still exists many limitations, such as capacity, equipment and infrastructure<sup>35</sup>. The technical competency of the health workers, and lack of equipment may be the reasons behind the low utilization of postnatal care by mother.

This finding can be explained by the fact that in the mountainous/hilly and rural areas of Nepal there has less access to public services, such as roads, transport and health services. The findings of the present study show that accessibility to the service affects use of postnatal care service. This is consistent with previous studies revealing that spending time to access to the service at each visit affects the use of postnatal service<sup>16,29,36</sup>. A study in Ethiopia supported our study by revealing that mothers travelling less than 1 hour to reach health institutions from home were more likely to utilize postnatal care services<sup>16</sup>. This study's findings was similar from a previous study<sup>37</sup> that providing health care service treating mental distress like depression, which causes women great suffering and has negative consequences for their social relationships and for the development of their infants<sup>37</sup>, affected use of postnatal care service among mothers.

### Recommendations

This study showed one in four mothers utilized postnatal care in Ramechhap district, Nepal, in accordance with the regional estimate. Local governments are being urged to pay special efforts to promote postnatal care service utilization. This study suggests promoting postnatal care service

should be targeted on mother's age more than 30 years old, with husband less educated and in a joint family. Moreover, special efforts to raise awareness on postpartum complications and to increase exposure to importance of postnatal care service should be paid. Finally, the findings of the present study suggest that a positive association between ever antenatal care visit and postnatal care visit may imply that mother's perception on antenatal care can affect the postnatal care. Indeed, our study also revealed that high level of perceived quality of health services and high accessibility of service were more likely to increase the utilization of postnatal service. Thus, strengthening the capacity of health facilities and outreach clinics should be considered to enable the provision of quality maternal health care service and further contribute to decrease in maternal and new-born morbidity and mortality.

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