



## ORIGINAL RESEARCH ARTICLE

### POSTNATAL CARE SERVICES UTILIZATION IN BHARATPUR SUB METROPOLITAN CITY, CHITWAN, NEPAL

Niki Shrestha<sup>1,\*</sup>, Bineta Tiwari<sup>1</sup>, Suneel Piryani<sup>1</sup>, Gayatri Khanal<sup>1</sup>

<sup>1</sup>Department of Community Medicine and Public Health, Chitwan Medical College, Bharatpur, Nepal

**Received:** 2 July, 2019

**Accepted:** 1 Sept, 2019

**Published:** 17 Sept, 2019

**Key words:** Mortality; Nepal; Post Natal Care.

*\*Correspondence to: Niki Shrestha, Department of Community Medicine and Public Health, Chitwan Medical College, Bharatpur, Nepal.  
Email: [shrestha.niki@cmc.edu.np](mailto:shrestha.niki@cmc.edu.np)*

DOI:<https://doi.org/10.3126/jcmc.v9i3.25781>

#### Citation

Shrestha N, Tiwari B, Piryani S, Khanal G. Postnatal care services utilization in Bharatpur metropolitan city, Chitwan, Nepal. Journal of Chitwan Medical College. 2019; 9(29): 43-50.

Peer Reviewed

#### ABSTRACT

**Background:** Postnatal period is a critical phase in the lives of mothers and newborn infants. 2.9 million neonatal deaths occur in the first week of life on an annual basis globally. In Nepal, the level of postnatal care coverage remains low despite the efforts and research on factors influencing the Post-natal care (PNC) services utilization is limited. Hence this study was conducted to explore the predictors of PNC utilization among mothers who had under one-year child.

**Methods:** A community-based cross-sectional study was conducted in Bharatpur Sub Metropolitan city, Chitwan among mothers having a child of less than one year age. Data was collected through face-to-face interview using interview-schedule. Descriptive (frequency and percentage), Bivariate (Chi-square) and Multivariate (logistic regression) analyses were performed.

**Results:** This study showed that the proportion of recommended PNC services utilization is low in comparison with those utilizing ANC services in Nepal. The percentage of women attending all the three recommended PNC visits was only 17.5%. The utilization of PNC services was associated with mother's educational status, parity, place of PNC services received and awareness about PNC services. The mode of delivery, danger signs seen in postnatal mothers, and danger signs seen in newborn were statistically significantly associated with PNC services utilization.

**Conclusions:** The findings of this study suggest context specific evidence which might be taken into consideration while planning to develop new policies to increase PNC utilization.

#### INTRODUCTION

Globally, 289, 000 women die due to maternal causes annually.<sup>1</sup> Around 50 to 71% maternal deaths occur within the postnatal period.<sup>2</sup> Likewise, 2.9 million neonatal deaths occur in the first week of life on an annual basis globally.<sup>3</sup> Unfortunately, 90% of these maternal and neonatal deaths occur in low - and middle - income countries.<sup>4</sup> Most maternal and newborn deaths are avoidable because healthcare solutions to prevent or manage complications related to pregnancy and birth are well known.

Postnatal period is a critical phase in the lives of

mothers and newborn infants, which starts immediately after birth and last for six weeks. During this period, mothers may develop serious, life-threatening complications. Despite the increased risk, this is the most neglected time for the provision and utilization of quality services in the developing world. Most maternal and infant deaths occur during this time due to the lack of appropriate care.<sup>5-7</sup> Several of these maternal and neonatal problems could be reduced if women receive appropriate postnatal care.<sup>5</sup>

In Nepal, the level of postnatal care coverage remains low despite the stakeholders' efforts. Three

post-natal care (PNC) visits (within 24hrs, on 3rd and 7th day of delivery) are recommended in the country. Nepal Demographic and Health Survey (NDHS) 2016 reported that only 57% of mothers and newborn received a postnatal checkup within two days of delivery.<sup>8</sup> In Nepal, research on factors influencing the PNC services utilization is limited. Hence, this study is an attempt to fill the information and knowledge gap. The purpose of this study was to explore the predictors of PNC utilization among mothers who had under one-year child.

## METHODS

A community-based cross-sectional study was conducted during April – May, 2017 in Bharatpur Sub Metropolitan city, Chitwan. The sample size was calculated using an infinite population correction formula. The computed sample size was 126 with 10 percent non-response rate. The sample was selected using a non-probability purposive sampling method. Mothers having a child of less than one-year age and consented to participate were included in the study.

Data was collected through face-to-face interview using interview-schedule. Data analysis was done as per the objective of the study using the SPSS version 20. The association between PNC service and exposure variable was assessed through bivariate and multivariate binary logistic regression analysis. Unadjusted and adjusted odds ratio (OR) were calculated to see the effect size of entered variables. A p-value of <0.05 was considered to be significant, and the confidence interval was set at 95 percent. Multicollinearity was tested among the variables before logistic regression analysis, and there was no significant collinearity (variation inflation factor 1-2).

Postnatal care (PNC) refers to the care given to the mother and her newborn baby after delivery. As per the protocol of Nepal, three PNC visits are recommended to every mother and baby, the first visit within 24 hours, second at the third day, and third PNC visit at seventh day of delivery. Services provided by the Government of Nepal during the PNC visit are - management of complication after delivery, exclusive breastfeeding counselling, nutrition education, vitamin A supplementation for the mother, iron tablets supplementation for mother, personal hygiene education, post-natal family plan-

ning counselling or services, and immunisation (BCG vaccine) of newborns. In this study, “High” utilization of PNC services refers to the respondent having two or more PNC visits and having utilized at least four PNC services whereas “Low” utilization of PNC services refers to the respondent having done less than two PNC visits and having utilized less than four PNC services. The ethnicities of the participants were categorized into an advantaged group (including advantaged Janajatis and upper caste) and relatively disadvantaged groups (including Dalits, disadvantaged Janajatis, disadvantaged non-dalit Terai people and religious minorities).

The study was approved by the Institutional Review Committee of Chitwan Medical College, Nepal (CMC-IRC). Verbal and informed written consent was obtained from the participants before conducting the interview. Confidentiality was assured and insured throughout the study. At the end of the interview, information about PNC and its importance was explained to the participants.

## RESULTS

The mean age of the participants was  $26.45 \pm 4.3$  years. Most of the mothers (46%) were in 25-29 years age group. Majority of the mothers were Hindu, and around two-thirds mothers (66.7%) were from upper caste groups. Around one-third of the mothers (34.9%) were educated up to bachelor level or above. Around half the mothers (55.6%) were housewives. Half of the mothers (51.6%) were living in joint/extended families, and most of the respondents (46.8%) had a family size of 5 to 8 members (Table 1).

Majority of the mothers (89.7%) reported that it took around thirty minutes to reach the nearest health facility. Majority of the mothers (95.2%) had attended the recommended four or more ANC visits and around half the mothers (48.4%) were primiparous. Around two-thirds of the mothers (64.3%) had their last delivery at government health facility, and around three-fifths of the mothers (61.1%) had a vaginal delivery. Around half of the participants (53.3%) stayed at the hospital for less than and equal to two days after delivery. 30.2% mentioned danger signs experienced during pregnancy as reasons for stay in the hospital (Table 2).

**Table 1: Sociodemographic characteristics of the study participants (n=126)**

Variable	Frequency (%)
<b>Age (in years)</b>	
15-19	5(4.0)
20-24	35(27.8)
25-29	58(46.0)
30 and above	28(22.2)
Mean	(26.45 ±4.3)
<b>Religion</b>	
Hindus	109(86.5)
Non-Hindus (Buddhist, Christian and Islam)	17(13.5)
<b>Ethnicity</b>	
Upper caste groups	84(66.7)
Relatively advantaged Janajatis	14(11.1)
Disadvantaged Janajatis	20(15.9)
Disadvantaged Non- Dalits	5(4.0)
Dalits	2(1.5)
Religious minorities	1(0.8)
<b>Mother's Educational status</b>	
Illiterate/Literate	19(15.0)
Primary	17(13.6)
Secondary	27(21.4)
Higher secondary	19(15.1)
Bachelor and above	44(34.9)
<b>Mother's Occupation</b>	
Housewife	70(55.6)
Agriculture	20(15.9)
Service	15(11.9)
Business	10(6.3)
Student	8(7.9)
Other	3(2.4)
<b>Family Type</b>	
Joint/extended	65(51.6)
Nuclear	61(48.4)
<b>Family size</b>	
3 to 4	54(42.9)
5 to 8	59(46.8)
9 and above	13(10.3)
<b>Family's monthly income</b>	
Less than 10,000	11(8.7)
10,000 - 25,000	37(29.4)
Above 25,000	78(61.9)

A total of 82.2% mothers had heard about PNC. However, only 16.7% of respondents correctly answered about the number of times and when PNC visits should be done as per protocol of Nepal, and among

them, the majority of mothers mentioned health personnel (47.6%) as the source of information about PNC visits. Only 17.5% of mothers attended all three PNC visits (as per protocol of Nepal within 24hrs, 3rd and 7th day) and 3.2% of mothers had no PNC visit. Regarding the first PNC visit, all mothers had a checkup within 24 hours of delivery. Among those who utilized PNC services, three-fourth of the mothers (74.6%) had their PNC in a government hospital. Regarding decision maker for PNC visits (only asked to women who had two or more PNC visits), most of the respondents stated that it was the deci-

**Table 2: Pregnancy and health services – related factors (n=126)**

Variable	Frequency (%)
<b>Time taken to reach nearest health facility</b>	
Around 15 minutes	9(7.9)
Around 30 minutes	113(89.7)
More than 40 minutes	4(3.2)
<b>Number of ANC visits</b>	
0 visit	2(1.6)
1 to 3	4(3.2)
4 or more	120(95.2)
<b>Parity</b>	
One	61(48.4)
Two or three	62(49.2)
Fourth or more	3(2.4)
<b>Sex of the current child</b>	
Male	75(59.5)
Female	51(40.5)
<b>Place of Delivery</b>	
Government health facility	81(64.3)
Private health facility	39(31.0)
Home	6(4.7)
<b>Mode of Delivery</b>	
Vaginal delivery	77(61.1)
Caesarean section	49(38.9)
<b>Duration of postpartum stay at hospital (n=120)</b>	
Less than and equal to 2 days	64(53.3)
3 to 4 days after birth	17(14.2)
5 or more days	39(32.5)
<b>Reasons for hospital stay</b>	
Danger signs seen during pregnancy	Multiple response answers 38(30.2)
Danger signs seen to postnatal mother	33(26.2)
Danger signs seen to newborn	21(16.7)

sion of both husband and wife (82.6%). Among four mothers who didn't attend any PNC visit, two mentioned lack of awareness of the need for PNC visits as a reason and two said ignorance. The mothers gave different reasons for attending only one postnatal care visit (n=53), the most frequent reason was lack of awareness of the need of PNC visits (88.7%), followed by cultural reasons (7.5%), being busy (5.7%), ignorance (5.7%), and long distance to health facility (1.9%). Reasons for attending two or more PNC visits were asked and more than half of mothers stated that after childbirth they were admitted at the hospital for more than three days and hence received PNC services. Other reasons include awareness regarding PNC services (13%), baby illness (13%), advised by health personnel for PNC visits (10.1%), mother's illness (10.1%), immunization of newborn (8.7%) and physical examination (8.7%). Regarding the services received during PNC, all respondents had attended immunization services (100%) followed by iron tablets supplementation (95.1%), exclusive breastfeeding counseling (67.2%), personal hygiene education (66.4%), vitamin A supplementation (65.6%), nutritional education (55.7%), postnatal family planning counseling and services (54.9%) and management of complications (23%) (Table 3).

**Table 3: PNC services utilization (n=126)**

Variable	Frequency (%)
<b>Knowledge about PNC</b>	
Yes	101(80.5)
No	25(19.5)
<b>Awareness about number of PNC visits as per protocol of Nepal</b>	
Yes	22(16.7)
No	104(83.3)
<b>If yes, source of information (n=21)</b>	
Healthcare personnel	10(47.6)
Studied somewhere	8(38.1)
Other	3(14.3)
<b>Number of PNC visits</b>	
Nil	4(3.2)
One	53(42.1)
Two	47(37.3)
Three	22(17.4)
<b>Timing of PNC visits* (n=122)</b>	
Within 24 hours	122(100.0)
3rd day of Delivery	56(45.9)
7th day of Delivery	35(28.7)
<b>Place of PNC services received(n=122)</b>	
PHC/Health post	1(0.8)

Government hospital	91(74.6)
Private hospital	30(24.6)
<b>Decision maker for PNC visits (n=69)</b>	
Both Husband and Wife	57(82.7)
Wife alone	5(7.2)
Husband alone	5(7.2)
Other family members	2(2.9)
<b>Reasons for no PNC visit (n=4)</b>	
Lack of awareness of the need of PNC visits	2(50)
Ignorance	2
<b>Reasons for attending only one PNC visit* (n=53)</b>	
Lack of awareness of the need of PNC visits	47(88.7)
Cultural reasons	4(7.5)
Being busy in other family matters	3(5.7)
Not interested (Ignorance)	3(5.7)
Increased distance to health facility	1(1.9)
<b>Reasons for attending two or more PNC visits* (n= 69)</b>	
Admitted at health facility	39(56.5)
Being aware about importance of PNC visits	9(13)
Baby illness	9(13)
As advised by health personnel	7(10.1)
Mother's illness multiple response answer	7(10.1)
Immunization of newborn	6(8.7)
Physical examination	6(8.7)
<b>PNC services utilization</b>	
Low Utilization	66(52.4)
High Utilization	60(47.6)
<b>Services Received during PNC visits*</b>	
Immunization of Newborn (Only BCG)	122(100)
Iron tablets supplementation (for Mother)	116(95.1)
Exclusive Breastfeeding Counseling	82(67.2)
Personal Hygiene education	81(66.4)
Vitamin A supplementation (for Mother)	80(65.6)
Nutritional Education	68(55.7)
Postnatal Family Planning counseling and services	67(54.9)
Management of complications	28(23)

\* multiple response answer

Bivariate analysis showed that mother's education, parity, mode of delivery, place of PNC service received, danger sign seen during pregnancy, danger signs seen to newborn, and awareness about PNC were significantly associated with PNC service uti-

lization (Table 4). In multivariate analysis, mode of delivery, danger signs seen in postnatal mothers, and danger signs seen in newborn were statistically significantly associated with PNC services utilization. However, mother's age, religion, ethnicity, mother's educational level, occupation, family type,

family size, family monthly income, parity, sex of the child, place of PNC services received, danger sign seen during pregnancy, awareness about PNC, and knowledge about PNC visits schedule did not show significant association with PNC service utilization (Table 4).

**Table 4: Association between PNC services utilization and exposure variables (n=122)**

Characteristics	Utilization of PNC Services		Unadjusted OR	p-value	Adjusted OR	p-value
	High (n=60)	Low (n=62)				
<b>Age</b>						
15-24	16 (44.4)	20 (55.6)	3.33 (0.76-14.65)	0.111	4.84 (0.53-44.44)	0.164
25-34	36 (48.0)	39 (52.0)	2.89 (0.71-11.74)	0.138	5.04 (0.68-37.57)	0.114
35 and above	8 (72.7)	3 (27.3)	Reference		Reference	
<b>Religion</b>						
Hindus	49 (46.7)	56 (53.3)	2.09 (0.72-6.08)	0.136	1.31 (0.24-7.23)	0.759
Non-Hindus	11 (64.7)	6 (35.3)	Reference		Reference	
<b>Ethnicity</b>						
Advantaged	51 (52.0)	47 (48.0)	0.553 (0.22-1.38)	0.205	1.00 (0.15-6.75)	0.966
Relatively disadvantaged	9 (37.5)	15 (62.5)	Reference		Reference	
<b>Mother's Educational status</b>						
Non-formal education	5 (26.3)	14 (73.7)	3.13 (0.97-10.09)	0.056	0.95 (0.11-8.28)	0.963
Primary education	9 (52.9)	8 (47.1)	1.27 (0.43-3.71)	0.669	2.94 (0.51-16.98)	0.228
Secondary education	9 (33.3)	18 (66.7)	2.68 (1.04-6.96)	0.042	2.54 (0.58-11.05)	0.215
Higher secondary and above	37 (58.7)	26 (41.3)	Reference		Reference	
<b>Mother's Occupation</b>						
Housewife/Unemployed	35 (53.0)	31 (47.0)	0.71 (0.35-1.46)	0.356	0.63 (0.19-2.05)	0.439
Working outside home also/employed/non-housewife	25 (44.6)	31 (55.4)	Reference		Reference	
<b>Family Type</b>						
Nuclear	27 (47.4)	30 (52.6)	1.15 (0.56-2.33)	0.708	0.63 (0.11-3.53)	0.597
Joint	33 (50.8)	32 (49.2)	Reference		Reference	
<b>Family size</b>						
3 to 4 members	24 (48.0)	26 (52.0)	0.48 (0.13-1.77)	0.271	0.38 (0.03-5.45)	0.479
5 to 8 members	32 (54.2)	27 (45.8)	0.38 (0.10-1.35)	0.134	0.19 (0.02-1.57)	0.122
9 members and/or more	4 (30.8)	9 (69.2)	Reference		Reference	
<b>Family's monthly income</b>						
25,000 or less	14 (45.2)	17 (54.8)	1.24 (0.55-2.81)	0.605	2.04 (0.9-8.47)	0.325
More than 25,000	46 (50.5)	45 (49.5)	Reference		Reference	

<b>Parity</b>						
Two or more	25 (40.3)	37 (59.7)	2.07 (1.00-4.26)	0.048	2.96 (0.79-11.03)	0.107
One	35 (58.3)	25 (41.7)	Reference		Reference	
<b>Sex of the child</b>						
Female	24 (48.0)	26 (52.0)	0.92 (0.45-1.90)	0.828	0.51 (0.15-1.71)	0.275
Male	36 (50.0)	36 (50.0)	Reference		Reference	
<b>Mode of Delivery</b>						
Vaginal delivery	19 (26.0)	54 (74.0)	14.56 (5.8-36.56)	<0.001	22.42 (5.66-88.9)	<0.001
Caesarean section	41 (83.7)	8 (16.3)	Reference		Reference	
<b>Place of PNC services received</b>						
Government Health facility	39 (42.4)	53 (57.6)	3.17 (1.31-7.67)	0.01	0.89 (0.21-3.76)	0.875
Private Health facility	21 (70.0)	9 (30.0)	Reference		Reference	
<b>Danger signs seen during pregnancy</b>						
Yes	23 (60.5)	15 (39.5)	0.51 (0.23-1.12)	0.094	0.61 (0.18-2.10)	0.43
No	37 (44.0)	47 (56.0)	Reference		Reference	
<b>Danger signs seen to postnatal period (mother)</b>						
Yes	18 (56.3)	14 (43.8)	0.68 (0.30-1.53)	0.353	0.22 (0.06-0.89)	0.033
No	42 (46.7)	48 (53.3)	Reference		Reference	
<b>Danger signs seen in newborn</b>						
Yes	16 (76.2)	5 (23.8)	0.24 (0.08-0.71)	0.01	0.22 (0.05-1.04)	0.049
No	44 (41.9)	57 (52.4)	Reference		Reference	
<b>Awareness about PNC</b>						
Yes	54 (54.0)	46 (46.0)	0.32 (0.12-0.88)	0.028	0.40 (0.88-1.80)	0.23
No	6 (27.3)	16 (72.7)	Reference		Reference	
<b>Know PNC Visits schedule as per Nepal</b>						
Yes	15 (68.2)	7 (31.8)	0.38 (0.14-1.02)	0.054	0.45 (0.09-2.20)	0.323
No	45 (45.0)	55 (55.0)	Reference		Reference	

## DISCUSSION

This study showed that the proportion of recommended PNC services utilization is low in comparison with those utilizing ANC services in Nepal. NDHS 2016 identified 69%ANC utilization, and 57%PNC utilization.<sup>8</sup> However, factors associated with the low use of PNC have not been reported frequently. Therefore, this study aimed to identify the determinants of PNC utilization among the mothers who had under one-year children.

In this study, the percentage of women attending all the three recommended PNC visits were only 17.5%. In Nepalese societies, there is a culture of segrega-

tion of mother and the newborn for around 12 days after delivery.<sup>9</sup> During this period, mother and newborn are not allowed to be touched by other people; and they are not allowed to go outside home, are often kept in isolated area inside the house. As they are restricted to home during these periods, the utilization of PNC services remains a major challenge, thus reducing chances of contacts with health care providers. On the other hand, there is no government mechanism in Nepal which supports home visits of health workers for PNC. Also in this study, the awareness of mothers about the recommended number of PNC visits was very low (16.7%) and may be this fact contributed to the unsatisfactory utilization of recommended all three PNC visits.

In this study, it was observed that, there was association between mother's educational status, parity, place of PNC services received and awareness about PNC services with utilization of PNC Services. Education is a significant determinant of maternal and child health. Education is likely to empower an individual to gain access to health promotion message, information to obtain services and importance of available services. Likewise, educated individuals are likely to be able to process the health message. Education of mothers has been found significantly associated with uptake of maternal services in other studies as well.<sup>10-12</sup> This study shows an association between high parity and PNC utilization. We could not find evidence which showed strong link between parity and PNC utilization. Association of PNC utilization with high parity could be because the women are more likely to shed their inhibitions and discusses openly and seek help during successive child births.

In this study, women seeking PNC visit in Government health facility were more than those seeking PNC visit in private health facility. Nepal Government makes the Maternal and Child health services free of cost in all the governmental health institutions. It also provides incentives to those mothers who utilize PNC services.<sup>8</sup> This could contribute to receiving PNC services from government institute.

It is interesting that, in this study, mothers who had gone through vaginal delivery were more likely to utilize PNC services in comparison to those undergoing Caesarean section. Hence we recommend that all PNC services should be provided under a broad umbrella for women undergoing all modes of delivery.

Those mothers who experienced any danger signs such as vaginal bleeding, weakness, blurred vision were more cautious about their health and were thus more likely to receive PNC services from health institutions. Similarly, studies conducted in Jabetine district in Amhara region<sup>2</sup>, in Debre Markos town<sup>13</sup> and Nepal<sup>14</sup> revealed that women who were aware of at least one obstetric danger sign of pregnancy were more likely to utilize PNC services as compared to the women who were not aware.

It was also observed that danger signs seen in newborn during postnatal period were a strong predic-

tor of maternal PNC utilization. This may be due to the fact that danger signs in newborn make mothers and families more conscious, aware and worrisome of their children which ultimately lead to bringing the children to the health institution.

There are a number of limitations in our study. Though we included all the eligible mothers for our study and used the regression model for in-depth analysis of factors determining the PNC services utilization, This is a cross sectional study done in one city with non-purposive sampling, Therefore, the current findings may not be representative and entirely generalizable for the whole district and country. Further qualitative research is recommended to explore great insight to understand further about socio-cultural domain including service site barriers like distance of health facility, availability of drugs and health personnel in the health facility )affecting PNC service utilization in Nepal. Additional research could be done to study the efforts and effectiveness of private sector for PNC utilization in Nepal.

## CONCLUSIONS

This study assessed PNC utilization and associated factors among women who had under one-year child. The study results provided a basic understanding of factors that are associated with PNC utilization. The findings of this study showed direct association between postnatal care utilization and mode of delivery, danger sign seen in the postnatal period (mother) and danger sign seen in the newborn. Therefore, the results suggested context specific evidence which might be taken into consideration when planning to develop new policies to increase PNC utilization. There is a need to initiate home visit service by health workers so that the mothers are reached within the period when they are confined within home.

## REFERENCES

1. World Health Organization. Trends in Maternal Mortality: 1990-2013, Estimates by WHO, UNICEF, UNFPA, The World Bank and the United Nation's Population Division. Geneva: WHO; 2014.
2. Workineh YG and Hailu DA. Factors affecting utilization of postnatal care service in Amhara

- region, Jabitena district, Ethiopia. *Science Journal of Public Health* .2014;2(3); 169-176. [\[DOI\]](#)
3. Lawn JE, Blencowe H, Oza S, You D, Lee AC, Walswa P, et al. Every newborn progress, priorities, and potential beyond survival. *Lancet*. 2014; 384(9938): 189-205. [\[DOI\]](#)
  4. Blencowe H, Cousens S, Oestergaard MZ, Chou D, Moller AB, Narwak R, et al. National, regional and worldwide estimates of preterm birth rates in the year 2010 with time trends since 1990 for selected countries: a systematic analysis and implications. *Lancet*.2012;379(9832):2162-2172. [\[DOI\]](#)
  5. World Health Organization. WHO technical Consultation on postpartum and postnatal care. Geneva: WHO; 2010.
  6. World Health Organization. WHO recommendations on postnatal care of mother and newborn. Geneva: WHO; 2013.
  7. World Health Organization. Postpartum Care of the Mother and Newborn: a practical guide. Geneva: WHO; 1998. WHO/RHT/MSM/983.
  8. Ministry of Health and Population (MOHP) [Nepal], New ERA, ICF International Inc. Nepal Demographic and Health Survey 2016. Kathmandu, Nepal: Ministry of Health and Population, New ERA, and ICF International, Calverton, Maryland; 2017.
  9. Karkee R. How did Nepal Reduce the Maternal Mortality? A Result from Analysing the Determinants of Maternal Mortality. *Journal of Nepal Medical Association*. 2012; 52(186): 88-94. [\[DOI\]](#)
  10. Bolam A, Manandhar DS, Shrestha P, Ellis M, Malla K, et al. Factors affecting Home delivery in the Kathmandu Valley, Nepal. *Health Policy Plan*. 1998; 13(2): 152-158. [\[DOI\]](#)
  11. Wagle RR, Sabroe S, Nielsen BB. Socioeconomic and physical distance to the maternity hospital as predictors for place of delivery: an observational study from Nepal. *BMC Pregnancy and Childbirth* . 2004; 4(1).8. [\[DOI\]](#)
  12. Poudel M, Khanal V, Acharya B, Adhikari M. Determinants of Postnatal Service utilization in a Western District of Nepal; Community Based Cross Sectional Study. *Journal of Women's Health Care*. 2013. 2:126. [\[DOI\]](#)
  13. Limenih M, Endale Z, Dachew B. Postnatal care service utilization and associated factors among women who gave birth in the last 12 months prior to the study in Debre Markos town, Northwestern Ethiopia: a community-based cross-sectional study. *International Journal of Reproductive Medicine*.2016.Article ID 7095352:7. [\[DOI\]](#)
  14. Dhakal S, Chapman NG, Simkhada PP, Teijlingen VRE, Stephen J and Raja EA. Utilization of postnatal care among rural women in Nepal. *BMC pregnancy and child birth*.2007;7(19). [\[DOI\]](#)