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Prevalence and predictors of institutional delivery in Lumjung, Tanahun and Gorkha district of Nepal: a community-based cross-sectional study

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ABSTRACT

Background: The Maternal mortality rate (MMR) in Nepal had dropped from 444 per 1, 00,000 live births in 2005 to 239 per 1, 00,000 live births in 2016. However, the MMR of Nepal is still highest in the South Asian countries except Afghanistan. Although maternal mortality has declined noticeably in Nepal, there still persists a low proportion of institutional deliveries. The aim of the study was to assess the factors influencing the utilization rate of institutional delivery.

Methods: A cross-sectional study was conducted in selected village development committee of Lamjung, Tanahun and Gorkha district using semi-structured interview schedule. A random sample of 1410 married women who gave birth in the last two years were included in the study. Multiple logistic regression analysis was carried out to identify the factors associated with institutional delivery.

Results: The prevalence of institutional delivery in three districts was 73.1%, highest in Lamjung (78.8%) and lowest in Gorkha (67.8%). Employed women (aoR=1.7, CI=1.05-2.80), seeking antenatal check-up (aoR=5.8, CI=3.00-11.16), secondary (SLC) or above education (aoR= 3.3, CI=1.93-5.54), more than 20 years of age at marriage (aoR=1.5, CI=1.02-2.04), Kshetri by cast (aoR=1.7, CI=1.11-2.64) were statistically significant and associated with an increased rate of institutional delivery.

Conclusions: Occupation, education, antenatal check-up, age at marriage, and ethnicity/cast are major factors for determining institutional delivery. The concerned authorities have to consider the predictors of institutional delivery in formulating the policy and plan for implementing safe motherhood delivery.

Keywords: Institutional delivery, Married women, Prevalence, Cross-sectional study, Nepal

INTRODUCTION

Every year, nearly half a million women and girls needlessly die as a result of complications during pregnancy or childbirth, and 99% of these deaths occur in the developing countries. There is evidence that giving birth in a health care facility is associated with lower maternal mortality than giving birth at home. Health facilities provide proper medical attention and hygienic conditions during delivery and thus can reduce the risk of complications and infections.

Globally, one-third of deliveries take place at home without assistance of skilled health workers.⁴

There is a substantial gap between the developed and developing countries with respect to safe delivery practices. In developed countries, almost all deliveries are attended by a skilled health worker in the health institutions, on the other hand, nearly two-thirds of deliveries are handled by traditional midwives or alone at home in developing countries. Appropriate delivery care is crucial for both maternal and perinatal health, and

increasing skilled health worker attendance during birth is a central goal of the safe motherhood and child survival strategy. Skilled worker attendance in health institutional at delivery was an important indicator in monitoring progress towards Millennium Development Goal 5 to reduce the maternal mortality ratio by three quarters between 1990 and 2015.⁶

It is evident that, in spite of the national and global efforts at reducing maternal morbidity and mortality through the safe motherhood initiatives, there has been no significant reduction in maternal morbidity and mortality in developing countries. Unsafe delivery practice is one of the major causes of maternal mortality in Nepal. The Maternal mortality rate (MMR) in Nepal had dropped from 444 per 1, 00,000 live births in 2005 to 258 per 1, 00,000 live births in 2015 [Annual reduction rate (2005-2015) = 5.4%]. 9, 10 However, the MMR of Nepal is still highest in the South Asian countries except Afghanistan. 10

In Nepal, the institutional delivery practice rate has increased from 18% in 2006 to 35% in 2011. Nearly twothirds (65%) of births in Nepal continue to take place at home (10). However, maternal mortality of Nepal has declined noticeably even though the proportion of births attended by skilled persons and deliveries conducted in health facilities is not increasing as per the expectation.¹¹ Nepal government targeted to reduce MMR to less than 70 per 100,000 lives and increase institutional delivery to 90 percent by 2030.¹² Increasing institutional delivery in a country like Nepal is important to reduce death due to pregnancy complications. 13,14 Keeping in mind to encourage institutional delivery and reduce the risk of death during childbirth, Nepal government is providing 24 hours Obstetric care services at the selected health facilities in every district and providing incentives to those women who deliver in the health institutions.¹⁵

The aim of the study was to identify the prevalence rate and factors influencing the institutional delivery in hilly districts of Nepal.

METHODS

Study design and area

A descriptive, cross-sectional, and community-based study was conducted during 2015 in thirteen Village development committees (VDCs) of three hilly districts (Lamjung, Tanahun, and Gorkha) of Nepal.

Nepal is divided into three ecological regions (Mountain, Hill, and Plain) and 75 districts. Each district is subdivided into municipalities and VDCs; Each VDC and municipality is further divided into smaller administrative units called wards. Lamjung, Tanahun and Gorkha has 56, 37 and 70 VDC's with 2, 5 and 2 municipalities, respectively. ^{16,17} In Nepal, municipalities are considered as urban while VDC's as rural areas.

Selection of participants

The study population was married women who gave birth in the last two years and residing permanently or temporarily in Lamjung, Tanahun, or Gorkha districts. Sample size was calculated on the assumption that each household of selected VDC's will have at least a woman who had given birth in the last two years. There were a total of 14108 households (Tanahun; 6916, Lamjung; 2896, and Gorkha; 4296) in the selected VDC's. Ten percent of the total households from each of the sampled VDC were taken. Thus, the sample size was 1410.

The sampling was done in two stages. In the first stage, VDC's and in second stage women who had delivered within two years were selected. Using the lottery method, 13 VDC's (4 Lamjung, 4 Gorkha, and 5 Tanahun) were selected. The selected VDC's were Duradada, Chandreswor, Jita and Chakratirtha of Tanahun; Finam, Bungkot, Namjung, and Taple of Gorkha; and Risti, Kyamin, Symgha, Ghansikuwa and Jamune-Bhanjyng of Tanahun.

For the lottery method, the name of all the VDC's of Lamjung, Gorkha and Tanahun district each was written in a separate, uniform-sized paper which was folded and put into a bowl. The papers were thoroughly mixed in the bowl. One by one, four papers were taken out. The bowls with papers were thoroughly shaken every time a paper was taken out. In Tanahun district, we purposively selected 5 VDC's inspite of four as it had a greater number of population among the selected districts.

In the second stage, the list of all houses in each selected VDC was taken from VDC office. The sample unit was selected by using systematic random sampling. One household was selected at random from each VDC and then every 10th household (kth item) was sampled. In case the respondent was unavailable or the household did not have women who delivered within two years, then the next nearest household was taken. Out of the 1410 samples, only those who provided complete information, i.e.; 1343 (95.6%) were included in the final study. The study period was from 22 April to 10 May, 2015.

Data collection and analysis

The data collection tool was a semistructured interview schedule (prepared in Nepali language on the basis of a review of the relevant literatures) and the data collection method was face-to-face interview. The data was collected by the medical students who underwent 15 days of orientation and training. The questionnaire included on socio-demography, respondent informationon's identities and pregnancy/delivery- related issues. Pilot testing was done on 10% (140) of sample size in 6 different VDC's of Chitwan district. The feedbacks from the pilot testing were incorporated and a revised questionnaire module was formulated. Modifications included reordering of questions as well as changes in words and

additions/deletions of some answer categories. The questionnaires were checked for completeness and accuracy of data before feeding data on Epi data 3.1. Data were entered using Epi data 3.1 software and analyzed using SPSS 16. The statistical analyses carried out was descriptive (frequencies and percentages), bivariate (Chi square test), and multivariate analysis (Binary logistic regression). Those variables that were significant ($p \le 0.05$) were modeled into multivariate analysis. In multivariate analysis, the odds ratio was adjusted by controlling the confounders and statistically significant variables were presented in tabular form. To determine the predictors of institutional delivery, types of delivery variable (institutional and home) was adjusted with type of family, ethnicity, age of the women at first child, education of mother, occupation of mother, antenatal check-up and age of women at marriage.

Inclusion and exclusion criteria

Only those women who delivered within the last two years or had children of less than 2 years were selected as a respondent. Those married women who were not available in three subsequent visits and/or did not give informed consent were excluded from the study.

Operational definition

Institutional delivery

Delivery which has occurred at the health facility such as Primary Health Care Centre, Community Health Centre, or Hospitals (private/public).

Home delivery

Delivery which was occurred at the respondent's house or on the way to a health facility in the absence of trained health care personnel's.

Ethnicity

It represents Bhramin, Kshetri, Janajati and Dalit.

Literate

Those who could read and write but did not attend school.

RESULTS

Table 1 depicts that the majority of the respondents were 20 years or above (93.5%), literate (92.5%), unemployed (88.2%), come from joint family (60.1%) and got married before 20 years of age. Almost all (96.2%) respondents attended the antenatal checkup.

Table 2 shows that the average prevalence of institutional delivery was 73.1%, highest in Lamjung (78.8%) and lowest in Gorkha (67.8%). Women who were employed, educated (school educated), had antenatal checkups, increased frequency of ANC visits who married after 20 years of age, Kshetri or Bhramin, lived in joint family and who delivered the first child at the age of 20-29 years were more likely to attend an institutional delivery (Table 3). Occupation, education, antenatal visits, age at marriage, and ethnicity of women were the determinants of institutional delivery (Table 4).

Table 1: Characteristics of the respondents (n=1343).

Characteristics	Number	Percentage
Age of women (years)		
<20	87	6.5
≥20	1256	93.5
Education		
Illiterate	114	8.5
Literate	114	8.5
1-8 class	486	36.2
9-10 class	307	22.9
Above SLC (+2)	322	24
Types of family		
Nuclear	536	39.9
Joint	807	60.1
Ethnicity		
Bhramin	353	26.3
Kshetri	238	17.7
Janajati	401	29.9
Dalit	351	26.1
Occupation		
Unemployed	1184	88.2
Employed	156	11.8
Age at marriage (years)		
<20	980	73

Continued.

Characteristics	Number	Percentage
≥20	363	27
Antenatal check-up		
Yes	1292	96.2
No	51	3.8

Table 2: Prevalence of institutional delivery.

District	Types of delivery	Types of delivery		
District	Home (%)	Institutional (%)	Total	
Gorkha	136 (32.2)	286 (67.8)	422	
Lamjung	104 (21.2)	387 (78.8)	491	
Tanahun	118 (27.4)	312 (72.6)	430	
Total	358 (26.7)	985 (73.1)	1343	

Table 3: Predictors of institutional delivery.

Variables		Types of delivery		Unadjusted OR	P value
v at lables		Home (%)	Institutional (%)	(95% CI)	1 value
	Illiterate	56 (49.1)	58 (50.9)	1	0.10
	Literate	45 (39.5)	69 (60.5)	1.5 (0.88-2.50)	0.18 <0.0001
	1-8 class	139 (28.6)	347 (71.4)	2.4 (1.59-3.66)	<0.0001
Education	9-10 class	65 (21.2)	242 (78.8)	3.6 (2.27-5.68)	< 0.0001
	Above SLC (+2)	53 (16.5)	269 (83.5)	4.9 (3.06-7.85)	<0.0001
Occupation	Unemployed	334 (28.2)	850 (71.8)	1	0.001
Occupation	Employed	24 (15.1)	135 (84.9)	2.2 (1.41-3.47)	0.001
	Bhramin	78 (22.1)	275 (77.9)	1.8 (1.26-2.47)	0.001
Ethnisite:	Kshetri	43 (18.1)	195 (81.9)	2.3 (1.52-3.38)	0.001 <0.0001 0.32
Ethnicity	Janajati	120 (29.9)	281 (70.1)	1.2 (0.86-1.59)	
	Dalit	117(33.3)	234 (66.7)	1	
Types of	Nuclear	167 (31.2)	369 (68.8)	1*	0.002
family	Joint	191(23.7)	616 (76.3)	1.5(1.14-1.86)	
Age (years) at	<20	284 (29)	696 (71.0)	1.6(1.19-2.13)	0.002
marriage	≥20	74 (20.4)	289 (79.6)	1	
Age (years) of	<20	156 (28.5)	391 (71.5)	1	
the women at	20-29	176 (23.7)	568 (76.3)	1.3(1.01-1.66)	0.048 0.022
first child	≥30	18 (46.2)	21 (53.8)	0.47(0.24-0.90)	
Antenatal	Yes	322 (24.9)	970 (75.1)	7.3(3.91-13.38) 1	< 0.0001
check up	No	36 (70.6)	15 (29.4)		
	Once	17 (68)	8 (32.0)	1	0.134
Frequency of	Twice	29 (50)	29 (50)	2.1(0.79-5.67)	0.134
ANC visit	Thrice	101 (36.7)	174 (63.3)	3.7(1.52-8.79) 9.2(3.91-21.70)	< 0.0001

Note: *Reference category.

Table 4: Predictors of institutional delivery.

Variables		Adjusted OR (95% CI)	P value	
Occupation	Unemployed	1*	0.024	
Оссирацион	Employed	1.7 (1.05-2.80)	0.021	
Antenatal check up	Yes	5.8 (3.00-11.16)	< 0.001	
	No	1	<0.001	
	Illiterate	1	0.12	
	Literate	1.6 (0.88-2.73)		
Education	1-8 class	2.1(1.32-3.32)	0.002	
	9-10 class	2.8 (1.67-4.61)	<0.001 <0.001	
	Above SLC (+2)	3.3 (1.93-5.54)	<0.001	

Continued.

Variables		Adjusted OR (95% CI)	P value	
Age at marriage (years)	<20	1	0.038	
	≥20	1.5 (1.02-2.04)		
Ethnicity	Bhramin	1.2 (0.813-1.75)	0.267	
	Kshetri	1.7 (1.11-2.64)	0.367 0.016	
	Janajati	1.02 (0.719-1.45)	0.016	
	Dalit	1	0.713	

Note: *Reference category types of delivery adjusted with types of family, ethnicity, age of the women at first child, education of mother, occupation of mother, antenatal check-up and age of women at marriage.

DISCUSSION

This study was carried out to assess the factors influencing the utilization rate of institutional delivery. The average prevalence of institutional delivery in three hilly districts was 73.1%. This proportion was higher than the national estimate (56%) posted from the Nepal Department of Health service annual report, 2014. A study by Shrestha et al. in Nepal (2012) reported that the practice of institutional delivery was nearly three-fourth (72.3%) in urban, 35% in semi-urban and 17.5% in rural areas, respectively.¹⁹ A study by Karki et al in Kaski, Nepal (2013) reported a slightly higher (85%) prevalence and a study by Shah et al in Chitwan, Nepal (2015) reported a prevalence (55%) of institutional slightly lower delivery. 20,21 This shows that there are wider variations in institutional delivery practices in Nepal. This may due to the differences among women created by their area of residence, ecological regions, wealth quintiles, education status, age and parity of women, caste/ethnicity, and so forth.8

Studies conducted outside Nepal like Ethiopia (Oroma district, 18.2%), Uganda (Busia district, 44.5%), and Tanzania (Biharamulo district, 50%) also reported a diverse proportion of institutional delivery. ²²⁻²⁴ In this study, married women who delivered at home (27%) need to adopt a safe institutional delivery practice in order to reduce childbirth related complications. Mothers are encouraged to attend intensive health education regarding the benefits of institutional health care delivery. Moreover, mothers from low socio-economic households require more support regarding income generating activities that can improve household incomes and enhance their decision-making power.

The highest and lowest prevalence rate of institutional delivery was seen in Lamjung (78.8%) and Gorkha (67.8%), respectively. It may be due to the fact that, every district is different in terms of its birth center, geography, transportation facilities, and ethnic groups.

The result of the analysis from Table 3 and 4 clearly shows that institutional birth seeking behavior in hilly areas of Nepal is significantly influenced by the type of family, age of women at first child, ANC visit, occupation of mother, education and age at marriage. In this study, we found that ANC checkup and its frequency have a significant role in enhancing an institutional delivery. Similar findings were supported from the studies conducted in Nepal, Tanzania,

and Ethiopia. ^{20,21,24-26} It is evident that a compulsory and regular ANC visit is not only required for creating an awareness on pregnancy & its associated risks but also to provide an encouragement for institutional delivery.

Level of education is a strong predictor of institutional delivery in the study selected areas. Similar findings were reported in various studies conducted in Nepal, Tanzania, and Ethiopia. ^{20,21,24,26} Ability to read and understand can be an added advantage especially with comprehension of written/oral messages for safe delivery. These messages are usually available in health care facilities through mass media and could positively shape mindset of women for the importance of institutional delivery. Further assessment showed a positive correlation in decision making ability with respect to level of education and number of years spent in school.

This study also revealed that those women who lived in a joint families had a high tendency to seek for an institutional delivery. It may be due to a good family support and promising care resulted from the joint family. Therefore, further studies, especially of qualitative ones, may be of relevance in exploring any underlying mechanisms behind this observation.

In this study, significant ethnic/cast variations affecting the option and access to institutional delivery were observed. Kshetris were more likely to deliver at the health institutions than Bhramins and Janajatis. This observation signals the prevailing cultural differences in perception, belief, and practice regarding maternal and child health care. Similar observation was made by other studies too.^{21,25}

In this study, it is evident that employed mothers opted an institutional delivery rather than home care. Similar observation was found in an Ethiopian study conducted in 2014.²⁶ Employment status is likely to enhance female autonomy so that mothers develop greater confidence and capability in taking decisions for their health. Employed women are more likely to be educated, much aware of difficulties during pregnancy, and likely to land up in institutions for birth. Women, who were married after the age of 20 years, were significantly associated with an increasing trend of seeking institutional delivery. The institutional delivery rate in Tanahun, Lamjung, and Gorkha is relatively high with respect to the national scenario. It is significantly associated with education level, employment status, age at marriage, ANC visits and the

type of family. Reproductive women should be informed regarding the benefits of institutional delivery through information, education, and communication programs. Concerned authorities (policy makers, health service organizations, community leaders) have to consider and incorporate the predictors of institutional delivery while formulating the plan or policy.

CONCLUSION

Occupation, education, antenatal check-up, age at marriage, and ethnicity/cast are major factors for determining institutional delivery. The concerned authorities have to consider the predictors of institutional delivery in formulating the policy and plan for implementing safe motherhood delivery.

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REFERENCES

- Agus Y, Horiuchi S. Factors influencing the use of antenatal care in rural West Sumatra, Indonesia. BMC Pregnancy Childbirth. 2012;12:9.
- 2. Mageda K, Mmbaga EJ. Prevalence and predictors of institutional delivery among pregnant mothers in Biharamulo district, Tanzania: a cross-sectional study. Pan Afr Med J. 2015;21:51.
- 3. Titaley CR, Hunter CL, Dibley MJ, Heywood P. Why do some women still prefer traditional birth attendants and home delivery?: a qualitative study on delivery care services in West Java Province, Indonesia. BMC Pregnancy Childbirth. 2010;10:43.
- 4. WHO. Proportion of births attended by a skilled health workers. Geneva: WHO; 2008.
- 5. Kruk ME, Prescott MR. The role of health systems and policies in promoting safe delivery in low- and middle-income countries: a multilevel analysis. Am J Public Health. 2012;102(4):645-50.
- United Nations. Millennium Development Goals, 2015. Available at: http://www.un.org/millenniumgoals. Accessed on 04 July 2021.
- 7. Weil O, Fernandez H. Is safe motherhood an orphan initiative? Lancet. 1999;354(9182):940-3.
- 8. Bhandari RT, Dangal G. Safe Delivery Care: Policy, Practice and Gaps in Nepal. J Nepal Med Assoc. 2013; 52(192):637-44.

- Government of Nepal, Ministry of Health and Population. Demographic and Health Survey, 2006. Available at: https://dhsprogram.com/pubs/pdf/FR257/FR257[132 012].pdf. Accessed on 04 July 2021.
- WHO, UNICEF, UNFPA. Trends in Maternal Mortality: 1990 to 2015, 2015. Available at: http://apps.who.int/iris/bitstream/10665/194254/1/97 89241565141_eng.pdf. Accessed on 04 July 2021.
- 11. Ensor T, Clapham S, Prasai DP. What drives health policy formulation: Insights from the Nepal maternity incentives Scheme?. Health Policy. 2009; 90(2):247-53.
- Government of Nepal. National Planning Commission. Sustainable Development Goals 2016-2030, 2015. Available at: http://un.org.np/sites/default/files/Draft_Report_SD G_Nepal_2016_2030_1.pdf. Accessed on 04 July 2021.
- 13. Campbell OM, Graham WJ, Lancet Maternal Survival Series steering group. Strategies for reducing maternal mortality: getting on with what works. Lancet. 2006;368(9543):1284-99.
- 14. Koblinsky M, Matthews Z, Hussein J, Mavalankar D, Mridha MK, Anwar I, et al. Going to scale with professional skilled care. Lancet. 2006;368(9544):1377-86.
- Ministry of Health and Population. Annual Report of Department of Department of Health Services (2012/2013). Kathmandu: Government of Nepal, Ministry of Health and Population, 2013. Available at: http://apps.who.int/iris/bitstream89241565141. Accessed on 04 July 2021.
- 16. National Population Census. Household and Population by sex. Central Bureau of Statistics, 2012. Available at: https://unstats.un.org/unsd/demographicsocial/census/documents/Nepal/Nepal-Census. Accessed on 04 July 2021.
- 17. National Population and Housing Census. Village Development Committee/ Municipality. Central Bureau of Statistics, 2014. Available at: http://apps.who.int/iris/bitstream/10665/194254/1/97 89241565141_eng. Accessed on 04 July 2021.
- 18. Ministry of Health and Population of Nepal, Department of Health Services. January Annual Report 2013/2014, 2015. Available at: http://dohs.gov.np/wpcontent/uploads/2014/04/Annu al_Report_2070_71.pdf. Accessed on 04 July 2021.
- 19. Shrestha SK, Banu B, Khanom K, Ali L, Thapa N, Stray B, Devkota B. Changing trends on the place of delivery: why do Nepali women give birth at home?. Reprod Health. 2012;9:25.
- 20. Karkee R, Binns CW, Lee AH. Determinants of facility delivery after implementation of safer mother programme in Nepal: a prospective cohort study. BMC Pregnancy Childbirth. 2013;13:193.
- 21. Shah R, Rehfuess EA, Maskey MK, Fischer R, Bhandari PB, Delius M. Factors affecting institutional delivery in rural Chitwan district of

- Nepal: a community-based cross-sectional study. BMC Pregnancy Childbirth. 2015;15:27.
- Fikre AA, Demissie M. Prevalence of institutional delivery and associated factors in Dodota Woreda (district), Oromia regional state, Ethiopia. Reprod Health. 2012;9:33.
- 23. Anyait A, Mukanga D, Oundo GB, Nuwaha F. Predictors for health facility delivery in Busia district of Uganda: a cross sectional study. BMC Pregnancy Childbirth. 2012;12:132.
- 24. Mageda K, Mmbaga EJ. Prevalence and predictors of institutional delivery among pregnant mothers in Biharamulo district, Tanzania: a cross-sectional study. Pan Afr Med J. 2015;21:51.

- Adhikari RK, Dahal LH. Factors affecting place of delivery in Dhading district. J Ins Med. 2008;30:40.
- 26. Feyissa TR, Genemo GA. Determinants of institutional delivery among childbearing age women in Western Ethiopia, 2013: unmatched case control study. PLoS One. 2014;9(5):97194.

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