Received Date: April, 2025 Revised: May, 2025 Accepted: June, 2025

Determinants of Early Post-Natal Care Utilization Among Women in Karnali Province, Nepal

Bijaya Mani Devkota

Central Department of Population Studies (CDPS), TU, Kathmandu, Nepal
Email: devkotabm2006@gmail.com,
https://orcid.org/0009-0005-1533-2678

Abstract:

This paper analyzes the socioeconomic and demographic variables that affect the use of post-natal care (PNC) within two days (42 hours after delivery) of delivering their newborns in Karnali Province by using the data on the Nepal Demographic and Health Survey (NDHS) 2022. PNC is necessary in the early stages of pregnancy to prevent complications in the post-partum period and minimize maternal and neonatal deaths, but the coverage is unevenly distributed among disadvantaged. The analytical design was cross-sectional and a weighted sample of 216 women who had recently given birth to live was used. The descriptive statistics were employed to investigate the PNC interest among different subgroups of the population and multivariate logistic regression was applied to determine the factors related to use of PNC.

The findings indicated that a lower proportion of 58.3 percent of the women received PNC in two days. Women between the ages of 20 and 29 years of age, the first time mothers, women who were better educated and the women who resided in more affluent households were more likely to utilize the services. The regression analysis found that maternal education and household wealth were the strongest predictors of timely postnatal care (PNC). Women with high education were over four times more likely to receive PNC than those with low education. Similarly, women from the richest households had higher chances of receiving PNC compared to poorer households. Caste/ethnicity, religion, and residence were not statistically significant factors. It highlights socioeconomic differences in PNC use and shows that policies are needed to improve education, reduce poverty, and increase maternal health access in rural areas.

Keywords: Post-natal care, maternal health, Karnali Province, NDHS, socio-economic determinants, health inequality

1. Introduction

The maternal and newborn health continuum consists of several essential parts, and post-natal care (PNC) is among the most important ones because most maternal and neonatal deaths happen during the first 48 hours after delivery (World Health Organization [WHO], 2023). Timely PNC is a critical time to identify postpartum complications, encourage

breastfeeding, secure neonatal thermal care as well as early detection of life-threatening situations like sepsis and postpartum bleeding. Although the number of maternal mortality has decreased globally, the inequality of PNC use is still high, in particular in low- and middle-income nations, when people have limited access to the services of skilled care (UNICEF, 2022). The attainment of Sustainable Development Goal (SDG) 3.1 and 3.2 of reducing maternal and neonatal mortality around the world depends on the provision of universal access to PNC services.

The country has experienced an impressive advancement in the maternal health indicators of Nepal in the last 20 years due to the increase in institutional delivery services, community-level health programs, and Female Community Health Volunteer (FCHV) network (Karkee & Lee, 2016). The uptake of early PNC, however, is disproportionately taken up between provinces, ethnicity and socioeconomic classes. The 79 percent of all women in the country obtain PNC within two days, and the figures are much lower in geographically disadvantaged regions such as Karnali (MoHP, 2023). This is marked by topographical terrain, inadequate transportation facilities, low densities of health facilities, and poverty, which are the key obstacles to maternal healthcare accessibility (Gurung & Qiu, 2021). It is important to comprehend the predictors of the use of PNC in such underserved environments to facilitate the development of specific interventions.

The interest of early PNC, however, is disproportionately taken up between provinces, ethnicity and socio-economic classes. It implies that 79 percent of all women in the country obtain PNC within two days, and the figures are much lower in geographically disadvantaged regions (Ministry of Health and Population, 2023). Nepal have discovered that education, economic status, place of residence, and sociocultural norms represent some of the factors associated with the use of PNCs (Khanal et al., 2014; Dhakal et al., 2018). South Asia have indicated that lower socio-economic caste groups, adolescent mothers and women with low autonomy in decision-making are less prone to PNC services (Rahman et al., 2017). Nevertheless, most of the available evidence is based on either national-level data that is not disaggregated by provinces or has concentrated more on the prenatal care and institutional birth than on early post-natal care (Singh et al., 2022). Though subnational differences in the use of maternal health services have recently started to be addressed in literature is among the least researched areas, even though the area has some of the highest maternal and neonatal health risks in the country (Shrestha& Maharjan, 2020).

The influences maternal health behaviors are socio-economic inequality. The households who are in the lower wealth quintiles always have less use of the skilled birth and post-natal services because of lack of funds, perception of low risk and lack of awareness on danger

signs (Shaikh & Hatcher, 2005). Women in remote mountain areas have to endure several hours to go to the closest birthing center and this restricts them to go back to PNC post birth. Also, gender fixes, discrimination by caste, and the lack of control and freedom over healthcare options also impose further limitations on the timely access to the services by social disadvantaged groups (Acharya et al., 2017). Although the mentioned determinants are analyzed on a larger Nepalese scale, in which ethnicity distribution and geographical barriers are quite different on the level of other provinces, has not been explored.

The Nepal Health Sector Strategy is focused on the empowerment of maternal and newborn health services, such as the increase of PNC coverage within the 48 hours of birth (Government of Nepal, 2015). However, the implementation of policy is different in different provinces, and the provincial level of evidence-based insights is necessary to meet the needs of the provinces and resource shortages. Although it has not received much empirical focus in the research of maternal health. Local knowledge is essential in delivering evidence-based interventions, including enhancement of transportation incentives, enhancement of the outreach programs, and deployment of qualified birth attendants in the remote communities.

Despite the valuable information offered by the existing studies, they tend to ignore province-specific variations, fail to systematically investigate early PNC (within 2 days), which reports some of the poorest maternal health statistics in Nepal. The study is unique with a provincial orientation and early PNC focus, and combining multi-dimensional determinants. Its results hold significant social and policy implications in the form of the reduction of preventable maternal and neonatal deaths, provincial health planning, and the targeted interventions to the most marginalized women in remote underserved regions of Nepal.

2. Data and methods

Study design: This paper used cross-sectional researchdesign based on secondary data on the Nepal Demographic and Health Survey (NDHS), 2022. The design has enabled the evaluation of the use of post-natal care (PNC) at one instance in time on women in Karnali Province. This is the right method to determine the relations between demographic and socioeconomic variables and PNC uptake.

Sample and sampling procedure: The sample size of the study was 216 women in this Province who had a live birth within the five years before survey and had all the information covered with post-natal care. The stratified two-stage cluster sampling process is employed where the wards are sampled as the initial sampling unit and the

households are then selected in a systematic manner within every cluster. This type of probability sampling model will allow making a nationally representative sample and will make it possible to make valid population-level estimates.

Data analysis methods: Data analysis was done using descriptive and inferential statistics. The prevalence of PNC utilization by demographic and socioeconomic features was summarized with the help of descriptive statistics, frequency and percentage distributions. Multivariate logistic regression was used to conduct the inferential analysis to determine factors that were related to the reception of PNC within 2 days of delivery. The strength and significance of the association were reported in adjusted odds ratios (AORs), 95% confidence intervals, and p-values. All the analyses took into consideration the complicated survey design of NDHS by using sampling weights to give accurate population-level estimates.

Ethical consideration: The DHS Program gave its permission to use the dataset. As the data are secondary and anonymized, no direct contact with the participants was established, and thus there was no physical, psychological, or social harm to a particular person. In the analysis, all safety, privacy, and ethical standards of the DHS Program were observed.

3. Results

Table 1 shows the distribution of post-natal care (PNC) among women accessed within two days of birth based on their sociodemographic factors. The percentage of respondents who could obtain PNC in time was 58.3 percent (n = 126) and 41.7 percent (n = 90) did not.

Age of women: There was a slight difference in the use of PNC according to age. The PNC uptake was greatest in women who were aged 20-24 years (40.3%), and 2529 years (27.0%). There were relatively lower utilization rates in adolescents under 20 years, and older women (30-49 years). This is an indication that younger adult women can be more involved in maternal health services.

Birth order: There is an interesting trend with regard to birth order. The proportion of timely PNC was the greatest in first-order births (42.9%), but women who gave birth in the third or higher order had lower proportions (26.6%). This trend is consistent with the fact that first-time mothers are more likely to utilize more maternal health services, and multiparous mothers might feel that they have fewer risks or more responsibilities at home.

Educational status: There was a significant rise in PNC uptake with education. The utilization rate of women educated at higher levels was 24.1 percent as opposed to 9.7 percent in the case of women who had no formal education. This goes in line with the existing connection between maternal education, awareness, and health-seeking behaviour.

Religion: Most respondents were Hindu and there was no significant religious difference in PNC utilization which means that there is no religious difference in service uptake.

Caste/ Ethnicity: PNC was used differently based on caste/ethnicity. Women in Other Terai groups used it most (62.0%), and Dalit women used it relatively less (27.7%). This trend is an indication of continuous social inequalities in the use of maternal health services in Nepal.

Place of residence: Urban women had a higher PNC utilization (51.8%) compared to rural ones (48.2%). The difference is small but it highlights geographical differences in the availability of post-natal services in Karnali Province.

Wealth quintile: Wealth status had a high gradient. Timely PNC was only received by 61.0 percent of women in the poorest quintile, whereas it was 69-90 in the middle-to-richest groups. There were significantly higher ratios of PNC use by women in wealthier households, which once again supports economic status as a factor in maternal health service usage.

Table 1: Distribution post-natal care within 2 days

Variable	No		Yes		Total	
	Number	Percent	Number	Percent	Number	Percent
Age						
<20	14	15.7	19	15.2	33	15.4
20-24	31	34.0	51	40.3	81	37.7
25-29	26	28.7	34	27.0	60	27.7
30-49	19	21.6	22	17.6	42	19.3
Birth order						
First	27	30.1	54	42.9	81	37.6
Second	28	30.9	38	30.5	66	30.7
Third or higher	35	39.0	33	26.6	69	31.8
Level of education						
No Education	24	26.7	12	9.7	36	16.8

Basic Education	55	61.1	83	66.2	138	64.0
Higher Education	11	12.2	30	24.1	41	19.2
Religion						
Hindu	85	94.8	120	95.7	206	95.3
Other religion	5	5.3	5	4.3	10	4.7
Caste/Ethnicity						
Dalit	33	36.8	35	27.7	68	31.5
Janjati	8	9.1	13	10.3	21	9.8
Other Terai	49	54.1	78	62.0	127	58.7
Brahmin/Chhetri	33	36.8	35	27.7	68	31.5
Place of Residence						
Urban	37	41.2	65	51.8	102	47.4
Rural	53	58.8	61	48.2	114	52.6
Wealth quintile						
Poorest	74	82.3	77	61.0	151	69.9
Poorer	10	10.6	19	15.2	29	13.3
Middle	2	2.5	10	7.9	12	5.7
Richer	4	3.9	9	6.9	12	5.7
Richest	1	0.6	11	9.0	12	5.5
Total	90	100.0	126	100.0	216	100.0

Source: Nepal Demographic and Health Survey, 2022

Factors relationship with demographic and socio-economic factors: The multivariate logistic regression has analyzed the factors related to receiving post-natal care (PNC) two days after delivery. When the results were corrected by the socio-demographic factors, the maternal age and birth order were not significantly related, though women of 30-49 years of age were more likely to receive PNC (aOR = 2.11, p = 0.185). Higher birth orders (third or more) were less likely to use PNC timely (aOR = 0.53, p = 0.081), which implies that multiparous women were less likely to use PNC, but the correlation was not significant.

Females with elementary education were almost three times more likely to receive PNC on two-day bases (aOR = 2.93, p = 0.014) and females with higher education were more than four times more likely to receive PNC (aOR = 4.11, p = 0.002) than females with no education. Wealth status showed a steep gradient: women of the richest homes were much more likely to use PNC on time (aOR = 13.19, p = 0.034) which also showed a lot of economic inequalities. There were no significant predictors of caste/ethnicity, religion, and place of residence. In general, the model shows that education and

household wealth are the most effective predictors of early PNC use in Karnali Province (Table 2).

Table 2: Distribution post-natal care within 2 days

Variable	Odds Ratio	Std. Err.	T	P>|t|	95% Conf. Interval	Sig
Age						
20-24	1.421186	0.5610517	0.89	0.377	0.645032-3.131271	
25-29	1.641205	0.7775865	1.05	0.3	0.6359593-4.235419	
30-49	2.10653	1.169427	1.34	0.185	0.6936425-6.39734	
Birth order						
Second	0.6283532	0.2034044	-1.44	0.156	0.3287704-1.200923	
Third or higher	0.5290956	0.1897284	-1.78	0.081	0.2581736-1.084317	*
Religion						
Other religion	0.7869643	0.4639626	-0.41	0.686	0.2418884-2.560325	
Caste/Ethnicity						
Janjati	0.9107603	0.4130889	-0.21	0.837	0.3674908-2.257156	
Brahmin/Chhetri	1.01271	0.2603121	0.05	0.961	0.6054903-1.693802	
Educational attainment						
Basic Education	2.926019	1.235928	2.54	0.014	1.256635-6.813106	**
Higher Education	4.10581	1.79268	3.23	0.002	1.713826-9.836284	***
Residence						
Rural	1.07091	0.3183022	0.23	0.819	0.5908225-1.941103	
Wealth quintile						
Poorer	1.590802	0.633923	1.16	0.249	0.7166674-3.531139	
Middle	3.13741	2.002467	1.79	0.078	0.874811-11.25196	*
Richer	1.932708	1.184367	1.08	0.287	0.5670598-6.587246	
Richest	13.19413	15.72423	2.16	0.034	1.215392-143.2336	**
_cons	0.3817755	0.1902602	-1.93	0.058	0.14084-1.034881	*

4. Discussion

This study has explored the demographic and socioeconomic conditions that may affect the use of post-natal care (PNC) in two days after delivery. These results find that women have timely PNC in 58.3 percent of cases, and that represents significant disparities with the national average of 79 percent of women in Nepal in the Nepal Demographic and Health Survey (NDHS) 2022 receiving timely PNC (MoHP et al., 2023). The comparatively poor coverage in this province is consistent with the past findings according to which the Mid- and Far-Western regions are the least adequately provided in maternal health services

(Paudel et al., 2019; KC et al., 2020). These findings highlight endemic geographical disparities in the access to basic maternal healthcare in Nepal.

Patterns on the age in the uptake of PNC showed that more women aged 20–29 years used the PNC with relatively low usage taking place in the adolescents and older women. This tendency is in line with the research that suggests that the barriers are limited autonomy, stigma, and lack of access to information (Shrestha et al., 2020; WHO, 2022). Likewise, the older multiparous women can be underestimating the significance of PNC because the former had a previous childbirth experience that was recorded in multiple South Asian settings (Rahman et al., 2018). Despite the fact that the results of logistic regression did not indicate age as a statistically significant predictor, the descriptive pattern still demonstrates the significant programmatic implication- in particular, maternal health interventions to age.

The birth order also showed a strong gradient with the first-order births showing a much higher PNC interest than the higher-order births. The regression findings validated the negative correlation between increased birth order and PNC utilization though the correlation was only significant marginally. The result is consistent with other Nepalese and other studies in the region which have indicated that mothers of multiple children are not likely to seek timely post-natal services (Singh et al., 2019; Yaya et al., 2020). Multitasking in the household, shortage of time and belief in reduced risk may also play a role in reducing the service usage by multiparous women.

The basic and higher educated women were found to have much higher odds of obtaining PNC in a timely fashion than the uneducated women. The same educational gradient has been observed consistently in studies conducted by DHS in different parts of the world where education has been found to improve health literacy, decision-making ability, and knowledge about the health system (Pradhan& Phuyal, 2018; Ahmed et al., 2010). Women also become more independent, mobile, and communicate better with health workers, which increase the chances of taking PNC services with education (Joshi & Sivakami, 2019). The strong positive correlation indicates that girls' education and women empowerment continue to be necessary in enhancing maternal health results.

The PNC use was significantly lower among Dalit women as per the past research that has found gross social exclusion and unfair access to health services among the marginal caste groups in Nepal (Bennett et al., 2008; Bishwakarma et al., 2020). Despite the fact that the results of the regression did not indicate statistically significant differences once adjusted, the descriptive pattern provides reasons to pay more attention to the equity-based interventions oriented at the marginalized population.

The PNC utilization differences between urban and rural women were found, and urban women indicated a slight higher level of PNC use. It has been long known that geographic remoteness, challenging topography, and inaccessibility to health facilities in this province are the primary factors that hinder the use of maternal health services (Subedi, 2020; Nepal et al., 2018). Although the regression results were not significant on residence, the problem of rural access is still significant in the context of the interpretation of the results.

The women in the highest quintile were more likely to use PNC timely by more than thirteen times as much as the women in the poorest households. This extremely close correlation is linked with the world literature that provides the significant determinant of financial resources on the capacity to cover transportation, facility delivery, and follow-up visits (Benova et al., 2018). The economic status is also a determinant of the health-seeking norms, support availability, and access to the health insurance schemes. Similar research done in Nepal shows the same findings, indicating that more than the poorer households, affluent households continue to report higher coverage of maternal health services, such as institutional delivery and PNC (MoHP et al., 2023; Shrestha et al., 2019).

The regression analysis also supported the pivotal concern of education and wealth in determining PNC utilization even after the adjustment of the demographic factors. The findings support the social determinants of health model that places the social economic status among the major causes of health disparities (Solar & Irwin, 2010). Initiatives to enhance the PNC uptake need to address structural and individual-level challenges such as poverty, service accessibility, and ignorance, therefore.

On the whole, the report determines the existence of significant differences in the use of PNCs among women, which depend on the socioeconomic status, education, caste/ethnicity, and birth order. Policymaking to enhance timely PNC uptake needs to work on: (a) enhancing community-based PNC outreach using Female Community Health Volunteers (FCHVs); (b) increased transportation incentives and maternity assistance; (c) culturally sensitive programmes targeting marginal caste groups; and (d) female education and economic empowerment. Enhancing the health system capacity in the remote parts of Karnali is also imperative in the context of providing equal opportunity of accessing lifesaving maternal health facilities.

5. Conclusion

This study has examined the determinants of post-natal care (PNC) use within two postpartum days among women in Karnali Province, Nepal, based on the data of the Nepal Demographic and Health Survey 2022. As shown, 58.3 percent of women have obtained

timely PNC, which is significantly less than the national average, which means that there are still significant regional differences in the adoption of maternal health services. Descriptive findings demonstrated significant differences in the age, birth-order, education, caste/ethnicity, residence, and wealth status. The increased PNC utilization was found among younger women (20 -29 years), first-time mothers, better-educated women, and also among other Terai populations, women in the urban population, and women in wealthier households.

Multivariate logistic regression also indicated that, education and wealth status were the strongest predictors of early PNC uptake. Women who were educated at the basic level and those who were educated at higher level were close to three to four times more likely to receive timely PNC than the uneducated women. On the same note, females in the richest households were much more likely to be using PNC than those in the poorest households. Even though other indicators like age, birth order, caste/ethnicity, religion, and residence were not statistically significant in the adjusted form, their pattern description highlights key social and structural differences.

The socio-economic status and educational levels of women determine the use of PNC in a timely manner. The enhancement of maternal health interventions should therefore focus on the disadvantaged groups by targeting them in terms of health education, community outreach, increase in transportation and financial incentives, and access to quality post-natal services. Such inequalities are critical in improving the maternal and newborn health results in this underserved province in Nepal.

References

Acharya, D. R., Bhattarai, K., Poobalan, A. S., van Teijlingen, E., & Chapman, G. (2017). Factors associated with maternal health service utilization in Nepal: A systematic review. *Journal of Community Health, 42*(5), 977–989.

Ahmed, S., Creanga, A. A., Gillespie, D. G., & Tsui, A. O. (2010). Economic status, education and empowerment: Implications for maternal health service utilization in developing countries. *PLoS ONE, 5*(6), e11190. https://doi.org/10.1371/journal.pone.0011190

Bennett, L., Tamang, S., Onta, P., & Thapa, M. (2008). *Unequal citizens: Gender, caste and ethnic exclusion in Nepal*. World Bank.

Benova, L., Owolabi, O., Radovich, E., Wong, K. L. M., Macleod, D., Langlois, E. V., & Campbell, O. M. R. (2018). Provision of postpartum and postnatal care services in low- and middle-income countries: A systematic review of evidence from DHS surveys. *Tropical Medicine & International Health, 23*(4), 388–403.

Bishwakarma, R., Uprety, S., Aryal, S., & Gurung, Y. (2020). Caste-based inequities in maternal health service utilization in Nepal. *Journal of Health, Population and Nutrition, 39*(1), 1–12.

Dhakal, S., Chapman, G. N., Simkhada, P. P., van Teijlingen, E. R., Stephens, J., & Raja, A. E. (2018). Utilisation of postnatal care among rural women in Nepal. *BMC Pregnancy and Childbirth, 18*, 1–9.

Government of Nepal. (2015). *Nepal Health Sector Strategy 2015–2020*. Ministry of Health.

Gurung, S., & Qiu, L. (2021). Barriers to accessing maternal health services in mountainous regions of Nepal. *Midwifery, 95*, 102921.

Joshi, C., & Sivakami, M. (2019). Older women's autonomy and maternal health service use in Nepal. *BMC Women's Health, 19*(1), 1–11.

Karkee, R., & Lee, A. H. (2016). Maternal and child health services in Nepal: Progress and challenges. *International Journal of Environmental Research and Public Health, 13*(3), 285.

KC, A., et al. (2020). Trends in maternal health services across Nepal's provinces. *BMJ Global Health, 5*(5), e002197.

Khanal, V., Adhikari, M., Karkee, R., & Gavidia, T. (2014). Factors associated with the utilization of postnatal care services among the mothers of Nepal. *Journal of Community Health, 39*(5), 952–957.

Ministry of Health and Population (MoHP), New ERA, & ICF. (2023). *Nepal Demographic and Health Survey 2022*. MoHP.

Nepal, S., Bhandari, P., & Adhikari, S. (2018). Barriers to maternal health services in hilly regions of Nepal. *Health Prospect, 17*(1), 21–27.

Paudel, D., Ahmed, M., Pradhan, A., & Dangol, R. (2019). Successful maternal and newborn interventions in Nepal. *Journal of Nepal Health Research Council, 17*(3), 301–308.

Pradhan, P. M. S., & Phuyal, S. (2018). Education level and maternal health service utilization. *PLOS ONE, 13*(12), e0209231.

Rahman, A., et al. (2018). Determinants of postnatal care in South Asia. *BMC Pregnancy and Childbirth, 18*(1), 1–9.

Rahman, M., Haque, S. E., Mostofa, M. G., & Tarivonda, L. (2017). Wealth inequality and maternal health service utilization in developing countries. *Health Education Research, 32*(5), 399–415.

Shaikh, B. T., & Hatcher, J. (2005). Health seeking behaviour and health service utilization in Pakistan. *Health Policy, 71*(1), 1–15.

Shrestha, G., et al. (2019). Postnatal care utilization patterns in Nepal. *BMC Public Health, 19*(1), 1–12.

Shrestha, N., & Maharjan, R. (2020). Subnational inequalities in maternal health services in Nepal. *PLOS ONE, 15*(12), e0243942.

Shrestha, S., Lama, S., & Shrestha, M. (2020). Adolescent maternal health in Nepal. *Journal of Population and Social Studies, 28*, 256–270.

Singh, L., et al. (2019). Inequalities in maternal health utilization in Asia. *Health Policy and Planning, 34*(9), 649–660.

Singh, U., Bhandari, P., & Adhikari, S. (2022). Predictors of maternal health service utilization in Nepal: Evidence from national surveys. *Women & Health, 62*(4), 345–360.

Solar, O., & Irwin, A. (2010). *A conceptual framework for action on the social determinants of health*. WHO.

UNICEF. (2022). *Maternal and Newborn Health Disparities: Nepal*. UNICEF.

World Health Organization (WHO). (2023). *WHO recommendations on maternal and newborn care*. WHO.

Subedi, M. (2020). Utilization of maternal health services in remote Nepal. *Dhaulagiri Journal of Sociology and Anthropology, 14*, 141–154.

World Health Organization (WHO). (2022). *Postnatal care for mothers and newborns: Highlights of new WHO recommendations*. WHO.

Yaya, S., et al. (2020). Wealth-related inequalities in maternal health care in low-income countries. *International Journal for Equity in Health, 19*, 1–11.