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Determinants of Early Post-Natal Care Utilization in Madhesh Province: A Population-Based Analysis of NDHS 2020

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Abstract

This paper focuses on post-natal care (PNC) is important in the prevention of maternal and newborn complications with timely care service received within 48 hours. Nevertheless, there is still an unequal use in low- and middle-income countries. It is estimated that socio-demographic and economic factors of early PNC uptake in Madhesh Province, Nepal.

A cross-sectional design and a multistage sampling were used using nationally representative data of the 2022 Nepal Demographic and Health Survey (NDHS). There were 734 women in the sample to be analyzed descriptively and 594 to be the subjects of logistic regression. Multivariate models that were tested investigated predictors of PNC receipt in the two postnatal days.

Only secondary data used and descriptive results indicated significant differences according to age, parity, education, residence, caste/ethnicity, and wealth. Logistic regression showed that the increase in probability of early PNC as a result of higher education and household wealth was large whereas women with third or higher-order births had dramatically lower chances. The effects of residence and caste decreased after adjusting, which argued that socio-economic mediation existed.

The use of PNC is still unequal with more disadvantaged women (poorer, less educated, rural, and high parity) being left out. Intervention measures should be directed, pro-poor, and equity based in order to enhance access and minimize the number of maternal and neonatal deaths that can be prevented in Nepal.

Keywords: *Post-natal service; Socio-demographic factors; Early postnatal use; logistic regression; Maternal and newborn health.*

Introduction

It is one of the very risk periods of the maternal and newborn mortality rates, and around 50 percent of worldwide maternal deaths and up to 50 percent of neonatal deaths happen within 48 hours after childbirth (UNICEF, 2023; Hug et al., 2021). Post-natal care (PNC) is thus critical in identifying and treating life threatening complications, including hemorrhage, sepsis, hypothermia, and feeding

problems (WHO, 2022). However, it is clear that evidence in low- and middle-income countries (LMICs) indicates poor and unfair early PNC coverage, as it is a manifestation of the continued health-system constraints and inequality in the advancement towards global efforts like every newborn action plan and sustainable development goals (Afnan-Holmes et al., 2015; Chou et al., 2022; Bhutta et al., 2020; You et al., 2022).

Madhesh Province, Nepal, the proportionate changes in maternal health, especially skilled birth attendance and institutional birth, have not resulted in corresponding changes in early PNC with the significant differences between socio-demographic and economic groups (Ghimire et al., 2018; Gurung et al., 2020; Karkee &Morgan, 2021; Acharya et al., 2022). Poor, rural, less educated, and socially marginalized women still have the most significant barriers (Amin et al., 2019; Devkota, 2023; Ebonwu et al., 2018; Benova et al., 2019). The care-seeking is also affected by parity and maternal age, and caste- and ethnicity-based disparities remain limiting access, especially to the Dalit and disadvantaged Janjati groups (Subedi & Blom, 2023; Gurung et al., 2020).

However, gaps still exist, such as the use of old datasets, the focused approach on PNC during the initial 48 hours, and the lack of multivariate analyses that include the critical equity factors including parity, caste/ethnicity, and wealth (Amin et al., 2019; Shrestha et al., 2021). The utilized in a limited number of studies and the intersections of various social disadvantages have not been studied. This research applies an equity-based analytical lens to determine the determinants of PNC in the two days following childbirth to childbirth to produce policy-relevant data to enhance the effectiveness of targeted interventions to aid Nepal in its quest to minimize maternal and newborn mortality to preventable causes.

Methods

This paper adopted a quantitative and analytical method that makes use of secondary data has aimed to determine the use of socio-demographic determinants of the use of PNC during the first two days of birth using logistic regression methods.

Study design:

A cross-sectional study design was chosen based on the fact that nationally representative household survey data use standardized tools and procedures, which facilitate sound comparisons across groups of people.

Sample and sampling procedure:

The sample of the study was a two-stage stratified cluster sample which was used to provide level of national representation. During the first stage, probability proportional to size was used to select enumeration areas; during the second stage, systematic sampling of households within each cluster was done. Women with a live birth during the reference period and all women between the age of 15- 49

years who came out with complete information concerning PNC were included in the analysis. The analysis sample (734 respondents) was used to analyze the sample descriptively and 594 cases to model logistic regression.

Data analysis procedures:

Multivariate logistic regression was used to calculate the adjusted odds ratio of receiving post-natal care within two days, adjusting the variables by age, birth order, caste/ethnicity, education, residence, religion, and wealth status. The establish the level of strength and direction of associations, odds ratios, 95 percent confidence intervals, and significance levels were reported.

Ethical consideration:

The research involved publicly available, Ethical approval to collect data was firstly provided to the DHS Program. All the analyses were conducted in compliance with the ethical standards of the secondary data use that provided privacy, safety of the researcher, and safety and responsibility in the use of sensitive data.

Results

Table 1 reveal that there is a significant socio-demographic disparity in post-natal care (PNC) uptake during two days after delivery in Nepal. There is also a high age gradient with women 20-24 years old recording an almost half of the total number of PNC users (49.4%), then 25-29 (26.3%) followed by adolescents (<20) and older women (30-49) with lower utilization. Birth order also influences service utilization where first-parity mothers report the highest PNC use (37.3%), with women with 3 or more births reporting the lowest coverage (28.5%), meaning the declining pattern of care use with higher birth parity. Educational attainment reveals a strong positive correlation: the greatest proportion of PNC users is represented by women with basic education (54.0%), and the higher the education, the higher is the utilization (14.5%), whereas women who do not attend school continue to make a disproportionate portion of non-users.

Despite the fact that religious differences are small, caste and ethnicity show slight disparities, with the Dalit women being slightly overrepresented among non-users. There are strong inequities in the residential and economic trends: 73.4 percent of PNC users are urban, demonstrating an advantage over rural women. The wealth gradients are also quite pronounced as only 7.3 percent of PNC users are the poorest in the quintile, but the uptake is rising steadily with wealth with the uptake of 14.8 percent being the highest among the richest. Among non-users, the poorest and poorer population prevails, which highlights the fact that there is always a financial obstacle to accessing post-natal care time in Madhesh province, Nepal.

Table 1: *Distribution Post-natal Care Within Two Days of the Respondents*

Variable	No		Yes		Total	
	Number	Percent	Number	Percent	Number	Percent
Age						
<20	24	7.9	47	11.1	71	9.7
20-24	137	44.4	210	49.4	347	47.3
25-29	94	30.6	112	26.3	206	28.1
30-49	53	17.1	56	13.3	109	14.9
Birth order						
First	63	20.3	159	37.3	221	30.2
Second	97	31.5	146	34.2	243	33.1
Third or higher	148	48.2	121	28.5	270	36.7
Level of education						
No Education	158	51.3	134	31.5	292	39.8
Basic Education	137	44.6	230	54.0	367	50.1
Higher Education	13	4.1	62	14.5	74	10.1
Religion						
Hindu	263	85.3	354	83.2	617	84.1
Other religion	45	14.7	72	16.8	117	15.9
Caste/Ethnicity						
Dalit	71	23.2	78	18.3	149	20.3
Janjati	46	15.0	69	16.3	115	15.7
Other Terai	21	6.8	25	5.9	46	6.3
Brahmin/Chhetri	161	52.4	228	53.5	389	53.0
Place of Residence						
Urban	240	78.1	312	73.4	553	75.3
Rural	68	22.0	113	26.6	181	24.7
Wealth quintile						
Poorest	56	18.3	31	7.3	87	11.9
Poorer	109	35.3	100	23.6	209	28.5
Middle	75	24.3	127	29.9	202	27.5
Richer	50	16.2	104	24.5	154	21.0
Richest	18	5.9	63	14.8	81	11.1
Total	308	100.0	426	100.0	734	100.0

Source: Nepal Demographic and Health Survey, 2022

Table 2 shows that multivariate predictors of post-natal care (PNC) within 594 observations during two days of birth. There is no statistically significant effect of age on early PNC use, but marginal non-significance indicates the higher odds women in 30-49 (OR = 1.90) have than the reference group.

Strong predictability Birth order is a good predictor: women with three or more births are significantly less likely to obtain timely PNC (OR = 0.35, p < 0.01), which suggests that higher-parity mothers are indeed neglected. Religion and caste/ethnicity do not show significant differences, but lower odds between Janjati and Other Terai groups indicate the presence of social disadvantages.

The strongest associations are between education and wealth. There is a moderately positive odds of early PNC amongst women with basic education (OR = 1.50, p < 0.10), and almost thrice the likelihood of timely care access among women with higher education (OR = 2.90, p < 0.05). The adjustment does not play a central role in residence and this implies that the differences among rural and urban are explained by the socio-economic factors. Gradients in wealth are still high: odds become stronger between the middle quintile (OR = 2.52, p < 0.01) and the wealthiest quintile (OR = 3.99, p < 0.01). Altogether, the model identifies education and household wealth as the most predictive factors of early PNC usage in Nepal.

Table 2: *Distribution Post-natal Care Within Two Days of the Respondents*

Variable	Odds Ratio	Std. Err.	t	P>|t|	95% Conf. Interval	Sig
Age						
20-24	0.970844	0.3315157	-0.09	0.931	0.4911599-1.919004	
25-29	1.095615	0.4532556	0.22	0.826	0.4798846-2.501375	
30-49	1.904232	0.9560212	-1.71	0.204	0.6992491-5.185704	*
Birth order						
Second	0.6023794	0.1948717	-1.57	0.122	0.3158751-1.148748	
Third or higher	0.3502424	0.1111089	-3.31	0.002	0.1859717-0.6596151	***
Religion						
Other religion	2.991988	3.117042	1.05	0.297	0.3742116-23.92227	
Caste/Ethnicity						
Janjati	0.3362665	0.3557169	-1.03	0.307	0.040732-2.77608	
Other Terai	0.3982011	0.2168406	-1.69	0.095	0.1343333-1.180379	
Brahmin/Chhetri	0.7972346	0.2046328	-0.88	0.38	0.4776869-1.330543	
Educational attainment						
Basic Education	1.49992	0.3392711	1.79	0.078	0.9550909-2.355546	*
Higher Education	2.899422	1.447633	2.13	0.037	1.070587-7.852375	**
Residence						
Rural	1.252443	0.2874852	0.98	0.33	0.7921992-1.980076	
Wealth quintile						
Poorer	1.411967	0.3937385	1.24	0.22	0.8093948-2.463139	
Middle	2.521022	0.7390686	3.15	0.002	1.404481-4.525195	***
Richer	2.519602	0.9767406	2.38	0.02	1.162466-5.461142	**
Richest	3.991556	1.961867	2.82	0.006	1.496905-10.64364	***
_cons	0.998455	0.4704085	0	0.997	0.3899705-2.556379	

Discussion

The descriptive and multivariate results altogether confirm the existence of strong socio-demographic and economic inequalities in the availing of early post-natal care (PNC) in Nepal. The presence of a strong age gradient is congruent with the previous data that women within the young reproductive age group are more likely to demonstrate increased interest in maternal health services, in part because of more exposure to health information and higher motivation to protect maternal and newborn outcomes (Karkee & Lee, 2016; Paudel et al., 2013). Conversely, reduced uptake in adolescents and older women may also be due to a lack of autonomy and social stigma as well as the decreased perceived vulnerability, which is also observed during the South Asian contexts (WHO, 2016; Sharma et al., 2017). Birth order also supports these disparities in that first-parity mothers have the most pronounced PNC use, and high-order births have significantly lower uptake, consistent with the multi-country DHS results that multiparous women also have competing household needs and reduced perceived need of care and health system access (Benova et al., 2018; Titaley et al., 2010). The regression result of the high-parity women (OR = 0.35) highlights parity as an obstacle of structure that needs to be intervened.

Education turns out to be one of the strongest predictors of early PNC use. More educated women had a significantly higher probability to receive timely care, which is consistent with the literature indicating that education can improve health literacy, autonomy, and decision-making ability (Joshi & Neupane, 2017; Ahmed et al., 2010). Even elementary education was positive, which demonstrates that maternal health can improve with small changes in female education. Even though there were slight signs of influence of religion, caste-based inequalities also existed descriptively with Dalit women being overrepresented in non-users. This corresponds to existing literature of caste-based discrimination and decreased access to services in marginalized populations in Nepal (Subedi, 2010; Nepali et al., 2020), which imply that socio-cultural exclusion has a consequence even when the difference in statistical significance is absent in adjusted models.

Residence had a powerful descriptive gap: urban women constituted almost three-quarters of PNC users; with the benefits in access to facilities, transport, and information (Khatri et al., 2017). Nevertheless, the loss of residence became non-significant with adjustment, which shows that the rural disadvantage is mediated to a considerable extent by socio-economic factors, which is also observed by other studies (Mahato et al., 2020). The strongest and the most consistent effect was on economic status: The proportion of PNC uptake increased steadily with the poorest quintile, to the richest, reflecting existing evidence that transportation costs, indirect expenses, and financial insecurity access hamper access to maternal care (Gage, 2007; Rutstein & Staveteig, 2014). Wealth being a key determinant is reaffirmed by the regression results that indicated that the odds were almost fourfold among the richest women (OR = 3.99).

Although the study has several strengths like the use of nationally representative data on NDHS 2022 and a multivariate analysis, its limitations include a cross-sectional study design, use of self-reported measures, and the lack of contextual variables, including the quality of care and the nature of intra-household decision-making. However, the study offers evidence on equity-based interventions in the form of policy-relevant and timely data to inform maternal health in Nepal.

Conclusion

This study demonstrates that there are evident socio-demographic and economic disparities in post-natal care (PNC) in Nepal two days after delivery Madhesh Province, Nepal. Younger, first-parity, educated, urban, and wealthier women have a much higher probability of having timely PNC, leaving adolescents, high-parity mothers, rural, uneducated, and poorer women behind. Finally, education and household wealth are identified as the most powerful determinants, meaning that the structural and socio-economic conditions are very influential in care-seeking. These results justify intervention strategies that are directed towards the poor, equity based, and pro-poor to empower every woman to access the required early PNC services and enhance maternal and newborn outcomes in Nepal nationwide by providing stronger community outreach, better health literacy, and financial and geographic assistance.

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