

## Women's postnatal care utilization from a medically trained provider in Bangladesh: Evidence from a cross-sectional study

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### Abstract

Maternal and neonatal mortality are still high in Bangladesh. The majority of these deaths occur within two days after delivery. The maximum number of deaths can be eliminated by providing timely postnatal care. This study aimed to identify the prevalence and risk factors associated with women's postnatal care utilization from a medically trained provider in Bangladesh. In order to perform this study, we used the most recent data from the Bangladesh Demographic and Health Survey 2017–18. A total of 3,287 women of reproductive age were examined. The multilevel Poisson regression model was used to identify the risk factors related to the utilization of postnatal care. The risk factors that were statistically significant were explained using an incidence rate ratio (IRR) with a 95% confidence interval. The prevalence of women's postnatal care utilization from a medically trained provider was 51.83%. Women's secondary education (IRR = 1.49, 95% CI = 1.22-1.82), higher secondary education (IRR = 1.66, 95% CI = 1.34-2.06), partners' higher secondary education (IRR = 1.28, 95% CI = 1.10-1.49), partners' other occupations (students, unemployed, imams, or religious leaders) (IRR = 1.40, 95% CI = 1.09-1.80), rural areas (IRR = 0.90, 95% CI = 0.83-0.98), exposing to mass media (IRR = 1.17, 95% CI = 1.07-1.27), richest wealth index (IRR = 1.38, 95% CI = 1.24-1.53), and middle wealth index (IRR = 1.20, 95% CI = 1.09-1.33) were factors significantly associated with women's postnatal care utilization. So, focusing on women's education, partner's education, partner's occupation, place of residence, exposure to mass media, and wealth index can play a vital role in increasing women's postnatal care utilization from a medically trained provider in Bangladesh.

**Keywords:** Postnatal Care; Multilevel Poisson regression model; Incidence rate ratio; Bangladesh

### 1. Introduction

Postnatal care (PNC) is defined as receiving treatment from a medically trained provider for the mother and newborn baby from the baby's birthday to the first 6 weeks (42 days)[1]. According to the World Health Organization, postnatal care should be provided to the mother and the newborn child at least three times. Following delivery, the first postnatal visit should happen within 48–72 hours, the second within 7–14 days, and the third within the first 6 weeks[2]. Postnatal checkups are essential to preventing pregnancy-related disorders in women and ensuring the well-being of the newborn baby[3]. It helps in lowering maternal and neonatal deaths[4]. Early PNC can be extremely important for identifying and managing problems in mothers and newborns. It also guides how to observe the health of newborn babies, provide good breastfeeding, and give women family planning advice[5]. This service can play a crucial role in protecting mother and newborn lives as well as promoting mother and newborn baby health[6]. One of the most important aspects of health-related issues is protecting mothers' health because women may contribute to the progress and development of any nation. But complications during pregnancy and childbirth result in the deaths of more than

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half a million women worldwide every year. There is a high risk of maternal and neonatal deaths within 24 hours of delivery [7]. A significant percentage of maternal and neonatal deaths take place in the first 48 hours following birth, with 50% of maternal deaths and 40% of neonatal deaths occurring within 24 hours of delivery [8]. Also, every day, on average, 830 women and, every year, 216 women per 100,000 live births worldwide pass away from complications related to pregnancy and childbirth, and almost 99% of all deaths occur in developing countries. [9,10]. In comparison to high-income countries, the maternal mortality ratio was nearly 20 times higher in low- and middle-income nations [11]. Every year, more than a million newborns throughout the world lose their lives on their first day of life. The majority of newborns die in developing countries, and the highest prevalence of neonatal death occurs in South Asia [12]. Despite a continuous decline in neonatal deaths, there are still 18 infant deaths per 1000 live births worldwide today [13]. Sustainable Development Goals 3.1 and 3.2 focus on achieving 70 maternal deaths per 100,000 live births and 12 neonatal deaths per 1,000 live births in the world by 2030. Around 40% of women worldwide do not receive the required postnatal treatment, and less than half of women take care of themselves within 24 hours of birth. If postnatal checkups were followed properly by women, about 60% of total maternal deaths could be eliminated [14].

Bangladesh, a developing country, is one of the most populous countries in the world [15]. Overpopulation is the main reason for slowing down economic growth, which adversely affects the overall health system of the country. Though Bangladesh is improving in the health sector day by day, the maternal mortality ratio and neonatal mortality rate are still high [16]. There are 196 maternal death in every 100,000 live births and 25–35 neonatal deaths in every 1000 live births in Bangladesh [17,18]. There is low utilization of postnatal care in Bangladesh. Only 52% of total women take treatment from a medically trained provider within 48 hours after delivery [19]. Despite the vital significance of postnatal care in a woman's entire life, no attempts have been made to analyze the risk factors of postnatal care utilization from a medically qualified provider in Bangladesh by using a multilevel Poisson regression model. The factors influencing the utilization of postnatal care have been addressed by the majority of earlier studies using a multivariate logistic regression model [20,21]. The objective of this study is to identify the determinants of postnatal care from a medically trained provider in Bangladesh. Policymakers will be able to develop strategies for raising Bangladesh's postnatal care utilization by determining these characteristics.

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## 2. Materials and Methods

We used secondary data from the most recent Bangladesh Demographic and Health Survey (2017–18). The survey, which was representative of the entire country, was conducted by the National Institute of Population Research and Training (NIPORT). All participants provided their informed consent, and the ICF Institutional Review Board (IRB) authorized the DHS survey (see the link: <https://dhsprogram.com/Methodology/Protecting-the-Privacy-of-DHS-Survey-Respondents.cfm>). The study analyzed 3,287 women in total who met the inclusion requirements. The outcome variable is postnatal care utilization from a medically trained provider. When a woman receives postnatal care from a qualified doctor, nurse/midwife/paramedic, family welfare visitor, community skilled birth attendant, sub-assistant community medical officer, community health care provider, health assistant, family welfare assistant, trained traditional birth attendant, or NGO worker, then it is defined as postnatal care utilization from a medically trained provider and coded as 1. When a woman receives treatment from an untrained traditional birth attendant, an unqualified doctor, or others, it is called postnatal care utilization from a medically untrained provider and coded as 0. The explanatory variables were women's age (15–24, 25–34, and 35–49 years), women's education (no, primary, secondary, and higher secondary), partner's education (no, primary, secondary, and higher secondary), women's occupation (agricultural worker, physical worker, service, business, and unemployed), partner's occupation (agricultural worker, physical worker, service, business, and others), division (Barisal, Chittagong, Dhaka, Khulna, Rajshahi, Rangpur, Mymensingh, Sylhet), place of residence (urban, rural), wealth index (poorest, middle, richest), exposure to media (yes, no), and religion (Muslim, non-Muslim). The background characteristics of the study population were described using descriptive statistics. We used a multilevel Poisson regression model to identify the determinants of postnatal care from a medically trained provider. The outcomes were presented as an incidence rate ratio (IRR) with a 95% confidence interval (95% CI). The STATA 13 version was used for all analyses.

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## 3. Results

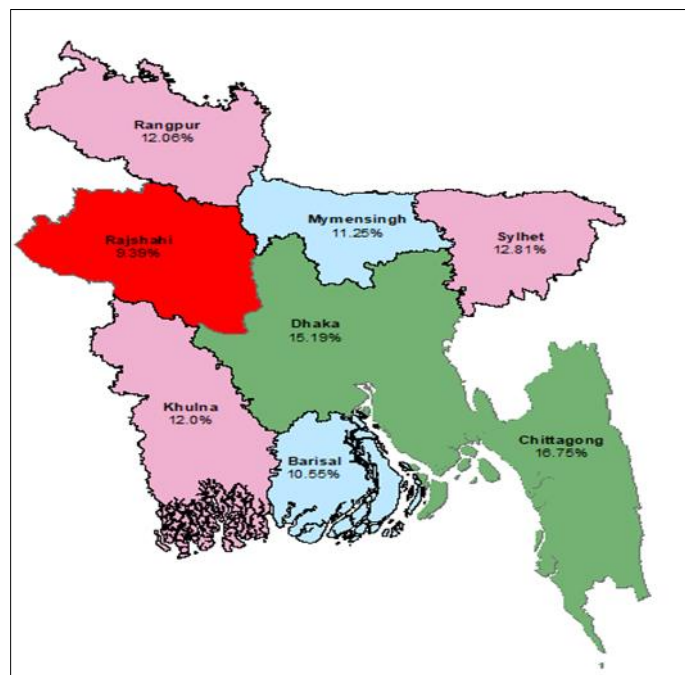
The background characteristics of the study's sample are shown in Table 1. More than half of the total women (51.83%) received postnatal care from a medically trained provider. Around 37.0% of total respondents were aged 35–49 years, and approximately 28.0% were aged 15–24 years. Almost 52.0% of the total participants had either secondary education or higher secondary education, while around 16.0% had no education. Approximately 46.0% of women's husbands had completed secondary or higher secondary education and around 21.0% had no formal education. Nearly half of the women (49.84%) were unemployed, and almost 46.0% of the respondents' husbands were physical workers.

About 25.0% of the total women came from Dhaka Division, and around 71.0% were from rural areas. Nearly 41.0% of the total participants belonged to the richest wealth index, and approximately 38.0% were from the poorest wealth index. Approximately 66.0% of the women had access to mass media, and the majority of the participants (90.68%) were Muslim.

**Table 1** Percentage distribution of selected variables, Bangladesh Demographic and Health Survey, 2017-18

Covariates	Percentage	Confidence Interval	
		Lower	Upper
Postnatal Care Utilization			
No	48.17	45.55	50.79
Yes	51.83	49.21	54.45
Women's age			
15-24 years	27.92	27.16	28.68
25-34 years	35.02	34.22	35.83
35-49 years	37.06	36.28	37.85
Women's education			
No education	16.56	15.72	17.44
Primary	31.25	30.32	32.19
Secondary	39.62	38.59	40.65
Higher Secondary	12.57	11.8	13.39
Partner's education			
No education	21.76	20.72	22.83
Primary	32.03	31.11	32.96
Secondary	29.9	29.01	30.79
Higher Secondary	16.32	15.38	17.3
Women's occupation			
Agricultural worker	1.88	1.47	2.42
Physical worker	13.96	12.94	15.05
Service	1.85	1.63	2.09
Business	32.47	30.76	34.22
Unemployed	49.84	48.01	51.67
Partner's occupation			
Agricultural worker	24.0	22.72	25.33
Physical worker	46.06	44.79	47.33
Service	5.52	5.02	6.06
Business	22.04	21.05	23.05
Others	2.4	2.13	2.69
Division			

Barisal	5.59	5.28	5.92
Chittagong	17.99	17.33	18.68
Dhaka	25.46	24.61	26.32
Khulna	11.61	11.17	12.06
Mymensingh	7.68	7.17	8.22
Rajshahi	13.92	13.34	14.53
Rangpur	11.83	11.27	12.4
Sylhet	5.92	5.65	6.21
Place of residence			
Urban	28.46	27.64	29.3
Rural	71.54	70.7	72.36
Wealth index			
Poorest	38.26	36.38	40.17
Middle	20.17	19.14	21.23
Richest	41.57	39.75	43.42
Exposure to media			
No	34.02	32.19	35.91
Yes	65.98	64.09	67.81
Religion			
Muslim	90.68	88.85	92.23
Non-Muslim	9.32	7.77	11.15



**Figure 1** Prevalence of postnatal care utilization in different divisions of Bangladesh

Figure 1 shows a regional variation in the utilization of postnatal services across several divisions of administration. The map's green area had the highest percentage of postnatal care use, while the red area had less utilization. Utilization of postnatal care was highest (16.75%) in the Chittagong division and lowest (9.39%) in the Rajshahi division.

Table 3 shows the findings from the multilevel Poisson regression model using Bangladesh Demographic and Health Survey 2017–18 data. In this model, women's education, partner's education, partner's occupation, place of residence, exposure to media, and wealth index were significantly associated with postnatal care utilization. Women completing secondary education (IRR = 1.49, 95% CI = 1.22-1.82) and higher secondary education (IRR = 1.66, 95% CI = 1.34-2.06) had a higher chance of utilizing postnatal care from a medically trained provider than women with no education. Women whose husbands passed higher secondary education (IRR = 1.28, 95% CI = 1.10-1.49) had significantly higher utilization of postnatal care than women whose husbands had no formal education. Women whose husbands were students, unemployed, imams, or religious leaders categorized as other groups (IRR = 1.40, 95% CI = 1.09-1.80) utilized more postnatal care than women whose husbands were agricultural workers. Rural women had a 10.0% lower likelihood of receiving postnatal care than urban women. Women who had access to mass media were 1.17 times more likely to utilize postnatal care from a medically trained provider compared to women who had no access to mass media. The incidence rate for women belonging to the richest wealth index (IRR = 1.38, 95% CI = 1.24-1.53) and middle wealth index (IRR = 1.20, 95% CI = 1.09-1.33) was higher compared to women belonging to the poorest wealth index.

**Table 2** Results of Multilevel Poisson Regression Model on Postnatal Care Utilization

Covariates	IRR
Women's age	
15-24 years	1.00
25-34 years	0.99 (0.93-1.06)
35-49 years	0.98 (0.85-1.13)
Women's education	
No education	1.00
Primary	1.14 (0.92-1.41)
Secondary	1.49 (1.22-1.82) ***
Higher Secondary	1.66 (1.34-2.06) ***
Partner's education	
No education	1.00
Primary	1.06 (0.92-1.23)
Secondary	1.14 (0.99-1.31)
Higher Secondary	1.28 (1.10-1.49) ***
Women's occupation	
Agricultural worker	1.00
Physical worker	1.03 (0.57-1.88)
Service	0.99 (0.53-1.82)
Business	0.96 (0.53-1.74)
Unemployed	1.02 (0.56-1.84)
Partner's occupation	
Agricultural worker	1.00
Physical worker	1.10 (0.97-1.24)

Service	1.09 (0.95-1.26)
Business	1.11 (0.97-1.26)
Others	1.40 (1.09-1.80) **
Division	
Barisal	1.00
Chittagong	0.95 (0.80-1.11)
Dhaka	1.03 (0.88-1.21)
Khulna	1.08 (0.93-1.27)
Mymensingh	0.99 (0.82-1.18)
Rajshahi	0.98 (0.82-1.17)
Rangpur	1.16 (0.99-1.37)
Sylhet	0.94 (0.79-1.12)
Place of residence	
Urban	1.00
Rural	0.90 (0.83-0.98) *
Exposure to media	
No	1.00
Yes	1.17 (1.07-1.27) ***
Wealth index	
Poorest	1.00
Middle	1.20 (1.09-1.33) ***
Richest	1.38 (1.24-1.53) ***
Religion	
Muslim	1.00
Non-Muslim	0.97 (0.86-1.09)

IRR: Incidence Rate Ratio; \*\*\*P ≤ 0.001; \*\*P ≤ 0.01; \*P < 0.05

#### 4. Discussion

The aim of this study was to examine the risk factors associated with women's postnatal care utilization from a medically trained provider in Bangladesh using nationally representative Bangladesh Demographic and Health Survey 2017–18 data. The use of postnatal care was greatly influenced by the women's education, partner's education, partner's occupation, place of residence, exposure to mass media, and wealth index. One of the main factors contributing to the increase in postnatal care use was women's education. Mothers with higher secondary education had a higher chance of receiving postnatal care than women with lower education. Another study conducted in Ethiopia also came to a similar result[22]. Higher-educated women are more concerned about their health and have proper knowledge about reproductive health-related problems as well as what problems may arise during the postnatal period, which enables them to get better medical services[23]. There is a close relationship between education and employment. Education helps women get a better job, which not only increases the financial condition of the family but also contributes to better health services[24]. Women with low levels of education are deprived of their fundamental rights and have lower knowledge of postnatal care. The provision of secondary and higher education can play a crucial role in increasing the utilization of postnatal care from a medically trained provider. It was found that the use of postnatal care was significantly correlated with the partner's educational attainment. Women whose husbands passed higher secondary education were more likely to utilize postnatal care compared to their partners who were uneducated. The similar result

was found in another study. Another study showed a similar finding[25]. Higher-educated males participate more in maternal health care services and can support their partners by supplying a provider who has advanced medical training[26]. There is a significant effect of the partner's occupation on women's postnatal care utilization. Women whose partners were engaged in student, unemployment, religious leaders, or imams categorized as other groups had a higher likelihood of receiving postnatal care utilization than agricultural workers. This outcome is consistent with another study[27]. The partner's occupation enriches the economic situation of the family and helps the family members get better health facilities. Place of residence is another factor that is significantly related to the utilization of postnatal care. Women who came from rural areas were less likely to use postnatal care than urban women. The similar result is in line with another investigation conducted in Kenya[28]. Due to a lack of public amenities, including transportation, healthcare, and educational facilities, rural women are deprived of their fundamental necessities and do not receive proper health care[29]. Another influential factor, the wealth index, is associated with women's postnatal care utilization. Women belonging to the richest wealth index were more likely to utilize postnatal care compared to women from the poorest wealth index. This result was found in another study [30,31]. The provision of healthcare facilities and care after delivery was greatly influenced by the wealth index[32]. Utilization of postnatal care was correlated with exposure to the media. Women who were exposed to mass media had a higher chance of receiving postnatal care than women who were not exposed to mass media. A similar result was presented in another investigation[33].

This study included both strengths and limitations. We used nationally representative data that included a large sample. Also, we utilized appropriate statistical modeling to identify risk factors for postnatal care utilization. Recall bias was prevalent because we analyzed cross-sectional data. Due to a lack of information, a few explanatory variables are not taken into account.

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## 5. Conclusion

Postnatal care utilization among women is still low in Bangladesh. It is crucial to protect the health of mothers and newborns. Attention to women's education, partner's education, partner's occupation, place of residence, exposure to mass media, and wealth index might play a crucial role in increasing women's postnatal care utilization from a medically trained provider in Bangladesh. Making effective policies and programs on the use of postnatal care will be aided by this study for the policymaker.

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## Compliance with ethical standards

### *Acknowledgments*

We thank BDHS for allowing us to use and access the DHS data set freely.

### *Disclosure of conflict of interest*

The authors declare that there is no conflict of interest.

### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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