Magnitude and Determinants of Postnatal Care Service Utilization Among Women Who Gave Birth in the Last 12 Months in Northern Ethiopia: A Cross-Sectional Study

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Introduction: The postnatal period is the first 6 weeks (42 days) following delivery of a baby. The first hours, days and weeks after childbirth are the most critical times for both the mother and newborn infants. Most maternal and neonatal deaths occur during the first 24 hours after childbirth.

Purpose: This study aimed to assess the magnitude and its determinants of postnatal care service utilization among women who gave birth in the last 12 months from May 1 to 21, 2019, in the Northern part of Ethiopia.

Methods: A community-based cross-sectional study was conducted among 413 women who had given birth in the previous 12 months. A systematic random sampling technique was used to select the study participants. Data were collected by using a semi-structured questionnaire adopted from UNICEF and similar studies. Data were entered, cleaned and coded into EPI Info version 3.5 and exported to SPSS version 20 for analysis. Logistic regression was applied to identify associations between explanatory variable and the outcome variable. Statistical significance was declared at p<0.05 and 95% CI.

Results: In this study, the magnitude of postnatal care service utilization was 37%. A live birth outcome AOR (95% CI) =5.7 (1.53,21.216), maternal educational AOR (95% CI)=3.3 (1.90,5.60) household income >1,500 ETB per month AOR (95% CI)=2.9 (1.20,6.70), a planned and supported pregnancy AOR (95% CI)=3.9 (1.71,9.01) and last pregnancy of facility delivered AOR= (95% CI)=3.1 (1.25,7.70) are positively associated with utilization of postnatal care services.

Conclusion: The major determinant factors that affect utilization of PNC identified in this study include monthly income of household, last pregnancy birth outcome, educational status of the mother, wantedness of the pregnancy and place of delivery were significantly associated with postnatal care service utilization. To improve PNC service utilization and to minimize maternal and neonatal mortality, mothers should be made aware about postnatal care services.

Keywords: utilization, PNC, maternal death, Dessie Ethiopia

Introduction
Globally, each year, 287,000 women die from complications related to pregnancy and childbirth, and about 99% of these deaths occur in developing countries which is a decline of 45% from 1990. The majority of maternal and neonatal deaths occur during childbirth and the postnatal period.\(^1\)\(^2\)
The majority of maternal deaths and disabilities occur during the postnatal period. Lack of care during this time period may result in death or disabilities.²

A large proportion of maternal and neonatal deaths occur during the first 48 hours after delivery. Thus, prompt postnatal care (PNC) for both the mother and the child is important to treat any complications arising from the delivery, as well as to provide the mother with important information on how to care for herself and her child.³

According to the EDHS 2016 report from the total of mothers, 42.2%, of mothers received postnatal care utilization within the first 6 weeks and only 17% received any within the first 48 hours after delivery.⁴,⁵

In Ethiopia, if all newborns receive appropriate postnatal care in the recommended time, neonatal mortality could be reduced by 10–27%.¹ In other words, high postnatal care coverage could save up to 60,000 newborn lives a year. Safe motherhood programmers recommend that all women receive a check of their health within 2 days after delivery.⁶

Postnatal care services utilization is one of the key components to reduce maternal mortality and improves the reproductive health outcome of women. Postnatal care, in particular, prevents the great majority of maternal and child morbidity and mortality. PNC services enable health professionals to identify post-delivery problems including potential complications and to provide treatments promptly. Therefore it is important for both the mothers’ and the child’s health in preventing both the short-term and long-term complications and deaths arising from delivery.

The level of PNC coverage is extremely low in Ethiopia. There is also limited information on mothers’ use of postnatal care services in the study area and previously no research had been conducted regarding utilization of postnatal care services in the study area.

Methods
Study Design and Area
A community-based cross-sectional study was conducted from May 1 to 21, 2019, at Dessie town. The study was conducted in Dessie town which is located at 401 km to the North east of the capital city of Ethiopia (Addis Ababa) and is found in the Amhara region with a distance of 480 km to the North East direction. According to Dessie town administration office report, Dessie town is the capital city of South wollo, it has a total of 15 kebeles, It has a total population of 219,998 and It has 52,362 women in the reproductive age group (15–49 years). There are four health centers, six health posts and one governmental general hospital providing PNC services in the town.

Sample Size Calculation
The sample size was determined using a prevalence of 42.2% of urban women postnatal care service based on a similar study done in EDHS 2016.¹⁴ Thus with 95% confidence level and 10% non-response rate, making the final sample size 413. The study was conducted by using a systematic random sampling method to recruit participants.

Sampling Procedure
From the total of 15 kebeles of Dessie Town, five kebeles were selected by a simple random sampling method. A sample frame of each kebele was taken from the zonal health bureau 3-month report and the sample size for each selected kebele was allocated proportionally. Study participants were selected by using a systematic random sampling technique. A list of respondent’s households was obtained from HEW. After obtaining a list of participant households, every K¹⁰ mother was recruited by labeling each household which had a mother who had given birth in the last year in the five kebeles until the required sample size was fulfilled and the starting household was selected by simple random sampling method. If there was more than one eligible mother in a household a lottery method was used.

Operational Definition
Postnatal Care Utilization
We examined whether the use of postnatal care services by women following delivery till 42 days was at least once after childbirth.

Data Collection Tool and Procedure
Four diploma holder midwives collected the data under supervision of two degree holding midwives. Data were collected by using a semi-structured questionnaire adopted from UNICEF and similar studies. Appropriate training and supervision were given about the aim of the study and the data collection technique for both data collectors and supervisors before the actual work was conducted.

Data Quality Assurance
Training was given for the data collectors and supervisors. The questionnaire was checked and pre-tested before
conducting data collection in a similar population in an adjacent kebele that was not selected for the study to validate the instrument. The questionnaire was translated into local language and back to English to check its consistency.

Data Processing and Analysis

After the data collection was completed the data was entered and cleaned using EPI info version 3.5 and analyzed using SPSS version 22. Descriptive statistics were computed for each study variable. All variables with an association of $p < 0.2$ in the binary logistic regression analysis were entered into the final multivariable regression model to identify their independent effect. Statistical significance was declared at $p < 0.05$. Tables were used for data presentation.

Ethical Consideration

Ethical clearance was obtained from the institutional Ethical Committee of Wollo University. Then permission letters from Dessie town health office were obtained. Written informed consent was obtained from the respondents. All participants provided written informed consent, and this study was conducted in accordance with the Declaration of Helsinki as a statement of ethical principles for medical research involving human subjects.

Results

Sociodemographic Characteristics of the Participants

In this study the response rate was 100%. From the total respondents, 245 (59.3%) were in the age group 20–29 years, 384 (92.8%) of the mothers were married and 234 (55.9%) of the respondents were Muslim religious followers. From the total of respondents, approximately one-sixth of the respondents, 65 (15.7%) were illiterate. In the case of their husbands’ educational status, 34 (8.2%) were unable to read and write, and 157 (38%) of the husband’s occupation were governmental employed (Table 1).

Obstetric Characteristics of Respondents

From the total of respondents, 283 (68.5%) mothers were categorized as Para two to Para four followed by Para one, 79 (19.1%). Among the respondents, 11 (3.7%) mothers faced stillbirth at their last delivery. Overall, 346 (86.2%) were planned and supported pregnancies and 389 (94.2%) mothers had their last delivery at a health facility.

| Variables                  | Frequency | Percent |
|----------------------------|-----------|---------|
| Age                        |           |         |
| <20                        | 24        | 5.8     |
| 20–34                      | 245       | 59.3    |
| 35–49                      | 144       | 34.9    |
| Marital status of the mother|         |         |
| Married                    | 384       | 84.3    |
| Single                     | 27        | 6.5     |
| Divorced                   | 28        | 6.8     |
| Widowed                    | 10        | 2.4     |
| Religion of the mother     |           |         |
| Orthodox                   | 174       | 42.1    |
| Muslim                     | 234       | 55.9    |
| Protestant                 | 5         | 2       |
| Ethnicity                  |           |         |
| Amhara                     | 403       | 97.8    |
| Oromo                      | 8         | 1.9     |
| Other                      | 2         | 0.5     |
| Educational status of the mother|       |         |
| Cannot read and write      | 65        | 15.7    |
| Can read and write         | 113       | 27.4    |
| Elementary education (1–8) | 110       | 26.6    |
| Diploma and above          | 125       | 30.3    |
| Occupational status of the mother|       |         |
| Housewife                  | 130       | 31.4    |
| Government employed        | 67        | 16.2    |
| Merchant                   | 81        | 19.6    |
| Daily laborer              | 91        | 22      |
| Farming                    | 16        | 3.9     |
| Other                      | 28        | 6.8     |
| Educational status of the husband (n=413)| | |
| Cannot read and write      | 34        | 8.2     |
| Can read and write         | 65        | 15.7    |
| Elementary education (1–8) | 109       | 26.4    |
| Secondary education and above| 205      | 49.6    |
| Husband’s occupational status (n=413)|       |         |
| Merchant                   | 157       | 38      |
| Farming                    | 16        | 3.9     |
| Government employed        | 157       | 38      |
| Daily laborer              | 79        | 1.9     |
| Other                      | 4         | 1       |
| Average monthly income     |           |         |
| <500 Eth birr              | 17        | 4.1     |
| 500–1500 Eth birr          | 173       | 4.2     |
| >1500 Eth birr             | 223       | 56.4    |
As to the mode of delivery, most respondents 301 (72.9%) delivered by spontaneous vaginal delivery. From the total of women who gave birth in the health institution, 316 (76.5%) of them were advised about danger signs of the postpartum period before discharge. Almost all, 368 (89.1%) of the mothers had antenatal care follow-up during their last pregnancy (Table 2).

Prevalence and Characteristics of Postnatal Care Utilization

From the total respondents, 153 (37%) mothers utilized postnatal care services while 260 (63%) of them did not utilize the service. With regard to the frequency of maternal PNC visits, 97 (63.4%) of the mothers had had one visit, 36 (23.5%) had had two visits, and the rest, 20 (13.3%), mothers had had more than three visits.

**Table 2 Obstetric Characteristics of the Women Interviewed Who had Given Birth in the Previous 12 Months in Dessie Town, Northeast Ethiopia, May 2019 (n=413)**

| Variables                        | Frequency | Percent |
|----------------------------------|-----------|---------|
| **Parity**                       |           |         |
| One                              | 79        | 19.1    |
| Two-four                         | 283       | 68.5    |
| Five and above                   | 51        | 12.3    |
| **Outcome of birth**             |           |         |
| Alive                            | 402       | 97.3    |
| Stillbirth                       | 11        | 3.7     |
| **Nature of pregnancy**          |           |         |
| Supported and Planned            | 356       | 86.2    |
| Supported but planned            | 49        | 11.9    |
| Unsupported and unplanned        | 8         | 1.9     |
| **Place of labor**               |           |         |
| At home                          | 24        | 5.8     |
| Health facility                  | 389       | 94.2    |
| **Mode of delivery (n=413)**     |           |         |
| SVD                              | 301       | 72.9    |
| Assisted delivery                | 83        | 20.1    |
| Cesarean section                 | 29        | 7       |
| **Counseling for danger signs before discharge (n=413)** | | |
| Yes                              | 316       | 76.5    |
| No                               | 97        | 23.5    |
| **ANC visit (n=413)**            |           |         |
| Yes                              | 368       | 89.1    |
| No                               | 45        | 10.9    |
| **Awareness of PNC service (n=413)** |         |         |
| Yes                              | 321       | 77.7    |
| No                               | 92        | 22.3    |

Associated Factors of Postnatal Care Utilization

During the bivariable logistic regression analysis, those variables that had a significant association with the dependent variable with p-values of less than 0.2 were entered into the multivariable logistic regression. Among the independent variables, marital status, maternal decision making on her child, birth outcome, parity, educational status, nature of last pregnancy, place of delivery, household monthly income and maternal decision making on her health had shown associations with p-values <0.2. Multivariable logistic regression analysis was conducted to examine the association between independent variables with the utilization of PNC service. In this study it was found that there is a statistically significant association between educational status of the mother, household income, nature of last pregnancy, outcome of last pregnancy and place of delivery. Mothers whose educational status was more than secondary school were three times AOR (95% CI) =3.3 (1.94, 5.58) more likely to utilize PNC services than those women who were illiterate. The mothers who had a monthly income >1500 ETB were more likely to utilize PNC services than the reference group AOR (95% CI) =2.3 (1.22, 6.69). Mothers who had given birth in a health facility were 3 times AOR (95% CI)=3 (1.24,7.68) more likely to get PNC service utilization than those who had given birth at home. Those mothers who had given birth to a live neonate were 6 times AOR (95% CI) =6 (1.54,1.23 (Table 3).

Discussion

This community-based cross-sectional study confirms that the magnitude of postnatal care service utilization was low among mothers who live in the study area.

Based on this study the result showed that the prevalence of PNC service utilization is 37%. This result is in line with the study conducted in Demecheha District, Northwest Ethiopia the prevalence of postnatal care service utilization was 34.8% and the study conducted in the southern part of Ethiopia was 37.2%.

In this study, utilization of PNC service is lower than the study conducted in Adwa town in the Northern part of Ethiopia (78.3%), Gondar Zuria District, Ethiopia
Table 3  Multivariable Logistic Regression Analysis of Associated Factors with PNC Service Utilization of the Participants in Dessie, Ethiopia, 2019 (n=413)

| Variables                          | Postnatal Care Utilization | COR (CI)                  | AOR (CI)            |
|------------------------------------|----------------------------|----------------------------|---------------------|
| Marital Status                     |                            |                            |                     |
| Married                            | 310                        | 211                        | 3.232 (1.500–6.965)*| 1.277 (0.443–3.681) |
| Divorced                           | 13                         | 12                         | 2.383 (0.806–7.044) | 2.619 (0.775–8.850) |
| Widowed                            | 5                          | 5                          | 2.200 (0.517–9.356) | 1.315 (0.248–6.963) |
| Single                             | 10                         | 22                         | 1.00                | 1.00                |
| Educational status of women        |                            |                            |                     |
| Unable to read and write           | 38                         | 64                         | 1.00                | 1.00                |
| Can read and write                 | 35                         | 33                         | 1.786 (0.956–3.328) | 1.702 (0.883–3.281) |
| Primary education                  | 80                         | 78                         | 1.727 (1.039–2.872)*| 1.476 (0.861–2.532) |
| Secondary education and above      | 185                        | 75                         | 4.154 (2.563–6.733)*| 3.292 (1.943–5.577)**|
| Monthly income (ETB)               |                            |                            |                     |
| <500                               | 9                          | 22                         | 1.00                | 1.00                |
| 500–1500                           | 55                         | 66                         | 2.037 (0.867–4.786) | 2.184 (0.881–5.414) |
| >1500                              | 274                        | 162                        | 4.134 (1.859–9.197)*| 2.850 (1.215–6.685)**|
| Decision making power on her health|                            |                            |                     |
| Self                               | 52                         | 55                         | 1.477 (0.710–3.075) | 1.759 (0.646–4.788) |
| Both                               | 270                        | 170                        | 2.482 (1.288–4.783)*| 1.594 (0.691–3.681) |
| Husband                            | 16                         | 25                         | 1.00                | 1.00                |
| Decision making power on her child’s health| |                            |                     |
| Self                               | 38                         | 51                         | 0.888 (0.455–1.735) | 0.994 (0.470–2.100) |
| Both                               | 274                        | 168                        | 1.945 (1.116–3.389)*| 1.360 (0.732–2.526) |
| Husband                            | 26                         | 31                         | 1.00                | 1.00                |
| Parity                             |                            |                            |                     |
| One                                | 122                        | 81                         | 2.071 (1.026–4.181)*| 1.416 (0.618–3.243) |
| Tow-four                           | 200                        | 147                        | 1.871 (0.949–3.686) | 1.162 (0.537–2.516) |
| Five and above                     | 16                         | 22                         | 1.00                | 1.00                |
| Birth outcome of the last pregnancy|                            |                            |                     |
| Alive                              | 335                        | 235                        | 7.128 (2.041–24.897)*| 5.708 (1.536–21.216)**|
| Still birth                        | 3                          | 15                         | 1.00                | 1.00                |
| Nature of the last pregnancy       |                            |                            |                     |
| Planned and supported              | 236                        | 160                        | 4.589 (2.109–9.984)*| 3.946 (1.727–9.015)**|
| Unplanned but supported            | 93                         | 62                         | 4.667 (2.062–10.563)*| 4.409 (1.847–10.526)**|
| Unplanned and unsupported          | 9                          | 28                         | 1.00                | 1.00                |
| Place of delivery                  |                            |                            |                     |
| Home                               | 7                          | 22                         | 1.00                | 1.00                |
| Health facility                    | 331                        | 228                        | 4.563 (1.917–10.859)*| 3.086 (1.240–7.684)**|

Notes: *Had significant association at p<0.2. **Statistically associated at p<0.05.

(66.83%) and Manmohan Memorial Institute of Health Sciences (69.2%)15 This difference may be due to place, study design, sample size difference and social context variation between the present study and previous studies. In this study, the finding is higher than the study done in Hadiya zone, South Ethiopia (22.7%).25 study conducted in Abuna Gindeberet District, West, Oromiya Region (31.7%)26 and in the EDHS 2016 report (17%).17 The difference may be due to time, place, cultural barriers and social context variation between the present study and previous studies.

The current study showed that utilization of postnatal care services, household monthly income, maternal educational status, birth outcome, nature of pregnancy and place of delivery are factors associated with PNC service utilization.
The first statistically significant factor in this study was the educational status of women. Maternal education above secondary school were 3 times more likely to use PNC than mothers who were illiterate, AOR (95% CI) = 3.3 (1.94, 5.58). This finding is similar with the study done in Jibitena district, Amhara region which revealed that women whose educational status was secondary school and above were about 4 times more likely to utilize postnatal care services than illiterate women which is also similar to studies conducted at Entoto Fana Health Center,\textsuperscript{12} in the rural Haramaya District Eastern Ethiopia,\textsuperscript{13} and in the Dembecha District, Northwest Ethiopia in 2015.\textsuperscript{14} This may be due to the fact that education is likely to enhance female autonomy so that women develop greater confidence and capability to make decisions on their health. It is also likely that educated women seek out higher quality services and have greater ability to use health care inputs that offer better care. Also, education helps to increase mothers’ awareness and increase acceptance of new idea and provides better education to other women regarding postnatal care utilization than those with a low educational level.

The second statistically significant finding of this study is the monthly household income which was a significant factor in the utilization of postnatal care services. Household income was positively correlated with postnatal care service utilization. Those women who had a monthly household income of >1500 ETB were 2.9 times more likely to utilize PNC services than those who earned <500 ETB AOR (95% CI)= 2.9 (1.215–6.685). This finding is consistent with a study done in developing countries, and studies carried out in Rwanda, Nigeria, Tanzania, India, and Nepal.\textsuperscript{16,27,28,33,36} The only research which supports this finding in Ethiopia was a study done at Entoto Fana health center, Gullele sub-city, Addis Ababa.\textsuperscript{21,34} This may be due to women with low income were less likely to use PNC services as compared to those with high income.

The third statistically significant factor in this study was birth outcome of the latest pregnancy. Those mothers who gave birth to a live neonate were 6 times more likely to utilize PNC services as compared with women who had a stillbirth; AOR (95% CI)= 5.7 (1.54–1.22). This is in line with a study done in Debre Markos town on postnatal care service utilization and associated factors,\textsuperscript{22} and studies carried out in Gullele Sub-city,\textsuperscript{30} and the rural Haramaya District, Eastern Ethiopia.\textsuperscript{31} The fourth major factor predicting postnatal care service utilization was wantedness of the pregnancy. Mothers whose pregnancy was planned and supported were 3.9 times more likely to use postnatal care services as compared to those women whose pregnancy was unplanned and unsupported [AOR (95% CI)=3.9 (1.727, 9.015)]. This finding is supported by studies done in three rural districts of Tanzania,\textsuperscript{25} and California.\textsuperscript{29}

The last statistically significant factor in this study was place of delivery. Mothers who delivered their last baby at a health facility were 3.086 times more likely to utilize postnatal care services than mothers who had their baby at home [AOR (95% CI)= 3 (1.240, 7.684)]. This finding is consistent with a study done in three rural districts of Tanzania,\textsuperscript{35} and studies carried out in Rwanda,\textsuperscript{36} Nigeria,\textsuperscript{32} Tanzania,\textsuperscript{35} and Nepal.\textsuperscript{9}

**Conclusion**

The results of this study revealed that the majority of the respondents were delivered in health facilities, however more than half of the respondents did not utilize the postnatal care services. In conclusion, this study show that utilization of the PNC services in Dessie town North east Ethiopia, is still low compared to some previous studies conducted in different areas of Ethiopia.

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**Disclosure**

The author reports no conflicts of interest in this work.

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