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Contents lists available at ScienceDirect

International Journal of Gynecology and Obstetrics

journal homepage: www.elsevier.com/locate/ijgo



CLINICAL ARTICLE

Use of early postnatal care among postpartum women in Eastern Uganda

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ARTICLE INFO

Article history:

Received 23 June 2014

Received in revised form 7 November 2014

Accepted 21 January 2015

Keywords:

Early postnatal care

Length of stay

Postpartum women

Uganda

ABSTRACT

Objective: To investigate the level and predictors of early postnatal care (EPNC) utilization in Soroti District, Eastern Uganda. **Methods:** A cross-sectional study was conducted at nine health facilities in February 2014. Women aged 15–49 years who had delivered in the previous year (but > 1 week ago) were enrolled at postnatal care clinics. Data were collected using a structured questionnaire. Multivariate analysis was used to identify factors associated with EPNC use (postnatal care visit 2–7 days after delivery). **Results:** Among 357 respondents, 55 (15.4%, 95% confidence interval [CI] 11.6%–19.2%) used EPNC services. EPNC attendance was significantly associated with formal employment (adjusted odds ratio [aOR] 3.88; 95% CI 1.08–13.93; $P = 0.038$) and education about postnatal care schedules (aOR 9.73; 95% CI 1.58–60.06; $P = 0.014$). Women at public health facilities were significantly less likely to have attended EPNC than were those at private facilities (aOR 0.03; 95% CI 0.01–0.10; $P < 0.001$). An increase in length of hospitalization by 1 day was associated with reduced EPNC utilization (aOR 0.63; 95% CI 0.43–0.91; $P = 0.015$). **Conclusion:** EPNC was poorly utilized and prioritized. Its use was hindered by protracted hospitalization, care provision at public facilities, maternal unemployment or self-employment, and lack of information.

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1. Introduction

High maternal and infant mortality and morbidity rates remain a significant public health issue for most low-income countries [1]. Maternal and newborn deaths occur mostly during pregnancy, delivery, or within the first week after delivery [2]. Estimates suggest that 50% of maternal and 40% of newborn deaths occur within the first 24 hours after delivery [3]. In Uganda, maternal and neonatal morbidity constitutes about 20.4% of the total disease burden and contributes 38% of the infant mortality rate [4]. Currently, Uganda has an unacceptable maternal mortality ratio of 438 maternal deaths per 100,000 live births, which is attributed mainly to hemorrhage, obstructed labor, pregnancy-induced hypertension, unsafe abortions, and septicemia [4].

Early postnatal care (EPNC) visits can reduce maternal and newborn morbidity and mortality, and enhance survival, particularly through early detection and management of postpartum complications [5]. However, it is the weakest of all reproductive and child health interventions in Africa [6] and receives much less attention from healthcare providers than pregnancy and childbirth [3]. Only 13% of women in Africa attend postnatal care appointments [2,6].

Health data for Soroti District in Eastern Uganda indicated that 58% of women attended postnatal care appointments between July 2012 and June 2013, and that the maternal mortality ratio was 167 maternal deaths per 100,000 live births, with deaths occurring mainly in the first week after birth (data from an interview conducted August 8, 2013, with a Soroti district health office worker). The aim of the present study was to investigate the level and predictors of utilization of EPNC visits among postpartum mothers in this district.

2. Materials and methods

A cross-sectional study was conducted at health facilities in Soroti District between January 30 and March 6, 2014. The study population included women aged 15–49 years who had had a delivery within the previous year, but more than 1 week ago. Women were enrolled when attending postnatal care clinics for interventions such as immunization, contraception, and growth monitoring. Informed consent was obtained from respondents before data collection. Participant identities remained anonymous throughout by coding. Approval was obtained from the Institutional Review Board of the International Health Sciences University, Kampala, Uganda.

Among 36 health facilities in Soroti District, nine were selected for inclusion; these nine comprised health facilities of all levels to give a representative sample of health facilities in the district. The district contains only two level IV health centers (HCIV) and one regional referral

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hospital (RRH), so these centers were selected purposively. The remaining six facilities were randomly selected by systematic sampling.

Using STATA version 12 (StataCorp, College Station, TX, USA), a required sample size of 310 was calculated for 85% power and a 95% confidence interval, assuming 7.7% of women attended postnatal care within 2–7 days of delivery [7]. To account for a 15% non-response rate, the final required sample size was 357. The sample size for each health facility was calculated based on its catchment population using Kish's formula for computing effective sample size [8].

At the selected health facilities, systematic random sampling followed by convenience sampling was used to select participants. Initially, the expected average daily number of mothers attending different services in the postnatal clinic was established from the clinician in charge. A sampling interval was obtained by dividing the average number of clinic attendees on a postnatal care clinic day by the required sample size for that particular health facility. From the obtained sampling interval, a convenience sampling method was used to select one respondent at a time until the required sample size was obtained.

Data for demographic, socioeconomic, and health system characteristics were collected by trained and supervised research assistants using a structured questionnaire consisting of both open- and closed-ended questions. The completed questionnaires were reviewed in real time for incompleteness, errors, and omissions. The questionnaire had been pretested by trained research assistants in a neighboring district to assess its acceptability, validity, reliability and appropriateness. The main outcome was EPNC use, which was defined as a postnatal care visit 2–7 days after delivery.

Data were cleaned for errors and omissions, entered into EpiData version 3.1 (EpiData Association, Odense, Denmark), exported to STATA version 12, sorted, and categorized. Necessary variable transformations were conducted. Legal and range values, routine data checks, skipping, and double data entry mechanisms in EpiData were used to minimize data entry errors.

Results were presented using tables with associated frequencies, percentages, odds ratios (ORs), confidence intervals (CIs), and *P* values. Numerical data were summarized using descriptive statistics such as mean, standard deviations, medians, and interquartile ranges (IQRs). Categorical data were analyzed using frequencies and percentages. The χ^2 test was used to analyze the relationship between the dependent variable and categorical variables whenever the cell count was equal to or greater than five. The Fisher exact test was used whenever the cell count was less than five. The *t* test was used to analyze the relationship between numerical independent variables and the dependent variable. *P* < 0.05 was deemed statistically significant. Binary logistic regression analysis was used to assess the magnitude of all significant relationships. Variables significant in the binary analysis were included in multivariate analysis to determine factors independently associated with EPNC use.

3. Results

Of the nine health facilities, eight were public (the RRH, two HCIVs, three level III health centers [HCIIIs], and two level two health centers [HCIIIs]); one HCII was a private facility. The mean age of the 357 respondents was 25.86 ± 5.80 years (median 25; IQR 22–30). Approximately two-thirds of participants had a parity of three or less, and most were married (Table 1).

Among the 357 participants, 345 (96.6%) reported having attended prenatal care during their recent pregnancy. The mean number of prenatal care visits was 4 ± 1 (median 4; IQR 3–4). A total of 305 (85.4%) women delivered at a health facility, and 309 (86.6%) had a spontaneous vaginal delivery. A skilled birth attendant (medical doctor, nurse, or midwife) attended 300 (84.0%) births, but a traditional birth attendant attended 46 (13.5%) and a traditional healer attended 9 (2.5%).

Among the 357 women, 191 (53.5%; 95% CI, 48.3%–58.7%) had used postnatal care services after the recent delivery, approximately half of

Table 1
Sociodemographic characteristics (n = 357).

Variable	No. (%)
Age group, y	
≤25	180 (50.4)
>25	177 (49.6)
Parity	
≤3	231 (64.7)
>3	126 (35.3)
Religion	
Catholic	140 (39.2)
Muslim	27 (7.6)
Anglican	139 (38.9)
Other	51 (14.3)
Marital status	
Single	44 (12.3)
Married	302 (84.6)
Divorced/separated	9 (2.5)
Widowed	2 (0.6)
Tribe	
Itesot	224 (62.7)
Kumam	77 (21.6)
Other	56 (15.7)
Education	
None	27 (7.6)
Primary	162 (45.4)
Secondary	133 (37.3)
Tertiary	35 (9.8)
Occupation	
None	245 (68.6)
Formal employment	40 (11.2)
Self-employment	72 (20.2)

whom had used them 2–4 weeks after delivery (Table 2). Among the 68 women who had used postnatal care services in the first week, 13 (19.1%) used them before 2 days and 55 (80.9%) between 2 and 7 days. Therefore, only 55 (15.4%, 95% CI, 11.6%–19.2%) of the 357 participants used EPNC services.

Univariate analysis showed that women who had accessed postnatal care services at a hospital were significantly less likely to have used EPNC than were those who had accessed services at a health center (*P* = 0.005) (Table 3). Additionally, mothers who had accessed postnatal care services at public health facilities were significantly less likely to use EPNC than those who attended public facilities (*P* < 0.001) (Table 3). Compared with women from the Itesot tribe, Kumams were significantly more likely to access EPNC (*P* = 0.002) (Table 3).

Mothers from households with incomes of more than 75 000 Ugandan shillings per month were significantly less likely to use EPNC than those from households with incomes of up to 75 000 Ugandan shillings per month (*P* < 0.001) (Table 3). Occupation had a significant association with EPNC use, with self-employed mothers less likely to use EPNC than

Table 2
Postnatal care attendance (n = 357).

Characteristics	No. (%)
Attended	
No	166 (46.5)
Yes	191 (53.5)
When attended ^a	
≤1wk	68 (35.6)
<2 d	13 (19.1)
2–7 d	55 (80.9)
2–4 wk	102 (53.4)
5–6 wk	21 (11.0)
Early attendance	
No	302 (84.6)
Yes	55 (15.4)

^a Among the 191 women who did attend.

Table 3
Univariate and multivariate logistic regression analyses.

Variables	Early postnatal-care attendance ^a		Unadjusted analysis		Adjusted analysis (significant variables at unadjusted/univariate analysis)	
	No	Yes	OR (95% CI)	P value	OR (95% CI)	P value
Category of health facility at which postnatal care services accessed						
Health centers (II, III, IV)	204/252 (81.0)	48/252 (19.0)	1.00	–	1.00	–
Hospital	98/105 (93.3)	7/105 (6.7)	0.30 (0.13–0.70)	0.005	0.88 (0.29–2.66)	0.186
Type of health facility at which postnatal care services accessed						
Private (PNFP)	15/46(32.6)	31/46(67.4)	1.00	–	1.00	–
Public	287/311(92.3)	24/311 (7.7)	0.04 (0.02–0.09)	<0.001	0.03 (0.01–0.10)	<0.001
Tribe						
Itesot	195/224 (87.1)	29/224 (12.9)	1.00	–	1.00	–
Kumam	55/77 (71.4)	22 (28.6)	2.69 (1.43–5.05)	0.002	0.77 (0.26–2.30)	0.640
Other tribes	52/56 (92.9)	4/56 (7.1)	0.52 (0.17–1.54)	0.236	0.50 (0.14–1.86)	0.304
Maternal occupation						
None	199/245 (81.2)	46/245 (18.8)	1.00	–	1.00	–
Formal employment	34/40 (85.0)	6/40 (15.0)	0.76 (0.30–1.93)	0.567	3.88 (1.08–13.93)	0.038
Self-employment	69/72 (95.8)	3/72 (4.2)	0.19 (0.06–0.62)	0.006	0.90 (0.23–3.55)	0.878
Household income per month, Ugandan shillings						
≤75 000	113/150 (75.3)	37/150 (24.7)	1.00	–	1.00	–
>75 000	189/207 (91.3)	18/207 (8.7)	0.29 (0.16–0.54)	<0.001	0.40 (0.14–1.10)	0.076
Informed of postnatal care schedules						
No	69/75 (92.0)	6/75 (8.0)	1.00	–	1.00	–
Yes	233/282 (82.6)	49/282 (17.4)	2.42 (0.99–5.89)	0.042	9.73 (1.58–60.06)	0.014
Educated on postpartum complications before discharge						
No	160/174 (92.0)	14/174 (8.0)	1.00	–	1.00	–
Yes	142/183 (77.6)	41/183 (22.4)	3.00 (1.73–6.30)	<0.001	1.61 (0.64–4.09)	0.314
Health worker behavior						
Friendly	152/192 (79.2)	40/192 (20.8)	1.00	–	1.00	–
Care a lot	27/30 (90.0)	3/30 (10.0)	0.42 (0.12–1.46)	0.174	0.61 (0.13–2.88)	0.536
Care very little	23/24 (95.8)	1/24 (4.2)	0.17 (0.02–1.26)	0.082	0.60 (0.62–5.73)	0.654
Rude	100/111 (90.1)	11 (9.9)	0.42 (0.20–0.85)	0.017	0.56 (0.20–1.59)	0.275
Queuing at the health facility at prenatal care						
Very short/short/okay	217/264 (82.2)	47/264 (17.8)	1.00	–	1.00	–
Very long/long	85/93 (91.4)	8/93 (8.6)	0.43 (0.20–0.96)	0.039	0.49 (0.15–1.60)	0.236
Access to nearby health unit						
Hard/difficult/not easy	86/110 (78.2)	24/110 (21.8)	1.00	–	1.00	–
Simple/easy/not difficult	216/247 (87.4)	31/247 (12.6)	0.51 (0.29–0.93)	0.027	1.26 (0.47–3.33)	0.645

Abbreviations: OR, odds ratio; CI, confidence interval; HCIV, Health Center four; PNFP, Private Not for Profit.

^a Values are given as number/total number (percentage).

unemployed mothers ($P = 0.006$) (Table 3). However, the literacy levels of mothers and their spouses, and the various forms of paternal occupations were not associated with EPNC use (Supplementary Material S1).

Compared with mothers who had not been informed of postnatal care schedules, informed mothers were significantly more likely to attend EPNC ($P = 0.025$) (Table 3). Additionally, women who had been educated on likely maternal and neonatal complications before discharge were three times more likely to use EPNC than those who had not received any education about these complications ($P < 0.001$). Development of maternal and newborn complications, prenatal care attendance, and person who conducted the delivery were insignificantly associated with lower odds of EPNC use (Supplementary Material S1).

A total of 288 (80.7%) women had full knowledge of the available postnatal care services at the nearest health facility, but this variable did not differ by EPNC attendance (Supplementary Material S1). Women who were aware of postnatal care services were less likely to attend EPNC visits, although this was not significant (unadjusted OR 0.73; 95% CI, 0.17 – 3.19, $P = 0.825$). Access to the nearest health facility was good for 247 (69.2%) women, but they were less likely to use EPNC than those who found it difficult to access their nearest health unit (unadjusted OR 0.51; 95% CI, 0.29–0.93; $P = 0.027$). Additionally, a long or very long queuing time at the health facility was associated with a reduced likelihood of EPNC ($P = 0.039$) (Table 3). Health worker rudeness significantly reduced EPNC use ($P = 0.017$) (Table 3).

The number of prenatal care visits, the spouses' prenatal care attendance, attitude to the benefit of postnatal care checkups, and education on likely pregnancy-related complications or postpartum complications were not related to EPNC (Supplementary Material S2). However, more women who were seen by receptive health workers during prenatal

care attended EPNC than did those seen by health workers who were not receptive ($P = 0.02$) (Supplementary Material S2).

The mean length of stay in health facilities after delivery was 2.2 ± 1.2 days. Length of stay was significantly associated with EPNC use ($P = 0.03$). An increase in length of hospitalization by 1 day was associated with a 31% reduction in EPNC use (unadjusted OR 0.69; 95% CI, 0.51–0.94; $P = 0.02$).

Multivariate analysis showed that EPNC was significantly associated with private health facilities ($P < 0.001$), formal maternal employment ($P = 0.038$), and being informed about prenatal-care scheduled ($P = 0.014$) (Table 3). Furthermore, an increase in length of hospitalization by 1 day was associated with a reduction in EPNC utilization (adjusted OR 0.63, 95% CI 0.43–0.91; $P = 0.015$).

4. Discussion

In the present study, few women attended EPNC. Only one socioeconomic factor was significantly associated with EPNC use in multivariate analysis: mothers with formal employment were four-times more likely to attend EPNC than mothers who were unemployed or self-employed. In terms of health systems factors, women who had accessed postnatal care services at public facilities were less likely to have used EPNC. Additionally, likelihood of EPNC use was increased among mothers who had been informed of postnatal care schedules.

The level of EPNC use was only 15.4% in the present study, confirming that EPNC remains highly neglected [3,9], poorly utilized [6], inadequately recognized [10], and is the weakest of all reproductive, maternal, and child health interventions [2]. However, the proportion was similar to the overall postnatal care utilization rate of 13% observed

in most parts of Africa [3,9,14]. In Nepal, 19% of women attend postnatal care within 48 hours of delivery [1]. Conversely, the EPNC rate reported in the 2008–2009 Kenyan Demographic Health Survey [8] (7.7%) was much lower than that in the present study. Overall, these findings confirm previous reports [6,11] that health workers in Africa largely advise mothers to return for postnatal care at 6 weeks.

The finding that socioeconomic factors are associated with EPNC is similar to that in a study from Mengo and Mulago hospitals in Kampala, Uganda [12]. Similarly, socioeconomic status has been linked with postnatal care use in India [3,13], Nepal [1], and Zambia [14].

The present study's finding that women who had accessed postnatal care services at private facilities indicates that Private Not for Profit (PNFP) health facilities remain major players in the provision of essential maternal and child health services. In Paletos, Brazil, a cohort study of patients at private and public health facilities [15] found that 96% of private hospital attendees utilized postnatal care compared with 72% at public health facilities. In Palestine, mothers at private health facilities have also been shown to have a higher rate of postnatal care than do those at public health facilities [16].

Variation in client satisfaction with service delivery could account for differences in service utilization. In Nigeria, a study [17] found significant differences in client satisfaction between private and public hospitals for maternal health services. Satisfaction was higher at a private hospital (73%) than at a public hospital (5.9%), and a much lower level of dissatisfaction at private (1.3%) than public hospitals (5.2%) [17].

The present study's finding that mothers informed about postnatal care schedules and timings had an increased likelihood of EPNC is consistent with previous studies from Zambia [14] and Kenya [18], which showed that inadequate maternal health education and information resulted in a decreased uptake of PNC services. The present study has confirmed the importance of scheduling postnatal care visits for specific days [6,10]. In Palestine, a five-fold increase in postnatal care utilization was realized after the inception of health information on the importance and schedules of postnatal care during prenatal care visits [19]. Additionally, the present results agree with a previous study in Swaziland [10], which showed a dramatic increase in postnatal care visits within the first week after delivery due to active health worker participation in educating and scheduling mothers.

A 1-day increase in length of stay in health facilities after delivery resulted in a 40% reduction in EPNC use in the present study. This finding contradicts results from other studies [21]; EPNC utilization was driven by postpartum complications in the present study whereas a study in Palestine indicated that EPNC was driven by the number of prenatal care visits and maternal knowledge of postnatal care [16]. Additionally, a prolonged stay in hospital was perceived to reflect perfect health at the time of discharge, and therefore promoted disregard for EPNC. However, the average length of stay after delivery was approximately 2 days, which implies that most women received immediate postnatal care during the first few hours after birth [1,2]. This finding complies with the WHO 2013 recommendation that mothers should be discharged after the first 24 hours to ensure sufficient medical and nursing care [20]. Additionally, a study in the USA [21] showed that women who had been hospitalized for a short period of time constituted the biggest population of EPNC users.

A limitation of the present study is that all information was self-reported. Therefore, reporting biases are a possibility, and should be considered in the interpretation of the results.

In conclusion, the present study has shown that EPNC utilization is low in Soroti District, Eastern Uganda. Postnatal care seems to have been scheduled for more than 7 days after birth. Maternal formal employment and access to information on the importance of postnatal care attendance and schedules increased EPNC use. Provision of postnatal care services at government health facilities and prolonged maternal length of hospital stay after delivery decreased EPNC use. Overall, utilization of EPNC needs to improve urgently. Interventions must mimic

service provision in the private health sector, be directed at self-employed or unemployed mothers, aim to reduce the average length of hospital stay, and encompass health education and policy change.

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.ijgo.2014.11.017>.

Conflict of interest

The authors have no conflicts of interest.

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