

Community-based assessment of postnatal care in Puducherry—A cross-sectional study

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ABSTRACT

Introduction: Postnatal period is a neglected period compared to the antenatal period. Providing adequate care to infant and mother during this vital period is essential. **Objectives:** To assess the postnatal care (PNC) received by the mothers and newborn children in Puducherry. **Materials and Methods:** Community-based cross-sectional study done among the postnatal mothers under the care of two urban Primary Health Centers (PHC A and PHC B) in Puducherry in 2015–2016. Eligible mothers were contacted at their houses within 4 weeks of completion of their postnatal period to assess the postnatal care. **Results:** Out of 227 postnatal mothers in the study, only 37.4% (85) (95%CI 31.3–43.9) of the mothers had received adequate counselling services on topics of nutrition, hygiene, contraception, essential newborn care, breastfeeding, and immunization. Cord care was given for 99.1% of the babies and breastfeeding position was checked for 88.5% of the babies. Among the mothers who had normal deliveries, 48.1% (76) (95% CI 40.4–55.9) of the mothers had initiated breastfeeding within 1 h of normal delivery and within 4 h of delivery for 72.4% (50) (95% CI 61.1–82.0) among the mothers who had a cesarean section. Only 20.7% (47) (95%CI 15.8–26.3) of the mothers and newborns had received at least one postnatal home visit and none of the mothers had received adequate postnatal home visits as per Indian Public Health Standards guidelines. Out of the 126 eligible mothers for JSY benefits, only 46% (58) (95% CI 37.5–54.8) of them had registered. Among those who were not registered, 20.6% had reported that they were unaware of the scheme. Out of 227 births, 14.1% (32) of them were of low birth weight (<2.5 kg) and 1.3% (3) were of very low birth weight (<1.5 kg) category. **Conclusion:** Although the antenatal care is satisfactory in the study setting, implementation of PNC needed further attention and active guidance via health system strengthening.

Keywords: Anemia, breastfeeding, Low birth weight, postnatal care, postpartum, very low birth weight

Introduction

Postnatal period is defined by the World Health Organization (WHO) as the period from 1 h after the delivery of placenta to 6 weeks after birth.^[1] Postnatal care (PNC) is the care given to the mother and the newborn from the time of delivery till 6 weeks postpartum.^[2] Postnatal period is a critical

transitional phase for both the mother and the newborn. Major changes occur during this period that determines the well-being of both the mother and the newborn. Yet, this is the most ignored period for provision of quality services.^[3]

Maternal and child health program since 1952 has recommended three home visits to postnatal mothers. The care given to the mother and the baby in the postpartum period has been varied and poor in South Asia, particularly in India. NFHS-4 (2015-16) reports that the mothers who received PNC from either a doctor, nurse, auxiliary nurse midwife (ANM), lady health visitor (LHV), or any other health personnel within 2 days of delivery for their last birth in the 5 years before the survey was 84.9%. But only

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Received: 04-06-2020

Revised: 09-09-2020

Accepted: 12-10-2020

Published: 27-02-2021

Access this article online

Quick Response Code:



Website:
www.jfmpc.com

DOI:
10.4103/jfmpc.jfmpc_1083_20

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How to cite this article: Selvaraj R, Ramakrishnan J, Sahu SK, Kar SS, Roy G. Community-based assessment of postnatal care in Puducherry—A cross-sectional study. J Family Med Prim Care 2021;10:798-803.

36% of children had received a health checkup from either of the above-mentioned health personnel within 2 days of birth.^[4] As per DLHS-4 (2012-13) data for Puducherry, only 71.1% and 74.1% of mothers had received PNC within 2 days and 2 weeks of institutional delivery respectively.^[5] It is important to strengthen the care received by the mother and the newborn during the critical postpartum period as well. Therefore, this study was conducted among the mothers registered in the selected Primary Health Centres (PHC), within 4 weeks of completion of their postnatal period, to assess the PNC received by the mothers and newborn children in Puducherry.

Methodology

Study design and setting

This study was a community-based cross-sectional study conducted in the service area of the two selected urban Primary Health Centres (PHC) in Puducherry among the 5 urban PHCs^[6] in Puducherry which catered to a population of 30,000–50,000 and located within 15 km distance from JIPMER.

Study participants

Mothers aged above 18 years who had registered for antenatal care in the two selected PHCs, completed 6 weeks after delivery and stayed in the respective service area during the study period were eligible up to 4 weeks of completion of their postnatal period.

Study period

This study was conducted between 1st of March 2015 and 29th of February 2016.

Sample size calculation

The sample size was calculated for the objective of assessing the prevalence of PNC received by the mothers in Puducherry. A previous study done by Chen L. *et al.*^[7] in China reported that 37% had received counselling on infant feeding, 32% on cord care, 24% reported that the service provider examined the baby, 24% had received a postnatal home visit within 42 days after delivery, and 18% were consulted on danger signs and thermal care. Taking into consideration the lowest percentage (18%) as the prevalence, an absolute precision of 5%, the estimated sample size was 227 using OpenEpi software version 2.3.^[8]

Sampling technique

For every month, an eligible list of mothers from the respective PHC was made. Eligible mothers were selected using simple random sampling technique till the required sample size was achieved.

Study tools

A pretested semi-structured proforma was developed based on the postnatal care assessment as per Indian Public Health Standards (IPHS) guidelines.^[9]

Operational definitions

For the purpose of the study, any postnatal home visit was defined as at least one home visit made by any health worker during the postnatal period. Adequate postnatal home visit was defined as at least three home visits made by any health worker for normal babies and additional three visits for low-birth weight babies during the postnatal period. Any counselling was defined as any advice given on nutrition, hygiene, contraception, essential newborn care, breastfeeding, or immunization by any health personnel from any health facility. Adequate counselling was defined as advice given on all the above-mentioned topics (nutrition, hygiene, contraception, essential newborn care, breastfeeding, or immunization) by any health personnel from any health facility.

Study procedure

The study protocol was reviewed and approved by Institute Research Monitoring Committee on 19.08.2014 and Institute Ethics Sub-Committee (Human studies) on 14.10.2014. Permission from Deputy Director of Public Health (DDPH), Puducherry was obtained. From the available list of PHCs in Puducherry, two PHCs with a population between 30,000 and 50,000 were selected. List of postnatal mothers were obtained from antenatal register available at respective PHCs. The preliminary details and contact number was collected from Mother and Child Tracking Card (MCTC). All the mothers were contacted over phone at the end of 6 weeks postpartum and their availability in the service area of respective PHC was confirmed. From the list of mothers who were available in the service area, a proportionate sample to be covered from the respective PHC population for that month was selected by simple random sampling technique. After an informed written consent, data on sociodemographic details, antenatal care, PNC, and health status of the mother and newborn during the postnatal period was obtained using structured pretested proforma, which was developed based on Indian Public Health Standards (IPHS) guidelines^[9] for postnatal assessment.

Study variables

Sociodemographic details of mothers like age, education, occupation, family type, socioeconomic status; antenatal history with delivery details like whether registered for JSY, parity, total number of antenatal visits, antenatal hemoglobin, any comorbidities detected during pregnancy; intra-natal details like place and type of delivery; details of the baby like birth weight, gender, gestational age at birth, pre-lacteal feeds, breast-feeding initiation, immunization at birth.

PNC: visit to any health facility for any complaint of mother or baby, number of visits and place of visit, postnatal IFA supplementation, frequency and timing of any postnatal home visit by any health worker from the PHC, adequate postnatal home visits, any postnatal counselling, adequate postnatal counselling.

Statistical methods

Data were entered using EpiData software version 3.1^[10] (EpiData Association, Odense, Denmark). Data were analyzed using IBM SPSS version 16 software.^[11] Continuous variables were expressed as mean and standard deviation. Proportions were reported as percentages and 95% confidence interval (CI).

Results

The total postnatal mothers enrolled for this study were 227, out of which 123 (53.9%) were from Area A and 104 (45.6%) were from Area B. The mean (SD) age of the study participants was 26.5 (4.6) years [range: 19–42 years]. The details on sociodemography of the postnatal mothers are given in Table 1. Majority (81.5%) of them were in the age group of 19–30 years.

Nearly two-third of the mothers (63.9%) had anemia during the third trimester of their antenatal period. Among them, majority (99%) of mothers had mild to moderate anemia. The mean (SD) third trimester antenatal hemoglobin of the participants was 10.7 (1.1) gm%. The other comorbidities newly detected during their pregnancy were Gestational Diabetes Mellitus (GDM-12.7%) and Pregnancy Induced Hypertension (PIH-9.2%) [Table 2]. All the mothers had institutional deliveries (100%). Majority (87.7%) of the participants had delivered in a Government institution and 12.3% of the mothers had delivered in private hospital or nursing homes.

Out of the total 227 babies born, 84.6% of the babies ($n = 192$) were of normal birth weight, 14.1% ($n = 32$) of them were of low birth weight (LBW <2.5 kg) and 1.3% ($n = 3$) were of very low birth weight (VLBW <1.5 kg) category. All the three VLBW babies were preterm babies. The mean (SD) birth weight of the babies was 2.9 (0.5) kg with a range of 1.3–4 kg. Eleven percent of the term babies were of low birth weight.

Postnatal care received at “the health facility” (place of delivery)

More than 98% (95%CI 95.8–99.4) of the mothers underwent routine examination of wound [including lower segment cesarean section (LSCS) and episiotomy wound], abdomen, and breast at the health facility where they had delivered during their immediate postpartum period. However, general examination for pallor was done only for 52% (95% CI 45.9–58.9) of them anytime during their postnatal period by any health personnel.

Nearly 82% ($n = 186$) (81.83% 95% CI 76.3–86.7) of the mothers were given some IFA tablets following delivery at the respective health facility as per the respective Institution policy where they had delivered. However, 12.8% ($n = 29$) (95%CI 8.9–17.6) of the mothers were advised to take IFA tablets for 6 months and were asked to collect from their respective PHC. Among the mothers who had received postnatal IFA supplementation, close to one-fourth (24.2%) had received for 1 month, nearly 15% (34

Table 1: Socio-demographic characteristics of the study participants (n=227)

Characteristic	Frequency	Percentage
Age in years		
19-24	83	36.6
25-30	102	44.9
31-36	36	15.9
37-42	6	2.6
Educational status*		
No formal schooling	4	1.8
Primary	11	4.8
Middle and High	65	28.7
Higher Secondary	48	21.1
Graduates	76	33.5
Post-Graduates	23	10.1
Employment status		
Homemaker	208	91.6
Employed [§]	19	8.4
Family type		
Joint	125	55.1
Nuclear	102	44.9
Socio-economic class [†]		
Class I (>5571)	32	14.1
Class II (2786-5570)	63	27.8
Class III (1671-2785)	50	22.0
Class IV (836-1670)	62	27.3
Class V (<836)	20	8.8
Total	227	100

*International Standard Classification of Education by UNESCO, 2011. [§]Housekeeping, Teacher/Lecturer/Professor, Engineer, Software developer, Tailor, Dance teacher, Staff nurse, Graphic designer. [†]Updated Modified Prasad classification 2014^[12]

Table 2: Parity, delivery details and comorbidities of the study participants (n=227)

Characteristic	Frequency	Percentage
Parity		
1	103	45.4
2	105	46.3
3	18	7.9
4	1	0.4
Delivery type		
Spontaneous vaginal delivery	155	68.3
Elective cesarean section	38	16.7
Emergency cesarean section	31	13.7
Assisted vaginal delivery	3	1.3
Comorbidity*		
ANAEMIA	145	63.9
GDM	26	11.4
PIH	18	7.9
GDM + PIH	3	1.3

*Multiple responses. GDM - Gestational Diabetes Mellitus, PIH - Pregnancy Induced Hypertension

had received for 3 months and only 4% (9) had received for 6 months as per the IPHS guidelines.

Nearly all the mothers (99.6%) had received some counselling on any one of the following topics such as nutrition, hygiene, contraception, essential newborn care, breastfeeding, or

immunization. According to IPHS guidelines for PNC, only 37.4% ($n = 85$) (95%CI 31.3–43.9) of the mothers had received adequate counselling services by any health personnel from any health facility, whereas advice on essential newborn care like prevention of neonatal hypothermia by providing warmth to the baby and protection from infections through proper cord and eye care was given to less than 50% of the mothers [Table 3].

Out of 227 babies born to the study participants, cord care was given for 99.1% (225) of the babies and breastfeeding position was checked for 88.5% (201) of the babies. Overall there were 158 normal deliveries, out of which 48.1% ($n = 76$) (95% CI 40.4–55.9) of the mothers were able to initiate breastfeeding within 1 h of delivery. Among the 69 mothers who had a LSCS, breastfeeding was initiated within 4 h of delivery for 72.4% ($n = 50$) (95% CI 61.1–82.0) of the babies. Pre-lacteal feeds like sugar water and honey was given to 5.7% (13) of the babies. Out of the 227 participants, 126 mothers who were eligible for JSY benefits, only 46% ($n = 58$) (95% CI 37.5–54.8) of them had registered for the benefit. Among the 54% (68) of those who were not registered, 20.6% ($n = 14$) reported that they were not aware of the scheme. Of those mothers who had registered under JSY, none had received the JSY cash benefit at the end of 6 weeks during the study.

Proportion of the mothers received “postnatal home visits” by “any health worker”

Around 20.7% (47) (95%CI 15.8–26.3) of the mothers had received any postnatal home visit (at least one home visit) by any health worker. None of the mothers had received adequate postnatal home visits by any health worker as per IPHS guidelines. Out of the 47 postnatal home visits made, majority had happened between 29th and 42nd day (36; 76.6%), 14.9% (7) had happened within the first 7 days and the rest 8.5% (4) between 14th and 28th days after delivery. Out of the 47 study participants who had received at least one postnatal home visit by a health worker, none of the mother and newborn were assessed for any health problems during the postnatal period.

Nearly half (43.2%) of the mothers had visited the hospital for some complaint either for themselves or for their baby during their postnatal period. Nearly 9% (20) had visited the hospital for health complaints in themselves and 34.4% (78) had visited for complaints in their babies. Out of the 20 mothers, 17 (85%) of them had gone to a Government health facility for their complaints and among the 78 babies who were taken to hospital, 46 (59%) were taken to a Government health facility. The health problems reported by the mother during the postnatal period is presented in Table 4.

The prevalence of anemia among postnatal mothers was 76.2% ($n = 173$, 95% CI: 70.4–81.4%). Postnatal anemia was considered as hemoglobin less than 12gm %.^[13]

Table 3: Counselling services provided to postnatal mothers after delivery by any health personnel at any health facility ($n=227$)

Counselling service*	Frequency	Percentage
Breastfeeding	214	94.3
Contraception	205	90.3
Nutrition	192	84.6
Hygiene	190	83.7
Immunization	177	78.0
Essential newborn care	93	41.0

*Multiple responses

Table 4: Self-reported health problems of the mother and baby during the postnatal period ($n=227$)

Health problem [§]	Frequency	Percentage
Mother		
Lower back ache	41	18.1
Prolonged bleeding per vaginum [#]	28	12.3
Inadequate milk secretion	16	7.0
LSCS Wound infection	9	4.0
Postpartum fever	8	3.5
Lower abdominal pain	8	3.5
Breast complaint*	7	3.1
Easy fatigability/breathlessness	6	2.6
Psychological disturbance	3	1.3
Bowel and bladder disturbance	3	1.3
Others**	12	5.3
Baby		
Upper Respiratory Infection	49	21.6
Jaundice	34	15.0
Physiological	32	14.1
Pathological	2	0.9
Umbilical cord infection	4	1.8
Fever	3	1.3
Others [@]	6	2.6

[§]Multiple responses. [#]Perceived bleeding per vaginum persistent for more than a month. *One mother had a small fibro-adenoma, 3 had retracted nipple and 3 had sore nipple. **Others: Giddiness, UTI, hemorrhoids, vaginal hematoma, retained placenta. [@]Other complaints reported: conjunctivitis, cleft lip & palate, small Patent Ductus Arteriosus & small Patent Foramen Ovale. None of the baby had convulsions, hypothermia, oral thrush, bowel and bladder disturbance, bluish discoloration while feeding

Discussion

Though there are some national level secondary data analysis on the utilization and determinants of PNC, community-based situation analysis to assess the actual service provisions of PNC as per WHO and national level guidelines were limited.

In this present study, only 20.7% of the mothers had received at least one postnatal home visit by any health worker within 6 weeks after delivery. None of the mothers had received adequate postnatal home visits as per IPHS guidelines, whereas the proportion of mothers who had received a postnatal home visit was much lower (8%) in Chen L *et al.* study^[7] conducted in China in 2011 compared to our study result. On the other hand, the proportion of mothers and newborns who had received a postnatal home visit within 3 days after delivery were 57% in Bangladesh, 50% in Nepal, and 11% in Malawi.^[14] A qualitative

study has revealed that woman felt vulnerable in their maternal role in the early postnatal period, wanted recognition and time to talk about their birth experience and had a personal relationship and confidence with the midwife during the home visit^[15] which further emphasizes the need to strengthen the component of postnatal home visits.

In the present study, more than 90% of the mother received some care at the health institution where they delivered their babies. However, the PNC assessment within 48 h in other studies was found to be only 44% by Singh A *et al.*^[16] and 72.6% by Bhattacharjee *et al.*^[17] Among Ethiopian women in Tigray region, only 8% had received PNC within 6 weeks of delivery. Less importance given to PNC by healthcare providers was identified to be the most common reason for it.^[18]

Only one-fourth (24.2%) had received IFA tablets from the place of delivery for 1 month, nearly 15% had received for 3 months and only 4% had received for 6 months as per the national guidelines. With the high burden of postnatal anemia among the mothers, it is imperative to extend the service uniformly to all mothers irrespective of the institution where they had delivered to efficiently to reduce anemia in postnatal mothers. Though IFA supplementation during antenatal period is highly emphasized, the iron supplementation during postpartum period is widely neglected. Makwana N *et al.*^[19] found that about 95% of female health workers had knowledge of compulsory IFA supplementation during postpartum period. But, in a study by Agarwal M *et al.*,^[20] it was noted that none of the female health worker had provided postpartum mothers with IFA tablets.

Though 99% received some counselling services, only 37.4% of the mothers received adequate counselling services. Similar findings were also observed in few other studies in India and other countries which reported that 80% received counselling in a tribal area of Madhya Pradesh,^[21] 78% in Nepal, and 87% in Malawi, respectively.^[20] Counselling received on essential newborn care like maintenance of warmth of the baby and protection from infections was low in our study (41%). Similarly, the Chinese study^[7] reported that 32% had received counselling on cord care and only 18% had received guidance on keeping newborns warm. The reasons for inadequate counselling on newborn care need to be explored and checklist can be made to counsel the mother adequately.

In the present study, 48.1% of the mothers who had normal deliveries were able to initiate breastfeeding within 1 h and 72.4% of the mothers who had a LSCS had initiated breastfeeding within 4 h of delivery. This was much lower compared to DLHS-4 (2012–13)^[5] and NFHS-4 (2015–16)^[4] data for Puducherry which reported 77.6% and 65.3% of the children under 3 years were breastfed within 1 h of birth.

A systematic review and Delphi survey from Belgium has shown that PNC should start in pregnancy with an individualized care plan.^[22] Strengthening of postnatal component in the health

system can significantly reduce maternal and neonatal morbidity and mortality as major changes occur during this period. Empowerment of mothers on postpartum care can enable them to identify danger signs in them and baby early and seek medical help when needed. Both health system strengthening and empowerment of mothers together can help the mother and the child to cross over this vital postnatal period successfully.

Strengths and limitations

This was a community-based cross-sectional study on postnatal care assessment and the enrolment of study participants within 4 weeks of completion of their postnatal period helped to reduce the recall bias. The standard guidelines were used to assess the PNC. However, the status of PNC in rural Puducherry was not assessed. The health workers' perception on barriers for PNC were not assessed.

Conclusion

Overall, the study revealed that the immediate PNC and counselling services received at the place of delivery was good. However, postnatal home visit and counselling pertaining to newborn care needs strengthening. Anemia among third trimester mothers and among postnatal mothers were high. Awareness regarding JSY and similar conditional cash transfer schemes for MCH should also be improved for availing the benefits. Exploring health system perspective for inadequate postnatal home visits may give better insights into improving PNC. Importance given to PNC is relatively less compared to antenatal care. Primary care physicians being the first point of contact in most cases can contribute significantly to strengthen the postnatal component of maternal and child health by addressing the weaker links in their service area. Thereby they can play a vital role in early identification of postnatal complications and prevention of avoidable maternal and neonatal deaths during postnatal period.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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