

Determinants of Utilization of Antenatal Care Services in Rural Lucknow, India

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ABSTRACT

Background: Antenatal care services are the first steps towards ensuring the health of mothers and the newborn. This is the key component for achieving Millennium Development Goals by 2015. But India's performance continues to be poor in providing antenatal care services to its huge population, particularly in the rural areas. **Objective:** To assess the determinants of utilization of antenatal services by rural beneficiaries in Lucknow, a district of north India. **Materials and Methods:** The study, cross-sectional in design, was conducted from August 2009 to July 2010. Multistage random sampling was used for selecting villages. A total of 352 recently delivered women were selected following systematic random sampling. Logistic regression was used to find out the determinants of three antenatal care services. **Results:** Overall, 85.5% of the beneficiaries surveyed were found to receive at least three antenatal care services from any health facility. Community health centre was the most common source for such care. Significant difference was found between beneficiaries who took three antenatal care visits and who did not in terms of age, socio economic status, and timing of registration. On multiple regression, only age (OR = 2.107, 95% CI = 1.132 - 3.923) and timing of registration (OR = 2.817, 95% CI = 1.487 - 5.338) were found to be the predictors for three antenatal care visits. **Conclusion:** Intervention should be focused on young and late registered women for ensuring sufficient care during pregnancy.

Keywords: Antenatal care, determinant, recently delivered women, rural India

Introduction

Antenatal care (ANC) services are considered to be the key element in the primary health care delivery system of a country, which aims for a healthy society. Over the past 60 years, the maternal health situation in the country has been staggering despite several changes in a rapidly evolving socioeconomic environment. The roles and responsibilities of primary care physicians have also been revised continuously in this context. Under their leadership, different cadres of health workers have been appointed to address the problem. As deadline for Millennium Development Goals is approaching, the need for improving the standard of maternal care is more than ever.

In the last decade, as per the National data, health indicators including utilization of antenatal care services were as poor as

60% in rural India.^[1] Keeping in view the gap between the target and reality, National Rural Health Mission (NRHM) was launched in April 2005, to improve the rural health care delivery system and health status of the people. Accredited Social Health Activists (ASHAs) were introduced at the village level for motivating the beneficiaries to utilize the antenatal care services provided by the government health facilities. Under supervision of Auxillary Nurse Midwives (ANM) and physicians at primary health care level, ASHAs were planned to play the role of a connecting bridge between community and first level government health sector. These groups of health care providers, along with Anganwadi workers (AWW), build the base line of rural health services in the country. They, under the Mission, seek to provide universal access to equitable, affordable and quality maternal health care, as well as to bring about an improvement in the health status of the pregnant women belonging to underprivileged sections of the society.

In this perspective, the present study aimed to find out the

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determinants of utilization of antenatal care services by the beneficiaries in rural Lucknow.

Materials and Methods

The present study, cross-sectional in nature, was conducted among rural beneficiaries in Lucknow district from August 2009 to July 2010. Lucknow, a district in Uttar Pradesh (UP), north India, is having 33.3% of the population living in rural area. The rural part of the district has a literacy rate of 61.8% overall and 52.3% among the females. Its 79.3% of the population is leading a low standard of living.^[2]

Recently delivered women (RDW) were taken as the study subjects. A RDW was defined as a post natal woman who had delivered a baby during the period from January 2009 till June 2010. Sample size calculation was done using the formula $4PQ/d^2$. The percentage of women attending antenatal care was 64.2% in rural UP, based on the findings of NFHS-3.^[3] A total of 352 were interviewed from 32 villages. Sample size was calculated with a relative precision of 10% and a design effect of 1.5.

Sample size calculation was done using formula to estimate a proportion requirement for 95% confidence. Considering non-response, an additional list of RDW (comprising of 10% of the sample size) was kept ready for every village. In case of absence or unwillingness of the RDW, the list was utilized.

Sampling technique

Multistage random sampling was used for selecting villages. In the first stage, out of nine Community Health Centers (CHCs) in Lucknow, two were chosen randomly. In the second stage, two Primary Health Centers (PHCs) were selected randomly from each CHC, thus four PHCs were included in the study. Under each PHC, two sub centers were taken within five km and two sub centers were taken more than five km away from the respective PHC. In each of the sub centers thus selected, two villages were selected, one in which sub centre is located and any other village, selected via random sampling. Thus, the study covered 32 villages, which includes equal (16 each) number of Sub Centre Villages (SCV) and Non-Sub Centre Villages (NSCV).

List of RDWs was collected from ASHAs and AWWs and then systematic random sampling was followed to pick up the requisite number of beneficiaries. All the RDWs refusing for interview were excluded (2.8%).

Tools of data collection

The study was conducted after clearance from the Institutional Ethical Committee and permission from the superintendents of the concerned CHC. Verbal consent was obtained from beneficiaries before interviewing. A pretested structured interview schedule was used to collect required information.

Among independent variables, age, religion, caste, type of family, education, socio economic status (SES), parity, and timing of registration were considered. For calculating SES, modified Pareek's classification^[4] for rural area was used. Three ANC visits were taken as outcome variable. It was considered adequate ante natal care, as per the national norm.

Statistical analysis

Data entry and analysis were done using PASW Statistics version 19.0 (SPSS Inc., Chicago, IL, US). Frequency and percentage for categorical variables were calculated. The Chi-square test and Fisher's exact test were used to compare the RDWs who took at least three antenatal care visits and who did not. Simple and multiple logistic regressions were applied to find out the predictors. Results were expressed in terms of odd's ratio (OR) and confidence interval (CI). Independent variables that were significant at univariate level were included in multivariate model for avoiding confounding. Backward logistic model, based on likelihood ratio, was used to find predictors for institutional deliveries at government hospitals. The fit of final model was assessed using Hosmer-Lemeshow goodness-of-fit test.

Results

About half (54.5%) of the RDWs were above the age of 25 years. Most of them (91.2%) were Hindu. Most of them (63.6%) were illiterate or having education upto primary standard. Regarding SES, 25.9% belonged to class V, as per Pareek's classification. Overall, 85.5% of the RDWs took at least three ANC services during their pregnancy (95% CI: 81.8% - 88.9%) and 53.7% of them got registered during the first trimester of pregnancy (95% CI: 49.1% - 59.1%).

All the RDWs got themselves registered for ANC. CHCs and Anganwadi Centers (AWC) were the most common (50.9% and 48.6%, respectively) sources of antenatal care services for them. For SCV, sub centre was the most common (52.3%) source followed by CHC (45.5%) for antenatal care services. For NSCV, AWC was the most common (63.1%) source followed by CHC (56.3%), for the same services [Table 1].

At the comparison between the profiles of the women who went for three ANC visits and who did not, significant difference was found in terms of age, SES, and timing of registration. About 89.1% RDW above the age of 25 years took three or more such visits. Majority (91%) of the pregnant women who got them registered early went for more number of antenatal visits. The influence of religion, caste, education, family type or parity was not prominent though higher utilization was seen with increasing education [Table 2].

On simple logistic regression, no significant relation was found between three ANC visits and religion, caste, education, family type or parity of the RDWs. However, significant relation was found between three ante natal care visits and age (OR = 1.189, 95% CI = 1.029 - 3.433), SES (OR = 1.888, 95% CI = 1.009 - 3.533), and timing of antenatal registration

(OR = 2.667, 95% CI = 1.427 – 4.984). Women with age more than 25 years, higher SES, and early registration were found to be more likely to get three or more number of antenatal visits [Table 3].

At multivariate level, significant variables in the model were age of woman (OR = 2.107, 95% CI = 1.132 – 3.923) and timing of registration (OR = 2.817, 95% CI= 1.487 – 5.338) [Table 4]. The result of Hosmer-Lemeshow goodness-of-fit test was not significant ($P = 0.683$, $df = 6$). Overall correct classification result indicated that 85.5% of the RDWs are predicted rightly about their number of antenatal visits.

Table 1: Distribution of RDWs according to the source of antenatal care during their last pregnancy*

Source	Number of RDWs					
	SCV (n = 176)		NSCV (n = 176)		Total (n = 352)	
	No.	%	No.	%	No.	%
Sub Centre	92	52.3	15	8.5	107	30.4
AWC	61	34.6	111	63.1	172	48.9
PHC	31	17.6	38	21.6	69	19.6
CHC	80	45.5	99	56.3	179	50.9
Other Govt. hospital	10	5.7	6	3.4	16	4.5
Private hospital	21	11.9	16	9.1	37	10.5

AWC: Anganwadi centre; PHC: Primary health centre; CHC: Community health centre; SCV: Sub centre village; NSCV: Non-sub centre village; *Multiple sources

Discussion

The study found that all the studied beneficiaries got themselves registered for antenatal care services. The extent of registration was in accordance with the finding of previous studies.^[5,6] However, the findings are different from the observation of Murthy,^[7] which showed that for PHC/SC villages, the coverage was more than other villages. No such difference was found in the present study with regard to presence of Sub Centre in the village and this could be attributed to presence of ASHA in every village. Majority of the beneficiaries attended three or more ANC check-up and they got themselves registered most commonly in the first trimester of pregnancy. This is not in accordance with the finding of previous studies conducted before NRHM.^[3,8] The difference, again, could be attributed to performance of ASHA.

It was observed in the present study that CHC and AWC were the most common sources of antenatal care services for the beneficiaries. This is not consistent with a previous study, which found that most of the pregnant females went to Sub Centre or PHC.^[9] Preference for CHC in the present study might be due to provision of lab facilities, while AWCs were chosen due to their presence in every village.

Among different factors, less age has earlier been established as the determinant for three or more ANC visits.^[3,10] In contrary to these studies, the present study suggests that increased age

Table 2: Comparison of the profile of the RDWs based on three antenatal care visits

Variables	Three ante-natal care visits					Test statistics
	Yes (n = 301)		No (n = 51)		Total (n = 352)	
	No.	%	No.	%	No.	
Age						
<25 yrs	130	81.2	30	18.8	160	χ^2 (df) = 4.299 (1) P value = 0.038
>25 yrs	171	89.1	21	10.9	192	
Religion						P value = 0.595 ^a
Hindu	273	85.0	48	15.0	321	
Muslim	28	90.3	3	9.7	31	
Caste						χ^2 (df) = 1.247 (1) P value = 0.264
Scheduled caste/ tribe	134	83.2	27	16.8	161	
Others	167	87.4	24	12.6	191	
Education						χ^2 (df) = 1.246 (1) P value = 0.264
Till primary standard	188	83.9	36	16.1	224	
Beyond primary standard	113	88.3	15	11.7	128	
SES						χ^2 (df) = 4.045 (1) P value = 0.044
Till class IV	229	87.7	32	12.3	261	
Class V	72	79.1	19	20.9	91	
Family type						χ^2 (df) < 0.00001 (1) P value = 0.984
Nuclear	148	85.5	25	14.5	173	
Joint	153	85.5	26	14.5	179	
Parity						χ^2 (df) = 0.258 (1) P value = 0.612
Primi	84	84.0	16	16.0	100	
Multi	217	86.1	35	13.9	252	
Early registration						χ^2 (df) = 9.943 (1) P value = 0.002
Yes	172	91.0	17	9.0	189	
No	129	79.1	34	20.9	163	

RDW: Recently delivered women; IFA: Iron and folic acid; SES: Socio economic status; ANC: Ante natal care; ^aFisher's test

Table 3: Factors associated with three antenatal care visits by the RDWs on simple logistic regression

Variables	Crude OR	95% CI	P value
Age			
<25 yrs	1		
>25 yrs	1.189	1.029 – 3.433	0.040
Religion			
Hindu	0.609	0.178 – 2.084	0.430
Muslim	1		
Caste			
Scheduled caste/ tribe	1		
Others	1.402	0.773 – 2.542	0.266
Education			
Till primary standard	0.693	0.363 – 1.322	0.266
Beyond primary standard	1		
SES			
Till class IV	1.888	1.009 – 3.533	0.047
Class V	1		
Family type			
Nuclear	1.006	0.556 – 1.822	0.984
Joint	1		
Parity			
Primi	0.847	0.445 – 1.611	0.612
Multi	1		
Early registration			
Yes	2.667	1.427 – 4.984	0.002
No	1		

RDW: Recently delivered women; IFA: Iron and folic acid; OR: Odd's ratio; CI: Confidence interval; SES: Socio economic status

Table 4: Predictors of three antenatal care visits by the RDWs

Variables	Adjusted OR	95% CI	P value
SES			
Till class IV	1.785	0.939 – 3.393	0.077
Class V	1		
Age			
<25 yrs	1		
>25 yrs	2.107	1.132 – 3.923	0.019
Early registration			
Yes	2.817	1.487 – 5.338	0.001
No	1		

RDW: Recently delivered women; SES: Socio economic status; OR: Odd's ratio; CI: Confidence interval

is associated with at least three antenatal visits. This might be due to increased awareness and more familiarity with the health workers with increasing age. Some other studies supported this view.^[11,12] The doctors at the PHC and CHC level should be more elaborate to the young pregnant ladies, as the latter, many a times, lack sufficient information.

As per our study, SES was associated with adequate number of ANC visits although after controlling for other variables, it could not come out as significant. Previous studies also pointed towards economic factor as a predictor.^[13-15] In an area where three fourth of the population survive in a low standard of living, economic factors could impact the health seeking behavior of women in many ways. Providing free care or conditional cash

transfer will continue to be weighed against loss of daily wages in financially staggering part of the society. Without an overall improvement in the standard of living, nothing more should be dreamt in this respect.

The effect of early registration was also evident on utilization of antenatal care. It is thought to pave way for longer period of contact between RDW and health workers. That explains higher tendency of early registered women to go for three or more number of ANC visits. A study from Syria also found the same.^[16] This finding is important, since it implies that encouraging early registration will ensure better maternal health in a long run.

A tendency for more visits was observed among educated RDWs. Although it was not statistically significant, it is worth noting as several other studies in the past recorded the role of education in deciding health seeking attitude of pregnant women.^[15,17-21] Lack of perception about the importance of antenatal care ultimately precipitates in inadequate utilization. Education, on the other hand, by imparting awareness and autonomy to the women, encourages utilization of maternal services and leads to demand for maternal health care services.

To sum up, NRHM was found to improve the extent of ante natal service coverage. More importantly, the introduction of ASHAs at the rural level seemed to have influenced the health care seeking attitude of the RDWs. It's too early to say that ASHAs have changed the face of primary health care over past few years. Setbacks are still there but it has been proved that ASHAs could play a pivotal role in improvising the health seeking attitudes of rural population. Primary care physicians should also motivate the RDWs for regular ante natal visits. At this stage of pregnancy, women are usually more receptive to their advices. This opportunity should be utilized today for the sake of a better maternal health tomorrow.

Strengths and Limitations

Evaluation of NRHM at the grass root level through a community-based approach, meticulously collected data and finding out the predictors for three ANC visits are few strengths of this study. On the other hand, dependence of the sampling procedure on the completeness of the lists of RDWs, retrieved from ASHA and AWW, is one of the limitations. Second, recall bias was not an impossible factor as the clients were asked regarding their pregnancies in this cross sectional study. Third, we did not ask for the reasons for getting less number of antenatal care visits. Elicitation of such causes would have revealed the views of the RDWs in this regard. Further research focusing on this aspect is warranted in future. In addition, a longitudinal study will help in better understanding of the role of socio demographic as well as behavioral factors for sufficient antenatal care.

Conclusion

Elder RDWs and those with early registration were found to be more likely to have at least three antenatal care visits. Encouraging

early registration and more focus on young mothers should be the thrust areas in maternal health program. Younger mothers are easily convincible, personal interaction with them on part of ASHA could bring in successful changes in behavior. Counseling for early registration should also get priorities, as it would be the first step for sufficient antenatal care visits to the health facility. Under NRHM, there is improvement in ANC coverage but health sector is yet to get 15% of the clients convinced, who are availing less care during their pregnancy. Besides, conditional cash transfer has certain limitations in Indian perspective, corruption being on of them. Until there are improvements in terms of quality of care and community participation, it will remain challenging to achieve higher coverage of ANC in rural areas. It is, therefore, recommended to focus on the predictors at individual as well as community level to bring about development in maternal health care utilization.

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