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Original Research Article

Exploring factors influencing post-partum length of hospital stay among women residing in two high priority districts of Uttar Pradesh: a quantitative study

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ABSTRACT

Background: The first hour and day following childbirth is a period of rapid change within child and mother, with a potential for immediate crises as more than half of global maternal deaths occur during the postnatal period, of which 45 percent maternal and three- quarters of neonatal deaths occur within one day after deliver. Despite of the importance of this period, less than half of mother and newborn get the checkup done in first 24 hours in the state of Uttar Pradesh in India. This quantitative study explored the factors associated with early postpartum hospital discharge.
Methods: This was a hospital-based study in which exit interviews were done using structured questionnaire from 278 recently delivered women at two randomly selected Community Health Centres of Gonda and Bareilly districts each, from Uttar Pradesh. The outcome variable was duration of hospital stay. Descriptive results were presented with comparison of factors within district, followed by bivariate analyses and linear regression was done to adjust for confounders.
Results: Longer distance of house from facility (0.07; 95 percent CI 0.04, 0.01; p<0.001), if informed about new-born care (0.49; 95 percent CI 0.01, 0.85; p 0.01), if ASHA had fewer visits to women house (-0.06; 95 percent CI -0.12, -0.1; p 0.01) were found to be the determinant of longer stay after adjusting for all variables that were found significant in bivariate analysis and were biologically plausible.
Conclusions: The present study concludes that there is lack of awareness among women and their relatives. Inadequate information provided by front line workers were some of the major factors influencing hospital stay pattern.

Keywords: High priority district, Hospital care, Length of stay, Postnatal care, Postpartum

INTRODUCTION

The first hour and day following childbirth are most crucial for both mother and new-born infant as 2/3rd of maternal and new-born deaths occur globally in the first two days after birth which testify to the inadequacy of care and its need immediately after birth.[1] Several global initiatives, including the Sustainable Development Goals, have contributed to a renewed focus on prevention of maternal and new-born mortality. Despite being relatively wealthy country, India witnesses the largest number of maternal and neonatal deaths in any single country, with over 63,000 maternal deaths and over one million neonatal deaths per year soon after childbirth.[2]

Within India, Uttar Pradesh along with other four large states of India, together account for more than half of the country's neonatal mortality, which accounts for about 14 percent of global new-born deaths.[3]

As per WHO.'s guideline for an uncomplicated delivery mother and child pair should stay under observation for 24 to 48 hours, revised in 2013 to: 'at least 24 hours' hospital stay after birth'. MOHFW has recommended a compulsory 48 hours stay post-delivery.[4,5] In spite of these guidelines only 62.4% women and 24.3% children in India receive postnatal care from health professional within 2 days of delivery, whereas just 54% women and 24.4% children in Uttar Pradesh receive postnatal care from health professional.[6,7] Despite so much of importance of the postpartum period, this period is generally neglected as rates of provision of skilled care are lower after childbirth when compared to rates before and during childbirth (WHO, 2008). The state of Uttar Pradesh has 75 districts out of which the district of Gonda and Bareilly has been identified as one of the backward districts of Uttar Pradesh by the National Institution for Transforming India (NITI aayog) and its health indicators are one of the poorest in India and study focusing on factors behind shorter hospital stay after delivery are almost nonexistence in these high priority districts.[8,9] So this study was planned which aimed at exploring factors influencing postpartum length of hospital discharge with an objective to assess reason for shorter hospital post-partum stay

Objectives of this study is to determine the duration of postpartum hospital, stay of women delivering at CHC of two high priority districts (Gonda and Bareilly) in Uttar Pradesh and to explore association of socio-demographic factors, maternal clinical profile, ANC parameters, neonatal factors and hospital factor with postpartum length of hospital stay.

METHODS

This was a quantitative, hospital based study which was carried out in community health centres (CHCs) of 2 high priority districts (Gonda and Bareilly) of Uttar Pradesh between December and March 2018. There are 19 high priority district in Uttar Pradesh as per report by NITI aayog[8]. From 19 high priority districts, 2 districts were selected randomly and later on within each of the two selected districts, two CHCs were selected randomly. A total of 278 recently delivered women were interviewed, 139 from each district and 69 from first CHC and 70 from second CHC. Once data collection of Gonda was completed, Bareilly District CHCs were visited and exit interviews were conducted with women who delivered at that site till the sample size was achieved.

Inclusion criteria

- Recently delivered women who gave consent for the study
- Study was conducted among women delivering at 2 selected CHC of Gonda and Bareilly district each.
- Only women with normal deliveries were included in the study

Exclusion criteria

- Women having undergone caesarean section or any major complication post-delivery were not included in the study.
- Those who refuse to give consent for the study.

Sample size was calculated using Open Epi, Version 3 software. Anticipated frequency was taken as 76.2 percent.[9] At 95 percent confidence interval with 5 percent precision with design effect 1, sample size was estimated as 278 recently delivered women

Study tool and data collection method

A structured questionnaire comprising open and close ended questions was used to gather information. These tools were developed in English and later translated into Hindi language. Questionnaire was divided into 2 parts; quantitative part included details about maternal socio-demographics and maternal factors whereas second part focused on neonatal factor, hospital factor and postnatal care practices. The study tools also included consent and a participant information sheet in local language. Validation of the tool was done prior to the administering it on women. Data was collected in hard copy, which was later entered into a database using Excel spread sheet. Sorting of data was done followed by cleaning and then analyses. Data was saved by making a backup file. A written consent was obtained from the respondent.

Data analysis

MS Excel was used to enter the data followed by sorting and cleaning of data. This data was later imported to STATA version 14.2 for further analysis. The descriptive analysis was presented as frequencies, percentages, mean and median as applicable. Bivariate analyses were conducted to look for association between the outcome and various factors studied (socio-economic, maternal, neonatal and health system). Subsequently, linear regression was done to adjust for confounders. The findings were presented as 95 percent CI and p-values.

Foour broad themes - socio-demographic characteristic of participants, maternal clinical profile, neonatal factor and factors related to health system for getting early discharge - were developed. Each variable under these 4 themes was compared between the two districts and presented in the form of p-values.

Following descriptive statistics, bivariate and multivariable analysis were done. Assumptions for normality, variance and collinearity were checked before or after running the tests. All the analysis was done on

log transformed outcome variable, as the outcome variable 'hours of hospital stay' was not normally distributed. Bivariate analyses were presented as crude coefficient at 95 percent CI with its p-value and adjusted coefficient was presented at 95 percent CI along with its p-value to adjust for confounders that were found statistically significant as part of bivariate analysis and those that were found to be biologically plausible for association with the outcome.

Ethical considerations

The proposal was approved by the Institutional Ethical Committee of Indian Institute of Public Health Delhi before commencing the study. Before the study started, due permission was also obtained from Chief Medical officer of selected district with the help of Technical Support unit of Uttar Pradesh. Participant information sheet and consent form was developed in local language for the study. Prior to conducting the interviews, the study objectives were explained to the participants through the sheet and written consent was obtained from the respondent. Confidentiality in every case was maintained throughout the study.

RESULTS

Data was successfully collected from a total of 278 participants, who had delivered at CHCs of Gonda and Bareilly districts of Uttar Pradesh (139 from each district). These were recently delivered women who were willing to participate, and were interviewed after taking their consent.

The mean age of participants in study was 26 years (SD 3.3 years), ranging from 18 to 35 years. A majority of them were Hindus (78%) and were reportedly living in Joint family (91%). Nearly half of these participants were illiterate. Participants' characteristics like, age of participant, family size, literacy status and age at marriage from both the districts were not similar with respect to socio-demographic variable collected as a part of study (Table 1).

Table 1: Distribution of socio-demographic characteristics of recently delivered mothers in the study.

Socio-demographic characteristics	Total, n (%) N= 278	Gonda, n (%) N= 139	Bareilly, n (%) N=139	p- value
Age in completed years - mean (SD)	26 (3.3)	26.4 (3.3)	25.5 (3.1)	0.02#
Religion of women - Hindu	217 (78.1)	111 (79.9)	106 (76.3)	0.5
Family type - Joint	255 (91.7)	127 (91.4)	128 (92.1)	0.9
Family size -mean (SD)	11.1 (3.7)	11.7 (3.9)	10.6 (3.4)	0.008#
Literacy status of women				
Illiterate	119 (42.8)	48 (34.5)	71 (51.1)	0.007#
Formal schooling	99 (35.6)	57 (41.01)	42 (30.2)	
Occupation of women - Housewife	198 (71.2)	94 (67.6)	104 (74.8)	0.3
Total live children*	3 (2-4)	3 (2-4)	2 (2-3)	0.06
Age at marriage - mean (SD)	18.9 (2.4)	18.6 (2.6)	19.2 (2.2)	0.04#

*Median with inter-quartile range was presented as the variable was not normally distributed, #p-value <0.05 was considered statistically significant

In this study 93.5 percent (n=260) women in had visited any government health for their ANC check-up but only 57 (22 percent) had their ANC check-up in first trimester of their pregnancy and only 17 (6.5 percent) had completed 4 ANC check-up. Majority of them (98 percent) had no knowledge about how many hours a woman should stay after delivery which is reflected as the median hours of stay was just 6 hours. In spite of good visits made by ASHAs they don't inform adequately to the women about birth preparedness (29% (n=65)) or importance of stay (6% (2.6%)). There were various other factors for shorter stay like poor infrastructure, medicine unavailability which were more in Gonda as compared to Bareilly. Factor like charging extra money was more in Bareilly as compared to Gonda. So, these findings indicate disparities between the districts (Table 2). Next the association of all the factors were done with the outcome of the study in which determinants of stay were longer distance of house from facility (0.07; 95 percent CI 0.04, 0.01; p<0.001), if informed about new-born care (0.49; 95 percent CI 0.01, 0.85; p 0.01), if ASHA had fewer visits to women house (-0.06; 95 percent CI -0.12, -0.1; p 0.01) were found to be the determinant of longer stay after adjusting for all variables that were found significant in bivariate analysis and were biologically plausible (Table 3).

DISCUSSION

This study was conducted in health facilities of 2 districts in Uttar Pradesh where the proportion of recently delivered women getting discharged early is quite

significant. The median duration of hospital stays among women delivering at the selected CHCs of the 2 districts was 6 hours (IQR 3-10.5), higher in Bareilly (7 hours) as compared to Gonda (5 hours). Only 6(2.6 percent) of the women have said that ASHAs informed them about importance of hospital stay after childbirth. Findings shows that 150 (53.9 percent) and 74 (26.6 percent) women have mentioned about poor hospital facility and poor hospital infrastructure as a factor for getting early discharge. 39 (30.4 percent) respondents have also mentioned about medicine unavailability and 106 (82.8 percent) women had stated un-hygienic condition of ward as one of the deciding factors for them to get discharged early. These results corroborate with result in an article which was a secondary data analysis from nationally representative survey of 92 countries and 30 LMICs where it was reported that familial dimension and health related factors were drivers of inappropriately short or long hospitalstays.[10] It was observed that some things were similar in both the districts' health facilities, such as staff scarcity because of which patients are at times left unattended after the delivery and health staff seldom inform women about new-born care as just 69 (24.8 percent) women stated that they were being informed about new-born care. Various other studies have also reported that hospital factors like small size of ward, unavailability of basic facilities and social and familial support were found to be an influencer of early hospital discharge.[11,12] Socio-demographic factors such as older age of the women, living in joint family with more small children were found to be a barrier for hospital stay. A similar response was obtained from qualitative section of study which reported familial issues as a factor for getting early discharge. These findings were found in accordance with an article from United States which reported that socio-demographic characteristics as well as if mother is clinically well may influence them to get early discharge from hospital.[13]

Table 2: Distribution of the maternal ANC status, Neonatal factor and various health system related factors for getting early discharged.

Factors for getting early discharge	Total, n (%) N= 278	Gonda, n (%) N= 139	Bareilly, n (%) N=139	p value
Health facility visit for ANC	260 (93.5)	131 (94.2)	129 (92.8)	0.6
Government and VHND visit[1]	240 (92.3)	118 (90.8)	122 (94.6)	0.17
1st trimester visit for first ANC[1]	57 (22)	25 (19.1)	32 (25)	0.001#
At least 4 ANC visit[1]	17 (6.5)	12 (9.2)	5 (3.9)	0.004
Pregnancy complications	31 (11.2)	14 (10)	17 (12.2)	0.6
Delivery complication	23 (8.3)	21 (51.1)	2 (1.4)	<0.001#
Knowledge among women about duration of stay after delivery less than 48 hour	272 (98)	135 (97)	137 (99)	0.4
Sex of newborn- Male	139 (50)	75 (53.9)	64 (46.1)	0.18
Birth weight - ≤2500	87 (31.3)	43 (30.9)	44 (31.7)	0.9
Gestational age- ≤37 weeks	42 (15.1)	19 (13.7)	23 (16.6)	0.5
Complications among newborn after delivery	73 (26.2)	34 (24.5)	39 (28.1)	0.5
Distance of CHC from home*	9 (6-13)	8 (5-13)	9.5 (6-13)	0.4
Duration of hospital stay post-delivery*	6 (3-10.5)	5 (3-10)	7 (3-11)	0.05#
ASHA visit during ANC	227 (81.7)	115 (82.7)	112 (80.5)	0.6
ASHA informed about birth preparedness[2]	65 (28.6)	29 (25.2)	36 (32.1)	0.24
ASHA informed about danger sign[2]	3 (1.3)	2 (1.7)	1 (0.9)	0.6
ASHA informed about importance of hospital stay after delivery[2]	6 (2.6)	2 (1.7)	4 (3.6)	0.4
Family related issues	215 (77.3)	111 (80)	104 (74.8)	0.3
Poor hospital infrastructure	74 (26.6)	73 (52.5)	1 (0.7)	<0.001#
Poor hospital facility	150 (53.96)	65 (46.7)	85 (61.2)	0.01#
Satisfactory hospital care	94 (33.8)	52 (37.4)	42 (30.2)	0.04#
Unhygienic ward &labour room[3]	106 (82.8)	58 (78.3)	48 (88.9)	0.12
Medication unavailability[3]	39 (30.4)	34 (45.9)	5 (9.3)	<0.001#
Health staff charged extra money[3]	52 (40.6)	0 (0)	52 (96.3)	<0.001#
Health staff not cooperative	66 (23.7)	24 (17.3)	42 (30.2)	0.01#
Health professional helpful & caring	190 (68.4)	100 (71.9)	90 (64.8)	0.2
Health provider informed about newborn care	69 (24.8)	22 (15.8)	47 (33.8)	0.001#
Health provider informed about immunization of child	11 (3.9)	5 (3.6)	6 (4.3)	0.7

*Median with inter-quartile range was presented as the variable was not normally distributed, #p-value <0.05 was considered statistically significant and significant at 1% level of significance, [1]N= Total- 260; Gonda- 130/Bareilly-129, [2]N= Total- 227; Gonda- 115/Bareilly-112, [3]N= Total- 128; Gonda- 74/Bareilly-54

Table 3: Association of "hours of hospital stay" with socio-demographic factor, maternal factor, neonatal factor and other hospital related factor.

Variable		Crude coefficient*			Adjusted coefficient$		
		B Coeff.	95% CI	p-value	B Coeff.	95% CI	p-value
Age in completed years		-0.05	(-0.08 ,-0.03)	<0.001^	-0.01	(-0.07, 0.05)	0.7
Religion of women	Hindu	Ref.			Ref.		
	Muslim	-0.2	(-0.42 , 0 .03)	0.07	-0.07	(-0.5, 0.3)	0.7
Family type	Joint	Ref.			Ref.		
	Nuclear	-0.37	(-0.7, -0.03)	0.03#	0.18	(-0.46, 0.8)	0.6
Family size		0.012	(-0.013, 0.04)	0.34	--	--	--
Literacy status of women	Illiterate	-0.13	(0.55, 0.28)		0.05	(-0.40, 0.5)	
	No formal education	0.18	(-0.28, 0.63)		-0.05	(-0.61, 0.52)	
	Formal schooling	-0.14	(-0.43,0.41)	0.15	-0.04	(-0.49,0.39)	0.9
	College/ graduate	Ref.			Ref.		
Occupation of women	Housewife	Ref.			Ref.		
	Farming	-0.08	(-0.34, 0.18)	0.8	-0.01	(-0.43, 0.22)	0.43
	Employed	-0.03	(-0.3, 0.24)		-0.2	(-0.5, 0.13)	
Total live children		-0.12	(-0.19, -0.05)	0.001#	0.03	(-0.15, 0 .18)	0.9
Age at marriage		0.01	(-0.03, 0.05)	0.68	-	-	-
Health facility visit for ANC	No	Ref.	(-0.13, 0.62)	0.19	-	-	-
	Yes	0.25					
Type of facility visit	Government and VHND visit	Ref.			-	-	-
	Private facility visit	-0.06	(-0.42, 0.3)	0.7			
First ANC visit	1st trimester	Ref.			Ref.		
	2nd trimester	-0.3	(-0.5, -0.07)		-0.21	(-0.6, -0.12)	
	3rd trimester	-0.7	(-1.05, -0.3)	<0.001^	-0.13	(-0.7, -0.41)	0.44
Total ANC visit	1 to 2 times	-0.12	(-0.5, 0.27)	0.28	-	-	-
	3 to 4 times	0.05	(-0.35, 0.46)				
	More than 4 times	Ref.					
Pregnancy complications	No	Ref.			-	-	-
	Yes	0.19	(-0.09, 0.49)	0.18			
Delivery complications	No	Ref					
	Yes	-0.18	(-0.51, 0.16)	0.3	0.06	(-0.19, 0.6)	0.3
Knowledge among women about duration of stay	<48 hour	Ref.			Ref.	(-2.1, 1.6)	
	≥48 hour	0.12	(-0.5, 0.7)	0.7	-0.33		0.7
Sex of newborn	Male	Ref.			-	-	-
	Female	0.05	(-0.14, 0.23)	0.64			
Birth weight	>2500	Ref.			Ref.		
	≤2500	0.29	(0.09, 0.5)	0.003#	-0.27	(-0.7, 0.15)	0.2
Gestational age of newborn	>37 week	Ref.	(-0.26, 0.26)		-	-	-
	≤37 week	0.003		0.98			
Complication among newborns after delivery	No	Ref.			Ref.		
	Yes	0.21	(-0.005, 0.42)	0.05#	-0.1	(-0.5, 0.5)	0.7
Breastfeeding initiated	No	Ref.			Ref.		

Variable		Crude coefficient*			Adjusted coefficient$		
within one hour	Yes	0.07	(-0.13, 0.25)	0.51	0.16	(-0.12, 0.44)	0.3
Distance of CHC from home (kms)		0.09	(0.07, 0.11)	<0.001^	0.07	(0.04, 0.1)	<0.001^
Asha visit during ANC	No	Ref.			-	-	-
	Yes	0.15	(-0.08, 0.39)	0.19			
Number of visits made by asha during pregnancy		-0.004	(-0.05, 0.04)	0.82	-0.06	(-0.12, -0.1)	0.01#
Asha informed about birth preparedness	No	Ref.			Ref.		
	Yes	0.29	(0.07, 0.5)	0.009#	0.15	(-0.15, 0.5)	0.4
Asha informed about danger sign	No	Ref.			-	-	-
	Yes	0.6	(-0.27, 1.4)	0.18			
Asha informed about importance of hospital stay after delivery	No	Ref.			-	-	-
	Yes	-0.30	(-0.94, 0.34)	0.352			
Family related issues	No	Ref.					
	Yes	-0.14	(-0.36, 0.08)	0.22	-0.19	(-0.6, 0.17)	0.23
Poor hospital infrastructure	No	Ref.			Ref.		
	Yes	-0.56	(-0.76, -0.36)	<0.001^	-0.17	(-0.6, 0.27)	0.43
Poor hospital facility	No	Ref.			-	-	-
	Yes	-0.01	(-0.19, 0.18)	0.94			
Satisfactory hospital care	Yes	Ref.			Ref.		
	No	0.17	(0.3, 0.4)	0.01	0.27	(-0.26, -0.5)	
	Not sure	-0.3	(-0.79, -0.15)		-0.06	(-0.5, -0.4)	0.55
Un-hygienic ward and labour room	No	Ref.		0.85	Ref.		
	Yes	-0.04	(-0.39, 0.32)		-0.07	(-0.5, 0.4)	0.7
Medication unavailability	No	Ref.			Ref.		
	Yes	-0.49	(-0.76, -0.21)	0.001#	-0.2	(-0.6, 0.16)	0.3
Staff charged extra money	No	Ref.			Ref.		
	Yes	-0.29	(0.02, 0.55)	0.03#	-0.12	(-0.49, 0.5)	0.6
Staff not cooperative	No	Ref.			Ref		
	Yes	-0.08	(-0.29, 0.14)	0.48	-1.3	(-0.6, 0.01)	0.1
Health professional helpful AND caring	No	Ref.			-	-	-
	Yes	-0.14	(-0.34, 0.06)	0.17			
Health provider informed about newborn care	No	Ref.			Ref.		
	Yes	0.92	(0.74, 1.11)	<0.001^	0.49	(0.01, 0.85)	0.01#
Health provider informed about immunization of child	No	Ref.	(0.08, 1.02)	0.02#	Ref.	(-1.2, 1.2)	0.8
	Yes	0.55			0.1		

*t test and chi square test was done to check for association and crude coefficient is presented at 95 percent CI with its p-value, $Linear regression was done with factors that was found significant in bivariate analysis and those factors that were biological plausible. #p-value <0.05 was considered statistically significant, ^Significant at 1% level of significance

Factors such as first ANC visit along with total ANC visit, having any delivery complication was found to be significantly different between districts. These results were similar to those of other studies which reported that parity and birth related factors, ANC parameters and maternal clinical profile were strongest predictors for early discharge.[11,12,14]

Inadequate care as well as information given by health professional after delivery was also found to be more influential factors in the present study as this information will not only give moral support but also it will help them to change the behavioural pattern that they have.

These findings were similar to those in the articlewhich states inadequate prenatal care, and care by midwives are some of the main reason for getting early discharge.[15] At the end of all analysis shorter distance of CHC from home, more visits made by ASHA during pregnancy and no information provided by health provider to women about new-born care were found to be significant factors leading to early hospital discharge.

These results corroborate with result in an article which was a secondary data analysis from nationally representative survey of 92 countries and 30 LMICs where it was reported that familial dimension and health related factors were drivers of inappropriately short or long hospitalstays.[10] The final finding of the study stated that the distance of hospital from home, lesser number of visits ASHA have made during whole pregnancy and if health provider has informed women about new-born care was found to be a significant factor leading to early hospital discharge.

In qualitative section nurses have mentioned that closer the women stay from hospital, the earlier they would want to get discharged from hospital after delivery. Similar findings were found in a study which was a secondary data analysis on 28,469 maternal medical records found that length of stay depends on place of residence and its distance from health centre, education of the mother as well as care and information given by hospital staff.[11]

There were various important factors related to ASHA visit and information provided by ASHAs but there were no similar studies found which would have involved such findings so as to corroborate this finding with present study result.

There were some possible biases as this was an exit interview and ability to recall was a major factor which was tried to minimize other biases were minimized as data was collected by single investigator so inter-observer variability has been avoided**.** This was a hospital-based study, but a community-based study would be able to give a more comprehensive picture of the issue.

CONCLUSION

The present study concludes that there is lack of awareness among women and their relatives about importance of hospital stay after delivery of new-born. Old traditional belief and trends are still ingrained in the mind of the society. Familial factors like working status of family members and availability of adequate services like bed availability, electricity, drugs, cleanliness of ward and space for their attendants to live in hospital were found to be a major factor influencing the health seeking pattern.

Major finding emerged from the study for shorter stay was-shorter distance of CHC from home, more visits made by ASHA during pregnancy and no information provided by health professional after delivery of new-born. Health system and other health professional factors are some of the important issues influencing hospital stay pattern.

Strengthening of health facility to make facilities available and maintenance of amenities and infrastructure. Staff should be motivated for patient centered approach which reduces the barrier of staff related issues for hospital stay. Front line workers and staff nurses should be trained to provide context specific counseling and motivation to beneficiaries. Handholding and mentoring of ASHAs is needed to upgrade their knowledge and mentoring skills. Basic facilities like food and waiting room to be made available at health centers for ASHAs and attendants.

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