

“Does ASHA make any difference in utilizing maternal health care services in India? Study based on National Rural Health Mission (NRHM)”

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Abstract

Background: Maternal health care services utilization depends upon various socio-economic, demographic and cultural factors. But availability and accessibility are another important factor which determined the extent of health care utilization.

Aims: This study tries to assess the role of ASHA in utilizing maternal health care services and see the level of awareness about the benefits given to JSY scheme and utilization of those benefits by using data from National Rural Health Mission (NRHM) initiated by the Government of India in 2005.

Methodology: Data collected for concurrent evaluation of National Rural Health Mission (NRHM) in 2009 was used. The analysis was done only on women who have given any birth since January 2005. The total sample comes around 78,205 women at reproductive age. Socio-economic and demographic characteristics and work done by ASHA were used as an explanatory variable to access the maternal health care utilization. The Chi-square test and "binary logit" model was used for analysis.

Result: A unit increase in referral facility by ASHA or any other health personnel, increases the probability of institutional delivery by 2.03 times ($p < 0.001$). While if ASHA arranged or helped in arranging transport facility increases the probability of institutional delivery 1.67 times ($p < 0.01$) than if she is not organizing transport service. If ASHA discusses about JSY, institutional delivery/approaches to get register than the probability of getting TT injection are 0.61, 1.88 and 1.64 times higher than that if she did not discuss those facilities. The probability of Awareness about JSY was significantly lower among age 30-39 years (OR 0.89; $P < 0.001$) in India. The probability of Awareness about JSY was less among the wealthiest quintile (OR .53; $P < 0.001$). Awareness about ASHA is 1.09 times higher among higher age group women and Christian ($p < 0.001$). Probability of benefits from JSY schemes is 1.25 ($p < 0.001$) times greater among women who get married after 18 years.

Conclusion: ASHA plays a significant role in using maternal health care facility. Results clearly show that the work done has a significantly positive impact on maternal health care utilization. If ASHA facilitated to get JSY card, then the probability of getting more than one TT injection are increased. Similarly, the probability of institutional delivery also increases if ASHA arranged or helped in arranging transport facility.

Key words: Institutional delivery, JSY beneficiaries, Referral facilities

Background

Maternal mortality, infant and child mortality is one of the major health indicators of development. India has large population and majority are from reproductive age group. There is enormous disparity has been observed in Indian health care system and its performance (Evans, D B; Tondan, a; Murray, C J; Lauer, Ja, 2011; Golechha, Mahaveer, 2015). Soon after the Independence government of India realizing the importance of maternal and child health care services, and took steps to strengthen in 1st and 2nd five-year plans. India is known as the first country to initiate family planning program in the world. The primary objective of the family planning was to improve maternal health. In the past decade, the other health indicator which is life expectancy at birth has been observed remarkable improvement. But still maternal mortality is high in India, and some of its states have much higher MMR and IMR compared to national averages. Maternal health care services utilization depends upon various socio-economic, demographic and cultural factors. But availability and accessibility is another important factor which determined the extent of health care utilization. In the year 2010, India recorded 57000 maternal deaths which are still very high (WHO, 2015; Hogan, M. C., 2010). The 4th and 5th MDGs, 5th goal are also talking about an improvement in maternal health. To improve health care system and its deliverance of services towards general population. (MGD goals India, 2013; Pandve H. T., 2015).

According to RGI estimates for the year 2000 maternal mortality were 407 per 100000 live births (Annual Report, MoHFW 2002). A low- level of maternal health care utilization in rural India shows correlation with both various socio-economic factors and accessibility to health facilities; however the association has been stronger with socio-economic factors than the accessibility to health care facilities (Paul, B. K., 2002). Many researchers find that mother age and education have a strong effect on the maternal health care utilization (Sugathan et al., 2001; Shariff and Singh, 2002). Access to a local health care facility has significantly increased maternity care use, and utilization of antenatal services is very low, only 10.3% of the women had more than three antenatal check-ups. ANC has a larger influence on safe delivery than any other factors (Mishra, V et al, 2008; Baba et al., 2013). In developed countries such as Italy has excellent antenatal practice 99% women visited to doctor at least three times during pregnancy. Ninety-nine and ninety-eight percent of women received TT injection and IFA tablets respectively (S. Sumithra et al., 2006). Accessibility of emergency obstetric care has a significant impact on to improve pregnancy-related acute renal failure especially in rural areas (Arora et al., 2010). It could be possible by giving emergency referral and transport facility in the area.

After 67 years of independence, Indian economy substantially goes up, but government expenditure on health is still very less compare to many other developing countries. Health indicators are still fragile, especially maternal deaths are high, particularly in rural areas. Other than socio-economic and demography factors awareness, acceptability, affordability and accessibility are the important factors which strongly influence the maternal health care utilization. Maternal health is one of the important health indicators therefore Government of India poured lots of funds and initiated National Rural Health Mission (NRHM) in 2005. Considerable improvement was observed in maternal health. In India pregnancy and childbirth have social and cultural aspects, however still a considerable number of births are taking place at home without any skilled health personnel, this is one of the major reasons for high maternal and infant death. In the present study, we try to see how this "Accredited Social Health Activist" (ASHAs) works to influence the eligible women for going safe or institutional delivery. Another thing is that how many women are aware of ASHAs in their area?

Aims

The specific objectives of this study are as below:

To assess the role of ASHA in utilizing maternal health care services.

To see the level of awareness among mothers about benefits given to JSY scheme and utilization of that benefits.

Methodology

For this study, we used data from National Rural Health Mission (NRHM) initiated by the Government of India in 2005, which was collected in August 2009 for concurrent evaluation of the program. The main objective of this program was to address the basic health care need to the underserved rural population. This program was started with the aim to provide, better and improve health care system by decentralization, structural organization, inter-sectoral convergence and by integrating and mainstreaming the different system of medicines in India. With the goal of 100% institutional or safe delivery, the Ministry of Health & Family Welfare, the Government of India implemented Janani Suraksha Yojana (JSY) in 2005. ASHA is the most important link which was introduced under this scheme because she is the one who connects the administrative level to the grassroots level, people. ASHA should be the person who belongs to the community and accountable for the monitoring of maternal health care, and her job is to spread awareness regarding family planning, Antenatal care (ANC), Neonatal care (NC), Postnatal care (PNC) and institutional delivery as well as taken women to the health institution. This survey collected data from 213,067 eligible women (aged 15 to 49 years) but in the present study we have made only, women who have given any birth since January 2005, the total sample comes around 78,205 women.

Descriptive statistics, bivariate analysis, Chi-square test and binary logistic regression model have been used for analysis. For the first objective, maternal health care services were taken as independent variable and different work done by ASHA is used as explanatory. For the first, Chi-square test was employed to assess the association between ASHA's work and health care services utilization. In the second objective, binary logistic regression analysis was used to measure the maternal health care utilization by background characteristics and further work done by ASHA was used as explanatory variable to explain the level of utilization of maternal health care services. Stata12 software was used for statistical analysis. Dependent variable used in this study is dichotomous. Hence, we used the binary logit model for predicting the probability of using maternal health care. This model predicts the logit that is the natural log of the odds of having an event. Mathematical expression of this model is as follow;

$$\ln(\text{ODDS}) = \ln\left(\frac{\hat{p}}{1-\hat{p}}\right) = a + bX$$

Where, \hat{p} is the predicted probability of the event, which is code with 1 (using maternal health care services) rather than 0 (not using maternal health care services). X is the predictor of the event.

Background of the respondent is presented in the table 1. Socio-economic and demographic characteristic of the of the women and household are major factors which influence the maternal health care utilization, further cultural practices and belief also play a significant

Table-1 Background characteristics of the respondents

Background characteristics	%	No
<i>Age</i>		
15-20	11.5	8,997
21-29	62.25	48,674
30-39	23.64	18,488
40-49	2.62	2,046
<i>Age at marriage</i>		
below 18 years	62.08	48,553
above 18 years	37.92	29,652
<i>Education</i>		
Never	41.51	32,463
1 to 8 years of schooling	35.21	27,531
9 and above years of schooling	23.29	18,210
<i>working status</i>		
Not working	74.65	58,381
Working	25.35	19,824
<i>Religion</i>		
Hindu	71.52	55,936
Muslim	8.45	6,609
Christian	16.78	13,119
Others	3.25	2,541
<i>wealth quintile</i>		
Poorest	25.21	19,726
Poor	16.98	13,280
Middle	17.81	13,932
Rich	19.99	15,634
Richest	20	15,641
Total	100	78,205

role in this. As regards to the age of the respondents, 62 percent are from 21 to 29 years of age group and interestingly 62 percent of the women reported that they get married before the age 18 years. Around 41 percent of the study respondent was not educated, which is quite important factor of being aware about rights and available facility in the community. Only 35.21 percent of them are have 1 to 8 years of schooling and 23.29 percent are reported to have 9 or above years of schooling. Seventy-five percent women are not working and 25.35 percent reported to currently working or worked during last 12 months. Majority, 71.52 percent women are Hindu followed by Christian 16.78 percent, Muslim 8.45 percent and others 3.25 percent. One-fourth of the respondent is from poorest household. Seventeen percent and 17.81 percent are belonging to the poor middle household respectively. However, twenty percent are from rich and 20 percent are from richest household.

Results

To see the association between indicators of maternal health care with work done by AHSAs, Chi-square test was used. Every work or facility (included in this study) provided by ASHA is strongly associated with institutional delivery. But it was much higher when ASHA helped women in getting register for JSY scheme.

Table-2 Association between work done by ASHA and maternal health care utilization, India

Role of ASHA	Place of delivery		Get TT injection		Number of getting TT injection during pregnancy		Doctor was present at the time of delivery	
	No	Yes	No	Yes	One	Two or more	No	Yes
ASHA Discussed about JSY								
No	20.23	79.77	13.46	86.54	12.13	87.87	25.36	74.64
Yes	15.15	84.85	8.51	91.49	8.70	91.30	21.45	78.55
χ^2 value	51.01 ^{***}		298.02 ^{***}		133.69 ^{***}		20.83 ^{***}	
ASHA discussed about institutional delivery								
No	19.23	80.77	13.58	86.42	11.34	88.66	23.28	76.72
Yes	15.18	84.82	7.67	92.33	9.25	90.75	22.43	77.57
χ^2 value	35.02 ^{***}		415.35 ^{***}		48.89 ^{***}		1.05	
ASHA approaches to get register in JSY scheme								
No	21.06	78.94	3.73	96.27	7.59	92.41	23.54	76.46
Yes	14.60	85.40	3.64	96.36	7.51	92.49	20.83	79.17
χ^2 value	156.74 ^{***}		0.10		0.04		15.46	
ASHA worker facilitated to get JSY card								
No	6.73	93.27	3.69	96.31	7.39	92.61	23.94	76.06
Yes	3.36	96.64	2.81	97.19	6.10	93.90	17.90	82.10
χ^2 value	45.30 ^{***}		3.85 [*]		3.98 ^{**}		29.97	
ASHA or any other health personal give referral								
No	6.42	93.58	3.56	96.44	7.19	92.81	22.22	77.78
Yes	3.17	96.83	3.08	96.92	6.22	93.78	22.57	77.43
χ^2 value	46.79 ^{***}		1.57		3.22 ^{**}		0.17	
ASHA arranged transport facility								
No	4.47	95.90	3.41	96.59	6.89	93.11	22.15	77.85
Yes	5.47	94.53	3.95	96.05	7.84	92.16	23.42	76.58
χ^2 value	26.57 ^{***}		1.27		1.88		1.33	

Note:- * $p < 0.01$, ** $p < 0.05$, *** $p < 0.000$

The Chi-square value (156.74, $p < 0.000$) of institutional delivery and ASHA's help in getting register for JSY is showing there is strong relation between two. From the table 2, it was clear that, there is a significant relation between getting TT injection (298.02, $P < 0.000$) and ASHA's discussion about JSY or institutional delivery (415.35, $P < 0.000$).

Also getting TT injection is significantly associated when ASHA facilitated to getting JSY card (3.85, $p < 0.05$). Whereas, other variables related to ASHA are not significantly associated with the women who are getting TT injections. Further ASHA's discussion about JSY and institutional delivery is significantly associated with getting the two or more injections (133.69, $p < 0.000$). Referral facility (3.98, $p < 0.05$) and help in getting JSY card (3.22, $p < 0.07$) is also significantly associated to getting two or more TT injections. When we see the association between the presence of doctors at the time of delivery and different work done by ASHA, only one variable, ASHA's discussion about JSY is come to be significantly associated with the presences of doctors at the time of delivery (20.83, $p < 0.000$). And all other work of ASHA is not showing significant association with the presences of doctors at the time of delivery.

Table-3 Probability ratio based on binary logistic regression analysis showing awareness and benefits utilization under JSY scheme by background characteristics

Background characteristics	Awareness about ASHA and JSY			Getting benefits of JSY		
	Aware about JSY	Heard about ASHA	Beneficiary of JSY scheme	registration of pregnancy	Get money at the time of ANC check-ups	Difficulty in getting money
<i>Age</i>						
15-20 [®]						
21-29	0.97	1.16 ^{***}	0.72 ^{***}	1.15	0.74 ⁺	1.05
30-39	0.89 ^{***}	1.43 ^{***}	0.46 ^{***}	1.26 ⁺	0.33 ^{***}	0.93
40-49	0.71 ^{***}	1.46 ^{***}	0.72 ^{***}	1.31	0.71	0.7
<i>Age at marriage</i>						
Below 18 years [®]						
Above 18 years	0.99	1	1.25 ^{***}	1.17 ⁺	0.78	0.75 ^{***}
<i>Year of schooling</i>						
Never [®]						
1 to 8 years of schooling	1.16 ^{***}	1.03	1.28 ^{***}	1.23 ^{**}	0.98	0.99
9 and above years of schooling	1.05 ^{**}	1.03	1.32 ^{***}	1.14	1.25	0.88
<i>Working status</i>						
Not working [®]						
Working	1.30 ^{***}	0.99	1.13 ^{***}	1.19 ⁺	0.57 ^{***}	1.10
<i>Religion</i>						
Hindu [®]						
Muslim	0.78 ^{***}	0.94 ^{**}	0.50 ^{***}	0.97	0.8	1.09
Christian	0.31 ^{***}	1.09 ^{***}	0.40 ^{***}	1.15	0.32 ^{***}	0.76 ⁺
Others	0.27 ^{***}	0.75 ^{***}	0.57 ^{***}	1.04	1.37	1.20
<i>Wealth quintile</i>						
Poorest [®]						
Poor	1.04	0.99	0.95	1.17	0.88	1.07
Middle	0.90 ^{***}	0.84 ^{***}	0.99	1.11	1.01	0.95
Rich	0.68 ^{***}	0.55 ^{***}	1.10 ^{***}	1.30 ^{**}	0.75	0.74 ^{***}
Richest	0.53 ^{***}	0.48 ^{***}	0.94 ⁺	1.37 ^{***}	0.85	0.78 ^{**}

Note:- * $p < 0.01$, ** $p < 0.05$, *** $p < 0.001$

In the table 3, the analysis was done separately for the entire four benefits (Beneficiary of JSY, Registration of pregnancy, Get money at the time of ANC check-ups and Difficulty in getting money) of the scheme and two awareness related outcome variable (Aware about JSY, Aware about ASHA) of the National Rural Health Mission in India. The result obtained from the analysis has been presented in the form of probability ratio (table 3). The probability ratios $[\exp(\beta)]$ represent probability that an outcome will occur given a particular exposure, compared to the probability of the outcome occurring in the absence of that exposure. The probability of Aware about JSY were significantly lower among age 30-39 years (OR 0.89; $P < 0.001$) in India. The pattern was similar in age group 40-49 years (OR 0.71; $P < 0.001$) lower and highly significant. Household wealth quintile and women educational attainment were other significant determinants of Aware about JSY. The probability of Aware about JSY were lower among the wealthiest quintile (OR .53; $P < 0.001$). The probability of Aware about JSY was 1.16 ($p < 0.001$) among those who were educated, 1 to 8 years of schooling, 1.05 ($p < 0.01$) among those who have 9 and above years of schooling comparison to those who attained never education. Similarly probability of awareness about ASHA is higher among higher age group women and Christian 1.09 ($p < 0.001$).

When we are talking about benefits received under the JSY schemes, probability of benefits from JSY schemes is 1.25 ($p < 0.001$) times higher among women who get married after 18 year of age, it is also 1.28 ($p < 0.001$) times higher among women have 1 to 8 year of schooling and 1.32 ($p < 0.001$) times higher among women with 9 and above years of schooling compare to women who never attended school. Those women who are working have 1.13 ($p < 0.001$) times higher probability of getting benefits of JSY scheme. Further women belongs to the religion other than Hindu are less likely to get benefits from JSY. Interestingly women from rich household are more likely to get benefits (1.10, $p < 0.001$) than poorest household and women from poor and middle household are less likely to get benefits from JSY, Hence women from richest household also (0.95, $p < 0.05$) less likely to get benefits from JSY. To see the level of pregnancy registration by background characteristics of the women, we observe that almost all variables are coming out significant expect women education and religion. Women from age 30-39 are more likely to go for pregnancy registration (1.26, $p < 0.05$). The women who got married after age 18 years are more likely (1.17, $p < 0.05$) to go for pregnancy registration than those who got married before the 18 years of ages. Similarly years of schooling is another important predictor of getting for pregnancy registration. Women with 1 to 8 years of schooling are significantly more likely (1.23, $p < 0.01$) to go for pregnancy registration than women who never attended school. Women having 9 or more year of schooling are also more likely to go for pregnancy registration but result is statistically not significant. Further, working women are more likely (1.19, $p < 0.05$) to go for pregnancy registration than their not working counter parts. Religion of the women is statistically not having any significant role in pregnancy registration, but economic status of the household play a major as a predictor of pregnancy registration. Women from rich wealth quintile are (1.30, $p < 0.01$) more likely to go for pregnancy registration than the women from poorest wealth quintile. Similarly women from richest wealth quintile are also more likely (1.30, $p < 0.001$) to go for pregnancy registration than the reference category.

In terms of monetary benefits from JSY scheme, women were asked that whether they get any cash or monetary help at the time of ANC or not. Result from binary logistic regression explains that the women from higher age group are less likely to get money at the time of ANC check-ups. Women from age group 21 to 29 are less likely (0.74, $p < 0.05$) to get money at the time of ANC check-ups than the women age group 15 to 20 years of age. And women from age group 30 to 39 years of age are also less likely (0.33, $p < 0.001$) to get money at the time if ANC check-ups. Women having 9 or more years of schooling are more likely to get money but this result is statistically not significant. Further, working women are less likely (0.57, $p < 0.001$) to get money at the time of ANC check-ups. Interestingly Christian women are less likely (0.32, $p < 0.001$) to get money than the Hindu women but women from other religious group

are more likely to get money at the time of ANC check-ups than the Hindu women but this is statistically not significant. Many women reported having difficulty in getting money from the JSY scheme. Women who got married after the age of 18 years are having less difficulty in getting money than the women who got married before the age 18 years. Similar to getting money at the time of ANC check-ups, Christian women are having (0.76, $p < 0.05$) less difficulty than the Hindu and other women are more likely to face difficulty in getting money but the result is not statistically significant. Rich and richest women are less likely to have difficulty in getting money than the women from poorest household.

Table-4 Probability ratio based on binary logistic regression analysis showing maternal health care utilization by various works done by ASHA

Role of ASHA	Place of Delivery	Get TT injection	Number of TT injection	Doctor was present at the time of delivery
ASHA Discussed about JSY				
No [®]				
Yes	1.20	0.61*	1.24	0.91
ASHA discussed about institutional delivery				
No [®]				
Yes	0.76	1.88**	1.19	0.95
ASHA approaches to get register				
No [®]				
Yes	1.09	1.64**	0.97	1.46***
ASHA worker facilitated to get JSY card				
No [®]				
Yes	1.38	0.99	1.35*	1.24*
ASHA or any other health personal give referral				
No [®]				
Yes	2.03***	1.40	1.03	0.79**
ASHA arranged transport facility				
No [®]				
Yes	1.67*	0.82	0.84	1.07

Note:- * $p < 0.01$, ** $p < 0.05$, *** $p < 0.001$

In order to understand the impact of different work done by ASHA on the maternal health care utilization, we used multivariate analysis. Since our response variable was binary in nature (1= benefits under JSY scheme and 0=otherwise and so on), we applied binary logistic regression analysis. Result shown in the table 4 explains that a unit increase in referral facility by ASHA or any other health personnel increases the probability of institutional delivery by 2.03 times more ($p < 0.001$). While if ASHA arranged or helped in arranging transport facility increases the probability of institutional delivery is 1.67 time more ($p < 0.01$) than if she is not arranging transport facility (Prinja, et al, 2014). Further, if ASHA discusses about JSY scheme, institutional delivery or approaches to get registered than the probability of getting TT injection is 0.61, 1.88 and 1.64 times higher than if she did not discuss about it. But number of getting TT injection depend only if ASHA facilitate in getting the JSY card, probability of getting more than one TT injection is 1.35 times higher ($p < 0.01$) among those who get facilitated by ASHA to getting JSY card. Probability of having a doctor at the time of delivery are 1.46 times higher

($p < 0.001$) if ASHA approaches to get register to the women in health institutions as compared to those who didn't approached by ASHA. Similarly if ASHA facilitate in getting JSY card to the women, probability of the doctor's presence, increase 1.24 times more ($p < 0.01$) than those who didn't get JSY card.

Conclusion

Results show that work done by ASHA has great influence on maternal health care utilization in India. But the results also show that still substantial numbers of needed population are far from the utilization of these services. Place of delivery is significantly influenced by referral and transport facility arranged by ASHA (Sharma 2009). If ASHA discussed with women about JSY, institutional delivery and if she helps to get registered at health institutions then chances of getting TT injection have also increased. If ASHA facilitated to get JSY card, then probability of getting more than one TT injection are increased by 1.35 times higher. Similarly probability of presence of a doctor at the time of delivery is increases. On the bases of present study it seems that the role of ASHA has significant impact on utilizing maternal health care. But there is a need to spread awareness about JSY schemes and its benefits so that more and more eligible women can get benefited from the JSY scheme and get better maternal health care services.

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