

Study on Maternal Health Care Services in the Eastern Indian States

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ABSTRACT The aim of the present study was to investigate the maternal healthcare services in Eastern Indian States (West Bengal, Odisha, Jharkhand, Bihar). The present study also tried to understand the effect of socio-economic and demographic factors in the utilization of maternal health care services in the above mentioned states of India, using NFHS-4 data. The present study considered only those women who conceived baby within last five years. All the study women were married and the age range was 15-49 years. Total sample size consisted of 170995 of ever married women. For statistical analysis, Pearson Chi-square test and Binary logistic regression were performed. The present study revealed that statistically significant difference in utilization of maternal health care services were present among women of different Eastern Indian states. The present study also depicted that residential pattern, caste, religion, respondent's occupation, respondent's age, respondent's educational attainments, Wealth Index had significant association with maternal health care services.

INTRODUCTION

Women play vital roles in growth and development of human society. In developing countries like India, women are dying due to pregnancy related problems that are easily preventable. Two-thirds of maternal deaths (201,000) occurred in Sub-Saharan Africa and 66,000 maternal death occurred in South Asia regions (Roser and Ritchie 2013). The study highlighted that approximately 529000 women died due to pregnancy related causes and 99 percent of maternal death occurred in developing country (Nour 2008). Nearly one quarter of all maternal deaths in the world was contributed by India. India not only missed its target but also imperilled the

global achievement of the Millennium Development Goal of Reducing maternal mortality by 75 percent from 1990 by 2015, due to its insufficient progress in reducing maternal mortality. Trained medical assistance were absent nearly 52 percent of all child birth cases in India. The condition is worse in Uttar Pradesh and Bihar where nearly three-fourths of women gave birth without attendance of trained medical professionals (Singh et al. 2009). Jaswal (2020), depicts that in India a large number of women age 19-29 years would die during or before childbirth. Alkema et al. (2015) found that in between 1990 and 2015, global maternal mortality fell by almost 44 percent, dropping from about 532 000 deaths in 1990 to an estimated 303 000 in 2015. More than 830 women died daily in childbirth or as a result of pregnancy and delivery. A recent study by Lakshmi and Jyothi (2017) highlighted that socioeconomic status, educational attainments, nutrition and antenatal care of patients were very low. The study also suggested that overall economic uplift, better standards of food and living and compulsory primary and health education were

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necessary for better maternal and child health. The study by Maiti et al. (2005) pointed out that non-tribal women enjoy better conditions than tribal women in terms of living standard, education and other socio-demographic indicators. The study by Cousins (2016) pointed out that in India, Assam had the highest maternal mortality rate, almost double the national average, with around 328 deaths per 100000 live birth. Studies (Moneith 1987; Bhatia and Cleland 1995; Kamal 2009) showed that prenatal care of mother depended on various factors like household living standard, availability of health facility, maternal education, occupational status, birth order etc. Many other studies were conducted to understand the effect of socio-economic and demographic variable on maternal health care services in Eastern states (Ghosh 2015; Dehury and Samal 2016; Subba 2013; Karvande et al. 2016; Ray et al. 1993; Chaudhuri and Mandal 2020). An impressive study by Alemayehu and Meskele (2017) showed that about 40.9 percent of study participants' health care decisions were made by their husbands. Husbands' decisions on health care services of their wives played a major role. Similar researches were conducted in different countries and states regarding maternal health care services (Tiruneh et al. 2017; Adhikari 2016; Acharya and Cleand 2000; Hotchkiss 2001; Jejeebhoy 2000; Hwang and Park 2019; Acharya 2018; Fasina 2020; Mumtaz et al. 2019; Vellakkal et al. 2017). Women aged 15-24 years were found to be more vulnerable and share 38 percent of all maternal deaths in India. Maternal mortality can be reduced substantially if proper maternal healthcare services can be provided to these women (Singh et al. 2021).

Objectives

The present study aimed to investigate the maternal healthcare services in Eastern Region states of India (West Bengal, Odissa, Jharkhand, Bihar). The present study also tried to understand the effect of socio-economic and demographic factors towards utilization of maternal health care services in the above mentioned states of India.

METHODOLOGY

The study area included Eastern States/zone of India. Eastern zone included the state of Bihar, Jharkhand, West Bengal and Orissa. The present

study considered only those women who conceived baby within last five years. All the study women were married and in the age range was 15-49 years. NFHS-4 fieldwork was carried out in two phases (20 January 2015 to 4 December 2016). The sample size was 628900 households. However, the interviews were successfully completed only in 601509 households. In the present study total sample size consisted of 170995 ever-married women. In the present study, maternal health care services included antenatal visit (at least 3 visits during their last pregnancy in health care centres), postnatal care (care received from health professionals within two months of delivery), tetanus toxoid (TT) vaccination (at least two tetanus vaccination during pregnancy). One of the most important aims of better maternal health care services of women is to reduce the number of deaths and illness associated with pregnancy and childbirth. For safe motherhood, delivery under proper hygienic condition and trained health care professionals are required. Here delivery place was broadly classified as Institutional and Home delivery. Modern method of contraceptive use included male and female sterilization, injectable, intrauterine devices (IUDs/ PPIUDs), contraceptive pills, implants, female and male condoms, diaphragm, foam/jelly, the standard days methods, the lactational method, and emergency contraception. Women were divided in two groups according to their family planning involvements. The group "jointly with husband" referred to those women who alone or jointly with husband took family planning (FP) decisions. The other group comprised of those women who didn't have any decision making rights. Different socio-economic and demographic indicators like educational attainment, occupation of respondent, wealth index, age, residential pattern were also included in the study to understand their influence on maternal health care services. Present study is based on the unit level data extracted from National Family Health Survey (NFHS-4) conducted by IIPS during 2015-16. This is the largest source which provides women related data at household level. NFHS 4 provides various socio-economic, demographic information which helps to capture maternal health care services in East India. It is a comparative as well as ex post facto research. Categorical Binary Logistic regressions were done to show the effect of socio-economic and demographic factors on maternal health care services.

Dependent variables were taken as binary. Each of the maternal health care services was coded as '1' if the woman received the complete dose, else it was coded as '0'. For antenatal visit, the complete dose referred to 'at least 3 visit', in which case it was coded as '1' or else '0'. Similarly other health care services were given codes '1' or '0' according as the service was respectively given or not given. Thus the code '1' was given for at least 2 tetanus injections during pregnancy, for institutional delivery and for post-natal check-up. The code was given as 0 for the corresponding service not given. Again modern contraceptive method was coded as '1' and traditional as '0', decision on family planning taken jointly with husband was coded as '1', else '0'. Statistical analysis was done using the statistical software package SPSS (18.0) and $p < 0.01$ or $p < 0.05$ were considered as statistically significant. Pearson Chi-Square test was performed to understand differences in maternal health care services in different states in East India.

RESULTS

Maternal health care situation in eastern region states of India was presented in Table 1. From the table it is clear that performance of Orissa and West Bengal in maternal health care services was way ahead of Jharkhand and Bihar. Complete antenatal visit was the highest in women of West Bengal (83.1%), followed by Orissa (82.3%). But the situation among women of Bihar (27.8%) in terms of antenatal visit was very unsatisfactory. Orissa (85.2%) and West Bengal (72.7%) showed

better result compared to Jharkhand (53.1%) and Bihar (52.5%) in postnatal care. The highest percentage of institutional delivery was found in the state of Orissa (85.0%) then followed by West Bengal (75.5%), Jharkhand (62.4%) and Bihar (66.3%). Most of the women of Orissa (90.5%) and West Bengal (90.3%) were taking TT vaccine during pregnancy and then followed by Jharkhand (86.2%) and Bihar (82.8%). Pearson chi-square test determined that maternal health care services were significantly different among the states.

Table 2 depicted that most of the women of Eastern region states preferred to take family planning decisions jointly with husband. But it was very shocking that nearly 10 percent of women from these states could not participate in the family planning decisions and depended on husband/ other family member. Most of the women at the time of data collection did not use any contraceptive method. The situation was relatively better among the women of West Bengal (53.3%) and Orissa (40.3%). As like all other factors, women of Bihar (16.6%) were way behind in the use of modern contraceptive methods. Pearson chi-square test depicted that there was a significant difference in family planning method and contraceptive use in different states of East India.

Table 3 showed the effect of socio-economic and demographic factors on maternal health care services through regression analysis. Women belonging to Muslim community were less likely to get antenatal care (0.911 times), postnatal-check-ups (0.866 times), institutional delivery (0.473 times), TT vaccination (0.936 times), modern

Table 1: Percentage distribution of maternal health care of East India

East Indian States	Antenatal visit		χ^2	Postnatal care		χ^2	Place of delivery		χ^2	TT vaccination		χ^2
	No (%)	Complete (%)		No (%)	Yes (%)		Institutional (%)	Home (%)		Complete (%)	No (%)	
Bihar	12146 (72.2)	4676 (27.8)	8999.4**	7990 (47.5)	8827 (52.5)	3236.57**	16868 (66.3)	8560 (33.7)	1763.3**	13925 (82.8)	2897 (17.2)	369.6**
West Bengal	752 (16.9)	3707 (83.1)		1214 (27.3)	3241 (72.7)		4028 (75.7)	1295 (24.3)		4028 (90.3)	431 (9.7)	
Jharkhand	4507 (50.4)	4440 (49.6)		4193 (46.9)	4751 (53.1)		7617 (62.4)	4584 (37.6)		7712 (86.2)	1235 (13.8)	
Orissa	1599 (17.7)	7416 (82.3)		1331 (14.8)	7675 (85.2)		9422 (85.0)	1669 (15.0)		8158 (90.5)	857 (9.5)	
Total	19004 (48.4)	20239 (51.6)		14728 (37.6)	24494 (62.4)		37935 (70.2)	16108 (29.8)		33823 (86.2)	5420 (13.8)	

Source: Data extracted from NFHS 4
*: $p < 0.05$, **: $p < 0.01$

Table 2: Percentage of family planning and contraceptive method use in Eastern region states

<i>East Indian States</i>	<i>Family planning</i>		χ^2	<i>Currently method used</i>			χ^2
	<i>Jointly (%)</i>	<i>Others (%)</i>		<i>No method (%)</i>	<i>Traditional (%)</i>	<i>Modern (%)</i>	
Bihar	3853 (86.9)	580 (13.1)	8395.5**	20996 (82.5)	224 (0.9)	4217 (16.6)	9451.8**
West Bengal	3214 (91.3)	307 (8.7)		1799 (33.8)	687 (12.9)	2842 (53.3)	
Jharkhand	2877 (90.3)	309 (9.7)		9021 (73.9)	427 (3.5)	2756 (22.6)	
Orissa	5517 (89.5)	649 (10.5)		4920 (44.3)	1706 (15.4)	4480 (40.3)	
Total	15461 (89.3)	1845 (10.7)		36736 (67.9)	3044 (5.6)	14295 (26.4)	

Source: Data extracted from NFHS 4

†: p<.05, **: p<.01

contraceptive method (0.751 times) than Hindu women. The results showed that scheduled tribe women were more likely to go for antenatal care (1.614 times) than scheduled caste. In all other aspects of maternal health care, services of scheduled tribe women were less likely to take maternal health care services than scheduled caste women. OBC (Other Backward Castes) women were less likely to take antenatal care (0.905 times) and use contraceptive method than scheduled caste women and it was statistically significant. OBC women were 1.145 time more likely to get institutional delivery than scheduled caste women. Women belong to general category were 1.123 times, 1.346 times, 1.278 times more likely to have antenatal care, institutional delivery and TT vaccination than scheduled caste women.

The present study also revealed that women engaged in clerical jobs were 3.794 times more likely to prefer institutional delivery than not working women and it was significant at 5 percent level. Women engaged in other professions were 1.398 time likely to have postnatal check-ups than not working women and the result was significant. Women engaged in agricultural work were significantly more likely to go for antenatal care (1.121 times), postnatal check-ups (1.210 times) and contraceptive method (1.474 times) than not working women. But women engaged in agricultural labour were 0.862 times less likely to have TT vaccination than not working women. Women engaged in services showed better maternal health care services than not working women and it was highly significant except for few cases like antenatal care, institutional delivery, TT vaccination, family planning. Women engaged in manual labour were 0.799 times less likely to have institutional delivery than not working women and 1.646 times more likely to have family planning

than not working women and the result is statistically significant. The present study showed that secondary educated women were significantly have better maternal health care services than women education level up to primary level or have no formal education. Secondary and higher secondary educated women had better maternal health care services except contraceptive method than primary educated or women with no formal education and it is significant at 1 percent level. Women aged 20-24 group were more likely to have postnatal check-ups (1.188 times) and contraceptive method (1.731 times) than women aged 15-19 years age group. Women aged 29-34 years were significantly more likely to have postnatal check-ups and contraceptive method than the reference group. The present study also revealed that women residing in urban areas had better maternal health care services than women residing in rural areas and it was statistically significant except for decision regarding family planning. Wealth Index played an important role in women's life. Women with better wealth index were more likely to prefer better maternal health care services than women, who belonged to poor wealth index except for few cases.

DISCUSSION

The present study aimed to investigate the impact of socio-economic and demographic factors on maternal health care services. The present study depicted that, in most of the cases, Orissa and West Bengal got better maternal health care services compared to Jharkhand and Bihar. The study also found that wealth index was significantly associated with maternal health care services (antenatal visit, postnatal check-ups, institutional delivery, method of contraceptive

Table 3: Odds ratio of the coefficients of logistic regressions of antenatal and post natal care, institutional delivery, vaccination, and the use of contraceptive and family planning on socio-economic and demographic variables

<i>Socio-demographic variables</i>	<i>Antenatal care</i>	<i>Postnatal care</i>	<i>Institutional delivery</i>	<i>TT vaccination</i>	<i>Contraceptive</i>	<i>Family planning</i>
	<i>Exp (B) 95% C.I. for EXP(B)</i>	<i>Exp (B) 95% C.I. for EXP(B)</i>	<i>Exp (B) 95% C.I. for EXP(B)</i>	<i>Exp (B) 95% C.I. for EXP(B)</i>	<i>Exp (B) 95% C.I. for EXP(B)</i>	<i>Exp (B) 95% C.I. for EXP(B)</i>
<i>Religion</i>						
Hindu [®]						
Muslim	0.911 (0.827-1.002)	0.866** (0.787-0.953)	0.473** (0.432-0.518)	0.936 (0.832-1.053)	0.751** (0.695-0.811)	1.312* (1.051-1.637)
Others	1.279** (1.073-1.525)	1.320** (1.102-1.581)	0.975 (0.820-1.159)	1.184 (0.955-1.467)	0.765 (0.665-0.880)	1.023 (0.695-1.504)
<i>Caste</i>						
SC [®]						
ST	1.614** (1.456-1.789)	1.040 (0.938-1.153)	0.715** (0.651-0.785)	0.949 (0.837-1.075)	0.854** (0.784-0.930)	0.972 (0.779-1.213)
OBC	0.905* (0.835-0.980)	0.979 (0.903-1.062)	1.145** (1.058-1.240)	1.068 (0.967-1.180)	0.913** (0.855-0.975)	0.953 (0.804-1.130)
General	1.123* (1.007-1.253)	1.016 (0.910-1.133)	1.346** (1.198-1.511)	1.278** (1.115-1.465)	1.057 (0.970-1.151)	0.945 (0.756-1.181)
<i>Respondent Occupation</i>						
Not working [®]						
Other professions	0.926 (0.706-1.215)	1.398* (1.035-1.889)	1.049 (0.728-1.510)	0.865 (0.637-1.174)	1.076 (0.878-1.318)	1.192 (0.635-2.237)
Clerical	1.428 (0.693-2.943)	1.808 (0.830-3.937)	3.794* (1.148-12.545)	0.671 (0.334-1.350)	1.299 (0.772-2.183)	0.764 (0.228-2.553)
Sales	0.949 (0.665-1.353)	1.302 (0.890-1.906)	1.092 (0.740-1.611)	0.900 (0.588-1.378)	1.254 (0.940-1.675)	1.195 (0.548-2.604)
Agricultural	1.121* (1.027-1.223)	1.210** (1.108-1.323)	0.930 (0.858-1.008)	0.862** (0.775-0.959)	1.474** (1.371-1.585)	1.097 (0.913-1.318)
Service	1.127 (0.915-1.388)	1.294* (1.043-1.606)	1.122 (0.907-1.388)	1.011 (0.784-1.304)	1.381** (1.174-1.625)	1.426 (0.898-2.264)
Manual	1.107 (0.963-1.273)	1.148 (0.997-1.322)	0.799** (0.703-0.909)	1.120 (0.937-1.339)	1.646** (1.468-1.844)	1.265 (0.943-1.698)
<i>Education</i>						
No [®]						
Secondary	1.982** (1.848-2.125)	1.553** (1.446-1.669)	2.131** (1.986-2.287)	1.203** (1.100-1.316)	1.239** (1.168-1.314)	1.301** (1.119-1.513)
Higher	2.848** (2.840-3.271)	1.998** (1.740-2.294)	4.973** (4.019-6.155)	1.312** (1.117-1.542)	0.964 (0.871-1.067)	2.014** (1.485-2.731)
<i>Age (in years)</i>						
15-19 [®]						
20-24	1.042 (0.877-1.239)	1.188* (1.000-1.411)	0.823 (0.668-1.013)	0.986 (0.790-1.232)	1.731** (1.445-2.074)	0.904 (0.523-1.562)
25-29	1.016 (0.855-1.207)	1.134 (0.956-1.346)	0.629** (0.512-0.773)	0.966 (0.774-1.205)	2.646** (2.211-3.166)	0.979 (0.569-1.684)
30-34	0.878 (0.734-1.051)	1.095 (0.916-1.310)	0.602** (0.487-0.745)	0.910 (0.723-1.144)	3.151** (2.620-3.790)	1.026 (0.589-1.784)
35 and above	0.709** (0.586-0.858)	0.970 (0.802-1.172)	0.451** (0.362-0.562)	0.739 (0.582-0.940)	2.873 (2.367-3.488)	0.904 (0.510-1.601)
<i>Residence</i>						
Rural [®]						
Urban	1.243** (1.143-1.352)	1.099* (1.010-1.196)	1.153** (1.052-1.263)	0.893* (0.808-0.988)	1.166** (1.093-1.244)	0.860 (0.727-1.018)
<i>Wealth Index</i>						
Poor [®]						

<i>Socio-demographic variables</i>	<i>Antenatal care</i>	<i>Postnatal care</i>	<i>Institutional delivery</i>	<i>TT vaccination</i>	<i>Contraceptive</i>	<i>Family planning</i>
Middle	2.087** (1.920-2.269)	1.634** (1.499-1.780)	1.981** (1.813-2.164)	1.051 (0.945-1.168)	1.502** (1.402-1.608)	1.040 (0.874-1.238)
Rich	2.930** (2.663-3.224)	2.100** (1.905-2.316)	3.110** (2.782-3.477)	1.221** (1.084-1.377)	1.595** (1.479-1.720)	1.222* (1.003-1.490)
Constant	0.677	1.090	2.744	4.676	0.195	7.873

*: $p < .05$, **: $p < .01$, Dependent variable: no or incomplete=0, complete= 1

use) where women with higher wealth index received better maternal health care than women with lower wealth index. The present study also highlighted that women residing in urban areas got advantage of better maternal health care services than women in rural areas. The present study also revealed that women with better education had better maternal health care services and the result was significant except for contraceptive method. Sabiti et al. (2014) found positive association between a women's educational attainment and antenatal visit, place of delivery, tetanus toxoid injection. Similar study conducted by Pandey and Singh (2017) pointed out that women's education had a significant relationship with the use of antenatal care services and place of delivery. Educated women took benefit of using maternal health services. Residence pattern also influenced women's health. Utilization of maternal health services was very low in rural area. A study by Paul and Chouhan (2020), revealed that women's educational attainment and wealth status were significant indicators of maternal health care. Other socio-demographic indicators like residential pattern, caste, religion, respondent's age, age at marriage, exposure to mass media and region had significant influence on maternal health. It is also very interesting finding of the present study that women's occupation had significant association with the use of maternal health care services except for few cases. Family planning is very important in a country like India where population growth is very high. India already has 1.3 billion people and will soon become the largest population of the world. Population growth is not just a problem in India but it has become a burden. In this current scenario implementing right family planning is very important for the development of our country. Without participation of women in family planning decision, India cannot achieve

its goal to control its population growth. But the present study showed that approximately 10 percent of women did not get the opportunity to take her own family planning decision, they had to depend on other family members for family planning, especially in Bihar (13.7%).

Hindu community were more likely to get antenatal care than women belonging to Muslim community, while women belonging to other religions were more likely to get antenatal care. Muslim women were less likely to have postnatal check-ups and institutional delivery than Hindu women. Women belonging to other religions were more likely to take postnatal-checks than Hindu women. The present study depicted that women belonging to other religions were 1.184 times more likely to have TT vaccination than women belonging to Hindu religion, though no significant association were found. While women belonging to Muslim community were 0.751 times less likely to use any contraceptive method than Hindu women, Muslim women were more likely to have family planning than Hindu women and both are statistically significant. Women with age group 20-24, 25-29, 30-34 and 35 and above were more likely to have safe motherhood care than women with in age-group 15-19 years. Pearson Chi square test was performed between maternal health care services and different states of East India. The result depicted that maternal health care services had significant variations among the states of East India. The present study confirmed that socio-economic and demographic factors had a strong influence on maternal health care services.

CONCLUSION

In developing countries like India, women are in the most vulnerable group of the society especially in reproductive age. So, women should be encouraged for gaining knowledge about health

and hygiene. The present study reflected that urban women are conscious about their maternal health care services than rural women. Education played significant role in women's life. As women got education, they got better maternal health care services compared to lower educated mother. Urban women had higher wealth index, better educational status and other facilities compared to rural women. Thus urban women got better antenatal care, postnatal check-ups, TT vaccination, institutional delivery and use of contraceptive method. Family Planning (FP) can help to improve women's status and quality of life. Knowledge of contraceptive use allows women to decide when to take a child. Right to access to FP is not only a human right, but also plays a crucial role for mother – child health as well as sustainable development of the country. To conclude, maternal and child health can be improved by ensuring health cares and especially during the period of child delivery all mothers should be attended by health care professionals.

RECOMMENDATIONS

Maternal health care services have significant impact on maternal and child health. Women's education and their accessibility towards mass media may help to increase awareness or knowledge regarding importance of maternal care services.

LIMITATIONS

Most of the time women are treated as weaker section of the society, and hence, they are less able to establish their view point. As a result, women cannot exert their opinion regarding maternal health care services. Women are not even able to take their own health care decision. Thus, woman, as well as her child, become worst sufferer. This paper could not, however, look into the aspects of ill-treatment to women and child especially during child delivery. This limitation is due to taking secondary data. It helped us to understand the situation or status of a group, but compared to primary data they may be less reflective of the situation. As secondary data was usually not collected for the same purpose as the original researcher had in mind, the purposes of original researcher get biased. However, the present analysis could depict the situation quite satisfactorily.

SIGNIFICANCE OF THE STUDY

Present study will help in understanding how the socio-economic and demographic factors influence maternal health care services and to formulate what intervention programmes are needed in the specific area to enhance better maternal health care services. The present study will also provide important information about rural and urban differences in maternal health. This study will also give very important knowledge about state wise situation on women's maternal health care services.

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