

Identifying the Socioeconomic and Demographic factors affecting the Maternal health care and delivery types of Santal women's of Dinajpur, Bangladesh

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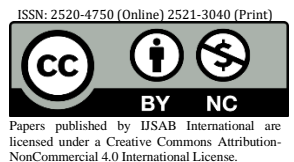
Abstract

Utilization of maternal healthcare properly is an important factor to reduce maternal mortality and infant mortality. This study was conducted to see the knowledge and practice regarding maternal healthcare (MHC) among santal women of Dinajpur. Santal are one of the largest tribal group of Bangladesh mainly living in Rangpur and Rajshahi division. They have their own culture and language. In this study 209 santal women having at least one child of age less than 5 years has been interviewed. Due to restricted sampling unit and lack of sampling frame, convenience sampling has been used for selecting sample from different region of Dinajpur district. It has been found from the study that 23.9% respondents gets married within 15 years and the majorities (63.3%) get married at age group 15 to 20 years. Maximum women experience their first baby birth in the age group 15 to 20 years which is 57.4%. About one third of the respondents had experienced a pregnancy that miscarried or ended by a stillbirth. Among the respondents 81.3% was hearted about menstruation before they enter in this group and almost half of the total respondents took part in a program arranged by NGO about maternal health care awareness. Almost 50% of the total respondents give birth in NGO sector. From the bivariate analysis it has been found that type of delivery has significant association with respondent current age, age at first birth and at age marriage. Also the place of delivery and respondent education level has significant association with type of delivery. From the binary logistic regression it has been found that lower middle class and middle class groups has higher chance of caesarean delivery than the poor group. Also, the respondents who get married or give birth their first baby after more than 25 years has higher rate of caesarean delivery than the reference group less than 15 years.



IJSB

Accepted 27 December 2023
Published 17 April 2024
DOI: 10.58970/IJSB.2354



Keywords: *Maternal Health Care (MHC), ANC visit, Delivery Type, Logistic Regression.*

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Introduction

There are about 50 distinct indigenous communities in Bangladesh. The Population Census of 2022 puts tribal/indigenous population at around 1,650,159. The largest concentration is in Chittagong but other areas in which these communities live include greater Mymensingh, greater Rajshahi, greater Sylhet, Dinajpur, Patuakhali and Barguna. Garo, Chakma, Manipuri, Marma, Munda, Oraon, Santal, Khasi, Kuki, Tripura, Mro, Hajong and Rakhain are some of the well-known ethnic minority communities of Bangladesh (Population and Housing Census, 2022). Santal are one of the largest ethnic group in Bangladesh. Majority of them are found in northern Bangladesh's Rajshahi Division and Rangpur Division. Apart from Bangladesh, they are also found in Jharkhand, West Bengal, Orissa, Bihar and Assam. Our research is conducted on Santal women. There are 129,049 Santal people in Bangladesh and among them 65,409 are women (Population and Housing Census, 2022). We selected 209 Santal women from Dinajpur District and collected data through face to face question and answer. Previously many research on Santal women's maternal health care have been conducted. Such as, Reproductive behavior of married women (Kabir et al., 2022). Nutritional study of reproductive aged ethnic women (Mohsin, 2019). Maternal nutrition status and child feeding practices; a retrospective study in santal communities, Birhum District, West Bengal, India (Stiller et al., 2020). However in our study, we worked on santal women's Antenatal care, delivery type and Postnatal care. We were highly interested on Santal women's delivery type (Normal, cesarean) and which factors directly or passively influenced the delivery of their baby.

In Bangladesh, we are burdened with a large number of populations. A number of population policies are implemented to take control over it and to improve its health status, but the health status of its population is still in low status. Malnutrition, lack of supply of food, low per capita income, not implementing proper policy and not having the health care facilities at a satisfactory level affects the health status directly.

Literature review

Bangladesh is a densely populated country of South East Asia that has a rich tribal presence. There are about 58 tribes living in different parts of the country. Bangladesh has 1.2 million tribal people, which is just above 1 percent of the total population (Abu et al., 2007). Percentage of visiting for antenatal care from medical provider has been increased about 28% in 2017 from 2014 (Ahsan et al., 2019). But the percentage of receiving quality care during pregnancy is still low which is less than 18%. The amount of cesarean delivery has also increased in 2022 by 10% as compared to 2014 and the present rate is about one third of the total delivery. About 50% of the total delivery take place in health care facility and among these only 13% is from public sector and 32% in private sector (Ahsan et al., 2019). Most of the delivery take place in the home of the husband or parent of the respondent and the attendant during delivery are not well trained or relatives (Islam et al., 2006). The Santal or Santhal, are a Munda ethnic group native to India. Santals are the largest tribe in the Jharkhand state of India in terms of population and are also found in the states of Assam, Tripura, Bihar, Chhattisgarh, Odisha and West Bengal. They are the largest ethnic minority in northern Bangladesh's Rajshahi Division and Rangpur Division. They have a sizeable population in Nepal and Bhutan. The Santals speak Santali, the most widely spoken of the Munda languages (Sinha, 2018). According to 2001, there have 300,061 santal in Bangladesh. In a study (Rafi et al., 2006), it has been claimed that the indigenous households comprise 1.5% of the total households in Bangladesh. Considering all these anomalies and applying a national average annual growth rate of 1.48 percent between the censuses of 1991 to 2001. On 1 January 2016, the 17 Sustainable Development Goals (Senkowsky et al., 1990) of the 2030 Agenda for Sustainable Development adopted by world leaders in September 2015 at a historic UN Summit officially came into force. Over the next fifteen years, with these new goals that universally apply to all, countries will mobilize efforts

to end all forms of poverty, fight inequalities and tackle climate change, while ensuring that no one is left behind. Santal community is a part of our society and we can't achieve the SDGs goal by keeping a community backward. The third goal of SDG is "good health and well-being". That's why we should know about the practice of maternal health care in Santal community.

Child birth is one of the most essential and critical period for the mothers and newborn babies as most of the changes occur during this period which determines the well-being of mothers and newborns. In the rural Bangladesh one of the common culture of giving birth was under the supervision of a women known as *dais*, who is usually a undrain person. In 1997 the proportion of delivery that take place under trained personal was only 11%(Paul and Rumsey, 2002). We have questioned 209 Santal women and found that there are still many mothers who give their child birth at home with the assist of Indigenous 'dais' which obviously results risky in normal delivery. The most commonly cited reason for choosing home delivery is "poverty". This leads us that Economic status plays a crucial role of Santal women child birth.

Most of the tribal groups of Bangladesh live in the hill track region especially in Chittagong division. Among the tribal groups living in the hill region traditional healers are still popular. Different health facilities are not easily accessible to the tribal groups living in these regions as compared to the population living in the plainland. Also in the decision making about health issue age and gender has significant effect (Rahman et al., 2012). In case of health shocks of the earning member of tribal population of hill region, it is very difficult for them to ensure proper treatment by their own earning. In such case the family members meet up the healthcare cost by selling their livestock or borrowing cash from others, which cause extreme poverty. To alleviate extreme poverty healthcare facility of these region should be improved (Kabir et al., 2019). The child and infant mortality among the tribal group of Rajasthan, India is high and the main causes of these are diarrhoea, anemia and acute respiratory disease. The fertility rate among the tribal women of Rajasthan is also high (Nagda, 2004).

Place of delivery in rural Bangladesh has a significant association with education and economic status of the women. Although different initiative has been taken to improve the maternal health and infant mortality in national level, maternal mortality rate is still one of the highest in the world. BRAC Health Center(BHS) started in 1996 to improve maternity care of rural women's and most of the women attend the BHS due to pregnancy complication(Afsana and Rashid, 2001). Among the patient with time sensitive complication of convulsion or excessive bleeding about 75% of these case are due to having care from unqualified provider (Koenig et al., 2007).

Bangladeshi adolescent girls also have misconception about reproductive health (RH) and sexually transmitted disease (STD). Knowledge of the adolescent about reproductive health and STD has significant association with mother's education level, age of the adolescent and media exposure status(Uddin and Choudhury, 2008). Moreover, the type of delivery among the Santal women depends on multiple factors like biological (age of the mother, age of the mother during marriage and first baby birth, miscarriage), Social-culture (religion/caste, antenatal care, maternal education, quality of antenatal care, indigenous 'dais' (assist in baby birth), tetanus injection, place of baby birth), economic factors (socio economic status, monthly income). All the above mentioned factors play vital role for the type of delivery (either cesarean or normal) of Santal women.

Data collection

The study was carried out to assess the maternal health care utilization among the santal women of Dinajpur District. The data for this study was collected from the santal woman who has at least one child of age less than 5 years. The respondent was selected to avoid information

bias, since most of the questions were recorded from their past memory. Since there was no complete list of the mothers who had at least one child of age under 5 years, we use convenience sampling for this study. Data has been collected from 209 mothers of having a child of age less than 5 from different villages of *Birganj, Kaharol and Kosba*. To collect the data from the respondent an interview schedule based on the question that are related to maternal health was developed and a pilot survey was carried out to check the validity of the questions. After collecting the data, the data was entry into SPSS and the data has been checked if it has any missing value or error and cross check with the questionnaire. To undertake this research, we have collected data from several Santal communities in Dinajpur District. It is assumed that, Respondents responded confidently and honestly on the questions they were asked through the questionnaire.

Methodology

Chi-square test

The chi-square test is used to determine whether there is a significant difference between the expected frequencies and the observed frequencies in one or more categories. A chi-square test also written as, χ^2 . It is any statistical hypothesis test where in the sampling distribution of the test statistic is a chi-squared distribution when the null hypothesis is true. Chi-square test are often constructed from a sum of square of errors, or through the sample variance. Test statistic that follows a chi-square distribution arise from an assumption of independent normally distributed data, which is valid in many cases due to the central limit theorem. A chi-square test can be used to attempt rejection of the null hypothesis that the data are independent. Also considered a chi-square is test in which this is asymptotically true, meaning that the sampling distribution (if the null hypothesis is true) can be made approximate a chi-squared distribution as closely as desired by making the sample size large enough.

Hypothesis of the study:

H_0 : There is no association between socioeconomic or demographic factor and MHC factor.

H_1 : There is an association between socioeconomic or demographic factor and MHC factor.

Using sample data, find the degrees of freedom, expected frequencies, test statistic, and the p-value associated with the test statistic.

Degrees of freedom: The degrees of freedom (DF) is equal to

$$DF = (r-1) * (c-1)$$

Where r is the number of levels for one categorical variable, and c is the number of levels for the other categorical variable.

The expected frequency counts are computed separately for each level of one categorical variable at each level of the other categorical variable. Compute R*C expected frequencies, according to the following formula-

$$E_{ij} = \frac{R_i * C_j}{N}$$

Where,

E_{ij} = expected frequency for the ith row jth column.

R_i = total in the ith row

C_j = total in the jth column

N = table grand total

Test statistic: The test statistic is a Chi-square random variables defined by the following equation-

$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

Where

- χ^2 = chi squared,
- O_i = observed value
- E_i = expected value.

P-value for chi-square statistic: A P-value for chi-square statistic is the probability that the chi-square value would be as large as it is (or larger) if really there were no relationship in the population. An observed relationship will be called statistically significant where the P-value for the chi-square test is less than α (typically $\alpha = 0.05$). In this case, if we reject the null hypothesis then we generalize that there is relationship in the population that is the variable are not independent.

Logistic Regression

Logistic regression model is most frequently used to describe statistical relationship between a dichotomous dependent variable and a number of independent variables.

Let Y is dichotomous dependent variable taking values 0 and 1 and suppose that

$$Y_i = \begin{cases} 1, & \text{if a specific survival event develop during the study period} \\ 0, & \text{otherwise} \end{cases}$$

Also let, $x = (x_1, x_2, \dots, x_p)'$ be a vector of p known or suspected risk factor or covariates (independent variables). The basic form of logistic regression model is then

$$P(y = 1|x) = \pi(x_i) = \frac{\exp(x_i\beta)}{1 + \exp(x_i\beta)} = P(x)$$

Where, α is a scale parameter and β is a $p \times 1$ vector parameter. $P(x)$ represents the probability that given by

$$P(y = 0|x) = 1 - \pi(x_i) = \frac{1}{1 + \exp(x_i\beta)} = 1 - P(x)$$

Then a well-known transformation of $P(x)$ known as logit transformation is defined as

$$g(x_i) = \text{logit}[\pi(x_i)] = \log\left[\frac{\pi(x_i)}{1 - \pi(x_i)}\right] = x_i\beta$$

Or, $g(x_i) = \beta_0 + \beta_1x_{i1} + \dots + \beta_kx_{ik}$

The logit transformation is very important in logistic regression analysis. It has many of the described properties of linear regression model. The logistic linear in its parameters, may be continuous and may range from depending on the range of x in this study, we use this basic model applied in case control study design.

Results and discussion

Table1: Frequency distribution of Respondents current age and first birth age.

Age Group	Respondent current age	Respondent age at first birth
<20	29(13.9)	146(69.9)
20-30	142(67.9)	59(28.2)
>30	38(18.2)	4(1.9)
Total	209	209

From the table 1, about 70% women experience their first baby birth at age <20, only 1.9% mothers experience their first motherhood in the age of >30 years and about 28% mother give

their first birth in 20-30 years. At the time of the study about 67% respondent are in the age group 20-30 and around 13.9% respondent are of age less than 20 years.

Table 2: Frequency distribution of respondent`s marriage age.

Age Group	Respondent age category at marriage
10-19	162(77.5)
>20	47(22.5)
Total	209

From table 2, we see that most of the respondents get married in 10-19 years (77.5%) which represents the majority of the respondents. Moreover, 22.5% of the respondents married at age greater than 20.

Table 3: Frequency distribution of different maternal health care utilization.

Variable	Yes	No
know about the place of obtaining a method of family planning	136 (65.1%)	73(34.9%)
participate any class/training organized by any NGO for maternal health awareness	97(46.4%)	112(53.6%)
know about menstruation before you started menstruating	170(81.3%)	39(18.7%)
aware of any community clinic in your area	162(77.5%)	47(22.5%)
visit the community clinic in the past three months	53(25.4%)	156(74.6%)
currently using any contraceptive method	177(84.7%)	32(15.3%)
Aside from your own housework work outside	83(39.7%)	126(60.3%)
ever had a pregnancy that miscarried or was aborted, or ended in a stillbirth	51(24.4%)	158(75.6%)
During this pregnancy given tetanus injection in the arm	113(54.1%)	96(45.9%)
Did anyone check on your health after you left the facility?	83(39.7%)	126(60.3%)
Received all the vaccine of last baby.	201(96.2%)	8(3.8%)
Participate in vitamin A capsule Campaign	197(94.3%)	12(5.7%)

From the table -3, it has been found that about 65% respondents know the place where they can obtain family planning concept. The percentage of the respondent who has participated in any training organized by any NGO about maternal health awareness is 46%. A very large majority (81.3%) of the respondent have learned about menstruation before their menstruation start. Among the respondents about three out of four respondents are aware about community clinic in their area and one of them has visited the community clinic in last three month from the study time. The percentage of the respondent who has checked their health after their delivery is 40.2%. Currently using of contraceptive method is very high that is 85%. The respondents are also largely engaged with the work aside their housework and the percentage is almost 40%.

The percentage of miscarried or still birth is also considerably high, about one fourth of the respondent had experienced at least one pregnancy that has been ended in a stillbirth or miscarried. More than 50% of the respondent received tetanus injection in their arm during their pregnancy. Almost all mothers had received all the vaccine of their baby and their participations in the vitamin A capsule are also very high and the percentages are 96.2% and 94.3% respectively.

Table 4: Place of taking health care from different sector.

	HOME	Govt. SECTOR	NGO SECTOR	Privet SECTOR	Others
Place of taking ANC	25(12.00%)	58(27.80%)	89(42.60%)	35(16.70%)	2(1.00%)
Place of giving birth	51(24.40%)	28(13.40%)	92(44.00%)	38(18.20%)	0(0.00%)

From the table 3, the antenatal care visit for last birth it has been found that most of the mother choose NGO sector which is 42.60% and about one forth visit government sector for antenatal

care. Again in case of delivery place NGO sector is also high (44%), where the government sector is only 13.4% and about 25% mother give birth in their husband or parents' home.

Table 5: Frequency distribution of the respondents and their partner Education level.

Education Level	Respondent Education level Frequency	Respondent partner Education level
No education	30(14.4%)	40(19.1%)
Primary	63(30.1%)	56(26.8%)
Secondary	84(40.2%)	81(38.8%)
Higher education and above	32(15.3%)	32(15.3%)
Total	209	209

It is evident from the data (table-5) that about 40% of the respondent studied up to secondary level and about 15% respondent studied till higher education and above, 14% mothers are illiterate and about 30% mothers studied till primary level. Similarly for the husband education level about 19% are illiterate, primary and secondary level are about 27% and 39% respectively, and about 15% studied higher education and above.

Table 6: Cross table of type of delivery and the related socio-economic and demographic variable.

Variable	Category	Normal	Cesarean	Sig
Respondent current age	<20	21(16.8%)	8(9.5%)	0.308
	20-30	83(66.4%)	59(70.3%)	
	>30	21(16.8%)	17(20.2%)	
Respondent age at marriage	10-19	107(85.6%)	55(65.48%)	0.001
	>19	18(14.4%)	29(34.52%)	
Respondent age at first birth	<20	99(79.2%)	47(55.9%)	0.001
	20-30	24(19.2%)	35(41.7%)	
	>30	2(1.6%)	2(2.4%)	
Respondent Education level	No education	20(16%)	10(11.9%)	0.002
	Primary	45(36%)	18(21.43%)	
	Secondary	50(40%)	34(40.48%)	
	Higher education and above	10(8%)	22(26.19%)	
Respondent partner Education level	No education	29(23.2%)	11(13.09%)	0.002
	Primary	34(30.4%)	18(21.47%)	
	Secondary	48(38.4%)	33(39.29%)	
	Higher education and above	10(8%)	22(26.19%)	
Income Status	3000-10000	77(61.6%)	36(42.86%)	0.019
	11000-20000	43(34.4%)	40(47.62%)	
	21000-30000	5(4%)	8(9.52%)	
Place of ANC visit	HOME	23(18.4%)	2(2.38%)	0.009
	Govt. SECTOR	35(28%)	23(27.38%)	
	NGO SECTOR	46(36.8%)	43(51.19%)	
	Privet SECTOR	20(16%)	15(17.86%)	
	Others	1(0.8%)	1(1.19%)	
ANC Visit	0	5(4%)	0(0%)	0.159
	1-3	59(47.2%)	38(45.23%)	
	>=4	61(48.8%)	46(54.76%)	
During this pregnancy received tetanus	NO	48(38.4%)	54(64.29%)	0.000
	Yes	77(61.6%)	30(35.71%)	
Respondent pregnancy miscarriage	Yes	30(24%)	21(25%)	0.497
	No	95(76%)	63(75%)	
Place of Delivery	HOME	51(40.8%)	0(0%)	0.000
	Govt. SECTOR	18(14.4%)	10(11.9%)	
	NGO SECTOR	45(36%)	47(55.96%)	
	Privet SECTOR	11(8.8%)	27(32.14%)	
Who assisted in delivery	Skilled	101(80.8%)	84(100%)	0.000
	Unskilled	24(19.2%)	0(0%)	
Religion	Hindu	53(42.4%)	23(27.4%)	0.001
	Buddhism	00(00%)	1(1.2%)	
	Christian	59(47.2%)	59(70.2%)	
	Others	13(10.4%)	1(1.2%)	

From the bivariate analysis (Table-6) it has been observed that respondent current age and the delivery type has insignificant association. The association between respondent age at marriage and type of delivery are significant at 1% level of significance. 86% normal delivery and 65% cesarean delivery are in (10-19) age category. Also, respondent age at first birth is significant at 1% for the delivery type. The respondents who first give birth at the age group (<20) have highest rate of normal delivery (79.2%) and cesarean delivery (55.9%). From the analysis we can see that respondents who received Secondary education have both highest rate of normal delivery (40%) and cesarean delivery (41%). Similarly, the respondent partner who received Secondary education have both highest rate of normal delivery (38%) and cesarean delivery (39%) and the significance is (2%). The Place of delivery has significant (1%) association with type of delivery, among the caesarean delivery 56% are at NGO sector and 32% are in privet sector. In the presence of skilled individuals there has been 81% normal delivery. Which is (1%) significant. The place of ANC visit of respondent’s also has significant association with type of delivery. However, the number of ANC visit is insignificant with delivery type. The status of receiving tetanus injection during pregnancy showed significant (1%) association with type of delivery. Another variable respondent pregnancy miscarriage is insignificant with delivery type. The respondents who received tetanus injection has (62%) rate of normal delivery and thus who received tetanus 64% rate of cesarean delivery. For the economic status variable, the respondents who are poor have the highest rate of normal delivery (62%) and respondents who are lower middle class have highest rate of cesarean delivery (48%). it has been found that it has significant association with type of delivery at 1% level of significance. Antenatal care visit has insignificant association with type of delivery. The number of normal delivery is highest among Cristian respondents and the significant is (1%).

Table 7: Logistic regression of type of delivery on the socioeconomic and demographic factor.

Variables	Category	$\hat{\beta}$	S.E($\hat{\beta}$)	Exp($\hat{\beta}$)	p - value
(Intercept)	-				
Respondent age category at marriage	10-19(Ref.)				
	>19	0.669	0.417	0.512	0.108
Respondent age category at first birth	<20(Ref.)				0.129
	20-30	1.122	0.319	3.072	0.000
	>30	0.745	1.016	2.106	0.463
Respondent Education level	No education (Ref.)				0.794
	Primary	-0.467	0.754	0.627	0.535
	Secondary	-0.633	0.629	0.531	0.314
	Higher education and above	-0.406	0.562	0.667	0.470
Respondent partner Education level	No education (Ref.)				0.321
	Primary	-1.281	0.690	0.278	0.063
	Secondary	-0.73.9	0.642	0.478	0.250
	Higher and above	-0.714	0.559	0.489	0.202
Income Status	3000-10000 (Ref.)			3k-10k	0.017
	11000-20000	1.625	0.727	0.197	0.025
	21000-70000	0.821	0.713	0.440	0.249
Received Tetanus	No (Ref.)				
	Yes	0.846	0.322	2.331	0.009
Respondent pregnancy miscarried	Yes (Ref.)				
	No	0.076	0.376	1.079	0.839

From the table-7, we can see that respondent age at marriage we categorized it into two classes as “10-19”, “>19” and selected the age group (10-19) years as the reference group. We found that the age group (>19) had lower rate of caesarean delivery than the reference category and

the regression coefficient is -0.669 which shows negative association with cesarean delivery. The chance of caesarean birth as compared to the reference is 0.488 times (OR=0.512) less than reference category. And it is insignificant (0.108). We classified respondents' Age at first baby birth into three classes such as "<20", "20-30", ">30" and we selected "<20" as our reference category. The values of regression coefficients of them are respectively 1.122 and 0.745 shows strong positive association between them and cesarean delivery. Respondents who are currently at age group 20-30 had 2.072 (OR=3.072) times, respondents who are currently >30 had 1.106 (OR=2.106) times less chance of caesarean delivery than that of reference category. For the variable "Respondents Education Level", we also categorized it into four level. Such as Primary, Secondary, Higher education and above with no education as our reference. Here, the value of regression coefficient is -0.467, which indicates that there is negative association between primary education and cesarean delivery. The effect is insignificant (0.535).

Similarly the regression coefficient values for respondents Secondary, higher education and above level are respectively (-0.633, and -0.406) and these values indicated negative association with the cesarean delivery. For secondary level the cesarean delivery is 0.465 times (OR=.531) less, for higher education and above level the cesarean delivery is 0.333 times (OR=0.667) less than that of no education level. The corresponding p-values are 0.314 and 0.470 which shows that all of them are insignificant. Similarly, we split the variable "Respondent Partner Education into four parts as- no education primary, secondary, higher education and above, with no education as our reference category. All of their regression coefficients (-0.063, -0.440, and -0.238) shows a negative association between them and cesarean delivery. The respondents, whose partner have Primary education went through cesarean delivery 0.758 times (OR=0.242) less than those whose partners have no education. In the same way, respondents partner with Secondary education, higher education and above level went through cesarean delivery respectively 0.439 times (OR=0.561) and 0.455 times (OR=0.545) less than that of reference category. All of their significance are 0.051, 0.391, 0.297.

For the economic status, monthly family income we categorized the variable into three categories as- poor, lower middle class and middle class and taking poor group as reference category. Their regression coefficient are -1.625 and -0.821 which shows that they are negatively associate. we found that the respondent of both lower middle and middle class has much higher rate of cesarean delivery compared to the poor group, and the rates are 0.803 (OR=0.197) and 0.56 (OR=0.440) times less respectively, and both of them are significant at 1% level of significance. The other variable respondent's "miscarriage", we classified into two categories as - "Yes" and "No". The value of regression coefficient is 0.076 which shows positive association between no category and cesarean delivery. The chance of caesarean birth as compared to the reference is 0.079 times (OR=1.079) higher than reference category. And it is insignificant (0.839). From the table it has been found that the respondent who received tetanus injection during their pregnancy the rate of cesarean delivery is higher than reference category and it is at 1% level of significant. The value of regression coefficient is .846 which indicates that there is positive association between respondents who received tetanus injection. The chance of cesarean delivery 1.331 times (OR=2.331) higher than reference category.

Conclusion

Our analysis shows that, some of the variables highly influences our respondent delivery type - such as their marriage age, first child birth age, income status, education level, their partner education level, tetanus injection, place of baby birth. Respondents, who married and give birth to their first child young age, have less chances of cesarean delivery. Moreover, those who give birth above 30 years age have 1.016 times higher chances of cesarean delivery than that of

young women. Also, less educated Santal couples have less chances of cesarean delivery. Around 56% cesarean delivery is taking place for the couples who have Secondary and higher education. Furthermore, poor people have the highest rate of normal delivery (61.6%) and upper middle class people have the lowest rate of normal delivery. And respondents who received tetanus injection has more chances of normal delivery. Total 209 Santal mothers were selected in the study, among them 67.9% are in 20-30 age group, 77.5% of them married at the age below 20 and 70% of them give birth to their first child at age 20-30. (34.9%) of them don't know where they can get any family planning method. The majority of the women (53.6%) women never participate any training organization by NGO for maternal health awareness. Again (22.5%) of them are not aware of any community clinic in the area. In our area, around (56%) cesarean deliveries took place at NGO sector and 11.9% cesarean deliveries are at the Govt. sector. On the top of that, in the presence of skilled individuals (nurse, midwife) the cesarean delivery rate is 100% and in the presence of unskilled individuals (relatives, neighbors) the cesarean delivery rate is 0%. Respondents who experienced miscarriage before have 0.079 times higher cesarean delivery rate than that of respondents who never experienced miscarriage. In our data, around 2.4% women never received antenatal care and 51.2% women received antenatal care more than (≥ 4) times. The women who took antenatal care more than or equal three times have the highest rate of normal deliveries (49%) and the women who never took ANC care have the lowest 4% rate of normal delivery and most of the pregnant women who visits NGO sector for ANC have the highest rate of normal delivery.

Acknowledgement

We would like to thank Institute of Research and Training (IRT), HSTU, Dinajpur, for funding this project.

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Cite this article:

Md. Sabuj Ali, A.S.M. Abu Saeed, Mst. Dilara Pervin, Shahana Parvin, Md. Ziaul Hassan, Mst Wahida Parvin, Sumyia Hasan, & Mithun Chandro Roy (2024). Identifying the Socioeconomic and Demographic factors affecting the Maternal health care and delivery types of Santal women's of Dinajpur, Bangladesh. *International Journal of Science and Business*, 35 (1), 48-58. DOI: <https://doi.org/10.58970/IJSB.2354>

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