# PUBLIC HEALTH RESEARCH

# Determinants of maternal care utilization among young Muslim women in India

*Saradiya Mukherjee[1]\* and Rakesh Chandra[2]*

[1] *Center for the Study of Regional Development, Jawaharlal Nehru University, India.*
[2] *Center for the Study of Regional Development, Jawaharlal Nehru University, India.*

*\*For reprint and all correspondence: Saradiya Mukherjee, Center for the Study of Regional Development, Jawaharlal Nehru University, India.*
*Email: mamonputush@gmail.com*

## ABSTRACT

| | |
|---|---|
| **Received** | 5 June 2014 |
| **Accepted** | 23 June 2014 |
| **Introduction** | Indian Muslims, compared to their counterparts from other religions, lag behind on several yardsticks related to socioeconomic progress and the same is true with maternal health care utilization. Due to low age at marriage among Muslims, a majority of births is ascribed to young (15-24 years) mothers, which pose serious concerns on the maternal health care of Young Married Muslim women (YMMW). A thorough search of past literatures on Muslim women's maternal health care reveals that the research on the determinants of maternal health care utilization among Muslim women is almost absent. |
| **Methods** | Retrieving data from the National Family Health Survey -3 (2005-06) this study attempts to assess the level of utilization and factors effecting three key maternal health indicators [Full Antenatal Care (ANC), safe delivery and Postnatal Care (PNC)] among YMMW (15-24 years) in India. Bi-variate analysis and chi-square test was applied and variables which were found to be significant were further included in binary logistic regression. |
| **Results** | The findings of the study reveal abysmally low levels of utilization for all three indicators of maternal health care i.e. full ANC, safe delivery and PNC. Multivariate analysis reveals that no mass media exposure, lower autonomy, education, poor economic background, higher birth order and unintended pregnancy are some of the reasons behind low maternal health care utilization. |
| **Conclusions** | The study suggests educating Muslim girls, promoting family planning use, involving media and collaboration between religious leader and health care system could be some important policy level interventions to address the unmet need of maternity services among YMMW. Existing government policies and programs should integrate YMMW who are poor and belong to backward states with poor demographic indicators. |
| **Keywords** | Young - Muslim women - ANC - delivery - PNC - socio-economic determinants. |

## INTRODUCTION

India is a home of 138 million Muslim populations which comprised the second largest religious group and the largest religious minority (Office of Registrar General, 2001)[1]. Most of the Muslims in India lives in Assam, West Bengal, Kerala, Uttar Pradesh and Bihar and they are relatively younger population too (TPMS 2008)[2]. According to 2001 census the total fertility rate (TFR) among Muslim was 3.06 which constitutes highest among the other religion counter parts in India.

Religion belief and practices are found to be closely related with the health outcomes and healthcare use in India[3]. It is now an established fact that Indian Muslims, compared to their counterparts from other religions, generally do not fare well on many yardsticks related to socio-economic progress. The Rajinder Sachar Committee, appointed by the Government of India in 2005, to conduct a systematic study of the social, economic and educational status of the Muslim community, reported that Muslims 'exhibit deficits and deprivation in practically all dimensions of development' and 'the deficits are particularly salient in the areas of female schooling and economic status'[4].

In India, sexual activity and fertility is sanctioned within the wedlock only. According to NFHS-3 report, almost half of 20–24-years old girls in India were married before the legal age at marriage, and about one in fifth girls were married as early as the age 15[5] (IIPS and Macro International, 2007). The fact that the average age at marriage and child birth is lowest among Indian Muslim women makes the issue of maternal health more complex and serious. Fertility level among Muslims is higher with comparatively shorter birth-interval (Office of Registrar General 2001)[1]. This increases the risk of complications, as high fertility with short birth interval is linked with pregnancy complication[6].

Pregnancy in below 20 years of age represents a high-risk group because of competing burden of reproduction and growth. Complications of pregnancy and childbirth are the leading cause of mortality among girls aged 15-19 years in developing countries (Mayor, 2004)[7]. Babies born to adolescents are at increased risk to birth injuries, low birth weight and stillbirth and infant mortality[7].

Although recent data shows maternal mortality ratio in a decreasing trend, however, six counties of the world, namely, India, Nigeria, Pakistan, Afghanistan, Ethiopia and democratic republic of Congo still bear the burden of highest maternal mortality. Majority of the maternal deaths of these counties occurs among adolescent and young mothers[8]. Skilled care in the antenatal period, intra-partum and post natal period can reduce maternal deaths by almost 74 percent, improve pregnancy outcome and reduce neonatal deaths[9]. However, whatever progress has been seen, in terms of utilization of maternal healthcare services in developing countries including India is skewed in favor of few forward socioeconomic groups[10-11].

A thorough search of past literature on Muslim women's health and healthcare reveals that studies in India have mainly focused on religious differences in fertility levels and contraceptive use while the research on the determinants of maternal health care utilization among Young married Muslim women is lacking in India[12-14]. This research gap gives us a genuine reason to inquire upon the dynamics of maternal health care utilization among Muslim women in India In this context, this paper attempts to assess the level of utilization and factors effecting three key maternal health indicators [full antenatal care (ANC), safe delivery and postnatal care (PNC)] among YMMW (15-24 years) in India.

## METHODS

*Data*

The current study used data from the third round of the National Family Health Survey (NFHS-3), conducted during 2005-06. NFHS-3 collected information from a nationally representative sample of 109,041 households, 124,385 women aged 15-49, and 74,369 men aged 15-54. More information on sampling and related issues can be found in the report of NFHS-3 which can be downloaded from the official website of International Institute for Population Sciences (http://www.rchiips.org/NFHS/index.shtml).

*Sample size for the study*

The recent study used sample of YMMW who gave at least one live birth during the five years preceding the survey. The study referred the term 'young' as the mothers who had experienced child birth in the age group of 15-24 years. The sample size for the current study was 2800 young Muslim mothers whose most recent child was born during the reference period stated earlier.

*Outcome variables*

The current study used three indicators of maternal healthcare utilization as outcome variables. The three variables included were full antenatal care, safe delivery care and postnatal care. Full antenatal care was defined as having received two tetanus toxoid (TT) injections, one hundred iron and folic acid (IFA) tables and at least three ANC visits to health facility during pregnancy. Safe delivery is a delivery conducted at health institutions (whether public or private) or at home, but, delivery conducted by doctors, nurse, lady health visitors (LHV), auxiliary nurse midwives (ANM). Postnatal care in the current study was considered as at least one checkup within 42 days after delivery.

*Independent variables*

The key socio-economic and demographic variables taken as independent or predictor variables in the study was guided by existing literature particularly for India 15-17. These were: maternal age at birth, age at marriage, place of residence, women's education, husband's education, castes, autonomy, mass media exposure, wealth index, work status of women, husband's occupation, family structure, birth order, wanted status of child and residence.

Maternal age at birth has been categorized into age group as '15-19 years' and '20-24 years'. Age at marriage of women was split into two category, i.e. <18 years and '18-24 years'. Educational attainment of women was categorized as 'Illiterate', 'Literate but below primary', 'Primary but below middle', 'Middle but below high school', 'High school and above'. Educational status of husband was categorized similarly. The identification of castes was based on the reporting of women and categorized as 'Others', 'Other Backward Class (OBCs)', 'Scheduled Castes (SCs)' and 'Scheduled Tribes (STs)'. Due to small sample size of ST Muslim women, SCs and STs were combined into one category. Women's autonomy was computed taking three dimensions namely women's decision-making ability (final say on own health care, final say on making large household purchase, final say on making daily household purchase, final say on food to be cooked), women's mobility (freedom to visit places), economic independence (assessed by having access to own bank account, and decision-making about husband earning). Highest score was given to woman who made her own decision for each indicators and autonomy was coded as high and low. Mass media exposure was coded as 'no exposure' if the woman reported no exposure to reading newspapers, watching television or cinema or listing to radio and coded as 'any exposure' otherwise.

Wealth quintile is divided into i.e., five groups (poorest, poorer, middle, richer and richest). Work status of women was categorized as 'not working' if the women reported the same and 'working' if the women reported being attached to any occupation (i.e. Professor, technical, manager, agricultural employee, domestic or household worker, services, skilled and unskilled manual worker). Husband's occupation was categorized and given four codes i.e. not working, regular salary, agricultural employee, and skilled/unskilled manual workers. Family structure was categorized into two and coded as 'nuclear' family in case the household was comprised of married couple (man and woman) living alone and 'joint' family otherwise. The parity of women was categorized according to the number of children women had at the time of survey and coded as '1', '2/3' and '4

and more'. The survey provides information on whether the last pregnancy of the women was wanted or unwanted and the study included a variable namely status of child as reported by women and coded as 'wanted' and 'unwanted'.

Studies have established that health seeking behavior of maternal healthcare of women varies across region 18. The study, in line with other literature, divides India into six regions. The six regions consist of North (Jammu and Kashmir, Himachal Pradesh, Punjab, Haryana, Rajasthan, Delhi and Uttaranchal), Central (Uttar Pradesh, Madhya Pradesh and Chhattisgarh), East (Bihar, Jharkhand, West Bengal and Orissa), North-East (Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura), West (Gujarat, Maharashtra and Goa), and South (Andhra Pradesh, Karnataka, Kerala and Tamil Nadu).

*Statistical analysis*

The study used bivariate analysis to examine the unadjusted associations of various independent variables with full antenatal care, safe delivery care, and postnatal care. Variables which were found to be significant (p=<5 %,< 1% and <10%) in chi-square test were included in further analysis. Three logistic regression models were applied to assess the independent association of the outcome variables with the selected predictor variables. Logistic regression is best used when the dependent variable is dichotomous (taking values of 0 and 1). The factors used in the regression were examined for evidence of multicollinearity by the means of calculating variance inflation factor (VIF) associated with individual variables in statistical software Stata 12. Low VIFs (below 2.40) confirmed that there was no significant multicollinearity existing in the final models we adopted. Odds ratios were calculated to understand the strength of association between dependent and independent variables and 95% confidence intervals were estimated for the test of significance. Data analysis was performed using statistical software Stata 12.

## RESULTS

*Background characteristics of the respondents*

More than 73% of YMMW (15-24 years) who gave their last birth during last five years preceding the survey belonged to the age group of 20-24 years (Table 1). An overwhelming majority (70.7%) of young Muslim mothers were married off before the legal age of marriage (i.e. 18 years) in India. A substantial proportion (67.0%) of the young mothers lived in rural parts of the country. About half (46.5%) of young Muslim mothers were illiterate and majority of them (54.1%) belonged to other castes. Only 21.9% of YMMW were found to have high autonomy and 69.3% were exposed to

any form of mass media. About 18.9% women were found to be 'not working' and 20.4% women belonged to 'poorest' wealth quintile. More than half (52.3%) of YMMW were found to be in birth order two or three and 20.9% mothers reported that their last child was not planned. The survey reported that 8.3%,23.7%, 34.3%,11.3%,6.3% and 16.1%, of YMMW, who gave birth during five years preceding the survey, belonged to Northern, Central, Eastern, Western, North-Eastern and Southern regions of the country , respectively.

**Table 1** Percentage distribution of women who had at least one live birth in their young age (15-24) during five years preceding the survey by background characteristics, NFHS-3 (2005–06), India.

| Background characteristics | % | N |
|---|---|---|
| Maternal age | | |
| 15-19 | 26.2 | 675 |
| 20-24 | 73.8 | 2125 |
| Age at marriage | | |
| <18 | 70.7 | 1808 |
| 18-24 | 29.3 | 992 |
| Place of residence | | |
| Rural | 67 | 1366 |
| Urban | 33 | 1434 |
| Woman's education | | |
| Illiterate | 46.5 | 1141 |
| Literate but below primary | 9.5 | 251 |
| Primary but below middle | 8.3 | 230 |
| Middle but below high school | 31.4 | 1004 |
| High school and above | 4.3 | 174 |
| Husband's education | | |
| Illiterate | 35.7 | 825 |
| Literate but below primary | 19.5 | 503 |
| Middle but below high school | 38.6 | 1253 |
| High school and above | 6.2 | 213 |
| Caste/Tribe | | |
| Scheduled Castes/Tribes | 2.9 | 130 |
| Other Backward Castes | 43 | 924 |
| Other | 54.1 | 1273 |
| Autonomy | | |
| Low | 78.1 | 2179 |
| High | 21.9 | 621 |
| Mass media exposure | | |
| Any exposure | 69.3 | 2174 |
| No exposure | 30.7 | 626 |
| Wealth quintile | | |
| Poorest | 20.4 | 375 |
| Poorer | 22.3 | 498 |
| Middle | 22.3 | 627 |
| Richer | 22.6 | 775 |
| Richest | 12.5 | 525 |
| Work status of women | | |
| Working | 81.1 | 2299 |
| Not working | 18.9 | 499 |
| Husband's occupation | | |

| | | |
|---|---|---|
| Not working | 0.9 | 23 |
| Regular salary | 27 | 861 |
| Agricultural employee | 18 | 394 |
| Skilled and unskilled manual worker | 54.1 | 1514 |
| Family structure | | |
| Nuclear | 45.2 | 1085 |
| Joint | 54.8 | 1462 |
| Parity | | |
| 1 | 37 | 1096 |
| 2/3 | 52.3 | 1418 |
| 4 and more | 10.7 | 286 |
| Wanted status of child | | |
| Wanted | 79.1 | 2242 |
| Unwanted | 20.9 | 555 |
| Region | | |
| North | 8.3 | 406 |
| Central | 23.7 | 577 |
| East | 34.3 | 586 |
| West | 11.3 | 291 |
| North-East | 6.3 | 418 |
| South | 16.1 | 522 |
| Total | 100 | 2800 |

*Note: Weights have been applied for calculating percentages. N= Sample size, Total number may not add up to equal due to missing values in the data.*

*Differentials in use of maternal healthcare by socio-economic and demographic characteristics*

Table 2 shows the percentage of YMMW who utilized the maternal healthcare services by selected background characteristics. In total, 12.5% of YMMW received full ANC during their last pregnancy. The corresponding figures for safe delivery and postnatal care were 38.6% and 11.6%, respectively. The utilization of full ANC and safe delivery care was found to be higher among age group of 20-24 years (18.2% and 39.8%, respectively). Among the YMMW who were married before age 18, only 31.3% utilized safe delivery care. However, the use of postnatal care among the women who were married off within 18-24 years was abysmally low (7.4%). YMMW who lived in urban areas reported to be utilizing more antenatal, delivery and postnatal care than their counterparts living in rural parts of the country.

It is evident from the table that higher educational attainment of the women corresponds with higher utilization of the care. The proportion of illiterate women availing full antenatal care was only 5.5% whereas the corresponding figure for women having 10 or more years of education was 35.9%. Similarly, utilization of safe delivery among women having 10 or more years of education was about 87.6% compared to about 20.1% among illiterate women. Postnatal care utilization was found to be considerably low among illiterate women (7.6%). It also showed a clear gradient with educational level. Similarly, husband's education was also seemed to be a positive factor influencing maternal healthcare utilization of YMMW. YMMW with educated husbands were found to be utilizing more maternal healthcare services than women with less educated husbands.

The utilization of safe delivery (33.1%) and postnatal (3.1%) care was lower among YMMW belonging to SC/ST categories compared to the women belonging to caste category known as 'Others'. More than 40% of YMMW who reported to have high autonomy found to be utilizing safe delivery care, but the proportion of postnatal care users among such women was considerably low (14.9%). Those who were not exposed to any source of mass-media reported very poor utilization of maternal care compared to their counterparts. The utilization of full ANC, safe delivery and PNC among women belonging to poorest wealth quintile was reported only 4.8%, 11.4% and 10.7% percent, respectively, while similar figures for women from richest quintile were 28.9%, 80.3% and 11.6%.

It was found that many more working women received full ANC, safe delivery and PNC compared to non-working women. About 13.7% women who were working received full ANC

compared to only 7.4% among non-working women. Similarly, utilization of safe delivery care was higher (40.6%) among 'working' YMMW than 'non-working' YMMW (29.8%). Only 3.2% YMMW with not-working husbands reported receiving full ANC, the corresponding figure for YMMW with husbands in regular salary was 16.3%. Similarly, utilization of safe delivery for YMMW with not-working husband and husband in regular salary was about 28.5% and 49.9%, respectively. Among those who lived in a joint family, the proportion of women receiving full

ANC and safe delivery services was 14.4% and 45.4%, respectively. The utilization of full ANC (17.2%) and safe delivery (50.4%) was higher among one birth order women than among women with birth order four or above. About 40.8% women with a wanted child opted for a safe delivery. A marked regional variation was observed for utilization of all three maternal health care services. The highest utilization of full ANC (34.7%), safe delivery (84.0%) and post natal care (23.2%) was observed among women who belonged to southern region.

**Table 2** Percentage of women who had at least one live birth in their young age (15–24) during the last five years preceding the survey by usage pattern of maternity care services across background characteristics, NFHS-3 (2005–06), India.

| Background characteristics | Full Antenatal Care | Safe Delivery | Postnatal Care |
|---|---|---|---|
| Maternal age | 3.14 | [8.25**] | [2.33] |
| 15-19 | 10.2 | 35.1 | 10.4 |
| 20-24 | 18.2 | 39.8 | 12.1 |
| Age at marriage | [42.4***] | [142.81***] | [3.42*] |
| <18 | 11.6 | 31.3 | 12.8 |
| 18-24 | 12.8 | 56.3 | 7.4 |
| Place of residence | [19.0***] | [254.25***] | [0.48] |
| Rural | 10.7 | 27.5 | 11.3 |
| Urban | 16.2 | 61.2 | 13.2 |
| Woman's education | [178.0***] | [523.01***] | [15.05**] |
| Illiterate | 5.5 | 20.1 | 7.6 |
| Literate but below primary | 11.1 | 26.5 | 14.7 |
| Primary but below middle | 12.6 | 43.6 | 21.8 |
| Middle but below high school | 20.1 | 61.6 | 19.3 |
| High school and above | 35.9 | 87.6 | 5.6 |
| Husband's education | [82.7***] | [317.96***] | [2.11**] |
| Illiterate | 5.6 | 18.8 | 9.6 |
| Literate but below primary | 10.0 | 30.5 | 11.6 |
| Middle but below high school | 17.8 | 56.1 | 15.3 |
| High school and above | 26.8 | 68.0 | 11 |
| Caste/Tribe | 4.271 | [33.50***] | [8.71**] |
| Scheduled Castes/Tribes | 8.7 | 33.1 | 3.1 |
| Other Backward Castes | 11.5 | 43.5 | 6.6 |
| Other | 13.2 | 53.3 | 13.1 |
| Autonomy | 0.49 | [6.52***] | [0.399] |
| Low | 12.2 | 37.5 | 10.8 |
| High | 13.6 | 42.6 | 14.9 |
| Mass media exposure | [42.3***] | [174.39***] | [12.29**] |
| No exposure | 6.8 | 21.1 | 10.0 |
| Any exposure | 15.1 | 46.5 | 12.8 |
| Wealth index | [151.4***] | [679.23***] | [8.09*] |
| Poorest | 4.8 | 11.4 | 10.7 |
| Poorer | 6.1 | 19.2 | 8.5 |
| Middle | 12.9 | 33.1 | 16.3 |
| Richer | 17.2 | 64.7 | 13.2 |

| | | | |
|---|---|---|---|
| Richest | 28.9 | 80.3 | 11.6 |
| Work status of women | [14.35***] | [23.4***] | [0.20] |
| Not working | 7.4 | 29.8 | 10.5 |
| Working | 13.7 | 40.6 | 12.0 |
| Husband's occupation | [13.36**] | [117.38***] | [3.60] |
| Not working | 3.2 | 28.5 | 19.7 |
| Regular salary | 16.5 | 49.9 | 8.5 |
| Agricultural employee | 10.9 | 21.7 | 12.2 |
| Skilled and unskilled manual worker | 11.2 | 38.7 | 12.5 |
| Family structure | [4.7**] | [70.98***] | [0.18] |
| Nuclear | 10.0 | 29.8 | 12.1 |
| Joint | 14.4 | 45.4 | 11.2 |
| Parity | [46.2***] | [130.15***] | [1.994] |
| 1 | 17.2 | 50.4 | 10 |
| 2/3 | 11.2 | 34.6 | 13 |
| 4 and more | 2.6 | 17.2 | 9.7 |
| Wanted status of the child | 0.546 | [13.80***] | [1.074] |
| Unwanted | 12.2 | 30.5 | 10.8 |
| Wanted | 12.6 | 40.8 | 14.6 |
| Region | [255.5***] | [715.44***] | [39.26***] |
| South | 34.7 | 84 | 23.2 |
| North | 9.2 | 40 | 7.1 |
| Central | 3.8 | 25.2 | 4.9 |
| East | 8.8 | 19.7 | 17.5 |
| North east | 6.0 | 12.1 | 3.7 |
| West | 16.6 | 72.9 | 15.9 |
| Total | 12.5 | 38.6 | 11.6 |

*Note: Chi square test was applied for each variable. Figures in parentheses are values of chi square test. Level of significance: ***p<0.01, **p<0.05, *p<0.10*

*Determinants of full antenatal care utilization*

The results of binary logistic regression presented in Table 3 revealed that woman's education, mass-media exposure, wealth quintile, birth order and region are statistically significant determinants of full ANC utilization among YMMW in India. Young mothers educated with high school and above were more likely to utilize the full ANC. The odds of receiving full ANC among women who were educated up to high school were almost twice higher (OR=2.181, CI=1.314-3.619) than the illiterate woman. Exposure to mass-media emerged as another significant variable. YMMW who were exposed to any form of mass-media were found to be more likely to utilize full ANC (OR=1.287, CI=0.874-1.895) than the women who were not exposed to any form of mass media. The odds of full ANC utilization among YMMW belonging to the richest wealth quintile were higher than the mothers belonging to the poorest wealth quintile. YMMW belonging to the richest wealth quintile were about three times more likely (OR=3.171, CI=1.601-6.282) to utilize full ANC than the mothers who belonged to the poorest wealth quintile.

The birth order of the woman comes out as another statistically significant variable influencing ANC utilization. YMMW with birth order four or more were about 65% less likely (OR=0.368, 0.197-0.689) to utilize full ANC compared to mothers who experienced only one birth. Region of the residence also plays a crucial role as it was found that YMMW belonging to northern and central regions of the country were 62% and 82% less likely to utilize full ANC, respectively.

**Table 3** Results from Binary Logistic Regression Model showing Odds Ratio and 95% Confidence Interval (CI) for receiving full antenatal care among women who had at least one live birth in their young age (15–24) during the last five years preceding the survey, NFHS-3 (2005–06), India.

| Covariates | Odds Ratio | CI (95%) |
|---|---|---|
| Age at marriage | 1.000 | |
| <18® | | |
| 18-24 | 0.959 | 0.723,1.272 |
| Place of residence | | |
| Rural® | 1.000 | |
| Urban | 0.904 | 0.689,1.187 |
| Women's education | | |
| Illiterate® | 1.000 | |
| Literate but below primary | 1.110 | 0741,2.003 |
| Primary but below middle | 1.218 | 0.675,1.823 |
| Middle but below high school | 1.447** | 1,018,2.057 |
| High school and above | 2.181** | 1.314,3.619 |
| Husband's education | | |
| Illiterate® | 1.000 | |
| Literate but below primary | 1.029 | 0.681,1.554 |
| Middle but below high school | 1.219 | 0.857,1.733 |
| High school and above | 1.205 | 0.727,1.996 |
| Mass media exposure | | |
| No exposure® | 1.000 | |
| Any exposure | 1.287* | 0.874,1.895 |
| Wealth quintile | | |
| Poorest® | 1.000 | |
| Poorer | 1.407 | 0.757,2.617 |
| Middle | 1.787* | 0.975,3.275 |
| Richer | 2.331* | 1.240,4.382 |
| Richest | 3.171*** | 1.601,6.282 |
| Work status of women | | |
| Not working ® | 1.000 | |
| Working | 0.871 | 0.576,1.160 |
| Husband's occupation | | |
| Not working ® | 1.000 | |
| Regular salary | 1.187 | 0.305,4.618 |
| Agricultural employee | 1.674 | 0.415,6.746 |
| Skilled and unskilled manual | 1.196 | 0.308,4.652 |
| Family structure | | |
| Nuclear® | 1.000 | |
| Joint | 1.100 | 0.308,4.652 |
| Parity | | |
| 1® | 1.000 | |
| 2/3 | 0.697* | 0.534,0.910 |
| 4 and more | 0.368** | 0.197,0.689 |
| Region | | |
| South® | 1.000 | |
| North | 0.385*** | 0.264,0.561 |
| Central | 0.168*** | 0.111,0.254 |
| East | 0.371*** | 0.256,0.539 |
| North East | 0.205*** | 0.129,0.325 |
| West | 0.532*** | 0.375,0.754 |

Note: ®=Reference category, Level of significance: ***p<0.01, **p<0.05, *p<0.10

*Determinants of utilization of safe delivery care*
The results of logistic regression analysis for delivery care are presented in Table 4. The significant variables associated with utilization of delivery care among YMMW were woman's education, woman's autonomy, birth order of the woman, wanted status of the child, wealth quintile and region of residence. YMMW with high school

and above education were 3.6 times more likely to go for safe delivery compared to illiterate Muslim mothers. Women's high autonomy was found to be positively and significantly (OR=1.243, CI=0.981-1.576) associated with safe delivery utilization.

The economic status of household appeared as another significant determinant. The odds of receiving safe delivery care increases with increasing prosperity (higher wealth quintile). The probability of receiving safe delivery was found to be more than five times higher among the women who belonged to richest wealth quintile than among women belonging to poorest wealth quintile. With increasing birth order among YMMW, the odds of receiving safe delivery decreases. The likelihood of receiving safe delivery was found 61% less among

the women of birth order four or more than among women of parity one.

The wanted status of child, i.e. whether the last pregnancy was wanted or not, was found to be another significant determinant of safe delivery care among young Muslim mothers. Women with wanted child were more likely to receive safe delivery care (OR=1.307, CI=1.010-1.690) than the mothers who reported that their last child was unwanted. Region of residence showed statistically significant effect on safe delivery care utilization. The safe delivery utilization for the young Muslim women was lowest among the Central region of India (OR=0.067, CI=0.046-0.098) followed by the Eastern region (OR=0.090, CI=0.061-0.133).

**Table 4** Binary Logistic Regression Model showing Odds Ratio and 95% Confidence Interval (CI) for safe delivery among Muslim women who had at least one live birth in their young age (15–24) during the last five years preceding the survey, NFHS-3 (2005–06), India.

| Covariates | Odds Ratio | CI (95%) |
|---|---|---|
| Maternal age | | |
| 15-19® | 1.000 | |
| 20-24 | 1.161 | 1.010,1.690 |
| Age at marriage | | |
| <18® | 1.000 | |
| 18-24 | 1.004 | 0.782,1.288 |
| Place of residence | | |
| Rural® | 1.000 | |
| Urban | 1.782 | 1.403.2.265 |
| Woman's education | | |
| Illiterate® | 1.000 | |
| Literate but below primary | 1.227*** | 0.851,1.770 |
| Primary but below middle | 1.932*** | 1.353,2.759 |
| Middle but below high school | 1.905*** | 1.471,2.467 |
| High school and above | 3.680*** | 1.959,6.644 |
| Husband's education | | |
| Illiterate® | 1.000 | |
| Literate but below primary | 0.854 | 0.854,1.588 |
| Middle but below high school | 1.195 | 1.195,2.023 |
| High school and above | 1.024 | 1.024,2.627 |
| Caste/Tribe | | |
| Other® | 1.000 | |
| Scheduled Castes/Tribes | 0.697 | 0.430,1.127 |
| Other Backward castes | 1.085 | |
| Autonomy | | |
| Low® | 1.000 | |
| High | 1.243* | 0.981,1.576 |
| Mass media exposure | | |
| No exposure® | 1.000 | |

| | | |
|---|---|---|
| Any exposure | 1.043 | 0.179,0.434 |
| Wealth quintile | | |
| Poorest® | 1.000 | |
| Poorer | 1.528** | 0.995,2.347 |
| Middle | 2.183*** | 1.429,3.333 |
| Richer | 3.649*** | 2.323,5.730 |
| Richest | 5.425*** | 3.199,9.200 |
| Work status of women | | |
| Not working ® | 1.000 | |
| Working | 1.108 | 0.856,1.434 |
| Husband's occupation | | |
| Not working ® | 1.000 | |
| Regular salary | 0.991 | 0.341,2.884 |
| Agricultural employee | 0.753 | 0.254,2.237 |
| Skilled and unskilled manual worker | 0.921 | 0.319,2.657 |
| Family structure | | |
| Nuclear® | 1.000 | |
| Joint | 1.131 | 0.908,1.410 |
| Parity | | |
| 1 | 1.000 | |
| 2/3 | 0.529*** | 0.415,0.675 |
| 4 and more | 0.398*** | 0.259,0.611 |
| Wanted status of child | | |
| Unwanted® | 1.000 | |
| Wanted | 1.307** | 1.010,1.690 |
| Region | | |
| South® | 1.000 | |
| North | 0.125*** | 0.083,0.187 |
| Central | 0.067*** | 0.046,0.098 |
| East | 0.090*** | 0.061,0.133 |
| North east | 0.460*** | 0.030,0.070 |
| West | 0.278*** | 0.179,0.434 |

*Note: ®=Reference category, Level of significance: ***p<0.01, **p<0.05, *p<0.10*

*Determinants of postnatal care utilization*
Estimated odds ratios for the postnatal care utilization by YMMW have been presented in Table 5. Age at marriage, woman's education, wealth quintile and region of the residence appeared to be statistically significant determinants for postnatal care utilization. YMMW who were married off at the age group of 18-24 years, were found to be 1.5 times more likely to utilize post natal care services than the Muslim girls who were married off before the legal age at marriage (i.e. 18 years for girls) in India. Educational attainment of women Young Muslim women with middle level education were more likely (OR=2.014, CI=1.202-3.374) to utilize postnatal care compared to the women who were illiterate. The likelihood of utilizing postnatal care by young Muslim women was found to be significantly varied by region. YMMW who lived in the northern part of the country were found to be 75% less likely (OR=0.249, 0.940-0.662) to utilize postnatal care compared to the women who lived in the southern part of the country.

**Table 5** Binary Logistic Regression Model showing Odds Ratio and 95% Confidence Interval (CI) for postnatal check-up among Muslim women who had at least one live birth in their young age (15–24) during the last five years preceding the survey, NFHS-3 (2005–06), India.

| Covariates | Odds Ratio | CI (95%) |
|---|---|---|
| Age at marriage | | |
| <18® | 1.000 | |
| 18-24 | 1.509** | 0.304,0.852 |
| Woman's education | | |
| Illiterate® | 1.000 | |
| Literate but below primary | 1.819** | 0.979,3.381 |
| Primary but below middle | 2.150** | 1.114,4.149 |
| Middle but below high school | 2.014** | 1.202,3.374 |
| High school and above | 3.144 | 0.608,16.267 |
| Husband's education | | |
| Illiterate® | 1.000 | |
| Literate but below primary | 1.089 | 0.644,1.841 |
| Middle but below high school | 1.129 | 0.687,1.858 |
| High school and above | 0.538 | 0.169,1.712 |
| Caste/Tribe | | |
| Other® | 1.000 | |
| Scheduled Castes/Tribes | 1.441 | 0.532,3.906 |
| Other Backward castes | 1.569 | 0.559,4.403 |
| Mass media exposure | | |
| No exposure® | 1.000 | |
| Any exposure | 0.975 | 0.623,1.524 |
| Wealth quintile | | |
| Poorest® | 1.000 | |
| Poorer | 0.670 | 0.368,1.221 |
| Middle | 1.687* | 0.945,3.012 |
| Richer | 1.546 | 0.776,3.080 |
| Richest | 1.247 | 0.446,3.484 |
| Region | | |
| South® | 1.000 | |
| North | 0.249** | 0.940,0.662 |
| Central | 0.174*** | 0.680,0.442 |
| East | 0.454* | 0.185,1.109 |
| North East | 0.950*** | 0.350,0.258 |
| West | 0.283** | 0.870,0.925 |

*Note: ®=Reference category, Level of significance: ***p<0.01, **p<0.05, *p<0.10*

## DISCUSSION

Although fertility peak in most of the high fertility states in India continues to be in the age group of 20-24 years, they are yet to receive a systematic public health response[19]. Of nearly half a million maternal death occurring every year, majority of the maternal deaths occur among younger women in the age group of 20-29 years. Skilled care in the antenatal period, intra-partum and postnatal period can reduce maternal deaths by almost 74%, improve pregnancy outcome and reduce neonatal deaths[19].

The findings of the study reveal abysmally low levels of utilization for all three maternal healthcare services among YMMW in India. Only

12.5%, 38.6% and 11.6% YMMW received full ANC, safe delivery and PNC services, respectively. The study also identified some important variables that had significant effect on utilization on full ANC, safe delivery and PNC services among YMMW. Age at marriage, mother's education, mass media exposure, women's autonomy, birth order, economic status, wanted status of child, and region of residence were found to be significant variables effecting maternal health care utilization.

The study showed positive impact of age at marriage on maternity care use. In a patriarchal set up like India, young or newlywed mothers generally have little or even no say about their own health care use which results into non use of the same[20].

We found that women education significantly increased the odds of receiving maternal healthcare services. This finding is similar to many previous studies where a positive relationship has been established between mother's education and utilization of maternity services. Educated women are considered to possess greater awareness about health seeking behavior, autonomy and decision making ability and negotiations skills[21]. Results reveal that YMMW who were exposed to mass-media were found to be more likely to go for full ANC compared to women who were not exposed to mass-media. Electronic and print media have often been used to promote reproductive and healthcare services and modify behaviors[22]. In developing country like India, where two-thirds of YMMW were found illiterate, the electronic media could be a good option to spread awareness about healthcare related issues. A study conducted in India argued that mothers' exposure to electronic media increases their use of prenatal care services significantly[23].

Autonomy has a positive and direct relationship with women's maternal health seeking behavior. About 78.1% YMMW in our study reported having 'low autonomy'. Maternal health in general is severely constrained by women's lack of authority to make healthcare related decisions for them. Substantial increase in maternal health care utilization was seen in our study among the YMMW who had reported higher autonomy. This result confirms similar findings by many previous studies[24].

More than half of YMMW (52.3%) in India were of parity two or three. Our study revealed that use of maternal healthcare services among YMMW decreased with increasing parity. Utilization of the services was generally lower among mothers of parity four and higher. It must be noted that a large majority of first time mothers in India generally spend their pregnancy period in their natal home. Therefore, extra care and expenditure for the first or second birth is a common practice in India compared to subsequent births. This finding is similar to many previous studies[25]. Older women they probably start believing that they have gained enough experience and knowledge about pregnancy and childbirth from previous pregnancies and births and therefore, utilizing healthcare services is not necessary for them.

It is a well-documented fact that the household wealth has a positive effect on the use of maternal healthcare. In India, the poor-rich gap in the utilization of maternal healthcare services has been confirmed by previous studies[26]. Although 42.7% YMMW in the study belonged to the poorest wealth quintile yet as expected, women from richer households were more likely to use maternal care. Women from rich households are generally more educated and have more autonomy compared to the women from poor households. Moreover, wealthier women also have enough resources to meet the expenses on healthcare whereas the poor women generally cannot.

The study established that the YMMW who reported having unintended pregnancy were found to be less likely to utilize maternal healthcare services. Women with unintended pregnancy may have less prepared mentally, physically or financially to bear a child or may identify the fetus in a later stage[27]. However, inferring a conclusion between unwanted pregnancy and low maternal use is ambiguous as there are studies which also established a positive or unclear relationship between unintended pregnancy and maternal health care utilization[28-29].

India, culturally being a highly diversified country, also exhibits vast rifts of regional variation in important indicators related to social-economic and healthcare utilization. Previous studies also have identified a remarkable regional variation in terms of utilization of maternal healthcare services[15,18]. Results from this study too clearly illustrated the same. YMMW who lived in southern parts of the country were found to be significantly more likely to utilize maternal health care services compared to their counter parts in other regions. Higher levels of socioeconomic development, advanced stage of fertility transition and better functioning of government healthcare systems could be some of the factors behind the better performance of the states belonging to Southern region. The States covered under the Central regions are characterized by comparatively poor socioeconomic and demographic indicators such as poor woman's literacy, limited exposure to mass media and low age at first marriage and dysfunctional government healthcare systems. A great majority of the maternal deaths are reported only from these northern states. Hence, it is not surprising that most of the regions show lower odds of maternal care compared to the South.

## CONCLUSIONS

Indian health policy has been delivering maternal health care services to all homogenously. However, the study has also showed maternal healthcare utilization varies across different socioeconomic and demographic groups. Therefore, it is high time for reproductive health policies and programs to tailor the need-specific interventions for YMMW to address the unmet need of maternal healthcare.

Educating Muslim women should be one of the top priorities for the government as improving educational opportunity and promoting higher education among YMMW would delay the age at marriage and child birth. Educated women would have higher autonomy and decision making ability for the use of health care. The policies should focus on providing universal education for Muslim girls as well as motivating families to educate their girl child. Use of contraceptive and family planning among newly married Muslim couples should be promoted to minimize the consequences of unwanted pregnancy and child birth. India should follow the example of Muslim dominated country Indonesia's performance of achieving major demographic goal through increasing the prevalence of contraceptive use. In case of Muslims who follow religious beliefs and practices discouraging the use of modern healthcare services so collaboration between religious leaders and healthcare system may help.

Encouraging the use of mass-media should be another important area where policy should focus. Affordable mass-media options such as radio can still prove to be beneficial in imparting maternal and child health related knowledge among poor young mothers living in far-off rural areas of the country.

Existing government policies and programs should integrate the young Muslim mothers who live in countryside, are poor and belong to backward states with poor demographic indicators. In 2005, a conditional cash incentive scheme, Janani Suraksha Yojana, was launched under the National Rural Health Mission to encourage pregnant women who belong to few selected demographically low-performing states to receive institutionalized maternal healthcare services. A recent national level sample survey called Annual Health Survey (AHS, 2010-11)[30] has sown some improvements in institutional delivery among women in rural areas. Contrary to that, the levels of full antenatal care and postnatal care do not seem to have improved. Therefore, policy must devise ways to improve full antenatal care and postnatal care, especially among YMMW who also reported child birth at home and low contraceptive use.

## REFERENCES

1. Registrar General and Census Commissioner, India. Census of India. Fertility Tables. Office of the Registrar General, India Ministry of Home Affairs. Government of India, New Delhi; 2001.
2. TPMS. Millennium Development Goals and Muslims. Delhi. Threek-E-Pasmanda Muslim Samaj; 2008.
3. Sanneving L, Trygg N, Saxena D, Malvankar DV, Thomsen S. Inequity in India: the case of maternal and reproductive health Global Health Action. 2013; 6:19145 http://dx.doi.org/10.3402/gha.v6i0.19145.
4. Sachar RS, Hamid TK, Ooman MA, Basith R, Basant AM. Social, economic and educational status of the Muslim community of India, New Delhi; 2006.
5. International Institute for Population Sciences & Macro International National Family Health Survey (NFHS-3), 2005–06: India. Volume I. Mumbai: IIPS; 2007.
6. Papia Raj.Pregnancy complications and health-seeking behaviour among married women in Uttar Pradesh, India. Research and Practice in Social Sciences. 2005; 1 (1): 48-63.
7. Mayor S. Pregnancy and childbirth are leading causes of death in teenage girls in developing countries. BMJ.2004; 328:1152.2. doi: http://dx.doi.org/10.1136/bmj.328.7449.1152-a.
8. Patton GC, Coffey C, Sawyer SM, Viner RM, Haller DM, Bose K, Vos T, Ferguson J, Mathers CD.Global patterns of mortality in young people: a systematic analysis of population health data. Lancet. 2009; 374:881–92.
9. World Health Organization: Guidelines for preventing early pregnancy and poor reproductive outcomes among adolescents in developing countries; 2011.
10. Haque. M.N. Individual characteristics effecting maternal health care utilization: Married adolescents and their use of maternal health care services in Bangladesh. The Internet Journal of Health 2009; 8(2). doi 10.5580/1d27.
11. Dalal K, Shabnam J, Andrews-Chavez J, Mårtensson LB, Timpka T. Economic empowerment of women and utilization of maternal delivery care in Bangladesh. Internet Journal of Preventive Medicine. 2012; 3:628-6.

12. Bhagat RB, Praharaj P. Hindu-Muslim fertility differentials. Economic and Political Weekly 2005; 40(5): 411–418.

13. Bhat PNM, Zavier AJF. Role of religion in fertility decline: The case of Indian Muslims. Economic and Political Weekly. 2005; 40(5): 385–402.

14. Kulkarni PM, Alagrajan M. Population growth, fertility and religion in India. Economic and Political Weekly 2005; 40(5): 403–410.

15. Navaneetham K, Dharmalingam A. Utilization of maternal health care services in southern India. Social Science and Medicine. 2002; 55(10): 1849–1869.

16. Bonu S, Bhusan I, Rani M, Anderson I. Incidence and correlates of catastrophic maternal health care expenditure in India. Health Policy and Planning 2009; 24:445–456.

17. Mukherjee S, Singh, A, Chandra, R. Maternity or catastrophe: A study of household expenditure on maternal health care in India. Health. 2013; 5: 109-118. doi: 0.4236/health.2013.51015.

18. Leone T, James KS, Padmadas SS, The Burden of Maternal Health Care Expenditure in India: Multilevel Analysis of National Data, Maternal and Child Health Journal; 2012.

19. World Health Organization. Provision of effective antenatal care: Integrated management of Pregnancy and Child Birth (IMPAC). Standards for Maternal and Neonatal care (1.6).2006, Department of Making Pregnancy Safer, Geneva, Switzerland.

20. Jejeebhoy S. and Rao SR. Unsafe motherhood: a review of reproductive health, in Women's health in India: Risk and vulnerability, ed. M. Das Gupta, LC. Chen and TN Krishnan. Delhi, Oxford University Press; 1995.

21. Babalola S and Fatusi A. Determinants of use of maternal health services in Nigeria – looking beyond individual and household factors BMC Pregnancy and Childbirth. 2009; 9(43) doi: 10.1186/1471-2393-9-43.

22. Rabbi. A.M. F. Mass Media Exposure and its Impact on Fertility: Current Scenario of Bangladesh. Journal of Scientific Research. 2012; 4(2):383-395.

23. Ghosh D. Effect of Mothers' Exposure to Electronic Mass Media on Knowledge and Use of Prenatal Care Services: A comparative Analysis of Indian States. The Professional Geographer. 2010; 58:3, 278-293, DOI: 10.1111/j.1467-9272.2006.00568.

24. Woldemicael G. Do Women with Higher Autonomy Seek More Maternal and Child Health-Care? Evidence from Ethiopia and Eritrea Stockholm Research Reports in Demography; 2007.

25. Magadi MA, Madise NJ, Rodrigues RN. Frequency and timing of antenatal care in Kenya: Explaining the variations between women of different communities. Social Science and Medicine. 2000; 51: 551–561.

26. Singh PK, Rai RK, Alagarajan M, Singh L. Determinants of Maternity Care Services Utilization among Married Adolescents in Rural India. PLoS ONE 2012, 7(2): e31666. doi:10.1371/journal.pone.0031666.

27. Wado YD, Afework MF Hindin MJ. Unintended pregnancies and the use of maternal health services in southwestern Ethiopia. BMC International Health and Human Rights. 2013; 13:36.

28. Eggleston, E. Unintended pregnancy and women's use of prenatal care in Ecuador. Social Science and Medicine. 2000; 51: 1011–1018.

29. Marston C, Cleland J. Do unintended pregnancies carried to term lead to adverse outcomes for mother and child? An assessment in five developing countries. Population Studies. 2003; 57: 77–93.

30. Census of India: Annual Health Survey: 2010-11.