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Consequences of Teenage Childbearing on Maternal and Child Health in India

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Abstract

Several studies have shown that early motherhood is associated with less utilization of maternal health care services as well as increased risk of maternal and child health outcomes. The present study advances our knowledge in Indian context. Adverse impacts of teenage childbearing on low weight at birth, infant mortality rate, and on mother's anaemic conditions is examined using data of third round of National Family Health Survey conducted during, 2005-06. Bivariate and multivariate analysis is employed in the study. Result indicates that risk of poor health is higher among teenage mothers than in the comparison group. However, differences are more pronounced for infant mortality. Multivariate analysis shows that teenage mothers are significantly and negatively associated with risk of low birth weight, infant mortality, and prevalence of anaemia after adjusting other confounders.

Keywords

Teenage childbearing; low birth weight; infant mortality; anaemia; India

Introduction

In developing countries where marriage is almost universal and gestures the onset of childbearing, early age at marriage has a strong influence on demographic, social, and economic phenomena. For example, given a set of age-specific marital fertility rates, early age at marriage possesses multiple influences. First, younger age at marriage implies higher aggregate rates of fertility resulting in higher rates of population growth. Second, early marriage is associated with a lower rate of school attendance and with lower social status and limits the labour force participation, particularly of females. Third and most important, it demands for special provision of family planning services and maternal and child healthcare, particularly for younger mothers, and their newborns.

As a developing nation, the Indian population reveals all these characteristics to certain extent. First, marriage is nearly universal in India with common practise of early marriage. Even after government's law of legal minimum age at marriage of 18 years for female and 21 years for male, median age at marriage are 17.2 years among women and 23.4 years among men in the country (IIPS & Macro International, 2007). Although the median age at marriage has steadily increased from 16.1, still more than half of women are married before the legal minimum age of 18 years. Second, India's family planning efforts are far from universal. For instance, about 56 percent of married women aged 15-49 were used some form of family planning methods in 2005-06, increased from 41 percent in 1992-93. Again the proportion is very low among married women aged 15-19, only 13 percent have practiced some form of contraception (IIPS & Macro International, 2007). Finally, as a result the population of the country is 1022 million (17% of world total population) and growing at average annual rate of 2.1 (Census of India, 2011).

The rapidly growing Indian population is largely contributed by the youth population. For instance, there are 350 million young persons aged 10-24 years in the country and majority of them are adolescent (Census of India, 2011). The majority of adolescents in the country, particularly females are out of school and have limited choices available for their future. Moreover, these girls receive less education and employment opportunities, poor healthcare services, and inadequate nutritional intake than boys indicating sharp intra-familial gender discrimination (CDPA, 2001). Despite the government's laws raising the legal age at marriage of 18 years for girls, strong socio-cultural pressure bind parents to marry their daughters early. Once the girls join their husband/in-laws household after marriage they have very little autonomy on decision making and freedom of movement. For instance, among married young women aged 15-19, only 40 percent have any involvement in decisions related to their own health care visits, while only 30% are allowed to go alone to the market (IIPS & Macro International, 2007).

Low educational attainment, limited choices, physical immaturity, and low autonomy limit healthcare utilization among teenage women during and after pregnancy. Previous studies demonstrated that teenage mothers are less likely to utilize maternal healthcare services than older mothers (Asscadi and Asscadi, 1993; Graham et al., 2001). Several socio-cultural constraints such as limited exposure to mass media, lack of knowledge of the health needs, complications during pregnancy, limited autonomy, and distance to health services become barriers to utilization of health services among adolescents (McCarthy and Maine, 1992; Konje et al., 1993). As a result younger women face several health problems related to childbearing which are avoidable with timely and appropriate care during and after pregnancy (Blankson et al., 1993; Morris et al., 1993; Mahfouz et al., 1995; Zabin and Kiragu, 1998).

Several studies from developed and developing countries have shown that childbearing during adolescence exerts negative health impacts on mothers and their newborns (Luker, 1966; Menken, 1972; Furstenberg, 1976; Card and Wise, 1978; Menken and McCarthy, 1979; Baldwin and Cain, 1980). Teenage childbearing is adversely associated with poor maternal health such as – weight gain, pregnancy-induced hypertension, and sexually transmitted diseases (Scholl and Hediger, 1994; Bozkaya et al., 1996; Lao and Ho, 1998; Koster et al., 2001; Gilbert et al., 2004; WHO, 2004; Chen et al., 2007). Anaemia among adolescents is another health problem associated with compromised

pubertal growth spurt and cognitive development. Along with nutritional deprivation, increased iron demand for adolescent growth, excessive menstrual losses of iron and early pregnancies aggravate and exacerbate pre-existing anaemia among adolescents. As a result anaemia is a primary contributor of maternal mortality. For instance, in India about 20-25% of maternal mortality among girls aged 10-19 is due to anaemia (CDPA, 2001).

Beside the maternal health, teenage childbearing is also associated with adverse child health outcomes. For instance, prevalence of low birth weight, pre-term birth, and pregnancy wastage is significantly higher among teenage than older mothers (Legrand and Mbacke, 1993; Fraser et al., 1995; Treffers, 2003; Wang and Chou, 2003; Yadav et al., 2008). Moreover, children of teenage mothers experience greater health problems and lower survival than older mothers. Teenage births are at higher risk of death than births of women aged 20-29 years (Hobcraft, 1987; Cochrane 1989; Haaga, 1989; Senanayake, 1990; Adetoro and Agah, 1998; Zabin and Kirazu, 1998; Alam, 2000). Biological immaturity of mother appears as a factor of such relationship (Simoes et al., 2003).

In India, few studies have established the link between mother's age and maternal and child health. A community based study shows that proportion of low birth weight is significantly higher among women under age 20 than other women (Hirve and Ganatra, 1994). Similarly, fewer studies compared health outcomes between teenage and non-teenage mothers. Study shows that prevalence of anaemia, preterm delivery, and low birth weight is more prevalent among teenagers than among women who were 20-24 years old (Banerjee et al., 2009). Similarly, proportion of low birth weight and infant mortality is higher among teenage than older mothers (UNFPA, 2003). Beside adverse health outcomes, teenage mothers are less likely to utilize prenatal and postnatal healthcare services than older mothers in India (Bezbaruah and Janeja, 2000; CDPA, 2001; Singh and Lahiri, 2008). As a result mortality among teenagers are higher than women older than 20 in the country (Mehta, 1998). In contrast, another study in the country has shown that adolescent pregnancy is not associated with adverse pregnancy outcomes (Sundari, 1993), possibly because new married teenagers returned to their maternal home for better care during pregnancy and delivery thus their health status is relatively better.

As the Indian population is largely adolescent, researchers have given attention to identify the needs of the adolescent population. In recent years several literatures have examined marital patterns among adolescents, their economic and political needs, and advocated the emerging premarital sexual and reproductive aspects of adolescents at national and sub-national level (Ram et al., 2008; Jejeebhoy and Ram, 2009; Moore et al., 2009; Ram et al., 2009a, 2009b; Santhya et al., 2010). Thus, most of the existing literature focuses on requirements of adolescents beginning from their transition to adulthood and up to marital status. However, comparatively few studies have examined teenage mother's greater health risk and lower health care services utilization. Moreover, most of the existing literature unmasks the situation of a particular area (very small) of the country and does not reflect the national scenario. While in India increasing proportions of the adolescent population, early marriage, and lower contraceptive use increases for early childbearing. This has been a major public health concern in the country as the huge number required special provision of family planning programs, including health care services. But there is very little evidence showing the health consequences of teenage childbearing at national level. Accordingly, in this paper, an attempt has been made to examine the consequence of teenage childbearing on selected maternal and child health indicators in the country. It is hypothesized that teenage childbearing is adversely associated with maternal and child health in India.

Data and Methods

Data

The study used data from third round of National Family Health Survey (NFHS-3) of India conducted during 2005-06. NFHS is large-scale, multi-round, and nationally representative survey and is in similar format with Demographic and Health Survey (DHS) of other countries. Third round of NFHS

is outcome of collaborative efforts of several organizations such as International Institute for Population Sciences (IIPS), United States Agency for International Development (USAID), Department for International Development (DFID), the Bill and Melinda Gates Foundation, United Nations International Children Fund (UNICEF), United Nations Population Fund (UNFPA), and Ministry of Health and Family Welfare (MoHFW), Government of India. The survey adopted two-stage sampling design in rural areas and three-stage in urban areas. Third round of NFHS samples comprise more than 99 percent of national population and cover a wide range of topics such as fertility, infant and child mortality, family planning, maternal and child health, health care utilization, knowledge and prevalence of HIV/AIDS, and many other issues and provides estimates at national and sub-national levels. NFHS-3 provides information on 109,041 households, 124,385 women (married and unmarried) age 15-49. Details of sampling procedure, sample size, and findings are available in national and states reports (IIPS & Macro International, 2007).

First of all we defined teenage women as – ever married women aged 15-19 who have had a live birth at the time of survey. The age group 15-19 is common age cut-off for teenagers used by previous researchers (Makinson, 1985; Chahande et al., 2002; Woldemicael, 2005; Mayfield, 2006; Yadav et al., 2008). The teenage mothers were compared with a control group of mother aged 20-29 who have given their first birth after age 20[†]. The group was chosen as the control because the mothers of 20-29 years old are at lowest risk of adverse health outcomes (Chen et al., 2007; Park, 2007).

Dependent variables analysed in the study are important measures of maternal and child health. Three dependent variables are selected – two of them indicating child health and one indicating maternal health – and compared between the teenage mothers and control groups. The variables are – low birth weight, infant mortality rate, and prevalence of anaemia – defined as follows:

i) *Low weight at birth*: Children whose birth weight is less that 2.5 kilograms is considered as low birth weight. Low birth weight is estimated for children born five years preceding the survey.

ii) *Infant mortality rate*: The probability of death under 1 year of age and estimated from births in five years preceding the survey.

iii) *Prevalence of anaemia*: Women suffered with any type of anaemia (mild anaemia, moderate anaemia, and severe anaemia) are considered as anaemic while other were considered as non-anaemic.

In the survey, anaemia is measured based on level of haemoglobin in the blood sample taken from the respondents. Based on haemoglobin concentration in blood, three levels of severity of anaemia is distinguished among women – mild anaemia (10-11.9 grams/decilitre), moderate anaemia (7.0-9.9 grams/decilitre), and severe anaemia (less than 7.0 grams/decilitre). To attain sufficient sample size among teenage mother we have combined all three levels of severity of anaemia into one category and defined as prevalence of any anaemia.

In order to understand the socio-economic characteristics of teenage mothers we used a set of pertinent covariates. In further analysis, the covariates are used as confounders. These covariates are – place of residence (urban/rural), parity (1, 2, 3 and above), educational status of mother/women (not educated, 1-5 years of schooling, 6 and more years of schooling), exposure to mass media (yes/no), currently working (yes/no), wealth quintiles (poorest, poorer, middle, richer, richest), religion (Hindu, Muslims, Others), caste (Scheduled Castes/Scheduled Tribes-SCs/STs, Other Backward Castes-OBCs, and Others), Body Mass Index-BMI (thin, moderate, obesity), antenatal care visits (less than

[†] For the control group we have selected only those women who have given their first birth after age 20 under the assumption that many of the women age 20-29 would have given birth when they were themselves teenagers. In such a case comparison of health indicators between teenage mothers and mothers age 20-29 will be biased to certain extent.

three visit, more than 3 visits), women's autonomy[‡] (low, medium, high), and regions (north, north-east, east, central, west, south).

Methods

Descriptive analysis is carried out to understand the percentage distribution of teenage mothers and the control group across key background characteristics in the country. Cross-tabulation is used to understand the differentials in selected child and maternal health indicators across the age group of mother. Multivariate analysis is used to understand the significant influence of age of childbearing on selected child and maternal health indicators after adjusting other socio-economic confounders. Two outcome variables considered in the study – low birth weight and prevalence of anaemia – are binary in nature (0 and 1) thus binary logistic regression is used for both of the health indicators. While Cox proportional hazard model is used for infant mortality in order to adjust for censored cases. Analysis is carried out using statistical package of STATA 8.0.

Results

Pattern of teenage pregnancy and motherhood in India, 2005-06

Figure 1 shows the level of teenage pregnancy and motherhood in India during 2005-06. Overall 12 percent of women age 15-19 became mother while 4 percent of women of the same age group were pregnant with their first child at the time of survey. In total, one in six women age 15-19 had begun childbearing in the country at the time of survey.

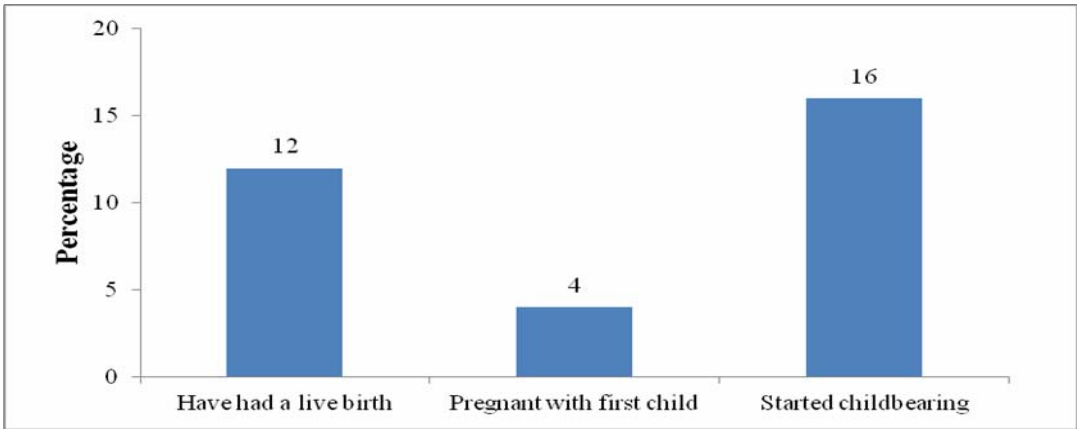

Figure 1. Percentage of women age 15-19 who have had a live birth, pregnant with first child, and started childbearing in India, 2005-06

Sample characteristics of teenage and other mothers

Table 1 presents percentage distribution of mothers age 15-19 (teenage mothers) and age 20-29 by selected key socio-economic characteristics in India during 2005-06. Result shows that majority of teenage mothers' belonged to rural areas (84%). Most of the teenage mothers were on their first parity (76%), while 21 percent were on their second parity and a minimal proportion were at three or more parity (3%). About half (47%) of teenage mothers were uneducated and one-third completed six or more year of schooling. Participation in economic activities was very low among teenage mothers – about four-fifths of (78%) of teenage mothers were not involved in any economic activities at the time

[‡] Women's autonomy is computed using six questions related to decision making: (i) decision on money spending, (ii) decision on health care, (iii) decision on large household purchase, (iv) decision on purchase of daily household need, (v) decision on visit to family or relation, and (vi) decision on spending husband earning.

Table 1. Percentage distribution of teenage vs. other women by selected socio-economic and demographic characteristics in India, 2005-06

	Ever married women who had a live birth			
	Women age 15-19	**Number**	**Women age 20-29**	**Number**
Place of residence				
Urban	15.8	7463	28.4	14255
Rural	84.2	17348	71.6	28941
Birth Order				
1	76.2	2278	27.9	8852
2	20.6	616	36.0	11439
3+	3.2	96	36.1	11485
Education status				
Not educated	46.7	5395	43.0	15523
1-5 years	20.6	3805	14.9	5814
6-10 years	32.7	15612	42.1	21859
Exposure to mass media				
No	34.5	4373	26.9	9684
Yes	65.5	20411	73.1	33493
Currently working				
Yes	22.2	18160	31.1	29345
No	77.8	6601	68.9	13784
Wealth Index				
Poorest	28.5	4432	20.7	7542
Poor	29.4	5071	20.8	8014
Middle	22.6	5390	20.7	8632
Richer	14.2	5181	20.8	9410
Richest	5.2	4738	16.9	9598
Religion				
Hindu	81.7	19503	80.8	34702
Muslims	15.5	3996	14.6	6086
Others	2.8	1298	4.6	2367
Caste				
SCs/STs	38.3	6981	29.2	11663
OBC	42.3	10020	41.8	16928
Others	19.4	7043	29.0	13270
BMI of women				
Thin	44.7	10807	37.2	14994
Moderate	53.2	12292	54.9	22925
Obesity	2.0	586	7.8	3418
ANC Visits				
Less than 3 visits	38.9	898	30.3	6348
3 and more visit	61.1	1409	69.7	14593
Women autonomy				
Low	60.7	4390	24.8	9566
Medium	21.4	1290	24.5	9265
High	17.9	1014	50.8	12026
Region				
North	8.6	3238	12.5	5735
Central	24.7	6680	24.3	9824
East	36.4	6001	24.2	9720
Northeast	3.7	935	3.6	1805
West	11.6	3389	14.5	6525
South	15.0	4567	20.9	9588
Total	**100.0**	**24811**	**100.0**	**43197**

of survey. Most of the teenage women were belonging to poor household (either from poorest or from poorer quintile). Majority (82%) of teenage mothers were Hindu. Ethnic composition of teenage mothers shows that 38 percent belonged to SCs/STs, 42 percent from OBC, and only 19 percent belonged to other castes. Though half of the teenage mothers had moderate body mass index but a considerable proportion (45%) were acutely undernourished at the time of survey. Three-fifths of teenage mothers had low level of autonomy. Regional distribution shows teenage motherhood was highest in east region (36%) while lowest in North-east region (4%).

Sample distribution of mothers age 20-29 followed a similar pattern to teenage mothers across place of residence, religion, caste, and region. But considerable differences are observed across parity, educational attainment, BMI, and autonomy. For instance, among mothers age 20-29, majority were of two and higher parity. More than two-fifths (42%) of mothers age 20-29 completed six or more years of schooling compared to one-third of teenage mothers. Similarly, 51 percent of mother age 20-29 had high levels of autonomy compared to only 18 percent of teenage mothers.

Differentials in selected health outcome across age group of mother in India

Table 2 presents differentials in selected health indicators between mothers aged 15-19 and those aged 20-29 across selected background characteristics. Results show that 29 percent of children of teenage mothers were underweight compared to 20 percent of those of mothers aged 20-29 (last row of the table). Infant mortality starkly varied between teenage and mothers and those age 20-29. It is twice high among teenage mothers than mothers age 20-29, 91 per 1000 live births and 43 per 1000 live births respectively. Likewise child health outcomes maternal health varied between the groups. For instance, prevalence of anaemia is higher among mothers aged 15-19 than mothers aged 20-29, 70 percent and vs. 55 percent respectively.

The analysis is also extended across selected background characteristics. Result shows that differentials in low birth weight children between teenage and other mothers is more profound in urban areas, lower parity, higher educational status, exposure to mass media, and among mothers who have gone for more than three antenatal care visits. For instance, between first parity mothers, proportion of low birth weight children is 28 percent among teenage mothers compared to 20 percent among mothers aged 20-29. In contrast, among higher parity (three and above) mothers, equal proportion of children (24 percent) were low birth weight belonging to teenage mothers and those age 20-29. Among women with six or more years of schooling, proportion of low birth weight children is 29 percent among teenage mothers and 19 percent among mothers age 20-29, on the other hand among uneducated women the proportion is equal across (26 percent) the groups. Proportions of low birth weight children between teenage and other mother considerably varied among those women who have gone for three or more antenatal care – 27 percent and 19 percent among teenage and mother age 20-29 respectively. Regional variation in low birth weight children between teenage and older mothers is also apparent.

Infant mortality between mothers age 15-19 and 20-29 varies starkly with their parity, educational and economic status, and antenatal care visits. Differences in infant mortality among teenage and mother age 20-29 are comparatively higher among women of higher parity than that of lower parity. For instance, among higher parity women (three or more) infant mortality rate is 104 per 1000 live births vs. 51 per 1000 live birth among mother's age 15-19 and age 20-29 respectively, while among mother with one parity it is 89 per 1000 live births and 46 per 1000 live births among teenage mothers and mothers age 20-29 respectively. Similarly, difference is comparatively higher among uneducated women compared to educated women. Among uneducated women, infant mortality is 111 per 1000 live births among teenage women and 71 per 1000 live births among mothers age 20-29, while among educated women (6 or more years of schooling) it is 53 per 1000 live births and 32 per 1000 live births respectively. The gap in infant mortality rate between mothers age 15-19 and 20-29 is comparatively higher among those mothers who have received less than three antenatal care visits compare to those who received three or more antenatal care visits. Regional differences in infant

Table 2. Differentials in selected child and maternal health indicators between teenage vs. other women across selected background characteristics in India, 2005-06

	LBW child		Infant mortality		Any anaemia	
	Women age 15-19	Women age 20-29	Women age 15-19	Women age 20-29	Women age 15-19	Women age 20-29
Place of residence						
Urban	28.7	17.8	75.1	34.2	66.6	50.2
Rural	28.4	22.3	95.8	51.2	70.1	58.1
Birth Order						
1	28.1	20.1	88.7	46.1	68.7	54.0
2	31.3	19.5	91.8	36.0	72.6	55.6
3+	23.5	24.5	104.3	50.7	70.8	59.3
Education status						
Not educated	25.5	26.0	110.5	70.8	72.2	63.2
1-5 years	30.7	26.5	104.5	51.1	72.1	59.4
6-10 years	29.0	18.6	53.3	31.9	64.3	50.9
Exposure to mass media						
No	22.0	29.5	88.5	70.4	74.8	64.5
Yes	30.2	19.5	83.2	38.8	66.7	53.3
Currently working						
Yes	25.7	19.7	78.9	51.1	69.5	56.3
No	29.2	20.3	89.8	41.2	69.6	55.1
Wealth Index						
Poorest	24.2	20.3	101.1	76.8	76.1	67.2
Poor	27.3	26.3	91.0	76.8	67.9	64.1
Middle	29.5	25.3	72.2	49.1	68.1	58.7
Richer	35.0	19.7	56.3	37.6	66.3	53.0
Richest	21.8	17.4	52.6	22.8	58.9	45.2
Religion						
Hindu	29.5	19.7	91.9	44.8	70.1	55.6
Muslims	22.2	21.1	97.2	40.6	68.9	56.5
Others	28.1	24.2	65.8	39.0	57.7	48.4
Caste						
SC/ST	26.3	23.9	89.5	52.6	71.2	61.3
OBC	31.9	19.5	84.4	46.0	68.9	54.9
Others	25.4	19.3	73.6	33.9	70.2	51.8
BMI of women						
Thin	31.5	22.5	78.8	51.5	71.8	61.2
Moderate	28.5	19.9	88.0	41.2	68.0	55.0
Obesity	10.5	18.2	92.1	35.4	60.7	40.0
ANC Visits						
Less than 3 visits	27.2	28.1	71.1	45.0	67.0	59.7
3 and more visit	27.1	19.0	48.1	22.1	68.4	53.2
Region						
North	28.4	27.4	103.5	36.0	67.6	50.8
Central	33.3	24.5	117.3	65.4	61.7	54.4
East	27.0	18.5	83.5	56.7	75.3	64.1
Northeast	25.0	15.8	97.2	37.5	70.4	65.9
West	33.0	21.7	55.8	37.5	69.7	52.2
South	25.8	16.3	72.0	32.2	68.8	52.3
Total	**28.5**	**20.2**	**90.5**	**43.4**	**69.6**	**55.3**

mortality between teenage and mothers age 20-29 are comparatively higher in north, central, and north-east region.

Differences in prevalence of anaemia among teenage mothers and mothers aged 20-29 is comparatively higher among, obese women and among women who received less than three antenatal care visits. For instance, among obese women, prevalence of anaemia is 61 percent among women age 15-19 compared to 40 percent among women age 20-29, on contrast among undernourished women the proportion is 72 percent vs. 61 percent among teenage and women age 20-29 respectively. Prevalence of anaemia between teenage and women aged 20-29 also varied with their parity, educational, and economic status. Regional differences is comparatively higher in north, west, and south region

Multivariate Analysis

In order to understand the significant impact of teenage childbearing on selected child and maternal health indicators, multivariate analysis is used. Several pertinent socio-economic and demographic variables namely place of residence, parity, education of women, exposure to mass media, household economic status, religion, caste, body mass index, antenatal care visits, and regions of the country along with mothers age are included in the analysis and results are given in table 3. In general, results obtained from multivariate analysis confirm the results of descriptive analysis. For instance, teenage motherhood has significant influence on all three health indicators in the country after adjusting other background characteristics.

Result shows that teenage childbearing is adversely associated with low birth weight of children in the country. For instance, the odds of low birth weight are significantly higher (1.19; <0.01) among mother aged 15-19 (teenage mother) than mothers age 20-29. Beside the mother age, parity, educational attainment, economic status, religion, and BMI is also appeared as significant determinants of low birth weight in the country. Higher birth order children are significantly less likely to be low birth weight than those of low birth order. Mother's educational attainment and household economic status is negatively associated with low birth weight. For instance, odds of low birth weight children is 0.79 among those women who attended six of more years of schooling. Similarly, odds of low birth weight is 0.79 among children of richest quintile. Low birth weight is significantly associated with mother's nutritional status. Low birth weight children significantly varied across the regions. For instance, odds of low birth weight children are significantly lower in central, east, north-east, west, and south region.

Like low birth weight, risk of infant mortality is also significantly higher among teenage mothers than mothers age 20-29 in the country. For instance, risk of infant mortality among teenage mother is 2.09 with respect to mother age 20-29. In addition, parity, mother's educational status, household economic status, BMI, and antenatal care visit is significantly associated with infant mortality in the country. For instance, risk of infant mortality is significantly lower (0.73; <0.01) among higher parity women (three or more parity). Risk of infant mortality is significantly lower (0.70; <0.01) among educated women (attended six or more years schooling). Similarly, risk of infant mortality is lower among richer (0.86; <0.05) and richest (0.55; <0.01) wealth quintile. Interestingly, antenatal care visit of mother reduces the risk of infant mortality. For instance, risk of infant mortality is 0.72 among those women who have gone for more than three antenatal care visits during pregnancy.

Beside the child health, teenage childbearing is also significantly associated with maternal health. For instance, odds of being anaemic are significantly higher (1.38; <0.01) among teenage women compared to women age 15-29. Women's age, higher parity, women educational status, household economic status, religion, caste, BMI, and antenatal care visit appeared as significant determinants of anaemia among women in the country. For instance, higher parity women (three or more parity) are significantly more likely (1.15; <0.01) to be anaemic. On other, educated women (six or more year of schooling) are significantly less likely (0.92; <0.05) to be anaemic in the country. Similarly, rich households are significantly positively associated prevalence of anaemia. Undernourished women are

Table 3. Result of multivariate analysis showing the determinants of selected child and maternal health indicators in India, 2005-06

	Low weight at birth	Infant Mortality	Any anaemia
Place of residence			
Urban®			
Rural	1.02	1.17	0.97
Age of women			
20-24®			
15-19	1.19***	2.09***	1.38***
Birth Order			
1®			
2	0.91**	0.72***	1.06
3+	0.86***	0.73***	1.15***
Education status			
Not educated®			
1-5 years	1.05	0.97	0.96
6-10 years	0.79***	0.70***	0.92**
Exposure to mass media			
No®			
Yes	0.88	0.85	0.91**
Currently working			
No®			
Yes	0.94	0.90	0.90***
Wealth Index			
Poorest®			
Poor	1.01	1.08	0.77***
Middle	1.15	0.98	0.75***
Richer	1.04	0.86**	0.71***
Richest	0.79***	0.55***	0.60***
Religion			
Hindu®			
Muslims	1.06	1.10	0.92**
Others	0.82**	1.29	0.71***
Caste			
SC/ST®			
OBC	1.01	0.99	0.84***
Others	0.98	0.86	0.85***
BMI of women			
Thin®			
Moderate	0.79***	1.24	0.89***
Obesity	0.75***	1.51**	0.67***
ANC Visits			
Less than 3 visits®			
3 and more visit	0.88**	0.72***	0.93**
Region			
North®			
Central	0.70***	1.43***	0.91**
East	0.56***	0.92	1.29***
Northeast	0.41***	0.75	1.16***
West	0.68***	1.05	1.04
South	0.46***	0.85	1.09*

®: Reference category *<0.01; **<0.05; *<0.1**

more likely to be anaemic than normal or obese women. The women with three or more antenatal care are significantly less likely (0.93; <0.05) to be anaemic with respect to those who availed less than three antenatal care.

Discussion and conclusions

The present study raised the issue of teenage childbearing and its consequence on selected child and maternal health indicators namely – low birth weight, infant mortality, and prevalence of anaemia among women in India. Data of third round of the National Family Health Survey conducted during 2005-06 is used in the study. In India, teenage women (15-19 years) constitute 20 percent of all women at reproductive ages (15-49). Early age at marriage is the most important factor causing women to initiate early childbearing in the country as more than 99 percent of the teenage first births occur within marriage. Along with early marriage, low use of contraception is another factor which increases chance of early childbearing among adolescents. For example, more than 94 percent of teenagers reported that they know at least one way to avert pregnancy. Nevertheless, only 23 percent of all married teenagers reported they had ever practiced any method and only 13 percent were currently using any contraceptive methods at the time of survey in the country. The initiation of early childbearing along with biological immaturity, low autonomous related to healthcare utilization, and other socio-cultural norms raise adolescents on several health risks.

Results indicate that the majority of teenage mothers are from rural area, living under poor educational and economic conditions, and belong to lower socio-cultural strata. Moreover, a considerable proportion of teenage women are undernourished. Even teenage women are with very low autonomy in decision making on different issues including own health care visits within family. All these factors may have influence on the health of teenage mothers as well as on their new borns (Imamura et al., 2007).

This study found that teenage childbearing is adversely associated with maternal and child health in India. Results are in similar direction with other studies corroborated the association between teenage childbearing and maternal and child health in other developing countries (Bacci et al., 1993; Scholl and Hediger, 1994; Bozkaya et al., 1996; Lao and Ho, 1998; Koster et al., 2001; Gilbert et al., 2004; WHO, 2004; Chen et al., 2007). We observed that teenage childbearing is adversely associated with low birth weight of children in the country as the percent of low birth weight children is significantly higher among teenage mothers than of mothers age 15-24. This finding is similar with previous studies (Senanayake, 1990; Legrand and Mbacke, 1993; Wang and Chou, 2003). Similarly, teenage births are at a higher risk of death than births of women aged 20–29 years. The possible reason may be physical immaturity of mother as well as low use of health care services. Younger mothers can be socially and psychologically too immature to take on many of the responsibilities of infant care and have little decision-making authority concerning health care utilization (Balk, 1997). Likewise child health indicators, teenage childbearing also exert an adverse impact on maternal health. The prevalence of anaemia is higher among teenage women than older women in the country. Overall teenage childbearing is associated with increased health risks for all selected health indicators but more strongly with infant mortality.

Multivariate analysis shows that after adjusting pertinent socio-economic covariates, age of mother is significantly associated with adverse health outcomes in India. After adjusting other covariates, age of mother appeared as a significant determinant of low weight at birth and infant mortality, as the odds of low birth weight and risk of infant mortality are significantly higher among mothers age 15-19. Similar results are observed for prevalence of anaemia among women. Mother's age, birth order, schooling, household economic status, and body mass index also appeared as significant determinants of all selected health indicators (low birth weight, infant mortality, and prevalence of anaemia) in the country. In general findings obtained from descriptive analysis are supported by the multivariate analysis.

Based on findings, we can conclude that observed adverse impacts of teenage childbearing on selected health indicators (low birth weight, infant mortality, and prevalence of anaemia) may be the consequence of a combination of factors. Biological immaturity at childbirth along with mother's poor nutritional status and underutilization of healthcare services in India may have adverse effect on the health of mothers and their newborns. As the previous studies have suggested in situations of economic hardship and social disruption, teenage girls are less likely to mature physiologically and more likely to remain unaware or ambivalent with respect to reproductive behaviours (Singh, 1986; Wulf, 1986; Garenne et al., 2000). The observed high and statistically significant risk of infant mortality may be much more associated with behavioural factors such as inadequate use of health facilities by teenage mothers as it can lead to increased complications among adolescent mothers and their children. Beside the aforesaid mechanism, early age at marriage and low use of contraceptives are other crucial factors which propel teenage girls into early childbearing in the country. Thus, in conclusion the study draws attention on three specific points to mitigate the effect of teenage childbearing on maternal and child health. There is need of – (i) enforcement of legal age at marriage to prevent early marriages, (ii) promotion of family planning among teenage girls, and (iii) formulation of the specifically designed maternal and child services to target teenage mothers.

Limitations

The present study suffered with two limitations. First, we have considered only ever married women age 15-19 as teenage mother under assumption that marriage is universal in India and due to strong socio-cultural norms only married women are permitted to conceive. For instance, result of third round of National Family Health Surveys shows a very few (less than 0.05%) never married women age 15-19 reported pregnancy or child bearing. Second, low birth weight is analysed only for those birth on which information is available (births not delivered in institutions are not weighted and thus excluded from the analysis).

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