

Correlates of Occurrence of Obstetric Fistula among Women in Selected States of India: An Analysis of DLHS¹-3 Data

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Abstract

Obstetric fistula is the most devastating form of maternal morbidity. It is an opening in the wall of vagina connecting to bladder or to rectum due to prolonged obstructed labour without timely medical assistance. A few research studies carried out in India and recently conducted DLHS-3 survey (2007-08) has information on obstetric fistula that gives scope for further research. This paper examines prevalence of obstetric fistula and its correlates using DLHS-3 data for selected states in India. Ever experience of obstetric fistula among women in these states ranges from 0.3 percent to 3.4 percent, being highest in Uttarakhand. Women living in rural areas have higher chance of obstetric fistula. Age and physical maturity is important factor in the occurrence of fistula and it is found that those women who were below 18 years at the time of their first birth have higher risk of fistula in comparison to those who had child at 18 or above years. In addition to this, those having problems at the time of delivery are around two times more likely to have fistula. Auxillary Nurse Midwife can be key players in the early detection and referral of cephalo-pelvic disproportion, malpresentation and prolonged, obstructed labour cases.

Key words: India, obstetric fistula, correlates, preventive measures, cephalo-pelvic disproportion.

Introduction

Reproductive morbidity including obstetric morbidity i.e. conditions during pregnancy, delivery and the post-partum period are major concerns in developing countries like India. Obstetric fistula is the most frequent and devastating form of maternal morbidities. The tissues of the vagina and rectum are damaged due to prolonged obstructed labour. It is an opening in the wall of the vagina connecting to the bladder (Vescovaginal Fistula (VVF)) and sometimes to the rectum (Rectovaginal Fistula (RVF)). The fistula forms when labour is allowed to progress for duration lasting from several days to a week when foetal head exerts pressure on surrounding soft tissues that result in tissue damage. The dead tissue

eventually falls away creating one or more holes that leak urine and/or faeces uncontrollably (UNFPA, 2005). Measurements of gynaecological and related morbidities are possible through questionnaire, clinical examination and laboratory tests. However, for diagnosis of obstetric fistula pelvic examination or injecting diluted methylene blue dye through foley catheter into bladder is required. Due to privacy, shyness about sexual and reproductive matters, such diagnoses are seldom possible in surveys.

Obstetric fistula is not prevalent in the developed and affluent countries because it occurs mainly due

¹ District Level Household Survey.

to congenital abnormalities, or from surgery, radiation, or in some cases because of unskilled abortion (Cook *et al.*, 2004). Studies (WHO, 2000; UNFPA, 2002) have revealed that there are multiple factors associated with fistula. Millions of women in the developing countries suffer from the condition because obstetric care is either unavailable, inaccessible, underutilized or of low quality (Donnay and Ramsey, 2006). The most common cause of obstetric fistula in developing countries is prolonged obstructed labour, which occur in around five percent of pregnancies and cause around eight percent of maternal mortality worldwide (WHO Report, 2005). The Persian physician Avicenna has early detected the relation between obstetric fistula and obstructed labour in the 11th century when he noted that in all cases women either were married too young or had weak bladders (Zachrain, 2000).

Several social, cultural and health system factors contribute to the prevalence of obstetric fistula in the developing countries. These factors have been pointed out as: lack of emergency obstetric care, early child marriage associated with early pregnancy, practice of severe forms of female genital mutilation, gender discrimination, poverty, limited decision-making power of women, illiteracy and low status of women, malnutrition and poor health services (FIGO, 2006). Other rare causes are from the complication of unsafe abortion, surgical trauma, sexual abuse and rape. It affects primarily poor rural women and teenage mothers living in remote areas where the health services are scarce and limited access to professional health care services.

The medical consequences of obstetric fistula can lead to secondary infertility, vaginal stenosis, amenorrhea, ulceration, infection, foot drop, kidney diseases and dehydration (Wall, 1998; Cook *et al.*, 2004). The psychological consequences are substantial with depression and early death from suicide. The impact of obstetric fistula on the woman's social and family life are dramatic and include separation from husband, children and other family members, poor economic conditions, inability to find employment and exclusion from religious activities (Glasier *et al.*, 2006). The FIGO Committee report (2006) stated that women suffering the ordeal of fistula are abandoned by their husbands and family and are shunned from their communities.

Obstetric fistula affects numerous girls and women every day and the condition leaves these affected women in a state of despair. Women so affected have to suffer not only the consequences of losing their children but also are subject to social humiliation, shame and embarrassment. They may become outcasts due to pungent smell and wetness from urinary or faecal incontinence. Because of

shame and discrimination connected to the fistula condition few people who happen to talk or care the affected women know this condition. However, the public sphere does not clearly understand this problem. There is limited knowledge on the socio-cultural aspects of fistula and its consequences to those having to live with the condition. A clear understanding of the condition is required in order to assist the public to appreciate and understand the consequences of living with fistula, particularly its psychosocial consequences.

Fistula limits women's ability to work or access jobs due to stigma. In general, women experience severe reduction in their source of independent income, which increases their dependence on others (UNFPA, 2006). Poverty, malnutrition and absence of family support force them to indulge in begging, commercial sex and comparable stigmatizing employment (Cook *et al.*, 2004). The grief of losing a child and becoming disabled exacerbates the pain, and further, they may have to spend years until they get a surgical repair. However, even few girls and women who are fortunate enough to find the needed funds may or may not get a repair, since few hospitals and surgeons are able to provide treatment (Bangser, 2006). The WHO Global Burden of Diseases report pointed out that, because women may live for many years with fistula, the burden borne by these women measured in quality-adjusted life years is immense (Wall, 2006). The capacity to repair obstetric fistula does not match with the incidence of fistula in developing countries. Thus, the number of women with fistula is steadily increasing, with the majority of these unfortunate women left in a state of desperation.

Very little information is available on the prevalence and incidence of obstetric fistula from Asia including India. UNFPA indicated an overall fistula prevalence of 2.2 percent (range 0.3-7.6 percent) in India based on four community surveys carried out during 1989-1993 (UNFPA, 2003). Case series reports from hospitals in Mumbai, Kolkata and Rohtak reported obstructed labour is a cause of fistula in 96.7, 89.6, and 73.4 percent cases, respectively (Raut and Bhattacharya, 1993; Rathee and Nanda, 1995; Chaudhuri *et al.*, 2007). However, a recent community-based cross-sectional survey for reproductive morbidities in Nasik district of Maharashtra, India revealed one case of vesicovaginal fistula among 1,167 women interviewed and examined (Kulkarni, 2007).

The Indian Council of Medical Research (ICMR) conducted a study and collected retrospective data on socio-demographic profile of women with obstetric fistula admitted to 24 tertiary level health care facilities of 12 states in India during 2000 to

2006. During this period, 717 women underwent genital fistula repair at these hospitals, but none at district hospitals. Uneven geographic distribution of fistula cases was noted, with more than 100 cases each from the states of Bihar, Uttar Pradesh, and West Bengal, but no case from Karnataka. Of the remaining 401 genital fistula cases, 389 (97 percent) were obstetric fistula, while pelvic surgery and accidental trauma contributed to six (1.5 percent) cases each (Singh *et al.*, 2009).

In the light of above discussions, it is clear that there is a lack of evidence to show linkages between socio-economic factors and occurrence of obstetric fistula in Indian population. Now, data collected in District Level Household & Facility Survey-3 are available. The present paper will present the profile of such women who has obstetric fistula and examine the correlates of obstetric fistula.

Data and Methodology

The present paper has used the data of District Level Household and Facility Survey-3 (2007-2008). The District Level Household and Facility Survey is one of the largest ever demographic and health surveys carried out in India, with a sample size of about seven lakhs households covering all the districts of the country. DLHS-3 was designed to provide estimates on important indicators on maternal and child health, family planning and other reproductive health services. DLHS-3 interviewed ever-married women (age 15-49) and never married women (age 15-24). Fieldwork was conducted in Bihar during December 2007 to May 2008 and gathered information from 47,137 households in 37 districts. In Chhattisgarh, it was conducted during November 2007 to March 2008 and gathered information from 19,314 households in 16 districts. In Jharkhand, it was conducted during December 2007 to April 2008 and gathered information from 32,261 households in 22 districts. In Uttar Pradesh, it was conducted during November 2007 to April 2008 and gathered information from

90,415 households in 70 districts. In Uttarakhand, it was conducted during April 2008 to August 2008 and gathered information from 16,964 households in 13 districts.

In DLHS-3, a separate module of obstetric fistula consisting of five questions was canvassed to all ever-married women to gather information on fistula status for the first time in the nationally representative sample survey. Following definitions are used in this paper :

Lifetime Obstetric fistula

This is based on women ever had/have experienced a constant leakage of urine or stool from vagina during the day and night i.e. continually wet (after a difficult childbirth, or sexual assault or after a pelvic surgery).

Current Obstetric fistula

This is based on women who had most recent still/live birth (only one birth since 2004 to survey date) and reported experience of obstetric fistula problem.

Occurrence of fistula by background characteristics

The demographic information such as total number of women interviewed, women ever given live birth, women with occurrence of lifetime obstetric fistula are depicted in Table 1 to have an idea about the sample size and number of women reported ever had/have the problem of obstetric fistula in selected states of India (Appendix I).

Obstetric fistula is one of the most important reproductive health problems that need special attention particularly in Uttarakhand, Uttar Pradesh, Bihar, Jharkhand and Chhattisgarh. Combined analyses of socio-economic characteristics of women who suffer from obstetric fistula in these

Table 1. — Number of women interviewed, women ever had live birth, number and percentage of women having occurrence of obstetric fistula by States, 2007-08.

States	Total women interviewed	Women ever had given live birth	Women having obstetric fistula	
			Number	Percentage
Uttarakhand	12640	11462	384	3.4
Uttar Pradesh	87564	77144	1312	1.7
Bihar	46840	40864	670	1.6
Jharkhand	26886	23751	650	2.7
Chhattisgarh	18166	16204	42	0.3

Table 2. — Percentage of women who have occurrence of obstetric fistula by household characteristics, 2007-08.

Household characteristics	Percent	N*
Residence		
Rural	1.7	163252
Urban	1.3	28204
Wealth Index		
Poorest	1.4	48349
Poor	1.6	48632
Middle	1.8	35926
Rich	2.0	31040
Richest	1.6	27509

*Women who ever given birth.

states are presented in Table 2. The occurrence of fistula is more among women in rural areas as compared to those living in urban areas. Surprisingly, it has been found that fistula is high among women in higher wealth quintiles. However, this is a debatable issue, as it is generally perceived that women with better living standard are able to have better access to health care services (Table 2).

Age wise occurrence of fistula depicts that high percentage of woman after 29 years have fistula.

Table 3. — Percentage of women who have occurrence of obstetric fistula by individual characteristics, 2007-2008.

Individual characteristics	Percent	N*
Age		
15-19	0.7	16596
20-24	1.2	36576
25-29	1.8	37078
30-34	2.0	33597
35-39	2.1	29283
40-44	1.8	22634
45-49	1.6	15692
Age at consummation		
Less than 18 years	1.8	107831
Greater than equal to 18 years	1.4	83621
Age at first birth		
Less than 18 years	2.0	41058
Greater than equal to 18 years	1.5	150395
Number of child birth		
1-2	1.3	74956
3 and above	1.9	116501
Ever attended school		
No	1.6	115479
Yes	1.7	75975
Highest years of school attended		
Less than 5	2.0	25993
6-8	1.7	21489
9-10	1.8	15127
11 and above	1.1	13318

*Women who ever given birth.

This may be in accordance to the fact that with increase in the number of children with age, the woman becomes reluctant to avail health care services as a result they become more prone to have fistula. Moreover, it can be seen that high percentage of women whose age at consummation and age at first birth are less than 18 years have fistula as compared to those who are above 18 years. This is because the pelvises of young mothers may not have been fully developed to meet the challenges of pregnancies and childbirth. Women's attendance to school however, does not show considerable variation (Table 3). However, higher percentages of women with less than five years of schooling suffer from obstetric fistula.

Distal causes that can lead to the development of obstetric fistula concern issues like lack of education, early age at consummation and childbirth. Early marriage and lack of education place women in positions of severe disadvantage and do not enable them to be advocates for their own health and well-being.

Association between problems during delivery and obstetric fistula

To examine association of delivery problem and occurrence of fistula, most recent delivery is considered as reporting of problems will be more accurate and it can be related to delivery characteristics as it is collected only for last still/live birth. For the most recent still/live birth from 2004 onwards, woman was asked about any problem she had at the time of delivery. Problems at the time of recent still/live birth delivery like premature labour, excessive bleeding, prolonged or obstructed labour/breech presentation, convulsion or high blood pressure and occurrence of fistula after the delivery have been given in Table 4.

In general it can be seen from Table 4 that women having problems during delivery have obstetric fistula. Around three percent women who have premature labour have fistula compared to around one percent women who do not have premature labour. Four percent women having excessive bleeding at the time of delivery suffer from the problem of fistula. Three and two percent women having prolonged and obstructed labour respectively have fistula. Women having convulsion or high Blood Pressure (BP) also suffer from fistula. It is around one percent who inspite of not having any problems during delivery, have obstetric fistula.

In terms of cultural factors, opinions and practices during prenatal, natal and post-natal care vary all over the world. In many developing countries including India, giving birth at home with the assistance of an elder woman or traditional birth attendant

Table 4. — Percentage of women who have occurrence of obstetric fistula after the recent delivery by problems during delivery, 2007-08.

Problems during delivery	Percent	N*
Premature labour		
No	1.2	35132
Yes	2.6	19405
Excessive bleeding		
No	1.4	49395
Yes	4.2	5143
Prolonged labour		
No	1.3	40548
Yes	2.9	13990
Obstructed labour/ Breech presentation		
No	1.2	23636
Yes	2.1	31901
Convulsion/high BP		
No	1.5	51473
Yes	5.5	3066

*Women who had recent still/live birth from 2004 onwards.

is considered the preferred and respected way to give birth. Some consider this point to be controversial and see it more as an economic access issue instead of a cultural issue. This negative perception of surgery can greatly influence a woman's decision to not seek out emergency obstetrical treatment.

Preventive measures

Prevention is the key to ending fistula as it is rightly said, "Prevention is better than cure". Making reproductive health awareness available to every woman that is possible would reduce the risk of maternal morbidity and death. Such awareness is particularly needed in rural areas as three-fourth population in India lives in villages. In addition to this, institutional delivery, skilled attendance at births, emergency obstetric care or quick and safe caesarean sections for women who develop complications during delivery, increasing women's literacy, age at marriage and child bearing would reduce the occurrence of fistula. Auxiliary Nurse Midwife located in the local communities can also contribute to promoting health practices to prevent fistula.

Fistula can be prevented not only by medical means but also through strategies to educate local communities about the cultural, social, and physiological factors that condition and lead to the risk for fistula. Community-level awareness campaigns to educate women about prevention methods such as proper hygiene and care during pregnancy and labour can be one of the strategies. Apart from these,

improved nutrition and outreach programs to raise awareness about the nutritional needs of female children to prevent malnutrition as well as improve the physical maturity of young mothers are important fistula prevention strategies.

Certain preventive measures that can be specifically taken care of at individual level are whether women went for Ante-Natal Care (ANC) during pregnancy, number of abortions she had and whether she got any advice to go for hospital delivery by trained personnel. If these aspects are taken care off, then the percent of women, suffering from obstetric fistula can be reduced to some extent. From Table 5 it can be seen that women who did not go for ante-natal check-up suffered from fistula more than those who went for ANC (2.1% vs. 1.4%). Around three percent women suffer from fistula who ever had abortions whereas around two percent women suffered from fistula who never had abortions. Those women who were given advice to go for hospital delivery suffer from fistula more than those who did not receive.

Correlates of Obstetric fistula

In this section, variations in fistula by its correlates are examined using multivariate techniques namely logistic regression analysis taking dependent variable (occurrence of obstetric fistula) as binary (yes or no). Residence of women is considered as one of the variable as those women who are living in rural areas will have difficulty to reach hospital for delivery. Age at first birth and level of educational attainment of women are other factors that have been considered for the analysis. Problems faced at the time of delivery are important indicator of occurrence of obstetric fistula (premature labour,

Table 5. — Preventive measures for obstetric fistula, 2007-08.

Preventive measures	Percent	N*
Received any ANC		
No	2.1	20493
Yes	1.4	34048
Ever had abortions		
No	1.6	48988
Yes	2.5	7394
Advise for hospital delivery by health personnel		
No	1.7	15219
Yes	2.4	5687

*Women who had recent still/live birth from 2004 onwards.

excessive bleeding, prolonged labour, obstructed labour/breech presentation, convulsion or high blood pressure). In addition to these, Ante-Natal Care (ANC) during pregnancy, number of abortions she had and whether she got any advice to go for hospital delivery by trained personnel have also been taken under consideration. The other predictors namely, wealth index, age of women, age at consummation, number of children, women ever attended school have been controlled. In short, it can be stated that all the variables mentioned in aforementioned paragraphs have been considered to find out the determinants of the occurrence of fistula (Table 6).

The women in rural areas are more likely to have fistula, as women in urban areas are 40 percent less likely to have fistula. This may be due to limited access to obstetric emergency care in rural areas. The availability and access to medical facilities that have a trained staff and specialized surgical equipment needed for cesarean births is very limited in rural areas. The availability of transportation, cost of transportation and all weather roads can all play a crucial role in the ability of pregnant women to access emergency obstetrical services. At the individual level, women whose age at first birth is above 18 years are 38 percent less likely to have fistula as compared to those who age at first birth is below 18 years. This finding is in accordance with the study of Muleta and William (1999) where it is stated that obstructed labour and fistula can occur at any age during childbearing years, adolescent women are at particular risk especially where early marriage is common. However it can be noted that the association between young age and fistula is most likely secondary to the increased incidence of cephalopelvic disproportion in younger women. Neither young age itself, early marriage, nor low parity alone are likely independent risk factors for cephalopelvic disproportion and subsequent obstructed labour and fistula, but they serve as proxies for pelvic immaturity. Pelvic bone maturity is a combination of the size and diameter of the pelvic bones as well as the diameter of the pelvic opening. Place of residence and age at first birth are both significant predictors for the occurrence of fistula.

The immediate cause of fistula is related to pregnancy and delivery. Some of the problems during delivery like premature labour, excessive bleeding, prolonged labour and convulsion or high blood pressure have significant associations with fistula. In accordance with bivariate results, it can be seen that women not going for ANC are more likely to have fistula as compared to those who went for ANC. Women who had abortions are more likely to have fistula who never had abortion. Those women

Table 6. — Factors determining obstetric fistula*, 2007-2008.

Household characteristics	Exp (β)	Significance level
Residence		
Rural [®]		
Urban	0.60	0.01
Age at first birth		
Less than 18 years [®]		
Greater than equal to 18 years	0.62	0.04
Problems during delivery		
Premature labour		
No [®]		
Yes	1.43	0.02
Excessive bleeding		
No [®]		
Yes	1.74	0.00
Prolonged labour		
No [®]		
Yes	1.34	0.05
Obstructed labour/ Breech presentation		
No [®]		
Yes	1.12	0.46
Convulsion/high BP		
No [®]		
Yes	2.43	0.00
Received any ANC		
Yes [®]		
No	1.98	0.00
Ever had abortions		
No [®]		
Yes	1.45	0.06
Advise for hospital delivery		
Yes [®]		
No	0.71	0.02

Based on women who had recent still/live birth.

[®] = Reference category; Dependent variable: 0 = No Obstetric fistula and 1 = Have Obstetric fistula. Variables controlled are wealth index, age of women, age at consummation, number of children, women ever attended school.

who were given advice to go for hospital delivery suffer from fistula more than those who did not receive. This may be due to the fact those women who had complications during pregnancy and were perceived to suffer from problems during delivery might have received advice but it depends whether they actually went for hospital delivery or not.

Discussion and Conclusion

The objective of this paper is to study the influence of demographic and socio-economic correlates or factors on the occurrence of obstetric fistula in some

selected states of India namely Bihar, Chhattisgarh, Jharkhand, Uttar Pradesh and Uttarakhand. It is evident from the analysis that women who reside in rural areas have more chance of occurrence of obstetric fistula. Women who have first child before age 18 have higher risk of obstetric fistula giving a clear cut message that the age at first birth is an important health related decision. In case of other studies, in evaluating the importance of age at consummation of marriage, found that the women consummating before the age of 18 years are at greater risk of occurrence of cervical cancer as well (Juneja *et al.*, 2003). Therefore, fistula prevention involves strategies to educate communities about the cultural, social, and physiologic factors that increase the risk for fistula. On the basis of physiologic immaturity, characterized by small pelvic size in the years immediately following menarche, it is advisable to delay childbearing for several years after menarche to prevent prolonged and obstructed labour and their sequelae. Hence, prevention of obstructed labour and fistula should begin very early in each girl's life. For example, improved nutrition and campaigns to raise awareness about the special nutritional needs of girl children to prevent chronic malnutrition and to improve the physical maturity of young mothers, as well as her overall health may be adopted as part of holistic fistula prevention strategies.

Women who had problems at the time of delivery have higher chance of fistula. This can be prevented by providing timely access to safe delivery. Fistula can be prevented through early detection and referral to emergency obstetric care facilities of cases of potential cephalo-pelvic disproportion (CPD) (capacity of the pelvis is inadequate to allow the fetus to negotiate the birth canal) and malpresentation where women likely to experience prolonged/obstructed labour. The prevalence of fistula in specific regions of countries should be mapped and taken into consideration when developing regional plans for construction of emergency obstetric care facilities like in the state of Uttarakhand, which have difficult terrain. Auxiliary Nurse Midwife can be key players in the early detection and referral of Cephalo-pelvic disproportion, malpresentation, and prolonged, obstructed labour cases.

Limitations of the study

Obstetric fistula is a sensitive topic especially for those who are suffering from this morbidity. The

large-scale data are mostly symptom based and do not administer detailed information about the phenomenon. The data has been collected mostly to know the prevalence rate of obstetric fistula in the country. It provides no other information that would throw light on pregnancy history that led to fistula or the consequences of fistula.

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Appendix I: The selected states of India

