



Pregnancy Complications and Birth Outcome: Do Health Care Services Make a Difference?

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Abstract

Complications of pregnancy are generally the symptoms and problems that are related to pregnancy and child birth. Many women face some minor health problems while some women who unfortunately get faced with more serious complications during pregnancy. The paper attempts to study the effect of pregnancy complications on birth outcomes and its association with utilization of maternal health care services using third round of District level household and facility survey data (DLHS-3). Multivariate and factor analysis has performed to see the interrelationship between complications in terms of their common underlying dimensions like reproductive health complications. Finding shows that, more than half of the studied women were suffering from any type of complications during pregnancy and were in the younger age cohort and those were residing in rural areas. It also shows a relationship of pregnancy complications on adverse birth outcome. It has found from the study that women with any pregnancy complications had a more chances of delivering still birth compared to women without any complication. Women having complications like paleness/giddiness and swelling of hands and feet during pregnancy, reported more of delivered still births. Near about 59 percent of women gone for full ANC check-ups (three ANC visit, TT injection and IFA tablets/syrup). Result shows that having any complication during pregnancy could also lead to complications at delivery such as labour related complications. Difference has found among Maternal Health Care service receivers and non-receivers on birth outcome. Prevalence of delivered still-birth has found higher among non-receivers compared to service receivers. Therefore, it needs a greater attention to improve health care services and awareness among common people and also requires the proper monitoring, both during and after pregnancy, in order to improve maternal and foetal outcomes by providing good health care services.

Keywords: Pregnancy complication, birth outcome, health care services, still-birth.

Introduction

The reproductive health has one of the most important matter of concern, mainly in the developing countries because of higher maternal mortality as well as to improve the quality of care that women has received at their reproductive time period. From the earlier studies it has found that, about 15 percent of all pregnant women develop a potentially life-threatening complication that calls for skilled care, and some will require a major obstetrical intervention to survive¹. It has also seen that women neglect their own health mainly in terms of reproductive health. Globally, about eight million women having pregnancy-related complications and more than half a million die from those complications. Studies has also found that the direct causes of maternal deaths and stillbirth are due to direct obstetric complications, primarily haemorrhage, sepsis, complications of abortion, preeclampsia and eclampsia, and prolonged/obstructed labour²⁻⁴. One of the study by WHO found that, mainly in developing countries, one woman on 16 may die due to pregnancy-related complications⁵.

Utilization of poor maternal health has considered to be the most important factor of maternal mortality. Literature shows

that millions of women in developing countries experience life threatening and other serious health problems related to pregnancy or childbirth. Complications of pregnancy and childbirth cause more deaths and disability than any other reproductive health problems⁶. Complications of pregnancy and childbirth are the leading cause of disability and death among women between the ages of 15-49. In India, one of the six countries that account for 50 per cent of the maternal deaths worldwide, has reduced the Maternal Mortality Ratio (MMR) by four per cent a year since 1990, more than double the global average. As per the report of National Family Health Survey (NFHS-3)⁷ conducted by Ministry of Health and Family Welfare during 2005-06, the Infant Mortality Rate is 50.4 for mothers in age group (20-29) years and is 76.5 for mothers with age less than 20 years. According to WHO, division of reproductive health, making motherhood safe is the world's women calls for national governments, multi-lateral and bilateral agencies and non-government organisations (NGOs) to make maternal health in a top priority and to ensure that the necessary political and financial resources are dedicated to this effort⁸. Similarly it is very much essential to take care of pregnant women as this is the time she needs more care, support as well as proper nutrition for the mother and foetus. Poor

maternal care is often related to the poor health of the new-born and also minimizes the chances of survival status of new-born as well.

Complications of pregnancy are the symptoms and problems that are associated with pregnancy. Many women face some minor health problems or complications during pregnancy. While some women who unfortunately had experienced of more serious pregnancy complications and they have no control over it. Being the highest toll of pregnancy complication is premature birth. There are lot of pregnancy complications and risk factors among the women before or after the delivery and also among the outcomes. Study also shows a large number of women die every year due to complications related to pregnancy and child birth and maximum of those maternal deaths occur in developing countries⁹. According to estimates by the World Health Organisation (WHO), each year an estimated 136,000 women die needlessly due to causes related to pregnancy, childbirth and abortion. It is unfortunate that large number of maternal deaths occur due to haemorrhage, obstructed labour and unsafe abortions while safe and affordable technologies to prevent such deaths to exist. One of the study shows that the MMR is an indicator of the quality of health care available during pregnancy, childbirth and in the postpartum period. Of all maternal deaths, 80% can be potentially avoided by interventions during pregnancy, childbirth and the postpartum period, that are feasible in most countries. The common causes of maternal death include haemorrhage, hypertension, infection, obstructed labour and unsafe abortion¹⁰.

One of the studies reveals that, over 50 million women experienced any complication related to pregnancy every year. While, 15 million of them were suffering from long-term illness or disability because they have no access to medical care, or because the medical care that they do manage to access is substandard¹¹. It has also been ascertained that pregnancy-related problems have far-reaching consequences on the overall reproductive health of women, in addition to their contribution to maternal mortality¹².

Several studies have found a significant association between birth order and utilization of health care services¹³. Receiving maternal health care services has found higher among women in their first order child may be because of the perceived risk that has associated with first pregnancy. While seeking maternal health care services has decreases with increasing in birth orders. Finding from the study by Wonget al., shows that having more children has act as a cause of resource constraints and which have a negative effect on health care utilization¹³. Similarly, it has also found out that women with a large number of children underutilize available health services because too many demands on their time force them to forgo health care¹⁴.

Antenatal Care: Utilization of maternal and child health care services is a complex phenomenon. Studies on preventive and curative services have often found that use of health services is

related to the availability, quality and cost of services, as well as to social structure, health beliefs and personal characteristics of the users. Antenatal care plays an important role in a successful delivery and healthy birth outcome. Study shows that regular visiting of antenatal classes help in the birth preparation of women and helps them physically or mentally for delivery as well. Similarly, antenatal care ensures maternal foetal health wellbeing and also prepares women physically fit for labour, delivery and the postpartum period. So, antenatal care has been defined as the care that a woman receives during pregnancy, helps to ensure healthy outcome for women and new-borns¹⁵. The safe motherhood programme had initiated that all pregnant women must receive basic, professional antenatal care for better health outcome¹⁶.

Antenatal care is a pregnancy related care provided by health worker either in a medical facility or at home. Ideally antenatal care should monitor a pregnancy for signs of complications, detect and treat pre-existing and concurrent problems of pregnancy, and provide advice and counselling on preventive care, diet during pregnancy, delivery care, postnatal care, and related issues. The Reproductive and Child Health programme recommends that antenatal care should cover the procedures to detect pregnancy complications apart from providing IFA tablets and TT injections¹⁸.

Need for the Study: Most often in a developing nation a women dies each minute of every day from complications related to pregnancy or child birth. While, pregnancy-related complications are found to be the leading causes of death and disability for women age 15-49 in developing countries (Safe motherhood programme). It is very much important to understand the relationship between mothers pregnancy related complications and its impact on the foetus as health of the new-born and survival are closely linked to the health of the mother before and during pregnancy, as well as during labour, childbirth, and the postpartum period. The use of maternal health care services has also considered to be the most important underlying factor influencing the health of the mother at the time of pregnancy as well as postpartum complications faced by women. As India is one of the developing nations with high rate of maternal mortality, it is very much important to know the association between having any health problems or complications during the reproductive time span and also the use of maternal health care services. Government of India launched many maternal health care programmes which are still lacking behind to fulfil the MDG goal.

Objectives: Thus, keeping in view of above mentioned need for the study, an attempt is made, to evolve a suitable strategy to understand. i. To see the prevalence of obstetric health complications among women and association with utilization of maternal health care services. ii. To see the interrelationship between obstetric health complication son adverse birth outcome.

Methodology

The present paper is based on the third round of District Level Household and Facility Survey (DLHS-3) which was conducted during December 2007 to December 2008. The District Level Household and Facility Survey (DLHS-3) is a nationwide survey covering 601 districts from 34 states and union territories of India. The study has done on currently married women which were taken out from the ever married women's questionnaire. In this questionnaire ever married women aged 15-49 were included and questions has been asked related to age, age at marriage and place of birth, educational attainment, number of biological children ever born and surviving by sex were collected. Details about antenatal check-up, experience of pregnancy related complications, place of delivery, delivery attendant and post-partum care, together with history of contraceptive use, sex preference of children and fertility intentions etc.

Bivariate and multivariate analysis has been performed to see the percentage of women having pregnancy complications and use of maternal health care services. For this purpose pregnancy related complications and all ANC check-up (more than three ANC visit, consume IFA tablets and TT injections received) has been taken care off. Full ANC is considered as received all above mentioned three ANC variables. The main application of factor analysis techniques are: to reduce the number of variables and to detect structure in the relationships between variables, that is to classify variables. For the present study complications during pregnancy, delivery and after delivery has been considered in a group to see the association between them.

Results and Discussion

Obstetric health complications during pregnancy and delivery: Figure-1 shows the percentage of women those were reporting of any complications during pregnancy. It shows that about 44 percent of the women had reported complications like paleness, giddiness or weakness during pregnancy. Excessive fatigue, swelling of hands, feet and face, vomiting were also found as the most reported complications among Indian women during pregnancy.

Less than one fifth of women were reporting of visual disturbance mainly caused by chronic vitamin A deficiency. It has found from the analysis that a few percentage of the studied women were reported of having high blood pressure, vaginal discharge, malaria, abnormal position of foetus, bleeding etc. during her pregnancy period. However, according to National Family and Health Survey-3 report, excessive fatigue has been reported by about 48 percent of women which was followed by swelling of legs, body and face (25%) and convulsion that were not from fever (10%) in India.

Figure-2 represents the complication that has been reported by women during the time of delivery. From the analysis it has found that labour related complication were mostly reported by women. More than half (69%) of studied women were reported of experiencing of obstructed labour during her delivery. Which is followed by premature (48.6%) and prolonged labour (34.1%). While studies says that labour is more common in humans than in primates, because the birth canal of a woman is not as straight and wide as in primates¹⁷.

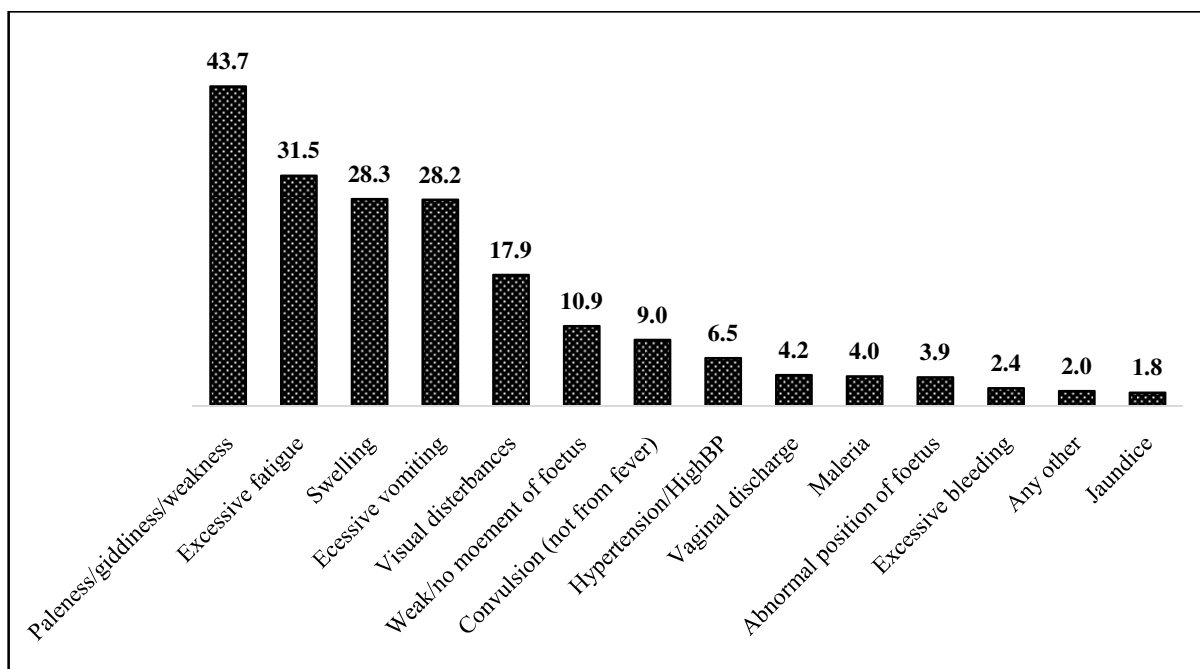


Figure-1
 Percentage of women reported of having type of Pregnancy complications in India 2005-06

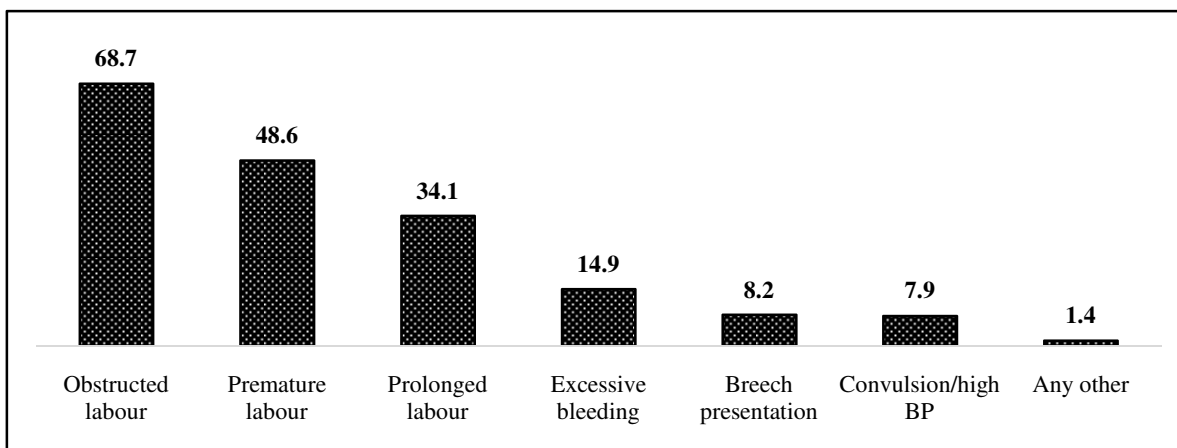


Figure-2
Percentage of women having Pregnancy complications in India

Socio-demographic differentials in reproductive health complications: Table 1 represents the socio-demographic differentials among women reporting of any obstetric health complications (during pregnancy, delivery and after delivery complications). The reporting of any delivery complications has been found highest among the studied women which is about 61 percent. Near about 59 percent of women having any type of pregnancy complications and 39 percent had any complications just after delivery. It is clear from the analysis that as the age increases prevalence of any obstetric health complication decreases a bit. But generally it has been said that below age 20 and above 35 age groups of reproductive life is considered to be the risk age group. Similarly, study shows that urban women were more aware and knowledgeable of health consequences than rural counterparts because of higher exposure of mass media and social interaction. Still, the rural women are not much empowered to come forward for their personal health care. The same picture has been seen in case of educational status of women; it shows higher educated women reported less health complications than not-educated and medium class educated women. While household standard of living has also shown a positive attitude towards reporting of health complications as women belong to higher wealth quintile reported of having less of obstetric health complications (pregnancy, delivery and after delivery) as compared to women that belongs to a poor wealth quintile.

Full antenatal care i.e. more than three ANC visit, receive at least two tetanus toxoid injection and taking 100 Iron Folic Acid tablets during pregnancy. From the table it has been seen that women those who received full ANC, reported more of having obstetric health complications compare to non-receivers. This variation has been seen mainly among those who were reported more delivery and post-delivery complications. This may be because those women who were suffering from more complications at the time of pregnancy, delivery and just after delivery visited more health care facilities as well as health care providers. It is a general

perception among human being that when the problems or the complication is unrestrained than they went to doctor or health clinics. In India people mainly from the remote rural regions are still using and believing on traditional medicines and practices for their day to day and maternity related practices.

In table 2 the percentage of women showing ever had any experience of pregnancy related complications and also reported of any complications during delivery. It has been found from the results that most of the women were reported of any delivery complication who had also experienced of any complication during her pregnancy. Complications like excessive bleeding and no or weak movement of foetus has reported by about 87 percent of women which has followed by the complications namely abnormal position of foetus i.e. ectopic pregnancy, convulsion and vaginal discharge. Among those who had reported of having any pregnancy and delivery complications, about 60 percent of them were visited any ANC during pregnancy.

Reproductive complications by use of MHC services: Table 3 shows the percentage of women with any pregnancy, delivery and post-delivery complications by use of health care services like, number of ANC visit, taking IFA capsules, receive TT injection and use of full ANC and the percentage of safe delivery. Any type of pregnancy complications has been found higher among those who received ANC once or twice than those never received any ANC. However, it has been found that those women who had received more than three ANC were suffering from less delivery and post-delivery complications. While percentage of safe delivery has inclined in a rapid way from non-receivers to more than three ANC receivers, which is 23 percent and 73 percent respectively. Among women who had consumed IFA tablets (100 and more) during pregnancy reported less of having any obstetric complications. Similarly, those women who had received TT injection during their pregnancy were less in reporting of any complications which clearly shows

that full ANC receivers expose less complication than non-receivers.

Delivery complications by the components of Antenatal check-ups: Table-4 shows the percentage of women having any delivery complications by use of different components of antenatal care services in India. Out of the total 61 percent women were reported of having any type of delivery complications, and among them more than half had received all

the components of antenatal care services. Which include weight measurement, height measurement, blood pressure check-up, sonography, ultrasound test, breast examination, urine test etc. About 49 percent of the surveyed women had reported of having premature labour, while 15 percent had excessive bleeding, 34 percent had prolonged labour, 69 percent had obstructed labour and 8 percent of them had reported of breech presentation and convulsion those who undergone all the mentioned antenatal components.

Table-1
Percentage of women having reproductive health problems by socio-demographic characteristics in India 2007-08

Background Characteristics	Any pregnancy complication	Any delivery complication	Any Post-delivery complication
Age			
15-24	59.9	63.1	37.9
25-35	58.1	59.9	35.6
More than 35	57.8	59.4	38.7
Residence			
Rural	58.9	62.4	39.4
Urban	58.4	58.0	30.2
Education			
No education	59.0	63.9	42.0
Less than 5 years	60.6	61.2	40.5
5-9 years	58.5	60.0	35.1
10 or more years	58.3	57.3	27.8
Employment			
Employed	63.5	64.7	43.5
Not employed	58.8	61.2	35.0
Religion			
Hindu	58.8	62.6	36.5
Muslim	66.1	63.0	45.1
Christian	46.1	38.3	25.1
Others	49.9	57.3	28.6
Caste			
Scheduled Caste	59.7	63.6	38.7
Scheduled Tribe	50.2	53.6	31.8
Other Backward Caste	61.0	62.3	38.3
Others	60.5	62.6	36.5
Wealth Index			
Poor	60.4	65.4	44.6
Middle	58.6	61.4	38.1
Rich	57.9	56.8	26.9
Visit Full ANC			
Yes	58.8	63.0	38.7
No	58.9	53.5	28.8
Total	58.8	61.2	36.8

Table2
Percentage of reproductive health problems during pregnancy and ANC on delivery complications in India 2007-08

Problems during pregnancy	Any delivery complication	
	N	%
Swelling of body and face	65390	72.3
Paleness/giddiness/weakness	101024	76.2
Visual disturbances	41461	80.7
Excessive fatigue	72785	78.9
Convulsions	20695	83.6
Weak or no movement of foetus	25272	87.1
Abnormal position of foetus	8965	85.1
Malaria	9229	80.9
Excessive vomiting	65263	74.1
Hypertension/high BP	14978	80.3
Jaundice	4071	79.8
Excessive bleeding	5596	87.6
Vaginal Discharge	9719	82.3
Any ANC visit	171302	60.4

Table-3
Percentage of reproductive health problems during pregnancy and delivery and after delivery by use of maternal health care services in India 2007-08

Maternal health care services	Any pregnancy complication	Any delivery complication	Any Post-delivery complication	Safe delivery	
				Yes	No
Number of ANC visit					
No visit	54.2	62.8	40.8	23.3	76.7
Visit once	63.9	66.7	32.2	40.5	59.5
Visit twice	61.8	66.1	41.4	42.6	57.4
Three and more visit	59.6	57.9	32.2	73.0	27.0
Receive IFA tablets					
No IFA tablets	63.1	64.9	42.1	50.4	49.6
Less than 100 tablets	59.8	61.5	35.2	61.3	38.7
More than 100 tablets	58.8	54.5	29.8	77.3	22.7
Taken TT injection					
Not taken	70.6	70.6	27.8	35.3	64.7
1 injection	63.9	66.7	44.9	40.5	59.5
2 and more injection	61.8	66.1	41.4	42.6	57.4
Full ANC					
Yes	58.9	53.5	28.8	83.5	16.5
No	58.8	63.0	38.7	45.4	54.6

Results of Pearson correlation (factor analysis): Pearson correlation numbers measure the strength and direction of the linear relationship between the two variables. The correlation coefficient can range from -1 to +1, with -1 indicating a perfect negative correlation, +1 indicating a perfect positive correlation, and 0 indicating no correlation at all. In table 5 the correlation between pregnancy complications and delivery complications has shown using Parson Correlation methods. It has clear from

the table that there is no strong positive correlation between pregnancy complications and delivery complications as well. However, foetus related complication shows a negative correlation between other delivery complications reported by women. The entire variables has shown a positive interrelationship but very weak relationship has found among the variables.

Table-4
Percentage of women with any delivery complication by use of antenatal care services in India 2007-08

Components of Antenatal check ups	Any delivery complication	Premature labour	Excessive bleeding	Prolonged labour	Obstructed labour	Breech presentation	Convulsions/high BP	Other
Weight measured	56.8	49.0	16.3	34.8	62.5	9.3	8.6	2.0
Height measured	52.9	52.2	18.7	35.4	55.2	10.8	9.1	2.5
Blood pressure checked	56.3	47.9	16.6	35.2	62.0	9.9	9.3	2.2
Blood tested	58.1	49.2	16.3	34.9	62.4	9.9	8.8	2.1
Urine tested	58.8	49.2	16.0	34.8	63.2	9.8	8.7	2.0
Abdomen examined	58.0	48.5	15.9	34.9	64.5	9.8	8.6	2.0
Breast examined	53.8	49.7	17.9	35.0	59.6	11.6	9.9	2.4
Sonography/Ultrasound test done	56.1	47.5	16.0	34.1	60.7	11.5	9.4	2.7
Total	61.2	48.6	14.9	34.1	68.7	8.2	7.9	1.4

Table-5
Pearson correlation for pregnancy and post-delivery complications among women, India, 2007-08

Correlations	Minor complications and anemia	Foetus related complication	Discharge related and anemia	Other pregnancy complication	Fever and discharge (PDC)	Labour related complication (PDC)	Presentation of breech (PDC)	Other post-delivery complications
Minor pregnancy complications and anemia	1	0.0	0.0	0.0	0.336**	0.233**	0.065**	0.052**
Foetus related complication		1	0.0	0.0	0.155**	0.127**	0.240**	-0.004
Discharge related complications and			1	0.0	0.124**	0.035**	0.173**	0.051**
Other pregnancy complication				1	0.099**	0.034**	0.115**	-0.020**
Fever and discharge (PDC)					1			
Labour related complication (PDC)					0.0	1		
Presentation of breech (PDC)					0.0	0.0	1	
Other post-delivery complications					0.0	0.0	0.0	1

Note: PDC: Post Delivery Complications ** Correlation is significant at the 0.01 level (2-tailed).

Discussion

Study under Ministry of Health and Family Welfare (Reproductive and Child Health –II programme) it has found that Maternal deaths are clustered around labour, delivery and the immediate postpartum period, with obstetric haemorrhage

being the main medical cause of death. Skilled attendance during delivery, access to emergency obstetric care and postnatal care (PNC) are cost effective and lifesaving investments for mothers. The extent of services available and availed during complications related to pregnancy, delivery and

postpartum indicates the state of obstetric morbidity and mortality¹⁹. The present study tries to explore the association between reproductive health complications and use of maternal health care services among Indian women. This is clear from the study that women face lot of complications during her reproductive period and which may lead future complications as well as maternal mortality. Earlier studies has shown that lack of access to health care along with poor quality of the delivery system and its responsiveness to women's needs make women more vulnerable to maternal morbidity. In general, maternal and reproductive morbidity is an outcome of not just biological factors, but also of women's poverty, powerlessness and lack of control over the resources as well²⁰. Women in developing countries face a high risk of severe complications during pregnancy and delivery. These can lead to adverse consequences for their own health and that of their offspring²¹.

Results also shows that women with less education, belongs to lower wealth quintile were more vulnerable to health complications because of lack of use of services or may be because of lack of knowledge regarding complications. It is very much important to improve the health care needs as well as health knowledge among those backward sections to lowering down the cause of maternal mortality in India. As already mentioned above that women visited health care centres those with more complications but it should be urge for all women to take health care services and advice during her reproductive time period.

Conclusion

In conclusion we can say that, yes the use of maternal health care services may reduce the probability of developing many complications during pregnancy, delivery and after delivery.

There were some factors which may help women mainly from developing countries to seek lifesaving healthcare services. Such as: i. To reduce the distance from health facilities for easy availability, ii. Minimizing the direct or indirect cost of service fees as well as the fees associated with transportation, drugs and supplies, iii. Multiple demands on a women's time, iv. To empower women on decision making power within the family

These problems can be reduced by implementing various mother and child health care programmes mainly for the backward and remote areas of the country like Jannani Suraksha Yojona through which the maternal mortality can be preventable.

References

1. World Health Organization (WHO), Pregnancy Exposes Women in poor states to 200-fold risk of death, compared with rich ones, *Populi*, 27(2), 4 (2000)
2. Stanton C., Lawn J.E., Rahman H., Wilczynska K.K. and Hill K., Stillbirth rates: Delivering estimates in 190 countries, *Lancet*, 367 (9521) 1487-94 (2006)
3. Gabrysch S. and Campbell O., Still too far to walk: literature review of the determinants of delivery service use, *BMC Pregnancy Childbirth*, 9, 34 (2009)
4. Turan J.M., Johnson K. and Polan M.L., Experiences of women seeking medical care for obstetric fistula in Eritrea: implications for prevention, treatment, and social reintegration, *Global Public Health*, 2(1), 64-77 (2007)
5. World Health Organization (WHO), Beyond the numbers: Reviewing maternal deaths and complications to make pregnancy safer, (2004)
6. EC/UNFPA, Making Pregnancy and Childbirth Safer [fact sheet]. EC/UNFPA Initiative for Reproductive Health in Asia in cooperation with the German Foundation for World Population, (2000)
7. International Institute for Population Sciences (IIPS) and macro international, *National Family Health survey (NFHS-3)*, 2005-06: India: I. Mumbai: IIPS, (2007)
8. World Health Organization (WHO), Division of Reproductive Health: World Health Day Technical Report, Organization Geneva (1998)
9. World Health Organization (WHO), World Health Report 1999: Making a Difference, World Health Organization Geneva (1999)
10. Matthews Mathai, Reviewing Maternal Deaths and Complications to Make Pregnancy and Childbirth Safe, *Regional Health Forum*, 9(1), (2005)
11. Datta K.K., Sharma R. S., Razack P.M.A., Ghosh T.K. and Arora R.R., Morbidity pattern amongst rural pregnant women in Alwar, Rajasthan-a cohort study, *Health and Population Perspectives and Issues*, 3, 282-292 (1980)
12. Bhatia J.C. and Cleland J., Determinants of use of maternal care in a region of south India, *Health Trans, Rev.*, 5(2), 127-142 (1995a)
13. Wong E.L., Popkin B.M., Gullkey D.K. and Akin J.S., Accessibility, quality of care and prenatal care use in the Philippines, *Social Science and Medicine*, 24, 927-944 (1987)
14. McKinlay J.B., Some approaches and problems in the study and use of services: an overview. *Journal of Health and Social Behaviour*, 13, 115-152 (1972)
15. World Health Organization (WHO)/United Nations Children's Fund (UNICEF), Antenatal Care in Developing Countries: Promises, Achievements and missed Opportunities- An Analysis of Trends, Levels and Differentials 1990-2001, WHO, Geneva (2003)
16. Harrison K.A., The Political Challenge of Maternal Mortality in the Third World. Maternal Mortality and

- Morbidity – A Call to women for action, Special Issue, May 28 (1990)
17. Ministry of Health and Family Welfare (MOHFW): Reproductive and Child health Programme: Schemes for Implementation, Department of Family Welfare, New Delhi, (MOHFW). (1998b): Family Welfare Programme in India, Year Book, 1996-97, Department of Family Welfare, New Delhi, (MOHFW), (1997)
 18. Abou Zahr C., Prolonged and obstructed labour. In: Murray CJL and Lopez AD, eds. Health dimensions of sex and reproduction: the global burden of sexually transmitted diseases, maternal conditions, perinatal disorders, and congenital anomalies, WHO (1998)
 19. Ministry of Health and Family Welfare. Reproductive and Child Health –II programme. New Delhi: Government of India, (2008)
 20. Ramasubban R. and Jejeebhoy S., Women's reproductive health in India. New Delhi, Rawat Publications, (2000)
 21. Filippi V., Goufodji S., Sismanidis C., Kanhonou L., Edward F., Ronsmans C., Alihonou E. and Patel V., Effects of severe obstetric complications on women's health and infant mortality in Benin, *Tropical Medicine and International Health*, **15(6)**,733-742 (2010)