Title: Use of Maternal Health Care in Rural India: Relative Importance of Socio-Economic Status and Accessibility

Biplab Dhak
Assistant Professor
Gujarat Institute of Development Research
Email: biplab3b@gmail.com

Use of Maternal Health Care in Rural India: Relative Importance of Socio-Economic Status and Accessibility

Abstract

With the evidence of low maternal health care utilization, particularly lack of full ante natal care, institutional delivery, this study investigates determinants of seeking antenatal care and institutional delivery, with the focus of assessing relative importance of socio-economic status and accessibility to health centre. Using nationally representative data set from the District Level Household and Facility Survey (DLHS-3), this study reiterates the low level of maternal health care utilization in rural India and shows correlation with both various socio-economic factors and accessibility to health facilities where association has been stronger with socio-economic factors than the accessibility to health facilities. Further, it has been observed that self motivation fails to ensure women with maternal health care utilization unless they are motivated or permitted by their husband or mother in-law.

Key words: Maternal Health care, Rural India, Socio-economic status, accessibility

Introduction:

Attaining improved maternal health status has been top most priority to the government of India since its first five year plan (1951-56) in order to reduce both maternal and child mortality[1]. The target continued to reinforce year after year and it has also been reflected in recent population policy-2001 within the wider context of reproductive and child health program, and through the commitment towards achieving millennium development goal 5 *i.e.* reducing maternal mortality by three quarters between 1990 and 2015[2].

Over the last few decades, although India has witnessed success in terms of reducing both maternal and child mortality, the level remain still very high as compared to that of any developed nation. India is still home to 63,000 maternal deaths per year which accounts almost one-fourth of all maternal deaths of the world even after the decline of mortality ratio to 230 from 390 for year 1990 to 2008[3]. Similarly, child mortality rate in India is considered to be very high as compared to developed nations despite the fall to 18 from 33 for the period 1991-92 to 2005-06[4, 5].

Among several many reasons, the lack of maternal health care utilization has been marked as an important cause for the large number of maternal deaths[6,7,8]. In India, merely 18.8 per cent of pregnant women receive full Ante Natal Care (ANC) (three ante natal checkup, one tetanus injection and 100 iron acid folic tablets); nearly three-quarter of births continue to take place at home, most of them are performed without the assistance of any trained health worker[9]; there has been dropout also from the spectrum of maternal health care utilization package. The proportion of women is very less utilizing all forms of maternal health care services- starting from ANC to institutional delivery. It is seen that, while 75 per cent of pregnant women use any type of ANC, the institutional delivery ended up in merely 47 per cent[9].

The utilization of health care is influenced by many factors. Health belief model[10] suggests three sets of factors- individual perceptions, modifying factors, and likelihood of action- that influence individuals to utilizing health care facilities. Individual's perception on seriousness about the disease drives towards health care use; modifying factors comprising various socio-demographic characteristics play role in boosting or preventing individuals in seeking health care; the likelihood of action is the result of cost-benefit analysis between seeking health care or not. Studies on health seeking behaviour highlight a range of potential modifying factors which increase women's propensity to seek health care. The modifying factors comprise various socioeconomic and demographic factors which enhance demand for utilizing maternal health care services through mainly increasing economic ability to seek treatment[11,12,13,14, 15,16,17,18].

Furthermore, several studies have stressed upon the importance of access to and quality of health services for increasing utilization of services[19,20,21,22]. Programs that maximize quality as well as access to services enhance client satisfaction, leading to greater utilization[23,24,25]. Access helps determine whether an individual makes contact with the provider, while quality of care influences a client's decision whether to accept and to continue using the services[26]. Another important factor, from the supply side, is the cost of health care which is a significant barrier to service use[27,28] .

Objectives

This paper aims to understand

(1) Determinants of maternal health care utilization.

(2) Examining relative importance of access to health services and socio-economic status to maternal health care utilization.

Data and Methods

Data

Data for this study is drawn from The District Level Household and Facility Survey (DLHS-3) on Reproductive and Child Health (RCH) carried out during 2007-08. It was designed to collect data at the district level on various aspects of health care utilisation for Reproductive and Child Health (RCH) and accessibility to health facilities. DLHS-3 is a nationally representative survey collected through using multistage sampling design for all districts in India (except Nagaland). In each district, 50 Primary Sampling Units (PSUs) which were census villages for rural areas and wards for urban areas were selected at the first stage by systematic Probability Proportional to Size (PPS) sampling. Circular systematic sampling was adopted for the selection of households. The data was collected from 7,20,320 households. From these households, 6,43,944 ever married women aged 15-49 years were interviewed. This study uses information of rural areas covering 5,04,272 married women because data concerning distance to health facilities had not been collected for urban areas in the survey.

Analytical methods

The first step of analysis is calculating percentage of using maternal health care- using any ANC, full ANC, and institutional delivery by age group, and various socio-demographic variables. In the later part of the analysis, logistic regression models are carried out to understand the determinants of maternal health care utilization. For k explanatory variables and n number of individuals, the model expression

is:

$$\log[p_i /1-p_i] = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \ldots\ldots + \beta_k X_k$$

where *P*i is the probability of occurring any particular event. In this study, dependent variables are: using any ANC or not; using full ANC or not; going for institutional delivery or not. α is the intercept, X_i (i= 1,2…..k) are the independent variables, and β_i are the slope for each independent variable.

Explanatory variables

The explanatory variables include demographic characteristic as age; socio-economic characteristics as religions, caste, women's education, husband's education, working status, and household wealth represented by an index made out of household assets.

Another explanatory variable is the distance to health centre from the place of residence. This variable indicates the accessibility of health care services of a woman.

Results

Maternal Health Care Utilization by Socio-demographic status

Table 1 presents pattern of utilization of maternal health care services- seeking any ANC, full ANC and institutional delivery- by various socio-demographic variables. Expectedly large variations are observed for using maternal health care services by socio-demographic indicators. The utilization is found to be higher among socio-economically well-off women. For example women with higher education, belonging to higher household economic status and staying in urban areas are found to be using more maternal health care services. The utilization is also found to be varying by age and caste: youngest (15-19) and oldest (40-49) cohort in the reproductive age group used comparatively less maternal health care than middle aged women (20-39); ST women used least care followed by SC and general caste.

Across any socio-economic group wide gap has also been observed between using ANC and institutional delivery. For example, while 54.9 per cent woman belonging to lowest wealth Quintiles used any ANC, full ANC and institutional delivery ended up in 6 per cent and 19.1 per cent respectively. Similarly, in the highest Quintiles, while 93.6 per

cent women use 'any ANC', 'full ANC' and 'institutional delivery' were 36.1 per cent and 80.1 percent respectively.

Table 1: Utilization of maternal health care in rural India by various socio-demographic variables

Characteristics	Any ANC	Full ANC	Institutional Delivery
Age			
15-19	74.7	12.9	43.5
20-29	73.6	16.1	40.7
30-39	62.4	11.8	29.6
40-49	47.7	06.6	18.8
Religion			
Hindu	70.6	14.6	38.5
Muslim	68.9	14.0	32.4
Christen	69.0	17.5	33.8
Others	72.2	13.4	44.0
Women's Education			
Illiterate	70.7	06.5	23.9
Below Primary	70.1	12.3	30.7
Primary	80.9	19.0	47.0
Secondary	90.2	31.3	65.7
Higher Secondary & above	94.2	38.5	76.5
Husband's Education			
Illiterate	66.5	05.0	16.3
Below Primary	65.9	11.0	27.2
Primary	72.4	14.3	37.9
Secondary	79.1	20.5	49.9
Higher Secondary & above	85.2	25.3	59.5
Caste			
ST	63.1	12.4	27.5
SC	69.4	12.4	35.6
Others	70.1	14.6	29.1
Work Status (Within last 12 Months)			
Worked	69.5	12.6	31.3
Not Worked	73.9	16.3	43.5
Household Wealth Quintiles			
1st	54.7	05.9	18.4
2nd	63.5	08.9	27.8
3rd	74.1	15.6	40.1
4th	83.9	22.9	54.5
5th	92.2	32.6	72.8
N= 275879			

Reasons for not adopting ANC and institutional delivery

Table 2 presents percentage distribution of women those did not seek maternal health care by various reasons. As can be seen lack of awareness appears to be the most important factor for not seeking ANC. 54.8 per cent of women thought that ANC is not necessary, 19 percent reasoned to unawareness, and 11.1 percent thought that ANC is not customary. Cost is also found to be one of the important factors for not using ANC since 23.8 percent women cited reason for that. Distance to health facility (15.1 percent), family members did not allow (6.7 percent), no time to go (9.7 percent) were also other reasons cited for not using ANC.

In case of institutional delivery, 34.1 percent reported that it is not necessary, 23.8 percent reported that they did not have time, 22.8 percent reasoned cost as a burden for not seeking institutional delivery. Other reasons are not customary (8 percent), distance (10.5 percent), poor quality of service (4.4 percent), family did not allowed (6.7 percent), lack of knowledge (6.5 percent), and others (2.9 percent).

Table 2: Responses by following reasons for not seeking ANC and institutional delivery

Reasons	ANC	Institutional delivery
Not Necessary	53.4	34.3
Not Customary	11.3	7.5
Cost too much	24.1	23.4
Distance is too much	16.7	11.7
Poor quality service	3.0	4.5
Family did not allowed	6.7	6.7
Lack of knowledge	20.4	6.8
No time to go	9.7	23.7
Others	2.7	2.7

Table-3 shows that proximity to health facility centre enhances maternal health care utilization. The impact is found to be more prominent for institutional delivery, while the percentage of institutional delivery is 51.3 if any health centre is available at the place of residence the percentage for the same is 35.2 if health centre is placed beyond 31 km. For other two indicators- any ANC and full ANC- decreasing trend with the increase of distance to any health centre has been observed but the extent remained lower as compared to institutional delivery. 77.8 percent of pregnant women used any kind of

ANC if health facility is at the village against 68.0 percent for distance of 31+ km. In case of full ANC, while percentage was 20.1 if health facility was at the village, it was 14.3 per cent for the highest distance (31+ km).

Table 3: Utilization of Maternal Health care in rural India by distance to health centre

Distance to Health facility from a Village	Any ANC	Full ANC	Institutional Delivery
Within a village	77.8	20.1	51.3
Up to 5 km	76.2	16.3	48.0
5-15 km	74.9	15.8	43.3
16-30 km	72.1	14.1	39.0
31+ km	68.0	14.3	35.2

Interaction between socio-economic status and distance to health centre with maternal health care utilization

Table 4 shows maternal health care utilization by wealth quintiles and distance to any health facility centre from the place of residence. This table confirms that both place of residence and health infrastructure are important for the utilization of maternal health care services. While with the increase of distance to health facility centre utilization decreases, utilization increases with the increase of household wealth. The interaction between household wealth and distance to health centre is also evident for three types of indicators of maternal health care. The percentage of women used any ANC belonging to first and 5th quintile exposing health facility centre within the same village of residence were 72.6 percent and 93 percent respectively; the same having exposure to health facilities within 31+ km were 55.7 and 92.4 percent respectively. The similar kind of interaction between household wealth and distance to health facility centre has also been observed for full ANC and institutional delivery. For example, 21.7 percent of women belonging to first wealth quintiles and accessing health facility within the same village of residence had institutional delivery against 87.7 percent for 5th quintiles; similarly, 17.6 percent of women belonging to first wealth quintiles with accessing health facility within 31+ km from the village of residence had institutional delivery against 72.9 percent for 5th quintiles.

Table 4: Maternal health care utilization in rural India by wealth quintiles and distance to health centre

Any Health facility	Any ANC					Full ANC					Institutional Delivery				
	Wealth Quintiles					Wealth Quintiles					Wealth Quintiles				
	1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th
Within a village	72.6	79.1	81.7	92.4	93.0	14.1	21.4	25.7	32.3	41.9	21.7	39.2	52.1	67.6	87.7
Up to 5 km	62.3	65.8	76.4	86.0	94.7	6.5	8.6	15.1	20.9	35.8	25.7	36.4	46.2	61.8	75.9
5-15 km	58.9	65.9	76.4	84.8	93.6	5.3	7.9	15.4	22.2	33.1	20.6	29.0	43.2	56.5	76.8
16-30 km	55.7	63.9	74.2	84.7	92.4	5.0	7.7	13.9	22.2	30.7	17.6	27.6	40.0	54.2	72.9
31+ km	52.3	62.4	73.2	82.8	91.1	5.8	9.4	16.3	23.4	33.4	17.8	26.9	38.7	53.3	70.6

Table 5 shows maternal health care utilization by education and distance to any health facility centre from the residential village. What indicates looking at the table, education seems to be more important than the proximity to health facility centre as far as utilization of maternal health care is concerned. While utilization of maternal health care services vary marginally with the increase of distance to health facility centre when education is taken into control, the same increases sharply with the increase of education irrespective of any distance to health centre and educational level of a woman.

Table 5: Maternal health care utilization in rural India by education and distance to health centre

Any Health facility	Any ANC					Full ANC					Institutional Delivery				
	Education					Education					Education				
	IL	BP	PR	SE	HS	IL	BP	PR	SE	HS	IL	BP	PR	SE	HS
Within a village	85.7	77.7	85.7	89.6	94.4	35.7	19.1	25.4	35.8	50.4	35.7	37.6	50.2	70.5	85.2
Up to 5 km	65.2	73.9	83.8	92.1	95.3	13.0	18.1	19.2	29.1	41.3	39.1	39.6	55.0	73.4	81.7
5-15 km	71.1	73.9	83.5	91.7	95.6	3.9	12.9	19.2	31.6	38.8	27.6	35.9	50.9	71.1	81.5
16-30 km	70.9	72.7	81.4	91.0	95.7	4.4	11.0	17.5	31.1	37.1	22.5	32.8	47.6	66.2	78.1
31+ km	70.0	67.5	79.7	89.1	92.7	6.5	11.9	19.3	31.4	38.8	22.0	27.6	45.2	63.1	72.9

Note: IL= Illiterate, BP= Below Primary, PR= Primary, SE=Secondary, HS= Higher Secondary

Motivational Factors behind utilizing maternal health care services

It is well known that self awareness is most important for adaptation of health care services and that can also be strengthen through motivation earned from external sources like health professionals, relatives etc. It is seen that (Table-6) there are various sources of motivation that a woman receive towards utilizing maternal health care services apart from her self-awareness. As the table shows, motivation from husband is found to be

most important for seeking both ANC and institutional delivery; 33.6 and 27.5 per cent of women reported that they were motivated by their husband for adopting ANC and institutional delivery respectively. Other sources of motivation like mother, mother in-law, and relatives, health professionals' roles are also found to be very significant as far as adopting maternal health care services are concerned.

Table 6: Percentage distribution of women by sources of motivation received for adopting ANC and Institutional delivery

Sources of motivation	ANC	Institutional delivery
Doctor	11.5	09.2
ANM	23.1	13.1
Health care professional	03.0	02.2
Anganwari worker	13.4	06.8
ASHA	03.6	03.0
NGO	01.3	01.3
Husband	30.0	22.3
Mother	15.8	10.1
Mother in-law	10.8	08.8
Relative	23.0	16.4
Self	27.4	12.6
Others	0.90	0.60

Multivariate Analysis

Table-7 presents results of multivariate analysis. Considering the binary nature of dependent variables- seeking any ANC, full ANC, and institutional delivery- logistic regression model has been used. This analysis has been carried out for understanding determinants of using any ANC, full ANC, and institutional delivery. The results show that age, religion, education, household economic status and health infrastructure indicated by distance to any health facility centre from the residential village are important as far as using maternal health care services are concerned. Utilization decreases with the increase of age. For example, using any ANC is less by 12 percent for the age group 20-29, 34 percent for the age group 30-39, and 41 percent for the age group 40-49 as compared to the age group 15-19. Education is found to be positively associated with the increased use of maternal health care services. Utilization for any ANC to full ANC and institutional delivery increases with the increase of women's education. The husband's education, however, shows weak influential power to increased maternal

health care utilization. Though women use greater maternal health care services if their husband is literate as compared to illiterate husband, sharp increase has not been observed with the increase of husband's educational level. Household economic status represented by household's wealth index is found to be very important for adaptation of maternal health care services. Utilization increases with the increase of household wealth; women belonging to the richest quintile adopt 4.43 times greater of 'any ANC', 2.58 times greater of 'full ANC', and 4.62 times greater of 'institutional delivery' as compared to the poorest quintile. Distance to health facility is found to be another important influential factor for adopting maternal health care services. Expectedly, utilization has been high for women those had accessibility to health facility within the residential village as compared to women those accessed from a distant place, and utilization is found to be decreasing marginally with the increase of distance to health facility centre. Another important finding observed through the multivariate analysis is the significant association between sources of motivation and continuation of maternal health care use. It is observed that women are more likely to receive full ANC and resort to institutional delivery if they receive motivation from their husband for maternal health care. Hence, male involvement in the women's reproductive health care is found to be an important component towards enhancing utilization of maternal health care. Even the analysis shows that husband's motivation works much better than self motivation or other relatives' as far as using full ANC and institutional delivery is concerned.

Discussion and Conclusions

Results of this study reiterate the fact that the utilization of maternal health care in India, particularly in rural India is low. Recent data (DLHS-3) shows that India needs to go far away to reach the ambitious target of using full of ANC and institutional delivery that set in the millennium development goals. The main problem lies in dropping out from the spectrum of maternal health care services, starting from ANC to institutional delivery. While using any ANC remained fairly at the satisfactory level (around 70 percent), the coverage of full utilization of ANC and institutional delivery remained at a very low level.

Table 7: Results of logistic regression analysis

Characteristics	**Any ANC**	**Full ANC**	**Institutional Delivery**
	Rural	**Rural**	**Rural**
Age (Ref. 15-19)			
20-29	0.82_a	1.16_a	0.73_a
30-39	0.61_a	1.06_a	0.63_a
40-49	0.45_a	1.04	0.55_a
Religion (Ref. Hindu)			
Muslim	1.15_a	1.23_a	0.86_a
Christen	0.79_a	1.09_b	0.76_a
Others	0.81_a	0.66_a	1.06_b
Women's Education (Ref. Illiterate)			
Below Primary	0.91	1.54_a	1.29_b
Primary	1.31_b	1.99_a	1.90_a
Secondary	2.16_a	3.12_a	2.91_a
Higher Secondary & above	3.24_a	3.96_a	4.20_a
Husband's Education (Ref. Illiterate)			
Below Primary	1.04	1.77_b	1.58_b
Primary	1.04	1.68	1.62_b
Secondary	0.92	1.55	1.58_b
Higher Secondary & above	1.00	1.36	1.53_b
Household Wealth Quintiles (Ref. Poorest)			
Second	1.28_a	1.24_a	1.39_a
Middle	1.82_a	1.68_a	1.95_a
Fourth	2.81_a	2.09_a	2.85_a
Richest	4.53_a	2.58_a	4.62_a
Sources of motivation for ANC (Ref. Health workers)			
Relatives		1.01	1.31_a
Self	--	0.96	1.02
Husband		1.77_a	1.88_a
Others		1.00	1.23_a
Distance to Health Facility (Ref. within village)			
Within the village			
Up to 5km	0.67_a	0.60_a	0.83_a
5-15 km	0.66_a	0.60_a	0.75_a
16-30 km	0.59_a	0.56_a	0.64_a
31+ km	0.53_a	0.56_a	0.61_a
Constant	3.99_a	0.05_a	0.26_a
N=643944			

Note: 'a' denotes $p< 0.01$; 'b' denotes $p< 0.05$

Expectedly, socio-economic status of a women and accessibility to health facilities are found to be important as far as utilization of maternal health care is concerned. Gradients in the utilization are found to be very distinct for both socio-economic status and distance

to health facility centre. Among many other influencing factors, education, particularly, women's education, household's economic standard and accessibility to health facility are found to be very effective to influencing utilization; the utilization of maternal health care increases substantially with the increase of all these factors. However, when relative comparison comes, household wealth is found to be relatively more effective than the proximity to health centre towards enhancing utilization of maternal health care services. The evidence stands more farms when other confounding factors to maternal health care utilization are taken into control. A significant difference has been observed in the utilization of health care services between the people those access health centres within their own village and people those access outside the residential village, but that difference does not increase markedly as distance to health centre increases. On the other side, education and household wealth are found to be relatively more effective to enhancing maternal health care; with the increase of both the factors, a sharp increase in has been observed. This finding perhaps strengthens the existing knowledge that 'socio-economic status of an individual is relatively more important than the proximity to health centre for using maternal health care' observed using NFHS-3 data (2005-06) by Kesterton and others[29].

Cost for health care has been another important barrier to accessing maternal health care services. About 23 per cent of women reasoned high cost for not using ANC and having institutional delivery. This picture is quite natural considering the very high delivery cost that is required to be incurred for accessing maternal health care services, particularly for institutional delivery[30,29]. It was found, based on one study in Maharastra, that average cost per delivery was rupees 1,039 if delivery was institutional as compared to rupees 160 if it was a home delivery amongst the lowest socio-economic group people[31,30] .

As we know, self motivation and knowledge about health care services lead to increased utilization; this study reiterate to fact once again. However, the interesting observation is that only self motivation may not be enough for women using health care. External motivations like motivation from husband, relatives or health professionals are also in need for pregnant women using maternal health care. Amongst these motivational sources, husband and relatives, particularly mother in-law are in the fore front. In the

analysis, it has been seen that motivation received from husband, health professional and relatives (mainly mother in-law) has stronger impact to utilization of ANC and institutional delivery than their self motivation. This observation simply implies that until now rural Indian women's decision to adopt health care do not lie in their own hand; they need to depend on permission from either husband or mother-in-law. Considering the women's less autonomy in terms of accessing mobility and decision making power, it is quite usual that self awareness or health professionals' advice towards seeking maternal health care will not be materialized into practice unless husband or mother in-law are aware and they allow women to go to seek maternal health care. Importance of husband's involvement for enhancing maternal health care services is not a new phenomenon; there have been ample numbers of studies that support how husband's participation enhance women's maternal health care utilization. International studies from a variety of regions have shown that reproductive health programs are likely to be more effective for women when men are involved in some way[32]. A study conducted in Bombay found that women made a greater number of antenatal maternal health clinic visits when their husbands had attended an informational session at the clinic, compared with those whose husbands did not attend[33].

In conclusion, it can be noted out that strengthening health care infrastructure, *i.e.* increasing supply of health care services, is essential for enhancing health care utilization. But increasing supply does not mean only provision of health infrastructure; it must ensure how to reach people. Parallel efforts of strengthening health care infrastructure and maintaining affordable cost must be placed for ensuring universal maternal health care utilization. The main priority should be given to increase the demand for health care through providing women's higher education and improved economic status than only setting up health centre since enhanced demand is found to be more effective than the enhanced supply as far as adaptation of maternal health care services is concerned.

Reference

1. Government of India. (1952). First Five Year Plan. New Delhi, Planning Commission
2. United Nations, Millennium Development Goals website: [http://www.un.org/millenniumgoals/].
3. WHO/UNICEF/UNFPA/World Bank. (2010). Trends in Maternal Mortality: 1990 to 2008. Estimates developed by WHO, UNICEF, UNFPA and The World Bank. Geneva, World Health Organization.
4. International Institute for Population Sciences (IIPS) and ORC Macro. (1995). National Family Health Survey (NFHS-1), 1992-93: India. Mumbai: IIPS.
5. International Institute for Population Sciences (IIPS) and ORC Macro. (2007). National Family Health Survey (NFHS-3), 2005-06: India. Mumbai: IIPS.
6. Tsui, A.O., J.N. Wasserheit., & J.G. Haaga. (1997). Reproductive Health in Developing Countries: Expanding Dimensions, Building Solutions. Washington, D.C.: National Academy Press.
7. World Health Organization (WHO). (2004). Making Pregnancy Safer: The Critical role of the Skilled Attendant: A Joint Statement by WHO, ICM and FIGO. Geneva: WHO.
8. World Health Organization (WHO). (2005). World Health Report 2005: Make Every Mother and Child Count. Geneva: WHO.
9. International Institute for Population Sciences (IIPS), 2010. District Level Household and Facility Survey (DLHS-3), 2007-08: India. Mumbai: IIPS.
10. Becker, M. H., L. A. Maiman., J. P. Kirscht., D. P. Haefner, and R. H. Drachman. (1977). 'The Health Belief Model and prediction of dietary compliance: A field experiment', Journal of Health and Social Behavior vol.18, no. 4, pp. 348-366.
11. Kanitikar, T. and R.K. Sinha. (1989). 'Antenatal care services in five states in India', S. N. Singh (eds.), Population Transition in India, Delhi: B.R Publishing.
12. Elo, I.T. (1992). 'Utilization of maternal health-care services in Peru: the role of women's education', Health Transition Review vol. 2, no.1, pp. 49-69.
13. Swenson, I.E., N.M. Thang., V.Q. Nham & P.X. Tieu. (1993). 'Factors related to the utilization of prenatal care in Vietnam', Journal of Tropical Medicine and Hygiene, vol. 96, no. 2, pp. 76-85.
14. Khan, Z., G.Y. Soomro, & S. Soomro. (1994). 'Mother's education and utilization of health care services in Pakistan', Pakistan Development Review, vol. 33, no.4, pp. 1155-66.
15. Barlow, R. and F Diop. (1995). 'Increasing the utilization of cost-effective health services through changes in demand', Health Policy and Planning, vol.10, no. 3, pp. 284-95.

16. Ahmed, S and W. H. Mosley. (2002). 'Simultaneity in the use of maternal-child health care and contraceptives: Evidence from developing countries', Demography, vol. 39, no 1, pp. 75-93.
17. Govindasamy, P. & B.M. Ramesh. (1997). 'Maternal Education and the Utilization of Maternal and Child Health Services in India', National Family Health Survey 24 Subject Reports, No. 5. Mumbai: International Institute for Population Sciences; and Calverton: Macro International, Demographic and Health Surveys (DHS).
18. Das, N. P., V.K Mishra, & P.K Saha. (2001). 'Does Community Access Affect the Use of Health and Family Welfare Services in Rural India?', National Family Health Survey Subject Reports No. 18. Mumbai: International Institute for Population Sciences; and Honolulu: East-West Center.
19. Rao, P.S. & J. Richard. (1984). 'Socio-economic and demographic correlates of medical care and health practices', Journal of Biosocial Science, vol. 16, no. 3, pp. 343-55.
20. Sarita, P.T. & R.Tuominen. (1993). 'Use of health care services in two rural communities in Tanzania', Community Dentistry and Oral Epidemiology, vol. 21, no. 3, pp. 133-45.
21. Kumar, R., M.M. Singh & M. Kaur. (1997). 'Impact of health centre availability on utilization of maternity care and pregnancy outcome in a rural area of Haryana', Journal of the Indian Medical Association, vol. 95, no. 8, pp. 448-50.
22. Rohde, J. & H Viswanathan. (1995). The Rural Private Practitioner. New York: Oxford University Press.
23. Koenig, M.A. & M.E. Khan,. (1999). Improving Quality of Care in India's Family Welfare Programme: The Challenge Ahead. New York: The Population Council.
24. Shelton, J.D. & S.S. Davis. (1996). 'Some priorities in maximizing access to and quality of contraceptive services', Advances in Contraception, vol. 12, no. 3, pp. 233-47.
25. Levine, R.E., H.E. Cross, S. Chhabra & H. Viswanathan. (1992). 'Quality of health and family planning services in rural Uttar Pradesh: the client's views', Demography India, vol. 21, no. 2, pp. 247-65.
26. Bertrand, J.T., K. Hardee., R.J. Magnani,., & M.A. Angle. (1995). 'Access, quality of care and medical barriers in family planning programs', International Family Planning Perspectives vol. 21, no. 2, pp. 64-69.
27. Bloom, S.S., T. Lippeveld and D. Wypij. (1999). 'Does antenatal care make a difference to safe delivery? A study in urban Uttar Pradesh, India', Health Policy and Planning vol.14, no.1, pp.38-48.
28. Griffiths, P and R. Stephenson. (2001). 'Understanding users' perspectives of barriers to maternal health care use in Maharashtra, India', Journal of Biosocial Science vol. 33, no. 3, pp. 339-359.

29. Kesterton, A. J, J. Cleland, A. Sloggett and C. Ronsmans. (2010). 'Institutional delivery in rural India: the relative importance of accessibility and economic status', BMC Pregnancy and Childbirth, vol.10, no.30, pp.1-9.
30. Borghi. J, T. Ensor, A. Somanathan, C. Lissner, and A. Mills. (2006). 'Mobilising financial resources for maternal health', The Lancet, vol. 368, no.9545, pp.1457-1465.
31. Balaji, R., T. Dilip. and R. Duggal. (2003). 'Utilisation of and expenditure on Delivery Care Services: Some Observations from Nashik District Maharshtra', Regional Health Forum WHO-South-East Asia Region 2003
32. Mbizvo, M. T. and M.T. Bassett. (1996). 'Reproductive health and AIDS prevention in sub-Saharan Africa: The case for increased male participation', Health Policy and Planning, vol. 11, no. 1, pp. 84-92.
33. Bhalerao, V.R., M. Galwankar., S. S. Kowli., R. Kumar, and R.M. Chauturvedi. (1984). 'Contribution of the edu- cation of prospective fathers to the success of a maternal health care programme', Journal of Postgraduate Medicine vol.30, no.1, pp. 10-12.