

Determinants and Utilization of Maternal Health Care Services in Urban Slums of an Industrialized City, in Western India

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Abstract

Objective: To assess the status of utilization of Maternal Health Care (MHC) services in slums of an industrialized city and elucidating the various determinants influencing the utilization.

Materials and methods: A Cross-sectional study using multi stage sampling methodology was conducted in slums of an industrialized city. The study participants were the women who had given a live birth in the last one year before 4 weeks of the study starts. Total one hundred eighty families were interviewed & analysed.

Results: The utilization of MHC services was poor as compared to national averages in urban slums. There was no association between age of mother, birth order, educational and occupational status of head of family with utilization of services while education and employment of mother, category and type of family, distance and time to reach health facility, were significantly associated.

Conclusion: The reduction of maternal mortality and morbidity mostly depends on the utilization of MHC services. The findings of this study have important implications for improving utilization of maternal health care services.

Keywords: Antenatal Care; Determinants; Utilization; Maternal Health Services; Urban Slums

Introduction

Women have an essential role in bringing up of the children and shaping the future of the country. There are 48.47% women in India, out of which about 22.2% are in reproductive age (1). Because of the risk associated with child bearing, women constitute the “vulnerable” group that is available in the need of health services (2). The loss of these women due to lack of MHC services is a great loss to families as well as to the society.

Every year about 289,000 maternal deaths occur all over the world. Out of which about 17% (50000) occur in India (2). Global observations show that the lifetime risk of maternal death nearly halved between 2000 and 2017, from 1 in 100, to 1 in 190 but there is a huge difference between high and low income countries i.e. 1 in 5400 compared to 1 in 45 (3). The reason of such maternal mortality is due to several factors, an important one being non-utilization or under-utilization of MHC services. Even though maternal care services are easily available and more accessible in urban areas but the MHC indicators of urban slums are poorer than those of overall urban areas (4).

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With respect to such reality it is very crucial to understand the factors that determine the utilization of MHC services. Hence, not surprisingly, reduction in maternal mortality rate (MMR) is one of the Sustainable Development Goal which aims to reduce maternal mortality to less than 70 deaths per 100000 live births by 2030 (5, 6). The scarcity of resources is often cited as a major constraint to ensuring that all mothers receive the care and interventions they need in a timely fashion.

The reduction of MMR, a positive pregnancy and healthy new born outcome can only be attained if the antenatal care (ANC) provided to women during pregnancy is made better and initiated early enough (7). ANC provides an entry point for women to the health care system. The objective of the system is to monitor the pregnant women regularly during their pregnancy, so that the risk factors can be identified. Therefore, the utilization of maternal health care is one of the important factors to reduce the incidence of maternal mortality. A recent study estimated the potential returns to investment in new technology versus research that could improve the delivery and utilization of health services. Surveying deaths among children less than five years of age, in 42 low income countries, the authors concluded that while improved technology had the potential to avert 21.5% of deaths, improved service utilization could avert 62.5% of child deaths (8).

Materials and methods

This was a cross-sectional descriptive study conducted in slums of an industrialized city from March 2013 to March 2014. The study participants were the women who had delivered a baby within one year of interview date along with the head of their families. The calculated sample size was 174, but 190 families were interviewed considering 10% of non-response rate. We were able to obtain complete information from 180 families as from remaining ten families; some of the required information was missing, so their interview records were discarded.

The samples were collected using multistage sampling method: One slum area having a maximum population from each of the 23 wards were selected. Each of the selected slum area was again divided into four quadrants and two families wherein the mother had delivered in the past 1 year were randomly selected from each of the quadrants. Hence, the final sample size was 184. This was lesser than our calculated sample size of 190. Six slums from previously selected 23 slums were again selected randomly, and an extra family (totally 6) was selected

to complete the sample size.

This study has been approved by the institutional ethics committee. Each participant was clearly explained the purpose of the study, and informed consent was taken. They were interviewed using a pretested semi-structured questionnaire from house to house visits and information on utilization of MHC services were collected. The head of the family was also interviewed to cross-check the information. Available medical records and bills were also verified. The data were entered and analysed using the Microsoft office excels 2010.

Results

In our study, 45% of mothers were Below Poverty Line (BPL) card (ration cards that were issued to households living below the poverty line) holders. Majority of mothers (91%) were housewives & only 9% were employed. As per educational status, majority (51.66%) had a primary education, 25.55% were illiterate and only 3% were found to have graduate degree. Using Kuppusswamy socio economic classification (9), majority of families (159 (83.88%)) belonged to lower class and none belonged to the upper class. Urine pregnancy test of 81.11% of the mothers was done and only 40% of the mothers knew about their expected date of delivery.

Ninety-six percent of the mothers had received ANC services while 4 % had not received any kind of ANC services. Table 1 shows the characteristics of ANC and utilization of services by mothers during ANC visits and delivery.

Ninety-three percent had consumed the food supplements provided to them during antenatal period. In about three fourth of families the food supplements were utilized by other family members also. Forty percent of the mothers had received at least one home visit during the antenatal period (79.16% was conducted by the Anganwadi worker and 18.05% by link worker), while 60% of the mothers did not receive any home visit. Nearly one fifth of the mothers had developed certain complications during antenatal period out of which only one third had received the treatment.

Majority of mothers (67.80% in government & 72.12% in private hospitals) were discharged before 48 hours of delivery. During post natal period only 43% of mothers had received home visits which were mainly conducted by Anganwadi and link workers (84%) and out of those 30.77% of the mothers received less than two home visits while 69.23% had received two or more than two visits.

Table 1: Distribution of mothers according to utilization of services during ANC

Characteristics	N (n = 173)	%
Registration at Health Facility		
Government	107	61.85
Private	66	38.15
Gestational age at time of registration		
Within the first three months (i.e. Early Registration)	129	74.56
After Three Months (Late Registration)	44	25.44
Number of ANC ¹ visits		
Less than four	85	49.13
More than four	88	50.87
ANC visits undertaken at the type of Health Facility		
Private Hosp.	81	46.82
Government hospital	67	38.73
Anganwadi centre	18	10.40
Urban Health Training Centre (UHTC)	7	4.05
Most commonly used mode of transport		
Private Vehicle	137	79.19
On Foot	36	20.81
Government Vehicle	0	0.00
Services utilized during ANC Visits		
Weight recorded during ANC Visits	168	97.10
Regularly	5	2.90
Irregularly	167	96.53
TT ² injections received as per guidelines	169	97.68
IFA ³ tablets Given		
Less than 100	64	37.87
100 or more	105	62.13
Blood pressure measured during the visits	169	97.68
Laboratory tests undertaken	166	95.95
Nutritional advice received	139	80.34
Food supplements received	104	60.11
Place of delivery (n = 180)		
Governmental hospital	59	32.78
Private hospitals	104	57.78
Home	17	9.44
Mode of Transport during Delivery (n = 163)		
Private motor/Rickshaw	156	95.70
Governmental. Vehicle/Ambulance	7	4.30
Type of Delivery(N = 180)		
Vaginal	141	78.33
Caesarean section	39	21.67

1- ANC: antenatal care, 2- TT: tetanus toxoid, 3-IFA: Iron and Folic acid

Nine percent of mothers developed some complications during post natal period out of which 81% percent had received treatment. Only 36.66% had received counselling on family planning services out of which 69.7% had received it from the Government set up and only 22.73% had received from private hospitals.

Table 2 shows that there was no association between age of mother, birth order, educational and

occupational status of head of family with adequate number of ANC visits and early registration of pregnancy while education, employment of mother and type of family was significantly associated with the number of adequate ANC visits and early registration of pregnancy.

Table 3 indicates that the distance and time taken to reach the hospital was significantly associated with the institutional deliveries.

Table 2: Socioeconomic and demographic characteristics in relation to antenatal care and time of registration

Characteristics	Antenatal visits				Registration			
	Less than Four (N = 85)	More than Four (N = 88)	χ^2 -Value	P-Value	Early registration	Late registration	χ^2 -Value	P-Value
Age (Years)								
15-19	2 (33.33)	4 (66.67)	8.492*	0.081*	6 (100)	0 (0.00)	3.924*	0.269*
20-24	39 (51.31)	37 (48.68)			51 (67.11)	25 (32.89)		
25-29	37 (57.81)	27 (42.18)			49 (76.56)	15 (23.44)		
30+	7 (25.92)	20 (74.07)			23 (85.19)	4 (14.81)		
Educational Status of Mother								
Illiterate	31 (70.45)	13 (29.54)	14.904	0.0005	27 (58.7)	19(41.30)	9.562	0.0083
Primary	43 (47.78)	47 (52.22)			73 (81.11)	17(18.89)		
Secondary & above	11 (28.20)	28 (71.80)			29 (82.86)	6 (17.14)		
Birth Order								
One	32 (48.48)	34 (51.51)	4.709	0.0949	47 (71.21)	19 (28.79)	0.661	0.7185
Two	40 (57.14)	30 (42.86)			54 (77.14)	16 (22.86)		
Three or More	13 (35.14)	24 (64.86)			28 (75.68)	9 (24.32)		
Employment Status of Mother								
Employed	2 (12.50)	14(87.50)	9.467	0.0020	0 (0.00)	16 (100)	33.204	0.000
Not employed (housewife)	83 (52.87)	74 (47.13)			113 (71.97)	44 (28.03)		
Educational Status of Head of Family								
Illiterate	28 (49.12)	29 (50.88)	5.555	0.0621	40 (70.18)	17 (29.82)	3.969	0.1374
Primary	42 (57.53)	31 (42.47)			60 (82.19)	13 (17.81)		
Secondary & above	15 (34.88)	28 (65.12)			29 (67.44)	14 (32.56)		
Occupation of Head of Family								
Skilled	31 (48.44)	33 (51.56)	1.248	0.5357	43 (67.19)	21 (32.81)	3.31	0.1910
Unskilled	49 (51.58)	46 (48.42)			74 (77.89)	21 (22.11)		
Unemployed	5 (35.71)	9 (64.29)			12 (85.71)	2 (14.29)		
Type of Family								
Nuclear	63 (56.25)	49 (43.75)	6.542	0.0379	81 (73.32)	31 (27.68)	11.696	0.0028
Joint	12 (34.29)	23 (65.71)			22 (62.86)	13 (37.14)		
Three	10 (38.46)	16 (61.54)			26 (100)	0 (0.00)		
Category of Family								
General	19 (40.43)	28 (59.57)	6.307	0.0427	35 (74.47)	12 (25.53)	3.968	0.1375
OBC ¹	33 (44.59)	41 (55.41)			60 (81.08)	14 (18.92)		
SC/ST ²	33 (63.46)	19 (36.54)			34 (65.38)	18 (34.62)		
Socio-economic Status (Kuppuswamy Classification)								
Lower class	0 (0.00)	8 (100)	7.57 ³	0.055 ³	8 (100)	0 (0.00)	4.128*	0.247*
Lower-Middle	7 (43.75)	9 (56.25)			9 (56.25)	7 (43.75)		
Upper-Lower	77 (53.47)	67 (46.53)			107 (74.31)	37 (25.69)		
Upper-Middle	1 (20)	4 (80)			5 (100)	0 (0.00)		

1- OBC: Other Backward Class, 2- SC/ST: Scheduled Castes/Scheduled Tribes, 3- Yates' value

Discussion

This study from the urban slums of an industrialized city highlights the various aspects of utilization of maternal health care services like ANC visits, registration, health facility used, mode of transport and the ANC services availed.

Out of 173 pregnant women who received ANC services, 85 (49.13%) had less than four ANC

visits, 88 (50.87%) women had more than four ANC visits. Seven mothers out of 180 (3.88%) did not receive any ANC service. We found that in India, 66.4 % of women received full ANC (at least four ANC visits) in urban areas, whereas the corresponding figures for Gujarat 80.5 %, Maharashtra 75.6 %, Rajasthan 53.8% and for Madhya Pradesh is 51.6 % (10).

Table 3: Distance and time taken to reach health facility in relation to Institutional deliveries (n = 163)

	n	%	P value ¹
Distance of institution from Home			
Less than 5 km	117	71.78	0.0001
5 to 10 km	40	24.54	
10 to 15 km	6	3.68	
Time taken to reach the hospital			
Less than 30 minutes	95	58.28	0.0001
30 to 60 minutes	63	38.65	
60 to 120 minutes	5	3.07	

Early registration is of prime importance to identify the early signs of high risk pregnancy and to prepare the mother for the delivery. In our study, majority of women (74.56%) registered their pregnancy within the first trimester mainly in government facility (61.8%). NFHS-4 shows slightly higher percentage of women registered in first trimester which was 96.1 %, 87.9%, 84.7%, Kerala, Andhra Pradesh and Goa urban areas respectively (10). Table 1 indicated that majority (53.16%) of the mothers had their ANC visits in the government set up (Government hospital, Anganwadi centre or Urban Health Centre). But nearly half (47%) of the mothers had visited in private hospitals for ANC. It shows the distrust of mothers regarding quality of services provided in the government set up. Table 1 shows about 80% of the mothers used the private vehicle as mode of transport for taking ANC visits, which adds extra burden on their pockets and also affects the decision making about the number of ANC visits received and 20% of remaining mothers did not utilize any mode of transport. Our study shows that almost all the mothers' (97%) weight was regularly recorded and received two tetanus toxoid (T.T). injections during their ANC visits. The study conducted by Gopalakrishnan et.al. in Kancheepuram district of Tamilnadu reported the coverage of two T.T. injections to be 95.7% (11). About 98% of the mothers had received the IFA tablets which was more than the countries like Indonesia (76%), Kenya (69%) having the ANC coverage 96% comparable to the present study (12).

As we can see in Table 1 that in majority (97.68%) mother's blood pressure was measured and in most (95.95%) of the mothers some laboratory tests were done like blood tests, urine tests, HBsAg etc. In our study nearly 20% of the mothers did not receive any advice on nutrition during ANC period. It is the programme of Government of India to provide supplementary nutrition to the pregnant mothers

during antenatal period. In spite of these guidelines, our study shows that nearly 40% of the mothers did not receive any food supplement during their antenatal period. This indicates mismanagement of stocks of food supplements. Institutional delivery is the single most important factor to reduce the MMR. In our study there were total 163 (90.56%) institutional deliveries which is a very encouraging but out of this only 59 (32.78%) was in Government set up and 104 (57.78%) was in Private set up. The reasons could be easy availability and accessibility of the private hospitals and lack of trust in Government facilities. However, around 10% of them were delivered at home which is a cause of concern. Study by Vellakkal S et.al found that 46.2%, 82.6%, 56.7% institutional deliveries had occurred in Jharkhand, Madhya Pradesh and Uttar Pradesh respectively (13). This study reveals that majority of mothers used the private motor/rickshaw for travelling to health facility for delivery. Only 7 (4.30%) of the mothers had used the government vehicle which shows the underutilization of Govt. Vehicle. Our study shows that over three fourth (78.33%) of the mothers had normal or assisted vaginal delivery. The Lower Segment Caesarean Section (LSCS) rate in our study was 21.6% which is more than the normal. After evaluating the socio-demographic determinants, it was observed that educational and employment status of mother was strongly associated with utilization of the ANC services. On comparing the birth order against utilization of the ANC services it was found that mothers with birth order three or more had the least number of ANC visits as compared to those with birth order one or two. However, the above difference was not statistically significant. Study conducted by Babalola et.al, also finds the absence of a statistically significant association between the child's rank of birth and maternal services utilization among Nigerian women (14). A population based cross sectional study from Benin conducted by Sanni Yaya et. al. found that women with higher birth order (> 4) had significant reduction in adequate ANC visits and facility-based delivery respectively (15). On comparing the occupation of head of Family against utilization of ANC services it was found that the utilization of four or more ANC visits increased progressively from skilled (51.56%) to unemployed (64.29%) respectively while in case of less than four ANC visits the percentage of visits decreased from 48.44% (skilled) to 35.71% (unemployed) respectively.

The reasons for the above findings of less utilization of the services may be because our study population was from slum areas where most of the people were working on the daily wages, so for them going for ANC visits leads to loss of income. However, this difference is not statistically significant. In the present study, most of the families belong to lower socioeconomic class (78%). Out of remaining 22%, all belong to middle class and two-third of these families were registered early and utilized four or more than four ANC visits, although this difference is not statistically significant. In contrast several studies found that low socioeconomic status and under-utilization of maternal health services were interlinked (16-18). However, a similar study from Rwanda also did not find a significant association between poor utilization and low socioeconomic status (19).

On comparing the literacy status against the time of registration it was found that early registration was delayed in 41.30% of mothers who were illiterate. Those mothers who were literate had their ANC registration within the first trimester in more than 80% of cases. The above finding is statistically significant. Other potential benefits of antenatal care are counselling on nutrition and healthy pregnancy/delivery behaviour; provide tetanus immunization, iron and folic acid tablets and helping women for birth preparedness. However, there are a number of factors in developing countries that have the potential to be a hindrance to these aspects of antenatal care from being successful.

Table 3 indicated that a majority (72%) of those who had institutional delivery were living within 5 km radius of the institution. A quarter of them were residing within 5 to 10 km radius and only 3.68% were living more than 10 km away from the institution. Other study has also found that an increase in distance to the nearest health facility led to fewer institutional deliveries (20). Using the chi-square test for goodness of fit in the above table it can be seen that distance of institution from home of the beneficiary is significantly associated for the place of delivery. Distance from a facility adds to the financial burden facing Families through transport charges and time spent away from productive activity (21). It was found that the need for birth preparedness counselling as well as effective implementation of maternity benefit schemes to prevent families from pushing downward to the poverty line (22).

Conclusion

The utilization of maternal health care services was poor in the urban slums as compared to the national averages. Educational and occupational status of mothers, distance and time taken to reach the health facility are consistently strong predictors of all the maternal health services considered in this study, other determinants of service utilization generally vary in magnitude and level of significance by the type of maternal service - ante-natal care, and postnatal care. The study showed more utilization from private sector even though the government services available in urban areas. The Government should make efforts to increase the quality of services to gain the trust of community and to improve the level of awareness, knowledge among women about the utilization of antenatal care services.

Conflict of Interests

Authors have no conflict of interests.

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References

1. Government of India. Office of the Registrar General and Census Commissioner, India, Ministry of Home Affairs 2011.
2. Park K. Park's textbook of preventive and social medicine. 23rd ed. Jabalpur: Banarsidas Bhanot 2015.
3. Unicef Data, Maternal Mortality. Maternal mortality declined by 38 per cent between 2000 and 2017. 2019.
4. Kishore J. National Health Programs of India. 9th edition. New Delhi: Century publications; 2011.
5. Graham W, Wood S, Byass P, fillip V, Gon G, Virgo S, et al. Diversity and divergence: the dynamic burden of poor maternal health. *Lancet* 2016; 388: 2164–75.
6. Nino FS. Sustainable development goals- United Nations. United Nations Sustainable Development. 2019.
7. Tolefac PN, Tamambang RF, Yeika E, Mbuagbaw L, Egbe TO. Ten years analysis of stillbirth in a tertiary hospital in sub-Saharan Africa: A case control study. *BMC Research Notes* 2017; 10: 447.
8. Leroy JL, Habicht JP, Pelto G, Bertozzi SM. Current priorities in health research funding and lack of impact on the number of child deaths per year. *Am J Public Health* 2011; 101: 1000–1005.

- Health 2007; 97: 219–23.
9. Wani RT. Socioeconomic status scales-modified Kuppuswamy and Udai Pareekh's scale updated for 2019. *J Family Med Prim Care* 2019; 8: 1846-9.
 10. International Institute for Population Sciences (IIPS) and ICF. National Family Health Survey (NFHS-4), 2015-16. Mumbai: IIPS; 2017.
 11. Gopalakrishnan S, Eashwar VM, Muthulakshmi M. Health-seeking behaviour among antenatal and postnatal rural women in Kancheepuram District of Tamil Nadu: A cross-sectional Study. *J Family Med Prim Care* 2019; 8: 1035-42.
 12. Siekmans K, Roche M, Kung'u JK, Desrochers RE, De-Regil LM. Barriers and enablers for iron folic acid (IFA) supplementation in pregnant women. *Matern Child Nutr* 2018;14 Suppl 5: e12532.
 13. Vellakkal S, Reddy H, Gupta A, Chandran A, Fledderjohann J, Stuckler DA. A qualitative study of factors impacting accessing of institutional delivery care in the context of India's cash incentive program. *Soc Sci Med* 2017; 178: 55–65.
 14. Babalola S, Fatusi A. Determinants of use of maternal health services in Nigeria - looking beyond individual and household factors. *BMC Pregnancy Childbirth* 2009; 9: 43.
 15. Yaya S, Uthman OA, Amouzou A, Ekholuenetale M, Bishwajit G. Inequalities in maternal health care utilization in Benin: a population based cross-sectional study. *BMC Pregnancy Childbirth* 2018; 18: 194.
 16. Gertler P, Rahman O, Feifer C, Ashley D. Determinants of pregnancy outcomes and targeting of maternal health services in Jamaica. *Soc Sci Med* 1993; 37: 199-211.
 17. McCaw-Binns A, La Grenade J, Ashley D. Under-users of antenatal care: a comparison of non-attenders and late attenders for antenatal care with early attenders. *Soc Sci Med* 1995; 40: 1003-12.
 18. Nwosu CO, Ataguba JE. Socioeconomic inequalities in maternal health service utilisation: a case of antenatal care in Nigeria using a decomposition approach. *BMC Public Health* 2019; 19: 1493.
 19. Rurangirwa AA, Mogren I, Nyirazinyoye L, Ntaganira J, Krantz G. Determinants of poor utilization of antenatal care services among recently delivered women in Rwanda; a population based study. *BMC Pregnancy Childbirth* 2017; 17: 142.
 20. Kesterton AJ, Cleland J, Sloggett A, Ronsmans C. Institutional delivery in rural India: the relative importance of accessibility and economic status. *BMC Pregnancy Childbirth* 2010; 10: 30.
 21. Kowalewski M, Mujinja P, Jahn A. Can mothers afford maternal health care costs? User costs of maternity services in rural Tanzania. *Afr J Reprod Health* 2002; 6: 65-73.
 22. Sharma S, Verma PB, Viramgami AP, Vala MC, Lodhiya KK. Analysis of Out-of-Pocket Expenditure in Utilization of Maternity Care Services in Urban Slums of Rajkot City, Gujarat. *Indian J Community Med* 2018; 43: 215-19.

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