A Cross-sectional study to evaluate maternal health care services utilization among women residing in an urban slum area, Ahmedabad

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Abstract

Background: Reducing the global Maternal Mortality Ratio to less than 70 per 1,00,000 live births is the first target of Sustainable Development Goal-3. Adequate utilization of Maternal and Child Health (MCH) services is essential for improved maternal and neonatal health outcomes. The utilization of MCH services is a complicated phenomenon, and several factors have an impact on it. This study aims to assess the current status of utilization of antenatal, intranatal, and postnatal maternal health services and determinants of utilization. **Methods:** This cross-sectional study was conducted in an urban slum during January and February 2020 using a pre-tested, semi-structured questionnaire. A total of 126 women who delivered after 1st January 2018 were included as study subjects after getting informed oral consent. Data entry and analysis were done in Microsoft Excel. P-value<0.05 was considered statistically significant. **Result:** In all, 64% of study subjects had adequate Antenatal care (ANC) services utilization. The majority (94.5%) had institutional delivery. In all, 62% of women breastfed their child within four hours after birth. The reason for inadequate utilization was mainly due to lack of unawareness of MCH services. **Conclusion:** Overall, MCH services are good in this area. Efforts should be made to improve the quality of services for ANC registration within first trimester, Iron and Folic Acid tablet consumption, initiation of early breastfeeding, and postnatal care services, and the major determinants that influence utilization of MCH services including mother's education and parity.

Keywords: Utilization, maternal health care services, antenatal care, urban slum, institutional delivery, postnatal services

Introduction

Maternal healthcare is still a major challenge to the global public health system, especially in developing countries[(1)]. Reducing the global Maternal Mortality Ratio (MMR) to less than 70 per 1,00,000 live births is the first target of Sustainable Development Goal-3 (SDG-3)[(2)].

According to World Health Organization (WHO) data, almost 800 women died every day from preventable pregnancy and childbirth causes, and maternal death occurred almost every two minutes in 2020. Between 2000 and 2020, the MMR dropped by about 34% worldwide. Among all maternal deaths, almost 95% of maternal deaths occurred in Low Income and Low- or Middle-Income countries (LMICs). Care by skilled health professionals before, during, and after childbirth can save the lives of women and newborns[(3)].

The MMR in India has declined over the years from 130 in 2014-2016 and 103 in 2017-2019 to 97 in 2018-2020, as per the latest report of the National Sample Registration System (SRS) bulletin, 2020[(4)]. SRS reports MMR of Gujarat as 57 per lakh live births. Institutional deliveries in India have increased from 78.9% to 88.6%, and the same is true for Gujarat (94%) and Ahmedabad (95%) as per National Family Health Survey-5 (NFHS-5)[(5)]. Adequate utilization of Maternal and Child Health (MCH) services help in reducing maternal morbidity and mortality.

MCH services utilization is a complex phenomenon and is influenced by several factors. According to Andersen's healthcare utilization model, the usage of health services is determined by three dynamics: predisposing factors, enabling factors, and need. Predisposing factors could be characteristics such as race, age, and health beliefs. Enabling factors could be family support, access to health insurance, one's community, etc. Need constitutes both perceived and actual need for health care services. Therefore, the factors at different levels affecting the use of these services need to be clearly understood and assessed[(6)].

In view of this, current study was undertaken to assess the utilization and their determinants for various maternity benefit services among the urban slum population of Ahmedabad city.

Objectives

1. To estimate the current status of utilization of antenatal, intranatal, and postnatal services
2. To identify the determinants of utilization of MCH services

Materials and Methods

A community-based cross-sectional study was conducted in an urban slum area of Ahmedabad city from January to February 2020. There are six slums in the field practice area under the Urban Health Training Centre (UHTC) of the Medical College. Among them, three slums were selected by using simple random sampling. Sample size has been calculated by using the formula $n = z^2pq/d^2$ where the expected proportion has been taken as 95% of women received Antenatal care (ANC) in Gujarat[5]; d (absolute precision) was considered as 0.04; at Confidence level 95%, $z=1.96$. $n = z^2pq/d^2 = (1.96)^2(0.95)(0.05)/(0.04)^2 = 114$.

By adding a 10% response rate, we have calculated the sample size as 126.

The women who delivered between 1st January 2018 to 31st December 2019 were included in the study. The mothers were identified by door-to-door enumeration. Auxiliary Nurse and Midwife (ANM) registers and *Anganwadi* records were used to identify those mothers who were missed during enumeration. Forty-two mothers from each of the three slums were selected using systematic random sampling, making a total sample size of 126. Data collection from these 126 mothers was started after getting institutional ethical review board clearance. Mothers were interviewed using a pre-designed, pre-tested, semi-structured questionnaire after obtaining informed verbal consent. The questionnaire was based on relevant information about the antenatal, intra-natal, and postnatal services utilization, and was recorded along with the socio-demographic data. Income status has been categorized using modified BG Prasad classification[7].

Antenatal services were considered adequate if the pregnant woman had fulfilled the following all criteria[8]:

1. ANC registration at any time
2. Received required Tetanus-diphtheria (Td) injections
3. Consumption of a minimum of 100 Iron and Folic Acid (IFA) tablets
4. Minimum four ANC visits

Intranatal service utilization was assessed whether the delivery took place in a health facility/home, mode of delivery (normal vaginal delivery/cesarean section), and expenses in the current pregnancy and delivery. Postnatal service utilization was assessed by checking initiation of breastfeeding (within one hour/1-4 hours/more than four hours), whether current birth was registered or not, and assessing the immunization status of the child (unimmunized/partially immunized/age-appropriate immunization).

Data entry and analysis was done in Microsoft Excel. Data were expressed in percentages. Chi-square test (χ^2) test was used for evaluating the association between ANC and categorical variables, like place of delivery and socio-demographic characteristics, and postnatal service utilization and place of delivery. A p-value less than 0.05 was considered statistically significant.

Result

Table 1 shows that overall ANC service utilization. ANC registration in UHTC was quite good (94%), but among them, only 74.6% of females registered within the first trimester. All women (100%) had received immunization for tetanus, but consumption of IFA tablets was 91.3%, and a major reason for incomplete/nil consumption of IFA tablets was that women responded that they did not feel any need for that and three women have stopped taking medicine because of the side effects. Majority i.e., 82.6% of women had undergone a minimum of four ANC visits.

Table 1: ANC service utilization

ANC Services	Yes n (%)	No n(%)
ANC Registration	118 (93.7)	8 (6.3)
ANC registration within 1st trimester	88 (74.6)	30 (25.4)
ANC Visits	125 (99.1)	1 (0.9)
More than four ANC visits	104 (82.6)	22 (17.4)
IFA tablets consumption	115 (91.3)	11 (8.7)
Td taken	126 (100)	0 (0)

Abbreviations: ANC: Antenatal Care, IFA: iron and Folic Acid, Td: Tetanus-diphtheria

Table 2 shows the association of socio-demographic factors with ANC service utilization. Women's education has been strongly influenced for ANC utilization ($p<0.05$).

Table 2: Association of socio-demographic factors and ANC service utilization

Socio-demographic variable	Adequate Utilization (n=81) n (%)	Inadequate utilization (n=45) n (%)	Total (n=126) n (%)	p-value
Age (in years)				
15-20	2 (40)	3 (60)	5 (4)	0.54
21-25	31 (56.4)	24 (43.6)	55 (43.7)	
26-30	34 (73.9)	12 (26.1)	46 (36.5)	
31-35	9 (69.2)	4 (30.8)	13 (10.3)	
36-40	5 (71.4)	2 (28.6)	7 (5.6)	
Women's education				
Illiterate	10 (38.5)	16 (61.5)	26 (20.6)	***0.036**
Primary	42 (73.7)	15 (26.3)	57 (45.2)	
Secondary	20 (64.5)	11 (35.5)	31 (24.6)	
Higher and above	9 (75)	3 (25)	12 (9.5)	
Husband's education (n=125)				
Illiterate	7 (43.75)	9 (56.25)	16 (12.8)	0.38
Primary	33 (66)	17 (34)	50 (40)	
Secondary	29 (72.5)	11 (27.5)	40 (32)	
Higher and above	11 (57.9)	8 (42.1)	19 (15.2)	
Income				
Class I	1 (100)	0 (0)	1 (0.79)	0.46
Class II	12 (85.7)	2 (14.3)	14 (11.1)	
Class III	23 (57.5)	17 (42.5)	40 (31.7)	
Class IV	30 (58.8)	21 (41.2)	51 (40.5)	
Class V	15 (75)	5 (25)	20 (15.9)	

***p<0.05 statistically significant**

Table 3 shows that about 77.8% of women arranged their transport on their own, and 11.9% of beneficiaries reached the hospital via Government ambulance. The majority of women (94.5%) had institutional delivery, but 7 (5.6%) women had home deliveries, and the main reason for having home delivery was tradition, followed by hospital services were not acceptable. More than half, i.e., 62.3% women, incurred expenses INR 10,000/- or more during their antenatal, intranatal, and postnatal period. The median expenses for delivery was INR 15,000/-.

Table 3 states that the mother's education and parity were significantly associated with the place of delivery.

Table 3: Distribution of intranatal services utilization

Intranatal services	n (%)
Mode of transport	
Private vehicle	98 (77.8)
Government ambulance	15 (11.9)
Walking	13 (10.3)
Place of delivery	
Public Health Facility	64 (50.8)
Private Health Facility	55 (43.7)
Home	7 (5.6)
Mode of Delivery	
Normal	90 (71.4)
Cesarean	36 (28.6)
Expenses (in INR) (n=69)	
<10,000	26 (37.7)
10,000-20,000	16 (23.2)
20,000-30,000	14 (20.3)
30,000-40,000	6 (8.7)
40,000-50,000	6 (8.7)
>50,000	1 (1.4)

Table 4 states that the mother's education and parity were significantly associated with the place of delivery.

Table 4: Association of place of delivery with socio-demographic factors

	Place of delivery			
Socio-demographic characteristics	**Private health facility n (%)**	**Private health facility n (%)**	**Home delivery n (%)**	**p-value**
Age (in years)				
15-20	3 (60)	1 (20)	1 (20)	
21-25	25 (45.5)	27 (49)	3 (5.5)	
26-30	25 (54.3)	20 (43.5)	1 (2.2)	0.91
31-35	8 (61.5)	3 (23.1)	2 (15.4)	
36-40	3 (42.9)	4 (57.1)	0	
Women's education				
Illiterate	14 (53.8)	6 (23.1)	6 (23.1)	
Primary	36 (63.2)	20 (35.2)	1 (1.8)	
Secondary and above	10 (32.3)	21 (67.7)	0	****0.00047**
Higher and above	4 (33.3)	8 (66.7)	0	
Husband's education (n=125)				
Illiterate	9 (56.3)	5 (31.2)	2 (12.5)	
Primary	30 (60)	16 (32)	4 (8)	
Secondary and above	19 (47.5)	20 (50)	1 (2.5)	0.19
Higher and above	5 (26.3)	14 (73.7)	0	

Cont....

Table 4: Association of place of delivery with socio-demographic factors

Socio-demographic characteristics	Private health facility n (%)	Private health facility n (%)	Home delivery n (%)	p-value
Income (n=125)				
Class I	0	1 (100)	0	0.09
Class II	3 (21.4)	11 (78.6)	0	
Class III	18 (45)	20 (50)	2 (5)	
Class IV	31 (60.8)	18 (35.3)	2 (3.9)	
Class V	12 (60)	5 (25)	3 (15)	
No. of deliveries (n=81)				
1	21 (46.7)	24 (53.3)	0	**0.009
2	28 (51.9)	24 (44.4)	2 (3.7)	
3	9 (45)	7 (35)	4 (20)	
4	5 (83.3)	0	1 (16.7)	
5	1 (100)	0	0	
Total	**43 (50.8)**	**31 (43.7)**	**7 (5.5)**	

****p<0.05 statistically highly significant**

Table 5 shows postnatal service utilization. More than three-forth (78.9%) of mothers who delivered in public health facilities and only half (49.1%) who delivered in private health facilities had initiated breastfeeding within four hours; this difference was statistically significant. Most children from public and private health facilities were age-appropriately immunized, while 71.4% of children from home delivery were either unimmunized or partially immunized.

Table 5: Postnatal services utilization in relation to place of delivery

Postnatal services	Place of delivery			p-value
	Public health facility n (%)	Private health facility n (%)	Home delivery n (%)	
Breastfeeding initiation (n=126)				
Within one hour	2 (3.13)	2 (3.63)	1 (14.3)	*0.04
1-4 hours	47 (75.8)	25 (45.5)	2 (28.6)	
After four hours	15 (23.4)	28 (50.9)	4 (57.1)	
Birth registration (n=126)				
Yes	63 (98.4)	54 (98.4)	5 (71.4)	*0.02
No	1 (1.6)	1 (1.6)	2 (28.6)	
Immunization status (n=126)				
Not immunized	1 (1.6)	1 (1.8)	2 (28.6)	**0.00005
Partially immunized	1 (1.6)	2 (3.7)	3 (42.8)	
Age appropriate immunization	62 (96.9)	52 (94.5)	2 (28.6)	

***p-value statistically significant**

Figure 1 shows the main reasons for inadequate utilization. The main reason was unawareness about the MCH Services (38%), followed by need not felt (16%) and financial constraints (15%).

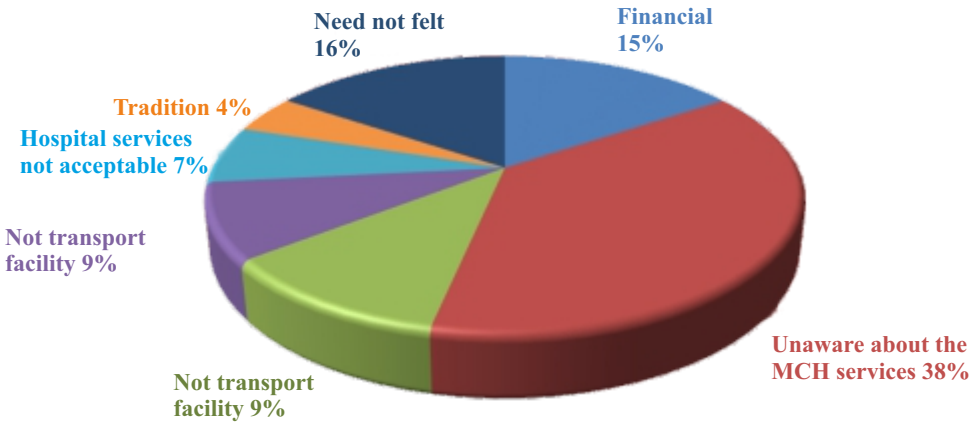

Figure 1: Main reason for inadequate utilization of MCH services

Discussion

Most maternal deaths can be prevented through care by skilled health professionals before, during, and after childbirth. In India, these health services are provided through a network of health centers in outpatient clinics and home visits by peripheral health workers. However, utilization of health services continues to be poor[9]. This could be due to lack of awareness, availability, or accessibility to these services[10].

This study was carried out in the urban slum area of Ahmedabad city. All women who had delivered within the last two years were interviewed and analyzed for antenatal, intranatal, and postnatal services utilization and factors affecting them.

According to NFHS-5 data, the proportion of women in India who received ANC has risen from 84% in NFHS-4[5] to 94%, whereas, in this study, adequate ANC utilization was only 64.3%. This means more efforts are needed by healthcare workers to increase awareness and strengthen ANC services.

Utilization of individual ANC services such as ANC registration in the first trimester (74.6%), Td injections (100%), more than four ANC visits (82.6%), and IFA tablet consumption was more than the national coverage survey[4]. Our study concluded that mother's education has a significant association with the utilization of ANC services, which is similar to other study findings[8,11].

Institutional delivery plays the most important role in reducing maternal mortality and morbidity. In our study, there were 119 (94.5%) institutional deliveries, which is very encouraging. However, around 5.6% of them were delivered at home. Another study conducted by Patel et al.[8] found 8% home delivery in an urban slum; both are much higher than the state's NFHS-5 report (2019-2020), of 1.1%, which is a cause of concern[5]. This study reveals that the majority of women used private motor/rickshaws for travel to health facilities for delivery. Only 15 (11.9%) of the women had used the government vehicle, which shows the underutilization of Government ambulance. Our study shows that over three-fourth (71.4%) of the mothers had a normal vaginal delivery. Our study's Lower Segment Cesarean Section (LSCS) rate was 28.6%, which is more than the national (22%) and Gujarat (21%) state's data[5]. After evaluating the socio-demographic determinants, it was observed that the ANC women's educational status and the number of deliveries were strongly associated with the utilization of intranatal services.

Only 3.2% of mothers have initiated breastfeeding within one hour, which is much lower than the state's NFHS-5 report, and is significantly associated with the place of delivery[5]. Immunization rates among public and private health facilities were higher as compared to home deliveries, and this difference is statistically significant.

The study has some limitations. The study was cross-sectional; the sample size was too small and taken from the field practice area of a providing tertiary medical college. Hence, utilization of services is more likely to be high in proportion compared to other areas. Despite these limitations, the study gives information on certain aspects of the quality of maternal health services in this area. The information can be utilized by the concerned health authorities for the improvement of health care for this group.

Conclusion

In this study, we assessed numerous predisposing factors (mother's education, number of deliveries) and enabling factors (place of delivery, initiation of breastfeeding) that affect the utilization of antenatal, intranatal, and postnatal health services. The major reason for inadequate utilization was a lack of awareness in the urban slum population, that can

be addressed via appropriate information, education, and communication drives to improve demand for the services.

Conflict of Interest: Nil

Source of Support: Nil

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Ethical consideration

Data collection was started after taking institutional ethical committee clearance.

Authors' Contribution

AD: Pilot study, Data collection, Data entry, Data analysis, Report writing; HP: Data collection; ST: Pilot study and Data analysis; NP: Report writing

Data availability statement

Data will be available with corresponding author on request.

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