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UTILIZATION OF MATERNAL AND NEONATAL CARE SERVICES IN RURAL LUCKNOW: A COMMUNITY BASES CROSS SECTIONAL STUDY

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ABSTRACT

Introduction: In India, report says that we failed to achieve the Millennium Development Goals. The maternal mortality rate and infant mortality rate in developing regions are approximately 15 times higher than developed countries. Hence safe delivery and essential newborn care, besides neonatal care in domestic setting and timely referral for cases unmanageable are important areas to be addressed. This study was aimed to assess the current pattern of utilization of maternal and neonatal care services in rural areas of Lucknow.

Material and Method: This community based cross sectional study was conducted in between August 2014 to July 2015. Study site was rural area of Lucknow. The study unit was a recently delivered woman, defined as a woman who gave live birth in last one year. A multi stage random sampling technique was used. We uses SPSS version 17 for our statistical analysis.

Results: We interviewed 368 RDWs and found that 10.6 % of RDWs did not visit even once to health care facility and almost 62% of registered RDWs were registered early. About 70% RDWs completed at least three ANC visits, 67.7% received complete course of tetanus toxoid and 79.1% received at least one hundred of iron and folic acid (IFA) tablets. Approximately 90% deliveries were conducted by qualified physicians in government institution. There was a clear reduction in facilitating services by health care workers before and after delivery. We found that age less than 30 years, higher socioeconomic strata, educational level higher than matriculation of RDWs were likely to complete their ANC cares and these associations were statistically significant.

Conclusion: We are still far away from health for all. To achieve SDG, a multi prong approach is need of hour.

Key words: Antenatal care (ANC), recently delivered woman (RDW), rural Lucknow, sustainable development goals (SDG)

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INTRODUCTION

The health status of women and children are eternally linked. When the health of women and children improve, life improves by every measure. Better Health leads to better education, productive life and economic opportunities which lead to broader prosperity. The Millennium Development Goals (MDGs) were established following the Millennium Summit of the United Nations Organization (UNO) in 2000[1]. All United Nations member states and at least 23 international organizations were committed to achieve the Millennium Development Goals by 2015. Maternal and child health related goals in MDG included two third reductions in Infant Mortality Rate (IMR), three fourth in Maternal Mortality Rate (MMR) and to increase the proportion of births attended by skilled health personnel[1]. But in India, report says that we failed to achieve MDG[2]. The MMR in

developing regions are 15 times higher than developed countries[3]. Current global MMR is 190 per 100,000 live births while in India, MMR is 178 and in Uttar Pradesh (UP) it is 292[4,5]. The current global IMR is 34 per 1000 live births while in India current IMR is 41 per 1000 live births[6] and in UP it is 56 per 1000 live births[7]. Hence safe delivery and essential newborn care, besides neonatal care in domestic setting and timely referral for cases unmanageable are important areas to be addressed. Despite the efforts utilization of MCH services by the rural community have not reached the desired level. The challenge that exists today is to reach the whole population, with adequate health services and to ensure proper utilization. Recently efforts to address these issues have gained momentum with the formulation of National Health Mission (NHM) which has proposed core strategic components to promote institutional deliveries and comprehensive essential obstetric care[8,9]. UNO's program sustainable developmental goals (SDG) officially came into force on 1 January 2016 to prevent planet by several measures including ensuring healthy lives and promote well-being for all at all ages[10]. This is targeted in this programme (SDG) to reduce global MMR less than 70 per 100,000 live births, neonatal mortality ≤12 per 1,000 live births and under-5 mortality to ≤ 25 per 1,000 live births by 2030[10]. This study was aimed to assess the current pattern of utilization of maternal and neonatal care services in rural areas of Lucknow. The primary objective was to study the services for maternal and neonatal care provided to the recently delivered woman (RDW) in the study area and their facilitators. Secondary objective was to assess the socio-demographic characteristics and its influence on utilization of maternal and neonatal care services.

MATERIAL AND METHODS

This study was a community based cross sectional study conducted in between August 2014 to July 2015. Study site was rural area of Lucknow district of UP state of India. Lucknow district, spread over an area of 2544 sq km is located 125 meter above the mean sea level and between 26.5^0 North and 27.5^0 East. This district has a population of 4.6 million with sex ratio of 917 while 1.6 million living in rural area[11]. The study unit was RDW, defined as a woman who gave live birth in last one year. The study protocol was approved by institutional ethical committee. It was reported in NFHSIII[12] that 64% of pregnant women received at least two injections of tetanus toxoid during their last pregnancy in rural Uttar Pradesh. On this basis, sample size was calculated by using formula $4pq/d^2$ where p for percentage of service utilization (64%), q for 100-p (36%) and d for allowable error (5%). The calculated sample size was 368. Multi stage random sampling technique was used to select RDW. At first stage, two from 8 blocks of rural Lucknow and second stage 10 villages from each selected block were selected randomly. In each village about 20 RDWs were surveyed consecutively. Only those RDWs included who were living in these villages for at least more than six months. RDWs those gave still birth and lived in these villages for less than 6 months of duration were excluded from the study. During interview of RDWs, data were recorded in preformed questionnaires on a paper. Data was collected on age, religion, caste, birth order of newborn, educational status of RDW, type of family and socioeconomic class (as per revised modified BG Prasad's classification[13]), ANC registration, early registration, number of ANC visits, number of tetanus toxoid received, IFA received and consumed, antenatal and postnatal maternal complication and, neonatal complications and its management, home visits antenatal and postnatal checkups etc.

Data was analysed using the software SPSS version 17. Univariate analysis was done to assess the distribution of baseline variables. Thereafter student "t" test and chi square test were used to compare continuous and categorical variables, respectively. The Odd's ratio with 95% confidence limit was also calculated to assess the association of various risk factors. Discrete data was analysed using Chi-square test. *P* values less than 0.05 were considered significant.

RESULTS

The present study was done in rural Lucknow, a district of north India in between August 2014 to

July 2015. We interviewed 368 RDWs and found that majority of RDWs (91.2%) were 18 to 30 years of age. In our study area, 75% and 25% RDWs were Hindus and Muslims, respectively. Only 13% population of RDWs were of general castes while 46.2% and 40.8% were belonging to other backward castes (OBC) and schedule castes/ schedule tribe (SC/ST) castes, respectively. In the study area, majority of RDWs (73.9%) were living in joint families. Education level was poor in RDWs. We found that only 45.6% were educated either till matriculation or above while 19% were illiterate. Female unemployment was very common in study area and we found that 80.4% of RDWs were unemployed. (Table 1)

Utilisation pattern of antenatal care (ANC) services is given in table 2. We found that 10.6 % of RDWs were not visit even once to health care facility. Early registration was defined as if ANC registration was done within twelve weeks of pregnancy and we found that almost 62% of registered RDWs were registered early. About 70% RDWs completed at least three ANC visits, 67.7% received complete course of tetanus toxoid and 79.1% received at least one hundred of iron and folic acid (IFA) tablets. Utilisation pattern of natal care services is given in table 3. Approximately 90% deliveries were conducted by qualified physicians in government institution. We found that 10.3% of newborn were LBW. Against the recommendation of 100%, there was only 27.7% of new born started breast feeding within one hour of delivery and 75.8% received colostrums. Postpartum conditions are given in table 4. ASHA was the most common counsellor or facilitator of RDWs for their ANC, natal and post natal cares. Only 84% of newborns received the complete primary immunization before discharge from delivery setup. (Table 5) There was a clear reduction in facilitating services by health care workers before and after delivery. We found that age less than 30 years, higher socioeconomic strata, educational level higher than matriculation of RDWs and if they were from general castes and joint families, they were likely to complete their ANC cares and these association were statistically significant. (Table 6)

Table 1: Baseline Characteristics of RDW

Characteristics		N=368	%
Present Age	≤ 30 Years	340	92.39
	>30 Years	28	7.61
Age at marriage	< 18 Years	90	24.46
	≥ 18 Years	278	75.54
Religion	Hindu	276	75.0
	Muslim	92	25.0
Caste	General	48	13.04
	OBC+SC/ST	320	86.96
Socioeconomic Class	≤ III	28	7.61
	IV+V	340	92.39
Type of Family	Nuclear	96	26.1
	Joint	272	73.9
Education	≥ Matriculation	168	45.65
	< Matriculation	200	54.35
Occupation	Non working	296	80.4
	Working	72	19.56
Parity	1	156	42.39
	>1	212	57.61

Table 2: Antenatal Care

Characteristics		N= 368	%
ANC registration	Yes	329	89.4
Time of registration	Early	228	61.9
	Late	101	27.5
Facilitator	ANM	8	2.2
	AWW	2	0.5
	ASHA	301	81.8
	Trained dai	2	0.5
	Others	4	1.1
	None	12	3.3
ANC Visits	1	14	3.8
	2	56	15.2
	≥3	259	70.4
Place of Antenatal care	Public health facility	302	82.1
	Private health facility	27	7.3
No of TT injections during pregnancy	1	20	5.4
	2	249	67.7
	None	60	16.3
IFA tablets	Received	291	79.1

Table 3: Natal Care

Characteristic		N=368	%
Place of delivery	Public Institution	329	89.4
	Private Institution	30	8.1
	Home	9	2.4
Reason for Institutional delivery	Incentive	26	7.1
	Better services	64	17.4
	Cheaper	64	17.4
	All	214	58.2
Counselor/ Facilitator / Escorted for Institutional delivery	ANM	14	3.8
	AWW	16	4.3
	ASHA	324	88
	None	26	7.1
Delivery conducted by	Doctor	329	89.4
	Trained Birth attendant	34	9.2
	Untrained personnel	5	1.3
Birth Weight of New born	< 2.5 Kg	38	10.3
	2.5-4.0 Kg	324	88
	> 4Kg	6	1.6
Colostrum	Given	279	75.8
	Not given	89	24.2
Initiation of breast feeding within	1 Hr	102	27.7
	1-6 Hr	130	35.3
	6-24 hrs	54	14.7
	>1 day	6	1.6
	Not breast feed	76	20.7
Counselor /Facilitator for initiation of breast feeding/ Exclusive Breast feeding /Prevention of hypothermia	ANM	24	6.5
	AWW	10	2.7
	ASHA	318	86.4
	None	16	4.3

Table 4: Postpartum Care

Characteristics		N=368	%
Postpartum Complications after discharge from hospital	Postpartum Hemorrhage	7	1.9
	Fever with/ without chills with foul smelling vaginal discharge/ Puerperal sepsis	9	2.4
	Mastitis /Breast abscess	13	3.5
	Postpartum Eclampsia	8	2.2
	Postpartum Psychosis	5	1.4
Counselor/ Facilitator of Postpartum illnesses after discharge	ANM	3	7.1
	AWW	2	4.8
	ASHA	28	66.7
	Others	9	21.4

Table 5: Post natal care

Characteristic		N=368	%
Immunization (BCG, Hepatitis B first dose and OPV) before discharge from delivery set up	Completed	309	84
	Not completed	59	16
Post natal home visit done by	ANM	24	6.5
	AWW	22	6.0
	ASHA	210	57.1
	None	112	30.4
Numbers of visit to Health centre by Mothers	One	168	45.6
	Two	54	14.7
	≥Three	27	7.3
	Nil	119	32.3
Numbers of visit to home by health workers	One	196	53.3
	Two	42	11.4
	≥Three	36	9.8
	Nil	94	25.5
Facilitator for hospital visit	ANM	32	8.7
	AWW	30	8.1
	ASHA	212	57.6
	None	94	25.5
Problems which developed in children within six weeks of delivery	Fever	9	2.4
	Feeding Difficulty	45	12.2
	Fast breathing	11	3.0
	Jaundice	32	8.7

Table 6: Comparison of RDWs on the basis completeness of antenatal care

Characteristics		ANC Completed n (%)	ANC Uncompleted n (%)	χ^2 (p Value)
Age	≤ 30 Years	228 (69.3)	74 (22.5)	34.25 **(<0.001)**
	>30 Years	6 (1.8)	21 (6.4)	
Religion	Hindu	172 (52.3)	74 (22.5)	2.61 (0.106)
	Muslim	58 (17.6)	25 (7.6)	
Caste	General	40 (12.1)	3 (0.9)	17.94 **(<0.001)**
	OBC+SC/ST	171 (52)	115 (35)	
Socioeconomic Class	≤ III	23 (7)	3 (0.9)	8.22 **(0.004)**
	IV+V	182 (55.3)	121 (36.8)	
Type of Family	Nuclear	43 (13.1)	42 (12.8)	54.16 **(<0.001)**
	Joint	216 (65.7)	28 (8.5)	
Education	≥ Matriculation	78 (23.7)	11 (3.5)	22.60 **(<0.001)**
	< Matriculation	144 (43.8)	96 (29.2)	
Occupation	Non working	210 (63.8)	53 (16.1)	2.25 (0.133)
	Working	58 (17.8)	8 (2.4)	
Timing of ANC Registration	Early	205 (62.3)	23 (7)	60.45 **(<0.001)**
	Late	52 (15.8)	49 (14.9)	

DISCUSSION

In this study we found that literacy rate was 81% among RDWs. Similarly, census 2011[11] showed 77.29 % of total literacy rate in Lucknow. According to NFHS III (2005-06)[12] 82.6% of household in Uttar Pradesh were Hindus and 16.3 % Muslims while in this study two third were Hindus and one third Muslims. These findings are similar to the present study and minor differences may be due to regional variation. In census data of 2011[11] reported that 47.1% of rural households in India have a nuclear family while in our study we reported a lower proportion (26.1% RDWs) living in nuclear families. This large difference reflects about increasing trend of living in nuclear families in rural area similar to urban.

Community will be most benefitted if early registration of pregnancy will be done. Early registration of pregnancy results in early recognition of risks in pregnancy so that measurement can be taken accordingly and suffering can minimize and infant mortality rate and maternal mortality rate can achieve as per SDG goal. In the study area, 89.4% of RDWs were registered for ANC and only 61.9% did early registration. ANC was completed in 70.4% of RDWs. Earlier to our study, ANC registration was reportedly low. In a study by Singh *et al* (2002)[14] reported 52.3% ANC registration in rural area of Ghaziabad, UP. Venkatesh *et al* (2005)[15] reported 35.9% of the women had utilized all the three services in urban slums of Davangere and Nomita Chandhiok *et al* (2006)[16] reported 73.9% had at least one antenatal visit. Similarly NFHS III, India (2005-06)[12] reported that almost three-quarters received ANC from a health professional and only 44% started during the first trimester of pregnancy. Even relatively newer data showed that early registration was not a common practice, with our state average being only 20.66%[17]**.** Newer study consistently reported higher proportion of ANC visits. Kumar V *et al* (2012)[18] reported significant increase in antenatal care from pre Janani Suraksha Yojana (JSY) era from 61.60 % to 95.60% in JSY period. Early ANC registrations in first trimester were also increased from 26.62 % to 72.80%[18]. Roy *et al* (2013)[19] reported that 85.5% were received at least three antenatal care services from any health facility including government and private health care facilities. So, there is a clear increase in ANC care and reported differences in our study and other studies may be due to differences in study design and increasing awareness about reproductive health. We found that 67.7% of RDWs were received two doses of tetanus toxoid. NFHS III, (2005-06)[12] reported 76% coverage of two doses of tetanus toxoid. We reported less than national average of 2005-06. In UP, official data was reported average 53.4 % coverage of tetanus toxoid[17]. The same report also showed 80.5% coverage of tetanus toxoid in rural Lucknow. Singh MK *et al* (2010)[20] reported 92.8% coverage of two doses of tetanus toxoid in rural areas of Lucknow**.** Similarly, Singh D *et al* (2002)[14] reported that 89.2% coverage of tetanus in rural area of Ghaziabad, UP. Under reporting in our study may be due to fact that we did not consider single dose tetanus toxoid as complete if one had received two doses in previous pregnancy. There may be other factors too as some study reported tetanus toxoid coverage whether one or two doses were received and there may be regional variations too. We also found that 79.1% of RDWs were received one hundred tablets of IFA during their recent pregnancy. In NFHS III, (2005-06)[12] reported 65% women received IFA

though only 23% taken for at least 90 days. In U.P the distribution of IFA was far below the national average**.** Baseline Facts-Uttar Pradesh, Govt. of U.P. Document (2005-07)[17] reported that the distribution of 100 IFA tablets to RDW was not satisfactory across the state. On an average only 10% - 30% RDW received 100 IFA tablets. Same report also said that 41.26% mothers consumed one hundred tablets of IFA in rural Lucknow. Also, Singh D *et al* (2002)[14] reported 22.5 % mothers took 100 tablets of IFA in rural area of Ghaziabad, UP. Contrast to relative older studies, newer studies are reported higher level of consumption of these tablets. In a study by Singh MK *et al* (2010)[20] reported 42.6% coverage of IFA tablets in rural areas of Lucknow. Though we found 79.1% RDWs were received one hundred of IFA in our area, we are still far away from 100% coverage. In this study we found that approximate 25 to 30% mothers either did not go health care centre or no health care worker came to their home during post natal period. This is higher than reported lack of post natal care in 42% of women in NFHS III, India (2005-06)[12]. Baseline Facts-Uttar Pradesh, Govt. of U.P. Document (2005-07)[17] revealed that post natal check-up after delivery was not a common practice and post natal checkup at Government facility was even lower. Neither the women nor the workers cared for post natal check-up, nor did they give any importance to it. We found that only 27.7% RDW started breast feeding within one hour of delivery. Similarly, Mahmood *et al* (2012)[21] reported 22% mothers started breast feeding within one hour of delivery in rural area of Bareilly and Singh MK *et al* (2010)[20] reported 25% RDW initiated breast feeding within one hour of birth in rural areas of Lucknow while Madhu *et al* (2009)[22] reported that 44% of the mothers initiated breastfeeding within 30 minutes with home delivery and 38% with caesarean delivery. We found that age less than 30 years, higher socioeconomic strata, education level higher than matriculation of RDWs and if they were from general castes and joint families, they were likely to complete their ANC cares and these association were statistically significant. Pallikadavath *et al* (2004)[23] reported that educated women had more access to health services. NFHS III (2005-06)[12] reported that ANC was lowest for ST mothers and highest was for mothers who did not belongs to OBC and SC/ST. This is also in accordance to Kavitha *et al* (1997)[24] who reported that women from higher castes were more likely to avail antenatal care**.** In a study by Venkatesh *et al* (2005)[25] observed that utilization of antenatal services was higher among women 18-29 years age group. Similarly NFHS III (2005-06)[12] reported that older women aged 35-49 years compared to younger women received much less antenatal care for their most recent birth. Nomita *et al* (2006)[26] revealed a statistically significant reduction in the proportion of women obtaining ANC with increasing age. These observations are in accordance to our study.

CONCLUSION

Age less than 30 years, higher socioeconomic strata, education level higher than matriculation of RDWs and if they were from general castes and joint families, they were likely to complete their ANC cares. We are still far away from health for all. To achieve SDG, a multi prong approach is need of hour.

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CONTRIBUTORS

AKY, PG, MRS and KKY conceptualized and designed the study, designed data collection instruments. AKY collected data. KKY and AKY did analysis of data and wrote manuscript. PG, MRS, DP and SS helped in writing of manuscript. All authors approved the final manuscript.

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